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ADDENDUM NO. 1
June 20, 2024

Taxiway A Reconstruction – Phase 5
Duluth International Airport
Duluth Airport Authority
AIP No. 3-27-0024-079-2024
SP No. A6901-22X
City of Duluth No. 24-4409
SEH No. DULAI 174212

De-Icing Tank Pad
Duluth International Airport
Duluth Airport Authority
AIG No. 3-27-0024-079-2024
SEH No. DULAI 173199

Midfield Ramp Repairs – Phase 2
Duluth International Airport
Duluth Airport Authority
SP No. A6901-216
SEH No. DULAI 175226

From: Short Elliott Hendrickson Inc.
3535 Vadnais Center Drive
St. Paul, MN 55110-3507
651.490.2000

To: Document Holders

DOCUMENT HOLDERS on the above-named project are hereby notified that this document shall be appended to, take precedence over and become part of the original bidding documents dated May 29, 2024 for this work. Bids submitted for the construction of this work shall conform to this document.

This addendum consists of the attached Pre-Bid Meeting Minutes, revised bid form reflected in BidExpress, revisions to the specifications, and revisions to drawings.

Changes to Bidding Requirements:

1. Document 00 41 00 – Bid Form: The bid form has been revised to reflect updated project quantities and revised bid item descriptions. The Bid Form is updated in BidExpress.

Changes to Specifications:

2. Specification 02 60 10.mn – Handling of Contaminated Soils – Debris – Groundwater – Updated to reflect existing project conditions. DELETE in its entirety and REPLACE with the attached revised specification section.

3. INSERT attached new Specification P-151 – Clearing and Grubbing

4. INSERT attached new Specification P-610 – Miscellaneous Concrete Structures

Changes to Appendices:

5. Appendix L – Stormwater Pond Testing Results – Updated to include additional test results. DELETE in its entirety and REPLACE with the attached updated appendix.

Changes to Drawings:

6. Drawing G5.03 State of Estimated Quantities – Phase 5: Updated to reflect miscellaneous bid item description revisions and updated SEQ notes. DELETE in its entirety and REPLACE with the attached revised drawing.

7. Drawing G5.04 State of Estimated Quantities – Phase 5: Updated to reflect miscellaneous bid item description revisions and updated SEQ notes. DELETE in its entirety and REPLACE with the attached revised drawing.

8. Drawing G5.05 Earthwork Summary – Phase 5 – Added noted to reflect backfill incidental to rock and muck excavation. DELETE in its entirety and REPLACE with the attached revised drawing.

9. Drawing C0.50 Demolition Plan – Phase 5 – Reflect fuel pipe vault to be removed. DELETE in its entirety and REPLACE with the attached revised drawing.

10. Drawing C5.01 Storm Sewer Plan – Phase 5 – Updated to reflect existing storm sewer pipe sizes. DELETE in its entirety and REPLACE with the attached revised drawing.

11. Drawing C5.02 Storm Sewer Plan – Phase 5 – Updated to reflect existing storm sewer pipe sizes. DELETE in its entirety and REPLACE with the attached revised drawing.

12. Drawing C5.04 Storm Sewer Plan – Phase 5 – Updated to reflect existing storm sewer pipe sizes. DELETE in its entirety and REPLACE with the attached revised drawing.

13. Drawing C5.05 Storm Sewer Plan – Phase 5 – Updated to reflect existing storm sewer pipe sizes. DELETE in its entirety and REPLACE with the attached revised drawing.

14. Drawing C5.06 Storm Sewer Plan – Phase 5 – Updated to reflect existing storm sewer pipe sizes. DELETE in its entirety and REPLACE with the attached revised drawing.

15. Drawing C5.07 Storm Sewer Schedule – Phase 5 - Tabulation updated to reflect correct storm sewer structure sizes. DELETE in its entirety and REPLACE with the attached revised drawing.

16. Drawing C5.07A Storm Sewer Details – Phase 5 – Insert attached new plan sheet to be included in project plan set.

17. Drawing C5.08 Pond Expansion – Existing Conditions – Phase 5 – Updated to provide additional detail for pond expansion construction. DELETE in its entirety and REPLACE with the attached revised drawing.

18. Drawing C5.09 Proposed Pond Expansion Plan – Phase 5 – Updated to provide additional detail for pond expansion construction. DELETE in its entirety and REPLACE with the attached revised drawing.

19. Drawing C5.10 MH-1 Cast-in-place General Notes – Phase 5 – INSERT attached new plan sheet to be INCLUDED in project plan set.

20. Drawing C5.11 MH-1 Cast-in-place Details – Phase 5 – INSERT attached new plan sheet to be INCLUDED in project plan set.

21. Drawing C5.12 MH-1 Cast-in-place Details – Phase 5 – INSERT attached new plan sheet to be INCLUDED in project plan set.

22. Drawing C6.0 Water Main Reconstruciton – Phaser 5 – Plan sheet updated to reflect callout of “Adjust Valve Box” for two existing valves at the site where finished grade will be lowered. DELETE in its entirety and REPLACE with the attached revised drawing.

Attachments:
Updated Bid Form reflected in BidExpress
Pre-Bid Meeting Minutes
Updated Specifications
Updated Drawings

Note: Receipt of this Addendum No.1, dated June 20, 2024 shall be acknowledged on BidExpress. Failure to do so will not allow Bidder to submit Bid.

END OF ADDENDUM

Building a Better World for All of Us®

PRE-BID MEETING MINUTES

RE: Taxiway A Reconstruction Phase 5
Duluth International Airport (DLH)

Date of Meeting: Tuesday, June 11, 2024

Project Manager: Jarrod Nelson

Time of Meeting: 2:30 p.m.

SEH No.: DULAI 174212 16.00

Location of Meeting: Virtual MS Teams / Airport Conference Room

Attendees: See attached attendance roster

The following items are to be discussed at the above referenced meeting:

I. **Project Representatives**

A. Owner Representatives – Duluth Airport Authority
1. Mark Papko – DAA, Director of Operations
2. Ryan Welch – DAA, Airside Manager
3. Matt Snell – DAA, Public Safety Manager
4. Paul Sinnot – DAA

B. Engineer Representative – Short Elliott Hendrickson, Inc.
1. Shawn McMahon, PE (MN, WI, IA, SD) – SEH, Project Principal, 651.925.7541
2. Jarrod Nelson, PE (MN, IA, ND, SD) – SEH, Project Manager, 651.325.8161
3. Adinda Van Espen, PE (MN, ….) – SEH, Project Manager, 320.428.3654
4. Mark Giddings, PE – Burns & McDonnell, Electrical Project Manager
5. Derek Bruemmer, EIT – Burns & McDonnell

II. **Project Information**

A. Please send all bid questions via email to:
jnelson@sehinc.com

B. Project Documents: Bidding Documents are available to view and download at no cost as www.bidexpress.com. Bidders must create a free account with Bid Express®; and login to search for city projects (search by “City of Duluth” or bid number). Bids will only be received electronically through Bid Express®.

C. Project Award: Project award will be based upon overall lowest base bid cost and available funding at the time of bid opening.

D. Please review **Article 3 – Qualifications of Bidders** included in Instructions to Bidders of the Project Manual for required documents to be submitted during the bid

1. Bid Security (5%, sent separately via email prior to bid opening), Bid Item Prices, Acknowledgement of Addenda, Declaration of Non-Collusion, Responsible Contractor Verification & Cert. of Compliance, First Tier Subcontractor List, and DBE certification reflecting intended DBE utilization percentage.

2. Items to be submitted within 72 hours after bid include: Buy American Certification, required supporting DBE documentation.

Major Items of Work Include:

Schedule A - Taxiway A Reconstruction – Phase 5 - 34,000 SY 13-inch P-501 PCC, 3,000 SY 12-inch P-501 PCC, 4,500 tons bituminous pavement (State Spec., P-401 and P-403 mixes), 60,000 CY excavation, 11,000 CY P-209 crushed aggregate base, 26,000 CY P-154 granular borrow, pavement marking, turf restoration, conduit, airfield lighting and signage, 3,500 LF storm sewer with storm structures, and 7,500 LF drain tile.

Schedule B - De-icing Storage Tank Pad - Construction of a concrete pad to support a 3,000-gallon tank for de-icing fluid. Project also includes minor grading and drainage improvements.

Schedules C & D - Midfield Ramp Repair – Phase 2 - Removal of 2,600 SY existing PCC airfield pavement, 1,800 CY excavation, placement of 1,500 CY crushed concrete base, installation of 3,000 SY 12-inch P-501 PCC pavement, and installation of 700 LF 6” diameter draintile . Project work also includes miscellaneous removals, pavement markings, turf establishment, and erosion control measures.

E. Anticipated Project Schedule:
1. Receive Bids: June 26, 2024
2. Anticipated Contract Award: July 2024
3. Anticipated Start of Construction: May 19, 2025 (125 Calendar Days)
4. No Construction or Contractor Access during DLH Airshow: July 3 – July 7, 2025
5. Anticipated Substantial Completion: September 20, 2025

F. Phasing (See Construction Safety Plan Sheet):

1. Phase 5A, Phase 5A-1, and Phase 5B work shall be complete in 125 calendar days, substantially complete by September 20, 2025.

Phase 5 construction will require that the contractor periodically pull back construction operations at the southerly limit of the proposed Taxiway R3 pavement to accommodate aircraft operations. Construction operations at the west end of the Midfield Ramp (near the Cirrus facility) will need to accommodate aircraft operations, requiring that the contractor periodically pull back construction operations at that location.

Phase 5A-1 construction requires that Runway 9/27 shall be closed for 60 consecutive hours for this phase upon approval from the DAA and other closures of Runway 9/27 for this phase shall be performed in 14 night closures approved by the DAA. Phase 5A-1 construction will also include water main reconstruction inside the Runway Safety Area.

Phase 5B work consists of stormwater pond expansion on the north side of the airfield.

2. Deicing Storage Tank Pad work shall be complete in 14 calendar days, substantially complete by October 15, 2025.

3. Midfield Ramp Repair – Phase 2 work shall be complete in 70 calendar days, substantially complete by September 20, 2025, including both the base bid work and bid alternate work.

G. Airport Security:
   1. Bidders must thoroughly examine Project Documents for security related requirements.
   2. Airport shall remain in full operation during construction except where required for project specific closures
   3. Airfield Safety and Security Training will be held at scheduled times, where the following topics will be discussed:
      a. Project Signage for Haul Routes and Site Access
      b. Procedure for Receipt of Deliveries
      c. Airfield and Site Security
      d. Badging Requirements
   4. Failure to comply with safety and phasing plans that results in a runway incursion or vehicle deviation will result in a penalty of $1,000. Security violations could result in a penalty of up to $10,000 per occurrence.
   5. Contractor is required to hire a third-party Professional Security Firm, for which DAA approval of security firm is required prior to contract award.

H. Access and Haul Routes
   1. Radio escort required across Tower Ramp to control traffic. No additional compensation will be made for hauling delays due to aircraft traffic.

I. Staging and Storage
   1. Contractor can pre-position equipment for project start. No contractor presence at airport allowed during DLH Airshow.

J. Quality Control Plan Required

III. **Contract Requirements**

A. Construction Staking – Contractor's Responsibility

B. Quantity surveys are required to be submitted for payment. As-built survey data to be collected and forwarded to Engineer. See Field Engineering in project manual.

C. Disadvantaged Business Enterprise – DBE Goal of 8.5%

D. Wage Rates
   1. Equal Employment Opportunity (EEO)
   2. State and Federal prevailing wage rate requirements

E. Buy American Certification

F. Permits
   1. City of Duluth Stormwater permit
      a. Paid for by the contractor.

2. NPDES permit
   a. Paid for by the contractor.
3. City of Duluth Haul Route Application
   a. Paid for by the contractor.
4. City of Duluth Grading Permit
   a. Paid for by the contractor.

IV. Project Work

A. General Scope
1. Batch Plant Setup – Mobilization Limited to 10% of total cost
2. Installation of Traffic Control Devices/Signage and Barricades
3. Covering of existing airfield taxiway and runway signs
4. Erosion Control BMP installation

B. Civil Scope
1. Concrete and Asphalt Pavement, Earthwork and Storm Sewer System Removals
2. Storm Sewer/Drain Tile Construction, Cast-in-Place Storm Sewer Structure
3. Stormwater Pond Expansion
4. Water Main Reconstruction
5. Pavement Construction
6. Striping
7. Seeding and Hydromulching
8. Disposal of Contaminated Soils and Materials at Abandoned Military Fuel Piping
9. Regulated Asbestos Removal at Abandoned Military Fuel Piping

C. Electrical Scope
1. Removal of existing taxiway edge lighting and signage
2. Existing utilities – locate, flag, and protect existing utilities. Pull back, protect, and reconnect existing cable. Reconstruction required for designated utilities.
3. Installation of new lighting, signage, and circuitry.
4. Routing of new circuit homerun duct banks and installation of new handholes adjacent to existing circuit homerun duct bank. Temporary jumpers required for construction phasing are considered incidental to mobilization. Existing circuit homerun duct bank to be demolished upon cutover of new homerun circuitry.
5. Detailed Schedule and Phasing Submittal Required
6. Temporary taxiway edge lighting and signage

D. Restoration
1. Locations: disturbed areas, storage areas, haul roads
2. Restored to equal or better conditions

V. Addendum

A. Addendum items anticipated to include:
1. Pre-Bid Meeting Minutes
2. Minor adjustments to project schedule and phasing durations
3. Incorporation of storm sewer cast-in-place structure design
4. Additional definition for stormwater pond expansion work

VI. Questions

c:

PRE-BID MEETING ATTENDANCE - TAXIWAY A RECONSTRUCTION - PHASE 5

Name	Email
Mark Papko	mpapko@duluthairport.com
Ryan Welch	Rwelch@duluthairport.com
Paul Sinnott	psinnott@duluthairport.com
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Heath Line	heath@kgmcontractors.com
Mike Wolf	mwolf@duluthmn.gov
Jon Carlson	Northland

SECTION 02 60 10

HANDLING OF CONTAMINATED SOIL/DEBRIS/GROUNDWATER

PART 1 GENERAL

1.01 SUMMARY

A. This section includes excavation, handling and disposal of contaminated soil, groundwater, dewatering, and other materials during Taxiway A Reconstruction – Phase 5. All contaminated material found on the Project shall be handled according to the following section. The Contractor shall comply with all applicable safety regulations imposed by federal and state law for handling pollutants, contaminants, or hazardous substances, wastes, or materials, including but not limited to 29 CFR PART 1910 and all subsequent revisions thereof.

B. The following is not included in this Section:
   1. Asbestos and heavy metals.
   2. Abrasives, additives, or coating chips generated from construction.

C. Related Sections:
   1. Section 04 41 33 – Removing Pavement and Miscellaneous Structures
   2. Section 31 11 00 – Clearing and Grubbing
   3. Section 31 23 16 – Structure Backfills

D. Measurement:
   1. Contaminated soil removed from the site will be measured based on tonnage of material weighed and certified slips from certified facility chosen by the contractor.
   2. Removal and disposal of the underground abandoned fuel piping and concrete pipe vault will be measured by the lump sum for all costs associated with the Item.
   3. Removal and disposal of associated oil/water mixture in piping will be measured by the gallons of material removed. In the event oil/sludge mixture is present in the piping, removal and disposal will be measured by the gallons of material removed.
   4. Dewatering will be measured by the lump sum for all costs associated with the Item.
   5. There is no separate measurement for temporary fencing around contaminated materials.
   6. There is no separate measurement for materials needed to stockpile contaminated materials or to line utility trenches with 6 mil polyethylene sheeting if petroleum impacts are present in the base and sidewalls of the trench.

E. Payment:
   1. Costs related to encountering contaminated soils or debris during the Project, including possible additional excavation and resulting additional backfill, stockpiling, removing, and continuing on and beneath impervious structures or materials, as authorized by Engineer, will be paid by the tons of removed material. This includes anything beyond the estimated quantity as shown in the contract documents. The contractor shall provide weight slips from disposal site to confirm payment.
   2. Costs related to removal and disposal of underground abandoned fuel piping and associated concrete pipe vault will be paid on a lump sum.
   3. Removal and disposal of associated oil/water mixture or oil/sludge mixture will be paid by volume of removed material based on established unit price.
   4. Costs related to dewatering, of any kind, will be paid by lump sum. This includes providing, installing, maintaining, and removing the system. Additionally, it covers any associated permitting fees or regulations needed to be provided to operate the system.
   5. No adjustment in Contract time or price will be made for Work stoppage and securing of Site.
   6. <u>There is no separate payment or adjustment for temporary fencing around contaminated materials. This is incidental to the project.</u>

7. There is no separate payment or adjustment for materials needed to stockpile contaminated materials or lining of utility trenches with 6 mil polyethylene sheeting if petroleum impacts are present in the base and sidewalls of the trench. This is incidental to the project.

1.02 REFERENCES

A. MDH - Hazardous Waste Disposal Rule 7045

B. MPCA - LUST Consultant Guidance for Petroleum UST/AST Investigation and Cleanup

C. OSHA - Hazardous Waste Operations and Emergency Response 1910.120

1.03 QUALITY ASSURANCE

A. Health and Safety:
   1. Excavation and stockpiling of contaminated soils and debris is governed by OSHA Standard 1910.120.
   2. Comply with Minnesota Pollution Control regulations for soil storage and disposal.
   3. Comply with local, state, and federal regulations pertaining to handling of the underground abandoned fuel piping and any associated oil/water mixture within the piping or petroleum contaminated soils from petroleum releases (MPCA Guidance for LUST Release Cleanup).
   4. File a Site Safety Plan with Engineer for acknowledgement.

B. Response Action Plan (RAP)
   1. Refer to the RAP provided in the project documents in **Appendix K.**

PART 2 PRODUCTS

2.01 MATERIALS

A. Reinforced Woven Polyethylene (PE) Sheeting:
   1. Tensile Strength: 110/85 psi, all directions.
   2. Tear Strength: 25/30 psi.
   3. Thickness: 6 mil base, 4 mils cover.
   4. Impermeable, non-adsorbent, UV resistant, rot and mildew proof.
   5. Supplier: McMaster Carr 8552K36 or approved equal.

PART 3 EXECUTION

3.01 DESCRIPTION OF CONTAMINATED SOIL, GROUNDWATER, AND OTHER MATERIALS

A. The western portion of the site is part of the larger Fuel Transfer Area of Concern (AOC) that was operated by the United States Air Force to transfer fuel to and from aircraft up until the early 1980s. Petroleum contaminated soil and groundwater are present within and downgradient of the Fuel Transfer AOC. Based on previous investigations, contaminated soil is associated with the former fuel piping, dispensers and metering vaults. Portions of the fuel piping are present at the site. The piping reportedly consists of an 8-inch fuel transfer pipe and a 6-inch defueling pipe. The piping is reported to consist of coated steel and be 5 to 8 feet below grade. Portions of the piping are also reported to contain an oil/water mixture. It is not known if an oil/sludge mixture is also present. A 5-foot diameter, 11-foot-deep concrete pipe vault is also reportedly located at the bend in the piping west of the existing connector pavement where the east/west run of piping turns south. An electrical line associated with the fuel piping is also reportedly asbestos containing material (ACM) and will be managed/disposed of in accordance with Section 2 82 20 – Regulated Asbestos Removal.

   An environmental investigation was conducted for the Taxiway A Reconstruction – Phase 5 site in 2024 that included collection and chemical analyses of soil samples near the abandoned fuel piping or

downgradient of the other underground components for the Fuel Oil AOC. During the investigation, ten soil samples were analyzed for volatile organic compounds (VOCs), gasoline/diesel range organics (GRO/DRO), and per- and polyfluoroalkyl substances (PFAS) compounds. Borings were advanced to maximum depths ranging between 11 and 15.5 feet bgs. No contaminants were detected at concentrations exceeding the MPCA recreational/residential Soil Reference Values (r SRVs), the MPCA Screening Soil Leaching Values (SLVs) or Unregulated Fill Criteria of 100 milligrams per kilogram for GRO/DRO; however, detectable concentrations of PFAS were detected.

During the 2007 Remedial Investigation conducted to evaluate the Fuel Transfer AOC, photoionization detector (PID) headspace readings between 24.3 and 302 parts per million (ppm) and DRO (up to 63 milligrams per kilogram [mg/kg]) were observed in soil along the abandoned fuel piping.

The Contractor should assume that all Project excavation operations could potentially encounter Contaminated/Regulated Soil or Debris.

Groundwater was encountered at approximately 15 feet below grade during the 2024 site investigation but there was insufficient volume to sample. However, groundwater was encountered as shallow as 8 to 10 feet bgs during the 2007 Remedial Investigation and was found to be contaminated with the following constituents:

- Benzene up to 17 micrograms per liter (ug/L)
- DRO up to 2,000 ug/L
- Ethylbenzene up to 65 ug/L
- 1,3,5-Trimethylbenzene up to 70 ug/L
- Total xylenes up to 199 ug/L

Soil that meets the Minnesota Pollution Control Agency (MPCA) definition of unregulated fill (https://www.pca.state.mn.us/sites/default/files/c-rem1-01.pdf) was encountered during the 2024 environmental investigation (soil borings B-3 thru B-6 and B-14). Unregulated soil is not considered contaminated and will be re-used onsite.

Regulated Soil was encountered near the fuel piping during the 2007 Remedial Investigation. Per MPCA's Best Management Practices for the Off-Site Reuse of Unregulated Fill dated March 2024, Regulated Soil has the following characteristics:

- Contains solid waste, debris, or asbestos containing material or exhibits visual staining and chemical odors.
- Organic vapors above 10 parts per million (ppm), as measured by a PID;
- Greater than 100 mg/kg DRO/gasoline range organics (GRO); or
- Contaminant concentrations greater than the MPCA's residential or recreational Soil Reference Values (RSRVs) and Screening Soil Leaching Values (SLVs). Naturally occurring concentrations of some metals, including arsenic, selenium or copper, can exceed SRVs or SLVs. Such soils are not considered impacted in the absence of a contaminant source or other field or laboratory indications of contamination.

Regulated soil that is petroleum impacted and has PID readings between 10 and 200 ppm may be re-used on site in certain circumstances as directed by the Engineer. Excess Regulated Soil, if encountered, will be properly disposed of offsite.

B. A Response Action Plan (RAP) has been prepared for this project. The RAP was written to conform to these provisions. The RAP is included in the **Appendix K** of the Project Manual. Previous investigation data including the previous Phase I Environmental Technical Memo and Environmental Investigations are available upon request.

3.02 EXCAVATION

A. Environmental monitoring will be conducted 1) during removal of the portion of the abandoned underground fuel piping that runs below proposed paved areas for the project and 2) during excavation for the storm water infrastructure.

B. The Contractor will notify the Engineer no less than three (3) working days before beginning removal of the abandoned fuel piping or beginning excavation for the storm water infrastructure. The Engineer will arrange for the DAA's Environmental Consultant to be at the site to screen, observe, and document the excavation and removal of contaminated material. The Contractor shall remove abandoned fuel piping or excavate for installation of the storm water infrastructure only when DAA's Environmental Consultant is present. DAA's Environmental Consultant will determine if conditions encountered during excavation are consistent with the Contaminated Soil category for the excavation area.

The fuel piping and vault will be removed by a MPCA-certified contractor in accordance with applicable federal, state, and local requirements. Based on the 2007 Remedial Investigation, the portions of the fuel piping that were exposed contained a fuel oil and water mixture; therefore, containment shall be set up below the piping to capture any liquid. The piping and any associated liquid/sludge will be removed and appropriately disposed of offsite. If liquid spills onto the surrounding soil, the impacted soil shall be excavated and stockpiled for screening/sampling by DAA's Environmental Consultant. The removed piping and contents will be managed at an appropriately permitted recycling and/or disposal facility. Contractor will manage and transport piping and vault and piping/vault contents in accordance with applicable US DOT Hazardous Materials Transport requirements. Contractor will submit MPCA Ten-Day advance notice prior to removing the fuel piping. Following removal, the Contractor will provide a draft "UST Notification Form", from the MCPA's Underground Storage Tanks program to the Engineer within 15 days after removing the piping.

In the event PID readings above 10 ppm are observed in the base or sidewalls of the storm water utility trenches, the Contractor shall line that portion of the trench with 6 mil polyethylene sheeting to limit contaminant vapor migration. To line the trench, a layer of 6 mil poly sheeting will be draped over the sidewalls and base of the excavation. Between 1 to 2 feet of clean fill will be placed at the base as pipe bedding, followed by the new storm sewer pipe, and an additional 1 to 2 feet of clean fill on top of the pipe, creating a buffer of clean backfill around the pipe. The polyethylene sheeting will then be wrapped over the top of the fill and storm sewer pipe.

If contaminated groundwater requires dewatering or if stormwater/snow melt comes in contact with contaminated soil and requires dewatering, the Contractor is responsible for obtaining all dewatering discharge permits for contaminated groundwater/surface water. DAA's Environmental Consultant will assist with providing previous sampling results and completing permit-required discharge monitoring and reporting.

The Contractor is responsible for all Contaminated Soil and Material landfill disposal approvals. The Contractor will notify the Engineer at the Preconstruction Conference if additional laboratory analytical sampling is required by the landfill(s) to accept the waste. The DAA's Environmental Consultant will be responsible for collecting and analyzing any additional laboratory samples required by the Engineer. The Contractor should be aware that typical sample analytical turnaround time is ten-business days (Monday through Friday).

The Engineer must approve excavation of any soils beyond the Project limits of disturbance.

Imported fill soil must be demonstrated to be contaminant free in accordance with MPCA's requirements for Unregulated Fill to the satisfaction of the Owner and Engineer. The Contractor shall document the source and volume of fill soil and provide associated analytical testing results to the Engineer prior to importing fill soil to the Project. For import sources that are determined to have no known or potential sources of contamination through environmental due diligence conducted by others, the Engineer may, after their review of the due diligence data, accept the import fill soil without associated analytical testing results. If the Engineer determines additional analytical data is required

to characterize the import fill soil, the Contractor shall be responsible for collecting and chemically analyzing the additional samples.

C. Contaminated Soil Category Requirements. The Contractor shall handle soil from the contaminated soil categories as specified below.
   1. Regulated Soil – The Contractor shall dispose of excess Regulated Soil excavated for the project at a Minnesota permitted industrial or solid waste landfill(s).
   2. Undesignated Soil - The Contractor shall be prepared to temporarily stockpile soil for additional testing if field screening results indicate that different contaminants than those identified during previous environmental investigation are potentially present. The Contractor shall be prepared to manage Undesignated Soil in accordance with Regulated Soil requirements if the City's Environmental Consultant or Engineer determines that the Undesignated Soil is contaminated (e.g., based on elevated field screening results, laboratory analytical results, debris, etc.).

3.03 CONTAMINATED SOIL AND MATERIAL HANDLING, STORAGE, AND DISPOSAL

A. Contaminated Soil and Material Approval and Documentation Requirements

The Contractor shall select a Minnesota permitted industrial or solid waste landfill(s) for disposal of Contaminated Soil and Material. The Contractor is responsible for obtaining landfill approval to accept material. The Contractor shall complete the following documentation for landfill approval and disposal tracking:
1. Complete a waste profile form provided by the landfill.
2. Submit the completed waste profile form to the DAA's Environmental Consultant for review and signature.
3. Submit the signed waste profile form and analytical data to the landfill.
4. Receive written approval from the landfill (e-mail is acceptable) and submit the approval to the DAA's Environmental Consultant before hauling material to the landfill(s).
5. Provide copies of manifests to the Engineer before hauling material to the landfill(s) and arrange with the DAA's Environmental Consultant for an authorized representative to be available to sign contaminated soil manifests as trucks leave the Project.
6. Submit copies of landfill scale tickets and corresponding manifests for each load hauled to the landfill(s) to the DAA's Environmental Consultant daily during hauling.

B. Contaminated Soil Excavation and Removal of Contaminated Materials

The DAA's Environmental Consultant must be present at the site before the Contractor begins excavating for stormwater utilities or removing fuel piping or the fuel vault. The Contractor will allow the DAA's Environmental Consultant access to all Project areas to observe and field screen soil during excavation.

The Contractor shall be prepared to segregate contaminated and potentially contaminated material for additional field screening and analytical testing as directed by the DAA's Environmental Consultant. The DAA's Environmental Consultant will perform any additional testing and analysis. The Contractor shall be prepared to dig test pits as directed by the Engineer in order for the DAA's Environmental Consultant to access soil to collect samples for analysis. If the DAA's Environmental Consultant determines for any reason that excavated material cannot be directed for reuse or disposal, the Contractor shall temporarily stockpile the material.

The Contractor shall manage open excavation areas to prevent to the extent possible, the flow of rainwater runoff into the excavation or the flow of contaminated groundwater out of the excavation. Water that comes into contact with contaminated soil is considered contaminated. The Contractor shall manage water run-off and run-on (for example: minimize the drainage area around the excavation, place berms up gradient of the excavation to divert runoff and/or cover the excavation). If water needs to be removed from the excavation, the Contractor shall use procedures described in Section 3.04-Contaminated Groundwater Handling, Storage and Disposal of this Specification.

C. Stockpiling of Contaminated Material

If excavated Contaminated Soil or Concrete cannot be hauled to the landfill before the end of the workday, the Contractor shall temporarily stockpile the contaminated soil.

1. DAA's Environmental Consultant shall approve all stockpile location(s).
2. The Contractor shall place contaminated soil from separate contaminated areas (as determined by the DAA's Environmental Consultant) into separate stockpiles.
3. The Contractor shall stockpile the contaminated soil on minimum 6 mil plastic and cover the stockpile with minimum 6 mil reinforced plastic. The stockpile cover will be securely anchored. Every stockpile will be covered as soon as work on the stockpile has been completed during the day, or at a minimum at the end of the working day. The stockpile will be constructed to protect the stockpile/containment area the flow of rainwater into the stockpile or the flow of contaminated water out of the stockpile/containment area.
4. The Contractor shall surround the stockpile with temporary fencing if the DAA's Environmental Consultant determines that additional security measures are necessary. The Contractor shall be responsible for the maintenance of the stockpile cover (and fencing if installed) for the duration of the Contract or until all contaminated materials are removed. The Contractor shall inspect the stockpile a minimum of once per week and document the stockpile(s) condition on a weekly tracking form that the Contractor will provide to the DAA's Environmental Consultant each week.
5. The Contractor shall construct saturated soil stockpiles to contain free liquids. The Contractor shall manage the stockpiles so that soil sufficiently dries to pass the paint filter test. The Contractor will collect free liquids for disposal in accordance with S-Contaminated Groundwater Handling, Storage and Disposal. Alternatively, the Engineer may approve mixing saturated contaminated soil with dry contaminated soils or amendments so that the soil passes the paint filter test.

   If the Contractor elects to move a secured stockpile for any reason, the cost of moving and re-stockpiling the soil shall be incidental.

D. Contaminated Soil and Other Material Disposal

The Contractor shall haul Contaminated Soil and Concrete removed for the project to a Minnesota permitted solid waste or industrial landfill(s) for use by the landfill as daily cover if the soil meets the landfill's daily cover criteria, or for disposal in a cell by the landfill if the material does not meet daily cover criteria.

1. The Contractor shall cover (tarp) loads of contaminated soil while in transit.
2. The Contractor shall not haul soil that contains free liquids to the landfill(s).
3. The Contractor shall minimize track out of contaminated soil from the project. Track out from contaminated soil areas will be treated as contaminated soil.

E. Contaminated Soil Contingency Plan

The Contractor shall follow the procedure outlined in Construction Contingency Plan (CCP) contained in the RAP in the event on-site observations indicate contaminated materials or contaminated soil as listed in CCP are unexpectedly encountered.

After the DAA's Environmental Consultant has approved work to resume in the unexpected, contaminated area, the Contractor shall complete work in accordance with S-Contaminated Soil Handling, Storage, and Disposal or as directed by the DAA's Environmental Consultant.

3.04 CONTAMINATED GROUNDWATER HANDLING, STORAGE AND DISPOSAL

A. If groundwater dewatering is necessary or surface water or snow melt comes in contact with Contaminated Soil and requires removal, the Contractor shall be responsible for obtaining all necessary permits and completing required documentation reports for discharge of contaminated groundwater. The Contractor shall submit the permit application(s) to the DAA's Environmental Consultant for review and approval before submitting the application(s) to the permitting authority.

B. Groundwater or impacted stormwater removed by the Contractor from within the Project limits of disturbance shall be discharged to the sanitary sewer under a sanitary permit and/or to the storm sewer under a National Pollutant Discharge Elimination System/State Disposal System Industrial (Contaminated Groundwater) Pump-Out Permit. Groundwater containing excess contaminant concentrations as determined by the permitting authority shall not be directly discharged to the storm and/or sanitary sewer.

C. The Contractor shall notify the DAA's Environmental Consultant no less than three (3) working days prior to beginning Project dewatering.

D. The DAA's Environmental Consultant will complete necessary sampling and testing of the dewatered groundwater as required by the permitting authority for discharge.

E. The Contractor shall measure and document the rate of groundwater discharge during dewatering. The Contractor shall record the rate of discharge daily and shall submit a discharge report to the DAA's Environmental Consultant weekly. The Contractor shall provide DAA's Environmental Consultant reasonable access to the effluent discharge sampling port.

F. The Contractor shall complete and submit discharge monitoring reports required by the permit(s) to permitting authority(s) and the DAA's Environmental Consultant.

G. In the event contaminant concentrations in a discharge sample exceed permit limits, the Contractor shall immediately stop discharging. The Contractor shall not re-start discharging until a groundwater treatment system has been designed and implemented to sufficiently treat the contaminated groundwater to meet permit limits and after the DAA's Environmental Consultant has given approval to restart dewatering.

H. The Contractor shall be prepared to treat contaminated groundwater prior to discharge with a portable groundwater treatment system if contaminant concentrations are determined to exceed permit limits. Treatment of the contaminated groundwater with a portable groundwater treatment system will include but not limited to the groundwater treatment equipment, equipment mobilization and demobilization, equipment installation, equipment operation and maintenance, and free product management and disposal. The portable groundwater treatment system shall have a treatment capacity equal to or greater than the rate of temporary construction dewatering. The groundwater treatment system shall include an effluent discharge sampling port. The Contractor shall provide a minimum of one on-site operator at all times during operation of the groundwater treatment system. The on-site operator will be trained and experienced in operating and maintaining the groundwater treatment system and will be responsible for maintaining the system in proper working order.

END OF SECTION

Item P-151 Clearing and Grubbing

DESCRIPTION

151-1.1 This item shall consist of clearing or clearing and grubbing, including the disposal of materials, for all areas within the limits designated on the plans or as required by the Resident Project Representative (RPR).

a. Clearing shall consist of the cutting and removal of all trees, stumps, brush, logs, hedges, the removal of fences and other loose or projecting material from the designated areas. The grubbing of stumps and roots will not be required.

b. Clearing and grubbing shall consist of clearing the surface of the ground of the designated areas of all trees, stumps, down timber, logs, snags, brush, undergrowth, hedges, heavy growth of grass or weeds, fences, structures, debris, and rubbish of any nature, natural obstructions or such material which in the opinion of the RPR is unsuitable for the foundation of strips, pavements, or other required structures, including the grubbing of stumps, roots, matted roots, foundations, and the disposal from the project of all spoil materials resulting from clearing and grubbing.

c. Tree Removal. Tree Removal shall consist of the cutting and removal of isolated single trees or isolated groups of trees, and the grubbing of stumps and roots. The removal of all the trees of this classification shall be in accordance with the requirements for the particular area being cleared.

CONSTRUCTION METHODS

151-2.1 General. The areas denoted on the plans to be cleared and grubbed shall be staked on the ground by the Contractor as indicated on the plans.

The removal of existing structures and utilities required to permit orderly progress of work shall be accomplished by local agencies, unless otherwise shown on the plans. Whenever a telephone pole, pipeline, conduit, sewer, roadway, or other utility is encountered and must be removed or relocated, the Contractor shall advise the RPR who will notify the proper local authority or owner to secure prompt action.

151-2.1.1 Disposal. All materials removed by clearing or by clearing and grubbing shall be disposed of outside the Airport's limits at the Contractor's responsibility, except when otherwise directed by the RPR. As far as practicable, waste concrete and masonry shall be placed on slopes of embankments or channels. When embankments are constructed of such material, this material shall be placed in accordance with requirements for formation of embankments. Any broken concrete or masonry that cannot be used in construction and all other materials not considered suitable for use elsewhere, shall be disposed of by the Contractor. In no case, shall any discarded materials be left in windrows or piles adjacent to or within the airport limits. The manner and location of disposal of materials shall be subject to the approval of the RPR and shall not create an unsightly or objectionable view. When the Contractor is required to locate a disposal area outside the airport property limits, the Contractor shall obtain and file with the RPR permission in writing from the property owner for the use of private property for this purpose.

151-2.1.2 Blasting. Blasting shall not be allowed.

151-2.2 Clearing. The Contractor shall clear the staked or indicated area of all materials as indicated on the plans. Trees unavoidably falling outside the specified clearing limits must be cut up, removed, and disposed of in a satisfactory manner. To minimize damage to trees that are to be left standing, trees shall be felled toward the center of the area being cleared. The Contractor shall preserve and protect from

injury all trees not to be removed. The trees, stumps, and brush shall be cut flush with the original ground surface. The grubbing of stumps and roots will not be required.

Fences shall be removed and disposed of as directed by the RPR. Fence wire shall be neatly rolled and the wire and posts stored on the airport if they are to be used again, or stored at a location designated by the RPR if the fence is to remain the property of a local owner or authority.

151-2.3 Clearing and grubbing. In areas designated to be cleared and grubbed, all stumps, roots, buried logs, brush, grass, and other unsatisfactory materials as indicated on the plans, shall be removed, except where embankments exceeding 3-1/2 feet (105 cm) in depth will be constructed outside of paved areas. For embankments constructed outside of paved areas, all unsatisfactory materials shall be removed, but sound trees, stumps, and brush can be cut off flush with the original ground and allowed to remain. Tap roots and other projections over 1-1/2 inches (38 mm) in diameter shall be grubbed out to a depth of at least 18 inches (0.5 m) below the finished subgrade or slope elevation.

Any buildings and miscellaneous structures that are shown on the plans to be removed shall be demolished or removed, and all materials shall be disposed of by removal from the site. The cost of removal is incidental to this item. The remaining or existing foundations, wells, cesspools, and like structures shall be destroyed by breaking down the materials of which the foundations, wells, cesspools, etc., are built to a depth at least 2 feet (60 cm) below the existing surrounding ground. Any broken concrete, blocks, or other objectionable material that cannot be used in backfill shall be removed and disposed of at the Contractor's expense. The holes or openings shall be backfilled with acceptable material and properly compacted.

All holes in embankment areas remaining after the grubbing operation shall have the sides of the holes flattened to facilitate filling with acceptable material and compacting as required in Item P-152. The same procedure shall be applied to all holes remaining after grubbing in areas where the depth of holes exceeds the depth of the proposed excavation.

METHOD OF MEASUREMENT

151-3.1 The quantities of clearing and grubbing as shown by the limits on the plans shall be the number of acres (square meters) or fractions thereof of land specifically cleared and grubbed.

BASIS OF PAYMENT

151-4.1 Payment shall be made at the contract unit price per acre (square meter) for clearing and grubbing. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

151-4.2 Payment will be made under:

Item P-151	Clearing and grubbing - per acre (square meter) or fractions thereof

END OF ITEM P-151

Item P-610 Concrete for Miscellaneous Structures

DESCRIPTION

610-1.1 This item shall consist of concrete and reinforcement, as shown on the plans, prepared and constructed in accordance with these specifications. This specification shall be used for all concrete other than airfield pavement which are cast-in-place.

MATERIALS

610-2.1 General. Only approved materials, conforming to the requirements of these specifications, shall be used in the work. Materials may be subject to inspection and tests at any time during their preparation or use. The source of all materials shall be approved by the Resident Project Representative (RPR) before delivery or use in the work. Representative preliminary samples of the materials shall be submitted by the Contractor, when required, for examination and test. Materials shall be stored and handled to ensure preservation of their quality and fitness for use and shall be located to facilitate prompt inspection. All equipment for handling and transporting materials and concrete must be clean before any material or concrete is placed in them.

The use of pit-run aggregates shall not be permitted unless the pit-run aggregate has been screened and washed, and all fine and coarse aggregates stored separately and kept clean. The mixing of different aggregates from different sources in one storage stockpile or alternating batches of different aggregates shall not be permitted.

a. Reactivity. Fine aggregate and coarse aggregates to be used in all concrete shall have been tested separately within six months of the project in accordance with ASTM C1260. Test results shall be submitted to the RPR. The aggregate shall be considered innocuous if the expansion of test specimens, tested in accordance with ASTM C1260, does not exceed 0.08% at 14 days (16 days from casting). If the expansion either or both test specimen is greater than 0.08% at 14 days, but less than 0.20%, a minimum of 25% of Type F fly ash, or between 40% and 55% of slag cement shall be used in the concrete mix.

If the expansion is greater than 0.20% the aggregates shall not be used, and test results for other aggregates must be submitted for evaluation.

610-2.2 Coarse aggregate. The coarse aggregate for concrete shall meet the requirements of ASTM C33 and the requirements of Table 4, Class Designation 5S; and the grading requirements shown below, as required for the project.

Coarse Aggregate Grading Requirements

Maximum Aggregate Size	ASTM C33, Table 3 Grading Requirements (Size No.)
1 1/2 inch (37.5 mm)	467 or 4 and 67
1 inch (25 mm)	57
¾ inch (19 mm)	67
½ inch (12.5 mm)	7

610-2.2.1 Coarse Aggregate susceptibility to durability (D) cracking. Coarse aggregate may only be accepted from sources that have a 20-year service history for the same gradation to be supplied with no history of D-Cracking. Aggregates that do not have a 20-year record of service free from major repairs (less than 5% of slabs replaced) in similar conditions without D-cracking shall not be used unless the material currently being produced has a durability factor greater than or equal to 95 per ASTM C666. The Contractor shall submit a current certification and test results to verify the aggregate acceptability. Test results will only be accepted from a State Department of Transportation (DOT) materials laboratory or an accredited laboratory. Certification and test results which are not dated or which are over one (1) year old or which are for different gradations will not be accepted.

Crushed granite, calcite cemented sandstone, quartzite, basalt, diabase, rhyolite or trap rock are considered to meet the D-cracking test requirements but must meet all other quality tests specified in Item P-501.

610-2.3 Fine aggregate. The fine aggregate for concrete shall meet all fine aggregate requirements of ASTM C33.

610-2.4 Cement. Cement shall conform to the requirements of **:**

ASTM C150 - Type I, IA, II, IIA, III, IIIA; V

ASTM C595 - Type IP, IP-A, IS, IS-A, IL.

ASTM C1157 – Types GU, HS, MH.

610-2.5 Cementitious materials.

a. Fly ash. Fly ash shall meet the requirements of ASTM C618, with the exception of loss of ignition, where the maximum shall be less than 6%. Fly ash shall have a Calcium Oxide (CaO) content of less than 15% and a total available alkali content less than 3% per ASTM C311. Fly ash produced in furnace operations using liming materials or soda ash (sodium carbonate) as an additive shall not be acceptable. The Contractor shall furnish the previous three most recent, consecutive ASTM C618 reports for each source of fly ash proposed in the concrete mix, and shall furnish each additional report as they become available during the project. The reports can be used for acceptance or the material may be tested independently by the RPR.

b. Slag cement (ground granulated blast furnace (GGBF)). Slag cement shall conform to ASTM C989, Grade 100 or Grade 120. Slag cement shall be used only at a rate between 25% and 55% of the total cementitious material by mass.

610-2.6 Water. Water used in mixing or curing shall be from potable water sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

610-2.7 Admixtures. The Contractor shall submit certificates indicating that the material to be furnished meets all of the requirements indicated below. In addition, the RPR may require the Contractor to submit complete test data from an approved laboratory showing that the material to be furnished meets all of the requirements of the cited specifications. Subsequent tests may be made of samples taken by the RPR from the supply of the material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

a. Air-entraining admixtures. Air-entraining admixtures shall meet the requirements of ASTM C260 and shall consistently entrain the air content in the specified ranges under field conditions. The air-entrainment agent and any water reducer admixture shall be compatible.

b. Water-reducing admixtures. Water-reducing admixture shall meet the requirements of ASTM C494, Type A, B, or D. ASTM C494, Type F and G high range water reducing admixtures and ASTM C1017 flowable admixtures shall not be used.

c. Other chemical admixtures. The use of set retarding, and set-accelerating admixtures shall be approved by the RPR. Retarding shall meet the requirements of ASTM C494, Type A, B, or D and set-accelerating shall meet the requirements of ASTM C494, Type C. Calcium chloride and admixtures containing calcium chloride shall not be used.

610-2.8 Premolded joint material. Premolded joint material for expansion joints shall meet the requirements of ASTM **D1751.**

610-2.9 Joint filler. The filler for joints shall meet the requirements of Item P-605, unless otherwise specified.

610-2.10 Steel reinforcement. Reinforcing shall consist of **reinforcing steel** conforming to the requirements of ASTM A615, ASTM A706, ASTM A775, ASTM A934**.**

610-2.11 Materials for curing concrete. Curing materials shall conform to **ASTM C171 or ASTM C309**.

CONSTRUCTION METHODS

610-3.1 General. The Contractor shall furnish all labor, materials, and services necessary for, and incidental to, the completion of all work as shown on the drawings and specified here. All machinery and equipment used by the Contractor on the work, shall be of sufficient size to meet the requirements of the work. All work shall be subject to the inspection and approval of the RPR.

610-3.2 Concrete Mixture. The concrete shall develop a compressive strength of 4000 psi in 28 days as determined by test cylinders made in accordance with ASTM C31 and tested in accordance with ASTM C39. The concrete shall contain not less than 470 pounds of cementitious material per cubic yard (280 kg per cubic meter). The water cementitious ratio shall not exceed 0.45 by weight. The air content of the concrete shall be 5% +/- 1.2% as determined by ASTM C231 and shall have a slump of not more than 4 inches (100 mm) as determined by ASTM C143.

610-3.3 Mixing. Concrete may be mixed at the construction site, at a central point, or wholly or in part in truck mixers. The concrete shall be mixed and delivered in accordance with the requirements of ASTM C94 or ASTM C685.

The concrete shall be mixed only in quantities required for immediate use. Concrete shall not be mixed while the air temperature is below 40°F (4°C) without the RPRs approval. If approval is granted for mixing under such conditions, aggregates or water, or both, shall be heated and the concrete shall be placed at a temperature not less than 50°F (10°C) nor more than 100°F (38°C). The Contractor shall be held responsible for any defective work, resulting from freezing or injury in any manner during placing and curing, and shall replace such work at his expense.

Retempering of concrete by adding water or any other material is not permitted.

The rate of delivery of concrete to the job shall be sufficient to allow uninterrupted placement of the concrete.

610-3.4 Forms. Concrete shall not be placed until all the forms and reinforcements have been inspected and approved by the RPR. Forms shall be of suitable material and shall be of the type, size, shape, quality, and strength to build the structure as shown on the plans. The forms shall be true to line and grade and shall be mortar-tight and sufficiently rigid to prevent displacement and sagging between supports. The surfaces of forms shall be smooth and free from irregularities, dents, sags, and holes. The Contractor shall be responsible for their adequacy.

The internal form ties shall be arranged so no metal will show in the concrete surface or discolor the surface when exposed to weathering when the forms are removed. All forms shall be wetted with water or

with a non-staining mineral oil, which shall be applied immediately before the concrete is placed. Forms shall be constructed so they can be removed without injuring the concrete or concrete surface.

610-3.5 Placing reinforcement. All reinforcement shall be accurately placed, as shown on the plans, and shall be firmly held in position during concrete placement. Bars shall be fastened together at intersections. The reinforcement shall be supported by approved metal chairs. Shop drawings, lists, and bending details shall be supplied by the Contractor when required.

610-3.6 Embedded items. Before placing concrete, all embedded items shall be firmly and securely fastened in place as indicated. All embedded items shall be clean and free from coating, rust, scale, oil, or any foreign matter. The concrete shall be spaded and consolidated around and against embedded items. The embedding of wood shall not be allowed.

610-3.7 Concrete Consistency. The Contractor shall monitor the consistency of the concrete delivered to the project site; collect each batch ticket; check temperature; and perform slump tests on each truck at the project site in accordance with ASTM C143.

610-3.8 Placing concrete. All concrete shall be placed during daylight hours, unless otherwise approved. The concrete shall not be placed until the depth and condition of foundations, the adequacy of forms and falsework, and the placing of the steel reinforcing have been approved by the RPR. Concrete shall be placed as soon as practical after mixing, but in no case later than one (1) hour after water has been added to the mix. The method and manner of placing shall avoid segregation and displacement of the reinforcement. Troughs, pipes, and chutes shall be used as an aid in placing concrete when necessary. The concrete shall not be dropped from a height of more than 5 feet (1.5 m). Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to procedures which cause segregation. Concrete shall be placed on clean, damp surfaces, free from running water, or on a properly consolidated soil foundation.

610-3.9 Vibration. Vibration shall follow the guidelines in American Concrete Institute (ACI) Committee 309R, Guide for Consolidation of Concrete.

610-3.10 Joints. Joints shall be constructed as indicated on the plans.

610-3.11 Finishing. All exposed concrete surfaces shall be true, smooth, and free from open or rough areas, depressions, or projections. All concrete horizontal plane surfaces shall be brought flush to the proper elevation with the finished top surface struck-off with a straightedge and floated.

610-3.12 Curing and protection. All concrete shall be properly cured in accordance with the recommendations in American Concrete Institute (ACI) 308R, Guide to External Curing of Concrete. The concrete shall be protected from damage until project acceptance.

610-3.13 Cold weather placing. When concrete is placed at temperatures below 40°F (4°C), follow the cold weather concreting recommendations found in ACI 306R, Cold Weather Concreting.

610-3.14 Hot weather placing. When concrete is placed in hot weather greater than 85ºF (30 ºC), follow the hot weather concreting recommendations found in ACI 305R, Hot Weather Concreting.

QUALITY ASSURANCE (QA)

610-4.1 Quality Assurance sampling and testing. Concrete for each day's placement will be accepted on the basis of the compressive strength specified in paragraph 610-3.2. The RPR will sample the concrete in accordance with ASTM C172; test the slump in accordance with ASTM C143; test air content in accordance with ASTM C231; make and cure compressive strength specimens in accordance with ASTM C31; and test in accordance with ASTM C39. The QA testing agency will meet the requirements of ASTM C1077.

The Contractor shall provide adequate facilities for the initial curing of cylinders.

610-4.2 Defective work. Any defective work that cannot be satisfactorily repaired as determined by the RPR, shall be removed and replaced at the Contractor's expense. Defective work includes, but is not limited to, uneven dimensions, honeycombing and other voids on the surface or edges of the concrete.

METHOD OF MEASUREMENT

610-5.1 Concrete shall be considered incidental and no separate measurement shall be made.

BASIS OF PAYMENT

610-6.1 Payment shall be made at the contract price concrete shall be considered incidental to other items of work and no separate payment shall be made.

Payment will be made under:

Item P-610	MH-1 Cast-in-place Storm Sewer Structure

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM A184	Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A704	Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A706	Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884	Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates

ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C666	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
ASTM C685	Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1157	Standard Performance Specification for Hydraulic Cement
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C1365	Standard Test Method for Determination of the Proportion of Phases in Portland Cement and Portland-Cement Clinker Using X-Ray Powder Diffraction Analysis
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types)
ASTM D1752	Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction

American Concrete Institute (ACI)

ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 308R	Guide to External Curing of Concrete
ACI 309R	Guide for Consolidation of Concrete

END OF ITEM P-610

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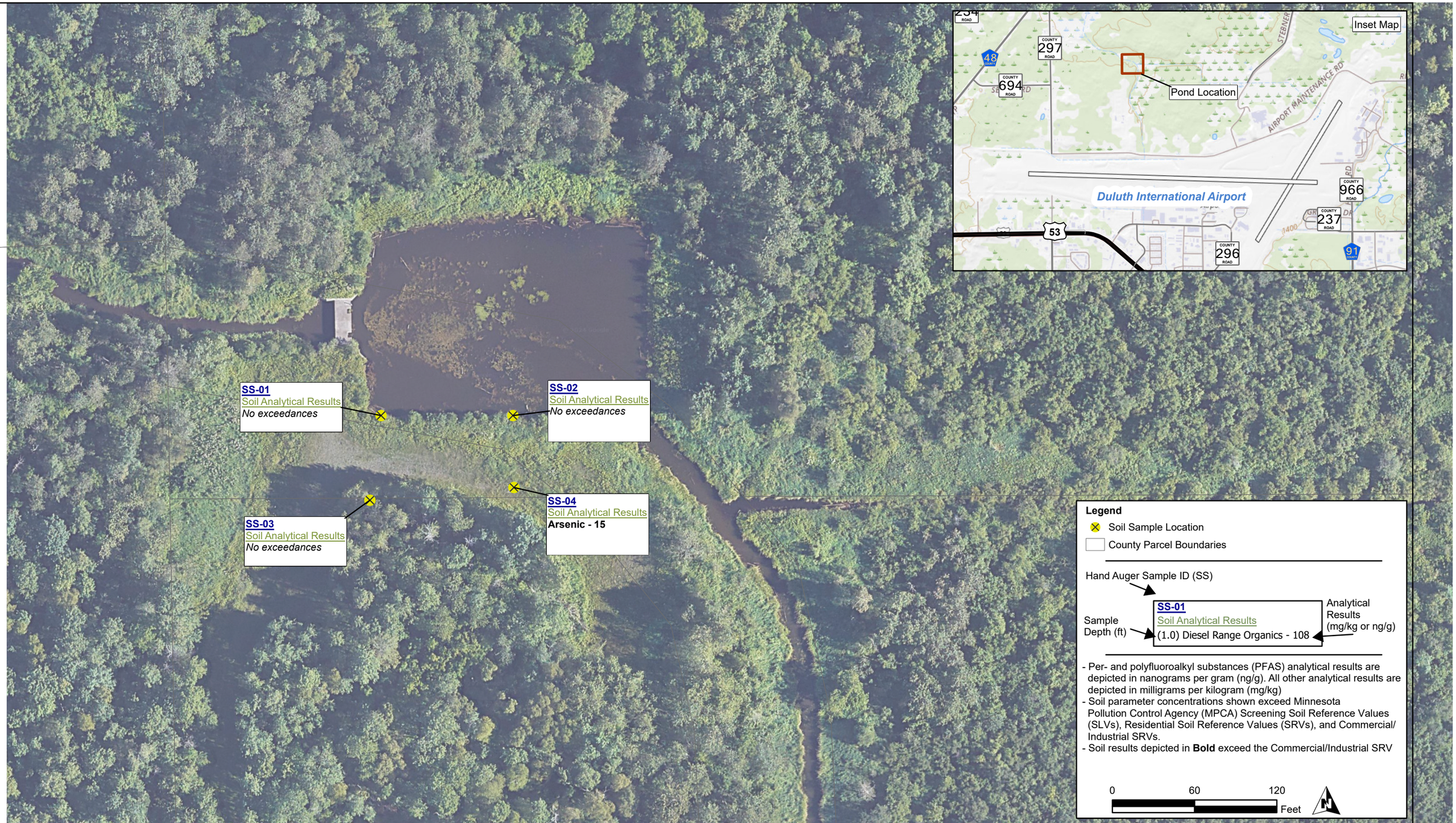
Appendix L

Stormwater Pond Testing Results



Path: X:\AE\D\DULAI\174212\96\GIS\APRX\DULAI_174212\DULAI_174212.aprx

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Project: DULAI 174212
Print Date: 6/13/2024

User Name: rhawkins
Projection: NAD 1983 UTM Zone 15N
Source: ESRI, MnDOT, SEH Digi, St. Louis County

Select Soil Analytical Results

Pond Expansion
Taxiway A Reconstruction - Phase 5
Duluth International Airport, Duluth, Minnesota

Figure 1

Table 1
Soil Analytical Results
Pond Expansion
Taxiway A - Phase 5 Reconstruction
Duluth International Airport, Duluth, Minnesota

Sample ID	Units	*Screening SLV (2014)*	Residential and Recreational Chronic SRV	**Commercial and Industrial Chronic SRV**	SS-01	SS-02	SS-03	SS-04
Laboratory ID					310-280096-1	310-280096-2	310-280096-3	310-280096-4
Sample Date					4/30/2024	4/30/2024	4/30/2024	4/30/2024
DRO and GRO								
Gasoline Range Organics	mg/kg	The MPCA Unregulated Fill Criteria for DRO and GRO is <100 mg/kg.			<21.3	<13.29	<10.8	<11.9
Diesel Range Organics	mg/kg				9.92	<8.48	<6.45	<7.03
Metals								
Arsenic	mg/kg	5.8	9	9	2.87	3.52	2.32	**15**
Barium	mg/kg	1700	260	41000	188[F1]	98.7	53.9	62.4
Cadmium	mg/kg	8.8	1.6	23	1.31	<0.579	<0.437	<0.531
Chromium^	mg/kg	36 / 1000000000	2.3 / 23000	62 / 100000	70.6	32	23.3	25.5
Lead	mg/kg	2700	200	460	9.69	6.94	5.16	6.33
Selenium	mg/kg	2.6	78	1200	3.29[NE]	1.79	<1.31	<1.59
Mercury	mg/kg	3.3	2.7	3.1	0.0501	0.0397	0.0454	<0.0239
PAHs								
All PAHs	mg/kg	Varies			BRL	BRL	BRL	BRL
Benzo(a)pyrene Equivalents								
Benzo(a)pyrene Equivalents	mg/kg	1.4	2	23	0	0	0	0
VOCs								
All VOCs	mg/kg	Varies			BRL	BRL	BRL	BRL
Glycols								
Ethylene glycol	mg/kg	-	3600	32000	<13.5	<13.9	<11.8	<12.4
Propylene glycol	mg/kg	-	-	-	<13.5	<13.9	<11.8	<12.4
PFAS (Per- and polyfluoroalkyl substances)								
Perfluorooctanesulfonic acid (PFOS)	ng/g	-	13	180	0.242[*+]	0.501[*+]	4.95[*+]	1.5[*+]
Perfluorohexanesulfonic acid (PFHxS)	ng/g	-	130	1600	<0.200	0.757	0.205	0.482
Perfluorooctanoic acid (PFOA)	ng/g	-	0.36	2	<0.200	0.265	<0.201	<0.200
Perfluorotridecanoic acid (PFTriA)	ng/g	-	-	-	<0.200	0.613[I]	0.268[I]	<0.200

Notes:
BRL - Below Reporting Limit
NE - Not an exceedance of MPCA SLV as SLVs for inorganic compounds should be applied for risk evaluation only at sites where significant metal releases are documented
^ - Total Chromium does not have established MPCA regulatory limits. Chromium III and VI regulatory limits are depicted.
F1 - Matrix spike and/or matrix spike duplicate recovery exceeds control limits
*+ - Laboratory control sample (LCS) and/or LCS duplicate is outside acceptance limits, results are high biased
I - Value is estimated maximum possible concentration (EMPC).

DULAI 174212
6/20/2024
X:\AE\D\DULAI\174212\3-env-stdy-regs\30-env-doc\Stormwater pond expansion\Components\Analytical Table_Pond

Abbreviations and Descriptions

Abbreviations:

BRL - No detections above laboratory reporting limits
DRO - Diesel Range Organics
EMPC - Estimated Maximum Possible Concentration
EPA - Environmental Protection Agency
GRO - Gasoline Range Organics
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
mg/kg - milligrams per kilogram
MPCA - Minnesota Pollution Control Agency
MS - Matrix Spike
MSD - Matrix Spike Duplicate
ng/g - nanograms per gram
PAH - Polycyclic Aromatic Hydrocarbon
PFAS - Per- and polyfluoroalkyl substance
PFHxS - Perfluorohexanesulfonic acid
PFOA - Perfluorooctanoic acid
PFOS - Perfluorooctanesulfonic acid
PFTriA - Perfluorotridecanoic acid
PID - Photoionization Detector
SLV - MPCA Screening Soil Leaching Values
SRV - MPCA Soil Reference Values
UFC - MPCA Unregulated Fill Criteria
VOC - Volatile Organic Compounds
<x - indicates analyte concentration not detected above the laboratory reporting limit

Lab Report Qualifiers:

F1 - Matrix spike and/or matrix spike duplicate recovery exceeds control limits.
*+ - LCS and/or LCSD is outside acceptance limits, results are high biased.
I - Value is EMPC.

Exceeds DRO/GRO MPCA UFC	DRO/GRO Exceeds MPCA UFC
Exceeds 2013 Screening SLV	Screening SLV - MPCA Screening Soil Leaching Values
Exceeds Residential/Recreational SRV	MPCA Soil Reference Values for Residential/Recreational properties
Exceeds Commercial/Industrial SRV	MPCA Soil Reference Values for Commercial/Industrial properties

Soil analytical methods include:

Diesel Range Organics by Wisconsin Method DRO
Gasoline Range Organics by Wisconsin Method GRO
Glycols by EPA Method 8015C
RCRA 8 Metals by EPA Method 6020B/7471B
PAHs by EPA Method 8270E
PFAS by EPA Draft-4 1633 by LC-MS/MS
VOCs by EPA Method 8260D

SEH
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ANALYTICAL REPORT

PREPARED FOR

Attn: Jennifer Force
Short Elliott Hendrickson, Inc. dba SEH
3535 Vadnais Center Drive
St. Paul, Minnesota 55110

Generated 5/15/2024 8:38:28 AM

JOB DESCRIPTION

Stormwater Pond Expansion
DULAI 174212

JOB NUMBER

310-280096-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

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Authorized for release by
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Job ID: 310-280096-1 — Eurofins Cedar Falls

Job Narrative
310-280096-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 5/1/2024 9:15 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.7°C.

GC/MS VOA
Method 8260D: The following sample was provided to the laboratory with a significantly lower initial weight than that required by the reference method: SS-01 (310-280096-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC/MS Semi VOA
Method 8270E_SIM: The following samples were diluted due to the nature of the sample matrix: SS-01 (310-280096-1), SS-02 (310-280096-2), SS-03 (310-280096-3) and SS-04 (310-280096-4). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Gasoline Range Organics
Method WI_GRO: The following sample was provided to the laboratory with a significantly lower initial weight than that required by the reference method: SS-01 (310-280096-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics
Method WI_DRO: Significant peaks, readily distinguished from background, were detected in the following sample within five minutes after the end of the analytical window defined by the last component eluting in the Diesel Range Organics (DRO) mix (i.e., n-Octacosane): SS-01 (310-280096-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC Semi VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-280096-1	SS-01	Solid	04/30/24 09:45	05/01/24 09:15
310-280096-2	SS-02	Solid	04/30/24 10:15	05/01/24 09:15
310-280096-3	SS-03	Solid	04/30/24 10:45	05/01/24 09:15
310-280096-4	SS-04	Solid	04/30/24 11:15	05/01/24 09:15

Detection Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Client Sample ID: SS-01 — Lab Sample ID: 310-280096-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diesel Range Organics (DRO)	9.92		7.65		mg/Kg	1	☼	WI-DRO	Total/NA
Arsenic	2.87		1.16		mg/Kg	5	☼	6020B	Total/NA
Barium	188	F1	1.16		mg/Kg	5	☼	6020B	Total/NA
Cadmium	1.31		0.581		mg/Kg	5	☼	6020B	Total/NA
Chromium	70.6		1.74		mg/Kg	5	☼	6020B	Total/NA
Lead	9.69		2.90		mg/Kg	5	☼	6020B	Total/NA
Selenium	3.29		1.74		mg/Kg	5	☼	6020B	Total/NA
Mercury	0.0501		0.0248		mg/Kg	1	☼	7471B	Total/NA

Client Sample ID: SS-02 — Lab Sample ID: 310-280096-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	3.52		1.16		mg/Kg	5	☼	6020B	Total/NA
Barium	98.7		1.16		mg/Kg	5	☼	6020B	Total/NA
Chromium	32.0		1.74		mg/Kg	5	☼	6020B	Total/NA
Lead	6.94		2.89		mg/Kg	5	☼	6020B	Total/NA
Selenium	1.79		1.74		mg/Kg	5	☼	6020B	Total/NA
Mercury	0.0397		0.0276		mg/Kg	1	☼	7471B	Total/NA

Client Sample ID: SS-03 — Lab Sample ID: 310-280096-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	2.32		0.873		mg/Kg	5	☼	6020B	Total/NA
Barium	53.9		0.873		mg/Kg	5	☼	6020B	Total/NA
Chromium	23.3		1.31		mg/Kg	5	☼	6020B	Total/NA
Lead	5.16		2.18		mg/Kg	5	☼	6020B	Total/NA
Mercury	0.0454		0.0228		mg/Kg	1	☼	7471B	Total/NA

Client Sample ID: SS-04 — Lab Sample ID: 310-280096-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	15.0		1.06		mg/Kg	5	☼	6020B	Total/NA
Barium	62.4		1.06		mg/Kg	5	☼	6020B	Total/NA
Chromium	25.5		1.59		mg/Kg	5	☼	6020B	Total/NA
Lead	6.33		2.66		mg/Kg	5	☼	6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Client Sample ID: SS-01
Date Collected: 04/30/24 09:45
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-1
Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<1.24		1.24		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Allyl chloride	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Benzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Bromobenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Bromochloromethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Bromodichloromethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Bromoform	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Bromomethane	<1.24		1.24		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
2-Butanone (MEK)	<1.86		1.86		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Carbon tetrachloride	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Chlorobenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Chlorodibromomethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Chloroethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Chloroform	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Chloromethane	<0.621		0.621		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
2-Chlorotoluene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
4-Chlorotoluene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
cis-1,2-Dichloroethene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
cis-1,3-Dichloropropene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,2-Dibromo-3-chloropropane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,2-Dibromoethane (EDB)	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Dibromomethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,2-Dichlorobenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,3-Dichlorobenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,4-Dichlorobenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Dichlorodifluoromethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,1-Dichloroethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,2-Dichloroethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,1-Dichloroethene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Dichlorofluoromethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,2-Dichloropropane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,3-Dichloropropane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
2,2-Dichloropropane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,1-Dichloropropene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Diethyl ether	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Ethylbenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Hexachlorobutadiene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Isopropylbenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Methylene chloride	<0.621		0.621		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
4-Methyl-2-pentanone (MIBK)	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Methyl tert-butyl ether	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Naphthalene	<0.621		0.621		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
n-Butylbenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
n-Propylbenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
p-Isopropyltoluene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
sec-Butylbenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Styrene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
tert-Butylbenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,1,1,2-Tetrachloroethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1

Client Sample ID: SS-01
Date Collected: 04/30/24 09:45
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-1
Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Tetrachloroethene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Tetrahydrofuran	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Toluene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
trans-1,2-Dichloroethene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
trans-1,3-Dichloropropene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,2,3-Trichlorobenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,2,4-Trichlorobenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,1,1-Trichloroethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,1,2-Trichloroethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Trichloroethene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Trichlorofluoromethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,2,3-Trichloropropane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,1,2-Trichlorotrifluoroethane	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,2,4-Trimethylbenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
1,3,5-Trimethylbenzene	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Vinyl chloride	<0.248		0.248		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1
Xylenes, Total	<0.372		0.372		mg/Kg	☼	05/09/24 09:13	05/09/24 19:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*	*05/09/24 09:13*	*05/09/24 19:23*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 120*	*05/09/24 09:13*	*05/09/24 19:23*	*1*
Toluene-d8 (Surr)	*96*		*80 - 120*	*05/09/24 09:13*	*05/09/24 19:23*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Acenaphthylene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Anthracene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Benzo(a)anthracene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Benzo(a)pyrene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Benzo(b)fluoranthene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Benzo(g,h,i)perylene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Benzo(k)fluoranthene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Chrysene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Dibenz(a,h)anthracene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Fluoranthene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Fluorene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Indeno(1,2,3-cd)pyrene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
2-Methylnaphthalene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Naphthalene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Phenanthrene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5
Pyrene	<0.0654		0.0654		mg/Kg	☼	05/02/24 12:50	05/03/24 15:57	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*80*		*37 - 131*	*05/02/24 12:50*	*05/03/24 15:57*	*5*
Nitrobenzene-d5 (Surr)	*93*		*30 - 138*	*05/02/24 12:50*	*05/03/24 15:57*	*5*
Terphenyl-d14 (Surr)	*77*		*24 - 145*	*05/02/24 12:50*	*05/03/24 15:57*	*5*

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Client Sample ID: SS-01

Date Collected: 04/30/24 09:45
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-1

Matrix: Solid

Method: WI-GRO - Wisconsin - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Wisconsin GRO	<21.3		21.3		mg/Kg	☼	05/10/24 11:43	05/12/24 08:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*83*		*80 - 120*	*05/10/24 11:43*	*05/12/24 08:41*	*1*

Method: SW846 8015C - Glycols- Direct Injection (GC/FID) - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylene glycol	<13.5		13.5		mg/Kg	☼		05/09/24 12:06	1
Propylene glycol	<13.5		13.5		mg/Kg	☼		05/09/24 12:06	1

Method: WI-DRO - Wisconsin - Diesel Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO)	**9.92**		7.65		mg/Kg	☼	05/02/24 09:28	05/07/24 15:21	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.87**		1.16		mg/Kg	☼	05/07/24 10:00	05/08/24 18:28	5
Barium	**188**	**F1**	1.16		mg/Kg	☼	05/07/24 10:00	05/08/24 18:28	5
Cadmium	**1.31**		0.581		mg/Kg	☼	05/07/24 10:00	05/08/24 18:28	5
Chromium	**70.6**		1.74		mg/Kg	☼	05/07/24 10:00	05/08/24 18:28	5
Lead	**9.69**		2.90		mg/Kg	☼	05/07/24 10:00	05/08/24 18:28	5
Selenium	**3.29**		1.74		mg/Kg	☼	05/07/24 10:00	05/08/24 18:28	5
Silver	<0.581		0.581		mg/Kg	☼	05/07/24 10:00	05/08/24 18:28	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.0501**		0.0248		mg/Kg	☼	05/03/24 17:39	05/07/24 10:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (EPA Moisture)	**26.0**		0.1		%			05/01/24 17:16	1
Percent Solids (EPA Moisture)	**74.0**		0.1		%			05/01/24 17:16	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Client Sample ID: SS-02
Date Collected: 04/30/24 10:15
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-2
Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<0.870		0.870		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Allyl chloride	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Benzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Bromobenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Bromochloromethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Bromodichloromethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Bromoform	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Bromomethane	<0.870		0.870		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
2-Butanone (MEK)	<1.30		1.30		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Carbon tetrachloride	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Chlorobenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Chlorodibromomethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Chloroethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Chloroform	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Chloromethane	<0.435		0.435		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
2-Chlorotoluene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
4-Chlorotoluene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
cis-1,2-Dichloroethene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
cis-1,3-Dichloropropene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,2-Dibromo-3-chloropropane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,2-Dibromoethane (EDB)	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Dibromomethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,2-Dichlorobenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,3-Dichlorobenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,4-Dichlorobenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Dichlorodifluoromethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,1-Dichloroethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,2-Dichloroethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,1-Dichloroethene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Dichlorofluoromethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,2-Dichloropropane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,3-Dichloropropane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
2,2-Dichloropropane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,1-Dichloropropene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Diethyl ether	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Ethylbenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Hexachlorobutadiene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Isopropylbenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Methylene chloride	<0.435		0.435		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
4-Methyl-2-pentanone (MIBK)	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Methyl tert-butyl ether	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Naphthalene	<0.435		0.435		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
n-Butylbenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
n-Propylbenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
p-Isopropyltoluene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
sec-Butylbenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Styrene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
tert-Butylbenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,1,1,2-Tetrachloroethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Client Sample ID: SS-02
Date Collected: 04/30/24 10:15
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-2
Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Tetrachloroethene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Tetrahydrofuran	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Toluene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
trans-1,2-Dichloroethene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
trans-1,3-Dichloropropene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,2,3-Trichlorobenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,2,4-Trichlorobenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,1,1-Trichloroethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,1,2-Trichloroethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Trichloroethene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Trichlorofluoromethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,2,3-Trichloropropane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,1,2-Trichlorotrifluoroethane	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,2,4-Trimethylbenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
1,3,5-Trimethylbenzene	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Vinyl chloride	<0.174		0.174		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1
Xylenes, Total	<0.261		0.261		mg/Kg	☼	05/09/24 09:13	05/09/24 19:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*	*05/09/24 09:13*	*05/09/24 19:46*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 120*	*05/09/24 09:13*	*05/09/24 19:46*	*1*
Toluene-d8 (Surr)	*96*		*80 - 120*	*05/09/24 09:13*	*05/09/24 19:46*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Acenaphthylene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Anthracene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Benzo(a)anthracene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Benzo(a)pyrene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Benzo(b)fluoranthene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Benzo(g,h,i)perylene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Benzo(k)fluoranthene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Chrysene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Dibenz(a,h)anthracene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Fluoranthene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Fluorene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Indeno(1,2,3-cd)pyrene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
2-Methylnaphthalene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Naphthalene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Phenanthrene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5
Pyrene	<0.0681		0.0681		mg/Kg	☼	05/02/24 12:50	05/03/24 16:17	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*79*		*37 - 131*	*05/02/24 12:50*	*05/03/24 16:17*	*5*
Nitrobenzene-d5 (Surr)	*96*		*30 - 138*	*05/02/24 12:50*	*05/03/24 16:17*	*5*
Terphenyl-d14 (Surr)	*72*		*24 - 145*	*05/02/24 12:50*	*05/03/24 16:17*	*5*

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Client Sample ID: SS-02

Date Collected: 04/30/24 10:15
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-2

Matrix: Solid

Method: WI-GRO - Wisconsin - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Wisconsin GRO	<12.9		12.9		mg/Kg	☼	05/10/24 11:43	05/12/24 09:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*84*		*80 - 120*	*05/10/24 11:43*	*05/12/24 09:07*	*1*

Method: SW846 8015C - Glycols- Direct Injection (GC/FID) - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylene glycol	<13.9		13.9		mg/Kg	☼		05/10/24 12:00	1
Propylene glycol	<13.9		13.9		mg/Kg	☼		05/10/24 12:00	1

Method: WI-DRO - Wisconsin - Diesel Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO)	<8.48		8.48		mg/Kg	☼	05/02/24 09:28	05/07/24 15:32	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.52**		1.16		mg/Kg	☼	05/07/24 10:00	05/08/24 18:39	5
Barium	**98.7**		1.16		mg/Kg	☼	05/07/24 10:00	05/08/24 18:39	5
Cadmium	<0.579		0.579		mg/Kg	☼	05/07/24 10:00	05/08/24 18:39	5
Chromium	**32.0**		1.74		mg/Kg	☼	05/07/24 10:00	05/08/24 18:39	5
Lead	**6.94**		2.89		mg/Kg	☼	05/07/24 10:00	05/08/24 18:39	5
Selenium	**1.79**		1.74		mg/Kg	☼	05/07/24 10:00	05/08/24 18:39	5
Silver	<0.579		0.579		mg/Kg	☼	05/07/24 10:00	05/08/24 18:39	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.0397**		0.0276		mg/Kg	☼	05/03/24 17:39	05/07/24 11:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (EPA Moisture)	**30.9**		0.1		%			05/01/24 17:16	1
Percent Solids (EPA Moisture)	**69.1**		0.1		%			05/01/24 17:16	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Client Sample ID: SS-03
Date Collected: 04/30/24 10:45
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-3
Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<0.638		0.638		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Allyl chloride	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Benzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Bromobenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Bromochloromethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Bromodichloromethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Bromoform	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Bromomethane	<0.638		0.638		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
2-Butanone (MEK)	<0.956		0.956		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Carbon tetrachloride	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Chlorobenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Chlorodibromomethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Chloroethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Chloroform	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Chloromethane	<0.319		0.319		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
2-Chlorotoluene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
4-Chlorotoluene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
cis-1,2-Dichloroethene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
cis-1,3-Dichloropropene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,2-Dibromo-3-chloropropane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,2-Dibromoethane (EDB)	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Dibromomethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,2-Dichlorobenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,3-Dichlorobenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,4-Dichlorobenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Dichlorodifluoromethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,1-Dichloroethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,2-Dichloroethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,1-Dichloroethene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Dichlorofluoromethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,2-Dichloropropane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,3-Dichloropropane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
2,2-Dichloropropane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,1-Dichloropropene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Diethyl ether	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Ethylbenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Hexachlorobutadiene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Isopropylbenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Methylene chloride	<0.319		0.319		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
4-Methyl-2-pentanone (MIBK)	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Methyl tert-butyl ether	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Naphthalene	<0.319		0.319		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
n-Butylbenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
n-Propylbenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
p-Isopropyltoluene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
sec-Butylbenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Styrene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
tert-Butylbenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,1,1,2-Tetrachloroethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1

Client Sample ID: SS-03
Date Collected: 04/30/24 10:45
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-3
Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Tetrachloroethene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Tetrahydrofuran	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Toluene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
trans-1,2-Dichloroethene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
trans-1,3-Dichloropropene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,2,3-Trichlorobenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,2,4-Trichlorobenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,1,1-Trichloroethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,1,2-Trichloroethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Trichloroethene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Trichlorofluoromethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,2,3-Trichloropropane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,1,2-Trichlorotrifluoroethane	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,2,4-Trimethylbenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
1,3,5-Trimethylbenzene	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Vinyl chloride	<0.128		0.128		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1
Xylenes, Total	<0.191		0.191		mg/Kg	☼	05/09/24 09:13	05/09/24 20:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*	*05/09/24 09:13*	*05/09/24 20:09*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 120*	*05/09/24 09:13*	*05/09/24 20:09*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*	*05/09/24 09:13*	*05/09/24 20:09*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Acenaphthylene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Anthracene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Benzo(a)anthracene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Benzo(a)pyrene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Benzo(b)fluoranthene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Benzo(g,h,i)perylene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Benzo(k)fluoranthene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Chrysene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Dibenz(a,h)anthracene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Fluoranthene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Fluorene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Indeno(1,2,3-cd)pyrene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
2-Methylnaphthalene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Naphthalene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Phenanthrene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5
Pyrene	<0.0580		0.0580		mg/Kg	☼	05/02/24 12:50	05/03/24 16:36	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*83*		*37 - 131*	*05/02/24 12:50*	*05/03/24 16:36*	*5*
Nitrobenzene-d5 (Surr)	*98*		*30 - 138*	*05/02/24 12:50*	*05/03/24 16:36*	*5*
Terphenyl-d14 (Surr)	*84*		*24 - 145*	*05/02/24 12:50*	*05/03/24 16:36*	*5*

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Client Sample ID: SS-03

Date Collected: 04/30/24 10:45
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-3

Matrix: Solid

Method: WI-GRO - Wisconsin - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Wisconsin GRO	<10.8		10.8		mg/Kg	☼	05/10/24 11:43	05/12/24 09:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*86*		*80 - 120*	*05/10/24 11:43*	*05/12/24 09:33*	*1*

Method: SW846 8015C - Glycols- Direct Injection (GC/FID) - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylene glycol	<11.8		11.8		mg/Kg	☼		05/10/24 12:10	1
Propylene glycol	<11.8		11.8		mg/Kg	☼		05/10/24 12:10	1

Method: WI-DRO - Wisconsin - Diesel Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO)	<6.45		6.45		mg/Kg	☼	05/02/24 09:28	05/07/24 15:44	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.32**		0.873		mg/Kg	☼	05/07/24 10:00	05/08/24 18:41	5
Barium	**53.9**		0.873		mg/Kg	☼	05/07/24 10:00	05/08/24 18:41	5
Cadmium	<0.437		0.437		mg/Kg	☼	05/07/24 10:00	05/08/24 18:41	5
Chromium	**23.3**		1.31		mg/Kg	☼	05/07/24 10:00	05/08/24 18:41	5
Lead	**5.16**		2.18		mg/Kg	☼	05/07/24 10:00	05/08/24 18:41	5
Selenium	<1.31		1.31		mg/Kg	☼	05/07/24 10:00	05/08/24 18:41	5
Silver	<0.437		0.437		mg/Kg	☼	05/07/24 10:00	05/08/24 18:41	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.0454**		0.0228		mg/Kg	☼	05/03/24 17:39	05/07/24 11:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (EPA Moisture)	**16.2**		0.1		%			05/01/24 17:16	1
Percent Solids (EPA Moisture)	**83.8**		0.1		%			05/01/24 17:16	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Client Sample ID: SS-04
Date Collected: 04/30/24 11:15
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-4
Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<0.718		0.718		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Allyl chloride	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Benzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Bromobenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Bromochloromethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Bromodichloromethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Bromoform	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Bromomethane	<0.718		0.718		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
2-Butanone (MEK)	<1.08		1.08		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Carbon tetrachloride	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Chlorobenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Chlorodibromomethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Chloroethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Chloroform	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Chloromethane	<0.359		0.359		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
2-Chlorotoluene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
4-Chlorotoluene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
cis-1,2-Dichloroethene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
cis-1,3-Dichloropropene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,2-Dibromo-3-chloropropane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,2-Dibromoethane (EDB)	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Dibromomethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,2-Dichlorobenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,3-Dichlorobenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,4-Dichlorobenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Dichlorodifluoromethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,1-Dichloroethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,2-Dichloroethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,1-Dichloroethene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Dichlorofluoromethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,2-Dichloropropane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,3-Dichloropropane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
2,2-Dichloropropane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,1-Dichloropropene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Diethyl ether	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Ethylbenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Hexachlorobutadiene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Isopropylbenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Methylene chloride	<0.359		0.359		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
4-Methyl-2-pentanone (MIBK)	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Methyl tert-butyl ether	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Naphthalene	<0.359		0.359		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
n-Butylbenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
n-Propylbenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
p-Isopropyltoluene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
sec-Butylbenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Styrene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
tert-Butylbenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,1,1,2-Tetrachloroethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1

Client Sample ID: SS-04
Date Collected: 04/30/24 11:15
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-4
Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Tetrachloroethene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Tetrahydrofuran	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Toluene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
trans-1,2-Dichloroethene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
trans-1,3-Dichloropropene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,2,3-Trichlorobenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,2,4-Trichlorobenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,1,1-Trichloroethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,1,2-Trichloroethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Trichloroethene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Trichlorofluoromethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,2,3-Trichloropropane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,1,2-Trichlorotrifluoroethane	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,2,4-Trimethylbenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
1,3,5-Trimethylbenzene	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Vinyl chloride	<0.144		0.144		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1
Xylenes, Total	<0.215		0.215		mg/Kg	☼	05/09/24 09:13	05/09/24 20:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*	*05/09/24 09:13*	*05/09/24 20:31*	*1*
Dibromofluoromethane (Surr)	*97*		*80 - 120*	*05/09/24 09:13*	*05/09/24 20:31*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*	*05/09/24 09:13*	*05/09/24 20:31*	*1*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Acenaphthylene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Anthracene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Benzo(a)anthracene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Benzo(a)pyrene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Benzo(b)fluoranthene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Benzo(g,h,i)perylene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Benzo(k)fluoranthene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Chrysene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Dibenz(a,h)anthracene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Fluoranthene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Fluorene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Indeno(1,2,3-cd)pyrene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
2-Methylnaphthalene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Naphthalene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Phenanthrene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5
Pyrene	<0.0611		0.0611		mg/Kg	☼	05/02/24 12:50	05/03/24 16:56	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*76*		*37 - 131*	*05/02/24 12:50*	*05/03/24 16:56*	*5*
Nitrobenzene-d5 (Surr)	*89*		*30 - 138*	*05/02/24 12:50*	*05/03/24 16:56*	*5*
Terphenyl-d14 (Surr)	*89*		*24 - 145*	*05/02/24 12:50*	*05/03/24 16:56*	*5*

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Client Sample ID: SS-04

Date Collected: 04/30/24 11:15
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-4

Matrix: Solid

Method: WI-GRO - Wisconsin - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Wisconsin GRO	<11.9		11.9		mg/Kg	☼	05/13/24 10:56	05/13/24 13:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*86*		*80 - 120*	*05/13/24 10:56*	*05/13/24 13:12*	*1*

Method: SW846 8015C - Glycols- Direct Injection (GC/FID) - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylene glycol	<12.4		12.4		mg/Kg	☼		05/10/24 12:21	1
Propylene glycol	<12.4		12.4		mg/Kg	☼		05/10/24 12:21	1

Method: WI-DRO - Wisconsin - Diesel Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO)	<7.03		7.03		mg/Kg	☼	05/02/24 09:28	05/07/24 15:55	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**15.0**		1.06		mg/Kg	☼	05/07/24 10:00	05/08/24 18:43	5
Barium	**62.4**		1.06		mg/Kg	☼	05/07/24 10:00	05/08/24 18:43	5
Cadmium	<0.531		0.531		mg/Kg	☼	05/07/24 10:00	05/08/24 18:43	5
Chromium	**25.5**		1.59		mg/Kg	☼	05/07/24 10:00	05/08/24 18:43	5
Lead	**6.33**		2.66		mg/Kg	☼	05/07/24 10:00	05/08/24 18:43	5
Selenium	<1.59		1.59		mg/Kg	☼	05/07/24 10:00	05/08/24 18:43	5
Silver	<0.531		0.531		mg/Kg	☼	05/07/24 10:00	05/08/24 18:43	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0239		0.0239		mg/Kg	☼	05/03/24 17:39	05/07/24 11:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (EPA Moisture)	**20.0**		0.1		%			05/01/24 17:16	1
Percent Solids (EPA Moisture)	**80.0**		0.1		%			05/01/24 17:16	1

Definitions/Glossary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Qualifiers

Metals

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Surrogate Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Solid | **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(80-120)	(80-120)	(80-120)
310-280096-1	SS-01	100	105	96
310-280096-2	SS-02	94	104	96
310-280096-3	SS-03	94	103	97
310-280096-4	SS-04	100	97	100
LCS 310-421128/2-A	Lab Control Sample	94	105	98
MB 310-421128/1-A	Method Blank	97	94	98

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Solid | **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		FBP	NBZ	TPHL
Lab Sample ID	Client Sample ID	(37-131)	(30-138)	(24-145)
310-280096-1	SS-01	80	93	77
310-280096-2	SS-02	79	96	72
310-280096-3	SS-03	83	98	84
310-280096-4	SS-04	76	89	89
LCS 310-420520/2-A	Lab Control Sample	91	123	96
MB 310-420520/1-A	Method Blank	87	103	86

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: WI-GRO - Wisconsin - Gasoline Range Organics (GC)

Matrix: Solid | **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		BFB
Lab Sample ID	Client Sample ID	(80-120)
310-280096-1	SS-01	83
310-280096-2	SS-02	84
310-280096-3	SS-03	86
310-280096-4	SS-04	86
LCS 310-421306/2-A	Lab Control Sample	85
LCS 310-421465/2-A	Lab Control Sample	89
LCSD 310-421306/25-A	Lab Control Sample Dup	96
LCSD 310-421465/25-A	Lab Control Sample Dup	88
MB 310-421306/1-A	Method Blank	88
MB 310-421465/1-A	Method Blank	86

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 310-421128/1-A
Matrix: Solid
Analysis Batch: 421133

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 421128

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<0.474		0.474		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Allyl chloride	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Benzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Bromobenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Bromochloromethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Bromodichloromethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Bromoform	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Bromomethane	<0.474		0.474		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
2-Butanone (MEK)	<0.711		0.711		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Carbon tetrachloride	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Chlorobenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Chlorodibromomethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Chloroethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Chloroform	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Chloromethane	<0.237		0.237		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
2-Chlorotoluene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
4-Chlorotoluene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
cis-1,2-Dichloroethene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
cis-1,3-Dichloropropene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,2-Dibromo-3-chloropropane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,2-Dibromoethane (EDB)	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Dibromomethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,2-Dichlorobenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,3-Dichlorobenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,4-Dichlorobenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Dichlorodifluoromethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,1-Dichloroethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,2-Dichloroethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,1-Dichloroethene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Dichlorofluoromethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,2-Dichloropropane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,3-Dichloropropane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
2,2-Dichloropropane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,1-Dichloropropene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Diethyl ether	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Ethylbenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Hexachlorobutadiene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Isopropylbenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Methylene chloride	<0.237		0.237		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
4-Methyl-2-pentanone (MIBK)	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Methyl tert-butyl ether	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Naphthalene	<0.237		0.237		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
n-Butylbenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
n-Propylbenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
p-Isopropyltoluene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
sec-Butylbenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Styrene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
tert-Butylbenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 310-421128/1-A
Matrix: Solid
Analysis Batch: 421133

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 421128

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,1,2,2-Tetrachloroethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Tetrachloroethene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Tetrahydrofuran	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Toluene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
trans-1,2-Dichloroethene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
trans-1,3-Dichloropropene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,2,3-Trichlorobenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,2,4-Trichlorobenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,1,1-Trichloroethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,1,2-Trichloroethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Trichloroethene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Trichlorofluoromethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,2,3-Trichloropropane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,1,2-Trichlorotrifluoroethane	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,2,4-Trimethylbenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
1,3,5-Trimethylbenzene	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Vinyl chloride	<0.0948		0.0948		mg/Kg		05/09/24 09:13	05/09/24 15:13	1
Xylenes, Total	<0.142		0.142		mg/Kg		05/09/24 09:13	05/09/24 15:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*	*05/09/24 09:13*	*05/09/24 15:13*	*1*
Dibromofluoromethane (Surr)	*94*		*80 - 120*	*05/09/24 09:13*	*05/09/24 15:13*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*	*05/09/24 09:13*	*05/09/24 15:13*	*1*

Lab Sample ID: LCS 310-421128/2-A
Matrix: Solid
Analysis Batch: 421133

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 421128

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acetone	1.96	1.852		mg/Kg		95	50 - 150
Allyl chloride	0.978	0.9071		mg/Kg		93	50 - 150
Benzene	0.978	0.9242		mg/Kg		95	80 - 127
Bromobenzene	0.978	0.8762		mg/Kg		90	80 - 129
Bromochloromethane	0.978	0.9459		mg/Kg		97	79 - 141
Bromodichloromethane	0.978	0.8285		mg/Kg		85	72 - 126
Bromoform	0.978	0.7379		mg/Kg		75	56 - 140
2-Butanone (MEK)	1.96	1.791		mg/Kg		92	50 - 150
Carbon tetrachloride	0.978	0.9325		mg/Kg		95	74 - 134
Chlorobenzene	0.978	0.9019		mg/Kg		92	80 - 123
Chlorodibromomethane	0.978	0.8413		mg/Kg		86	70 - 127
Chloroform	0.978	0.8991		mg/Kg		92	78 - 128
2-Chlorotoluene	0.978	0.9154		mg/Kg		94	80 - 123
4-Chlorotoluene	0.978	0.8816		mg/Kg		90	79 - 122
cis-1,2-Dichloroethene	0.978	0.9438		mg/Kg		97	80 - 131
cis-1,3-Dichloropropene	0.978	0.8125		mg/Kg		83	77 - 127
1,2-Dibromo-3-chloropropane	0.978	0.8642		mg/Kg		88	50 - 150
1,2-Dibromoethane (EDB)	0.978	0.9407		mg/Kg		96	80 - 126

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 310-421128/2-A
Matrix: Solid
Analysis Batch: 421133

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 421128

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dibromomethane	0.978	0.9404		mg/Kg		96	78 - 133
1,2-Dichlorobenzene	0.978	0.9433		mg/Kg		96	80 - 123
1,3-Dichlorobenzene	0.978	0.9287		mg/Kg		95	80 - 124
1,4-Dichlorobenzene	0.978	0.9631		mg/Kg		99	79 - 122
1,1-Dichloroethane	0.978	0.8492		mg/Kg		87	75 - 133
1,2-Dichloroethane	0.978	0.9127		mg/Kg		93	74 - 135
1,1-Dichloroethene	0.978	0.8695		mg/Kg		89	72 - 136
1,2-Dichloropropane	0.978	0.9113		mg/Kg		93	80 - 130
1,3-Dichloropropane	0.978	0.9437		mg/Kg		97	79 - 130
2,2-Dichloropropane	0.978	0.9384		mg/Kg		96	50 - 150
1,1-Dichloropropene	0.978	0.9260		mg/Kg		95	80 - 131
Diethyl ether	0.978	0.8338		mg/Kg		85	71 - 139
Ethylbenzene	0.978	0.8835		mg/Kg		90	80 - 123
Hexachlorobutadiene	0.978	0.8809		mg/Kg		90	50 - 150
Isopropylbenzene	0.978	0.8860		mg/Kg		91	80 - 125
Methylene chloride	0.978	0.9012		mg/Kg		92	50 - 150
4-Methyl-2-pentanone (MIBK)	1.96	1.545		mg/Kg		79	67 - 136
Methyl tert-butyl ether	0.978	0.8785		mg/Kg		90	72 - 136
Naphthalene	0.978	0.9339		mg/Kg		96	50 - 150
n-Butylbenzene	0.978	0.9562		mg/Kg		98	71 - 127
n-Propylbenzene	0.978	0.8888		mg/Kg		91	79 - 125
p-Isopropyltoluene	0.978	0.9298		mg/Kg		95	76 - 125
sec-Butylbenzene	0.978	0.9261		mg/Kg		95	76 - 125
Styrene	0.978	0.8748		mg/Kg		89	79 - 124
tert-Butylbenzene	0.978	0.9666		mg/Kg		99	78 - 124
1,1,1,2-Tetrachloroethane	0.978	0.8934		mg/Kg		91	78 - 127
1,1,2,2-Tetrachloroethane	0.978	0.8601		mg/Kg		88	74 - 131
Tetrachloroethene	0.978	0.9236		mg/Kg		94	80 - 134
Tetrahydrofuran	1.96	1.842		mg/Kg		94	65 - 141
Toluene	0.978	0.8555		mg/Kg		88	78 - 126
trans-1,2-Dichloroethene	0.978	0.8783		mg/Kg		90	75 - 134
trans-1,3-Dichloropropene	0.978	0.8691		mg/Kg		89	74 - 125
1,2,3-Trichlorobenzene	0.978	0.9294		mg/Kg		95	50 - 150
1,2,4-Trichlorobenzene	0.978	0.9512		mg/Kg		97	74 - 130
1,1,1-Trichloroethane	0.978	0.9315		mg/Kg		95	77 - 134
1,1,2-Trichloroethane	0.978	0.9285		mg/Kg		95	80 - 127
Trichloroethene	0.978	0.9678		mg/Kg		99	80 - 130
1,2,3-Trichloropropane	0.978	0.8605		mg/Kg		88	75 - 134
1,1,2-Trichlorotrifluoroethane	0.978	0.9406		mg/Kg		96	66 - 150
1,2,4-Trimethylbenzene	0.978	0.9352		mg/Kg		96	73 - 130
1,3,5-Trimethylbenzene	0.978	0.9505		mg/Kg		97	76 - 124
Xylenes, Total	1.96	1.782		mg/Kg		91	80 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*
Dibromofluoromethane (Surr)	*105*		*80 - 120*
Toluene-d8 (Surr)	*98*		*80 - 120*

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 310-420520/1-A
Matrix: Solid
Analysis Batch: 420746

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 420520

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Acenaphthylene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Anthracene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Benzo(a)anthracene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Benzo(a)pyrene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Benzo(b)fluoranthene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Benzo(g,h,i)perylene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Benzo(k)fluoranthene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Chrysene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Dibenz(a,h)anthracene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Fluoranthene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Fluorene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Indeno(1,2,3-cd)pyrene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
2-Methylnaphthalene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Naphthalene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Phenanthrene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1
Pyrene	<0.00973		0.00973		mg/Kg		05/02/24 12:50	05/06/24 11:22	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*87*		*37 - 131*	*05/02/24 12:50*	*05/06/24 11:22*	*1*
Nitrobenzene-d5 (Surr)	*103*		*30 - 138*	*05/02/24 12:50*	*05/06/24 11:22*	*1*
Terphenyl-d14 (Surr)	*86*		*24 - 145*	*05/02/24 12:50*	*05/06/24 11:22*	*1*

Lab Sample ID: LCS 310-420520/2-A
Matrix: Solid
Analysis Batch: 420603

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 420520

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acenaphthene	0.0646	0.06283		mg/Kg		97	50 - 124
Acenaphthylene	0.0646	0.06569		mg/Kg		102	52 - 119
Anthracene	0.0646	0.06358		mg/Kg		98	47 - 124
Benzo(a)anthracene	0.0646	0.06306		mg/Kg		98	54 - 138
Benzo(a)pyrene	0.0646	0.06307		mg/Kg		98	47 - 125
Benzo(b)fluoranthene	0.0646	0.06348		mg/Kg		98	49 - 138
Benzo(g,h,i)perylene	0.0646	0.06349		mg/Kg		98	33 - 143
Benzo(k)fluoranthene	0.0646	0.06177		mg/Kg		96	47 - 134
Chrysene	0.0646	0.06257		mg/Kg		97	48 - 127
Dibenz(a,h)anthracene	0.0646	0.06318		mg/Kg		98	40 - 141
Fluoranthene	0.0646	0.06514		mg/Kg		101	43 - 133
Fluorene	0.0646	0.06490		mg/Kg		100	52 - 126
Indeno(1,2,3-cd)pyrene	0.0646	0.05962		mg/Kg		92	40 - 139
2-Methylnaphthalene	0.0646	0.06365		mg/Kg		99	47 - 128
Naphthalene	0.0646	0.06065		mg/Kg		94	46 - 118
Phenanthrene	0.0646	0.06201		mg/Kg		96	47 - 132
Pyrene	0.0646	0.06436		mg/Kg		100	37 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*91*		*37 - 131*

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 310-420520/2-A
Matrix: Solid
Analysis Batch: 420603

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 420520

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Nitrobenzene-d5 (Surr)	123		30 - 138
Terphenyl-d14 (Surr)	96		24 - 145

Method: WI-GRO - Wisconsin - Gasoline Range Organics (GC)

Lab Sample ID: MB 310-421306/1-A
Matrix: Solid
Analysis Batch: 421312

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 421306

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Wisconsin GRO	<9.80		9.80		mg/Kg		05/10/24 11:43	05/12/24 07:50	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	88		80 - 120	05/10/24 11:43	05/12/24 07:50	1

Lab Sample ID: LCS 310-421306/2-A
Matrix: Solid
Analysis Batch: 421312

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 421306

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Wisconsin GRO			19.1	17.79		mg/Kg		93	80 - 120		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	85		80 - 120

Lab Sample ID: LCSD 310-421306/25-A
Matrix: Solid
Analysis Batch: 421312

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 421306

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Wisconsin GRO			19.4	20.01		mg/Kg		103	80 - 120	12	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	96		80 - 120

Lab Sample ID: MB 310-421465/1-A
Matrix: Solid
Analysis Batch: 421467

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 421465

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Wisconsin GRO	<9.31		9.31		mg/Kg		05/13/24 10:56	05/13/24 12:20	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	86		80 - 120	05/13/24 10:56	05/13/24 12:20	1

Method: WI-GRO - Wisconsin - Gasoline Range Organics (GC) (Continued)

Lab Sample ID: LCS 310-421465/2-A
Matrix: Solid
Analysis Batch: 421467

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 421465

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Wisconsin GRO			19.7	20.88		mg/Kg		106	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*89*		*80 - 120*

Lab Sample ID: LCSD 310-421465/25-A
Matrix: Solid
Analysis Batch: 421467

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 421465

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Wisconsin GRO			18.6	18.50		mg/Kg		100	80 - 120	12	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*88*		*80 - 120*

Method: 8015C - Glycols- Direct Injection (GC/FID)

Lab Sample ID: MB 310-420969/1-A
Matrix: Solid
Analysis Batch: 421109

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylene glycol	<9.90		9.90		mg/Kg			05/09/24 11:13	1
Propylene glycol	<9.90		9.90		mg/Kg			05/09/24 11:13	1

Lab Sample ID: LCS 310-420969/2-A
Matrix: Solid
Analysis Batch: 421109

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Ethylene glycol			99.5	95.19		mg/Kg		96	33 - 130		
Propylene glycol			96.1	91.84		mg/Kg		96	39 - 141		

Lab Sample ID: 310-280096-1 MS
Matrix: Solid
Analysis Batch: 421109

Client Sample ID: SS-01
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Ethylene glycol	<13.5		135	109.9		mg/Kg	☼	82	10 - 144		
Propylene glycol	<13.5		130	105.3		mg/Kg	☼	81	10 - 150		

Lab Sample ID: 310-280096-1 MSD
Matrix: Solid
Analysis Batch: 421109

Client Sample ID: SS-01
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Ethylene glycol	<13.5		134	89.84		mg/Kg	☼	67	10 - 144	20	40
Propylene glycol	<13.5		129	86.22		mg/Kg	☼	67	10 - 150	20	40

Method: WI-DRO - Wisconsin - Diesel Range Organics (GC)

Lab Sample ID: MB 310-420459/1-A
Matrix: Solid
Analysis Batch: 420814

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 420459

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO)	<6.80		6.80		mg/Kg		05/02/24 09:28	05/07/24 14:13	1

Lab Sample ID: LCS 310-420459/2-A
Matrix: Solid
Analysis Batch: 420814

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 420459

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Diesel Range Organics (DRO)	97.4	92.62		mg/Kg		95	70 - 120

Lab Sample ID: LCSD 310-420459/3-A
Matrix: Solid
Analysis Batch: 420814

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 420459

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Diesel Range Organics (DRO)	99.6	100.6		mg/Kg		101	70 - 120	8	20

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-420793/1-A ^5
Matrix: Solid
Analysis Batch: 421122

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 420793

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.968		0.968		mg/Kg		05/07/24 10:00	05/08/24 18:24	5
Barium	<0.968		0.968		mg/Kg		05/07/24 10:00	05/08/24 18:24	5
Cadmium	<0.484		0.484		mg/Kg		05/07/24 10:00	05/08/24 18:24	5
Chromium	<1.45		1.45		mg/Kg		05/07/24 10:00	05/08/24 18:24	5
Lead	<2.42		2.42		mg/Kg		05/07/24 10:00	05/08/24 18:24	5
Selenium	<1.45		1.45		mg/Kg		05/07/24 10:00	05/08/24 18:24	5
Silver	<0.484		0.484		mg/Kg		05/07/24 10:00	05/08/24 18:24	5

Lab Sample ID: LCS 310-420793/2-A ^20
Matrix: Solid
Analysis Batch: 421122

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 420793

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	194	199.3		mg/Kg		103	80 - 120
Barium	97.0	101.6		mg/Kg		105	80 - 120
Cadmium	97.0	97.31		mg/Kg		100	80 - 120
Chromium	97.0	91.14		mg/Kg		94	80 - 120
Lead	194	203.4		mg/Kg		105	80 - 120
Selenium	388	382.0		mg/Kg		98	80 - 120
Silver	97.0	111.7		mg/Kg		115	80 - 120

Lab Sample ID: 310-280096-1 MS
Matrix: Solid
Analysis Batch: 421122

Client Sample ID: SS-01
Prep Type: Total/NA
Prep Batch: 420793

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	2.87		232	245.0		mg/Kg	☼	104	75 - 125

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-280096-1 MS
Matrix: Solid
Analysis Batch: 421122

Client Sample ID: SS-01
Prep Type: Total/NA
Prep Batch: 420793

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	188	F1	116	314.6		mg/Kg	☼	109	75 - 125
Cadmium	1.31		116	119.2		mg/Kg	☼	102	75 - 125
Chromium	70.6		116	172.0		mg/Kg	☼	87	75 - 125
Lead	9.69		232	255.3		mg/Kg	☼	106	75 - 125
Selenium	3.29		464	469.1		mg/Kg	☼	100	75 - 125
Silver	<0.581		116	136.3		mg/Kg	☼	117	75 - 125

Lab Sample ID: 310-280096-1 MSD
Matrix: Solid
Analysis Batch: 421122

Client Sample ID: SS-01
Prep Type: Total/NA
Prep Batch: 420793

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	2.87		233	264.0		mg/Kg	☼	112	75 - 125	7	20
Barium	188	F1	117	260.4	F1	mg/Kg	☼	62	75 - 125	19	20
Cadmium	1.31		117	129.0		mg/Kg	☼	109	75 - 125	8	20
Chromium	70.6		117	208.0		mg/Kg	☼	118	75 - 125	19	20
Lead	9.69		233	272.2		mg/Kg	☼	113	75 - 125	6	20
Selenium	3.29		467	506.1		mg/Kg	☼	108	75 - 125	8	20
Silver	<0.581		117	142.4		mg/Kg	☼	122	75 - 125	4	20

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 310-420676/1-A
Matrix: Solid
Analysis Batch: 420907

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 420676

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0163		0.0163		mg/Kg		05/03/24 17:39	05/07/24 10:50	1

Lab Sample ID: LCS 310-420676/2-A
Matrix: Solid
Analysis Batch: 420907

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 420676

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.130	0.1315		mg/Kg		101	80 - 120

Lab Sample ID: 310-280096-1 MS
Matrix: Solid
Analysis Batch: 420907

Client Sample ID: SS-01
Prep Type: Total/NA
Prep Batch: 420676

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.0501		0.212	0.2457		mg/Kg	☼	92	80 - 120

Lab Sample ID: 310-280096-1 MSD
Matrix: Solid
Analysis Batch: 420907

Client Sample ID: SS-01
Prep Type: Total/NA
Prep Batch: 420676

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.0501		0.183	0.2211		mg/Kg	☼	94	80 - 120	11	20

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Method: Moisture - Percent Moisture

Lab Sample ID: 310-280096-1 DU
Matrix: Solid
Analysis Batch: 420417

Client Sample ID: SS-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	26.0			27.8		%				7	39
Percent Solids	74.0			72.2		%				2	10

GC/MS VOA

Prep Batch: 421128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	5035	
310-280096-2	SS-02	Total/NA	Solid	5035	
310-280096-3	SS-03	Total/NA	Solid	5035	
310-280096-4	SS-04	Total/NA	Solid	5035	
MB 310-421128/1-A	Method Blank	Total/NA	Solid	5035	
LCS 310-421128/2-A	Lab Control Sample	Total/NA	Solid	5035	

Analysis Batch: 421133

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	8260D	421128
310-280096-2	SS-02	Total/NA	Solid	8260D	421128
310-280096-3	SS-03	Total/NA	Solid	8260D	421128
310-280096-4	SS-04	Total/NA	Solid	8260D	421128
MB 310-421128/1-A	Method Blank	Total/NA	Solid	8260D	421128
LCS 310-421128/2-A	Lab Control Sample	Total/NA	Solid	8260D	421128

GC/MS Semi VOA

Prep Batch: 420520

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	3546	
310-280096-2	SS-02	Total/NA	Solid	3546	
310-280096-3	SS-03	Total/NA	Solid	3546	
310-280096-4	SS-04	Total/NA	Solid	3546	
MB 310-420520/1-A	Method Blank	Total/NA	Solid	3546	
LCS 310-420520/2-A	Lab Control Sample	Total/NA	Solid	3546	

Analysis Batch: 420603

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	8270E SIM	420520
310-280096-2	SS-02	Total/NA	Solid	8270E SIM	420520
310-280096-3	SS-03	Total/NA	Solid	8270E SIM	420520
310-280096-4	SS-04	Total/NA	Solid	8270E SIM	420520
LCS 310-420520/2-A	Lab Control Sample	Total/NA	Solid	8270E SIM	420520

Analysis Batch: 420746

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-420520/1-A	Method Blank	Total/NA	Solid	8270E SIM	420520

GC VOA

Prep Batch: 421306

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	WI GRO	
310-280096-2	SS-02	Total/NA	Solid	WI GRO	
310-280096-3	SS-03	Total/NA	Solid	WI GRO	
MB 310-421306/1-A	Method Blank	Total/NA	Solid	5035	
LCS 310-421306/2-A	Lab Control Sample	Total/NA	Solid	5035	
LCSD 310-421306/25-A	Lab Control Sample Dup	Total/NA	Solid	5035	

GC VOA

Analysis Batch: 421312

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	WI-GRO	421306
310-280096-2	SS-02	Total/NA	Solid	WI-GRO	421306
310-280096-3	SS-03	Total/NA	Solid	WI-GRO	421306
MB 310-421306/1-A	Method Blank	Total/NA	Solid	WI-GRO	421306
LCS 310-421306/2-A	Lab Control Sample	Total/NA	Solid	WI-GRO	421306
LCSD 310-421306/25-A	Lab Control Sample Dup	Total/NA	Solid	WI-GRO	421306

Prep Batch: 421465

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-4	SS-04	Total/NA	Solid	WI GRO	
MB 310-421465/1-A	Method Blank	Total/NA	Solid	5035	
LCS 310-421465/2-A	Lab Control Sample	Total/NA	Solid	5035	
LCSD 310-421465/25-A	Lab Control Sample Dup	Total/NA	Solid	5035	

Analysis Batch: 421467

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-4	SS-04	Total/NA	Solid	WI-GRO	421465
MB 310-421465/1-A	Method Blank	Total/NA	Solid	WI-GRO	421465
LCS 310-421465/2-A	Lab Control Sample	Total/NA	Solid	WI-GRO	421465
LCSD 310-421465/25-A	Lab Control Sample Dup	Total/NA	Solid	WI-GRO	421465

GC Semi VOA

Prep Batch: 420459

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	WI DRO PREP	
310-280096-2	SS-02	Total/NA	Solid	WI DRO PREP	
310-280096-3	SS-03	Total/NA	Solid	WI DRO PREP	
310-280096-4	SS-04	Total/NA	Solid	WI DRO PREP	
MB 310-420459/1-A	Method Blank	Total/NA	Solid	WI DRO PREP	
LCS 310-420459/2-A	Lab Control Sample	Total/NA	Solid	WI DRO PREP	
LCSD 310-420459/3-A	Lab Control Sample Dup	Total/NA	Solid	WI DRO PREP	

Analysis Batch: 420814

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	WI-DRO	420459
310-280096-2	SS-02	Total/NA	Solid	WI-DRO	420459
310-280096-3	SS-03	Total/NA	Solid	WI-DRO	420459
310-280096-4	SS-04	Total/NA	Solid	WI-DRO	420459
MB 310-420459/1-A	Method Blank	Total/NA	Solid	WI-DRO	420459
LCS 310-420459/2-A	Lab Control Sample	Total/NA	Solid	WI-DRO	420459
LCSD 310-420459/3-A	Lab Control Sample Dup	Total/NA	Solid	WI-DRO	420459

Leach Batch: 420969

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Soluble	Solid	DI Leach	
310-280096-2	SS-02	Soluble	Solid	DI Leach	
310-280096-3	SS-03	Soluble	Solid	DI Leach	
310-280096-4	SS-04	Soluble	Solid	DI Leach	
MB 310-420969/1-A	Method Blank	Soluble	Solid	DI Leach	
LCS 310-420969/2-A	Lab Control Sample	Soluble	Solid	DI Leach	

GC Semi VOA (Continued)

Leach Batch: 420969 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1 MS	SS-01	Soluble	Solid	DI Leach	
310-280096-1 MSD	SS-01	Soluble	Solid	DI Leach	

Analysis Batch: 421109

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Soluble	Solid	8015C	420969
MB 310-420969/1-A	Method Blank	Soluble	Solid	8015C	420969
LCS 310-420969/2-A	Lab Control Sample	Soluble	Solid	8015C	420969
310-280096-1 MS	SS-01	Soluble	Solid	8015C	420969
310-280096-1 MSD	SS-01	Soluble	Solid	8015C	420969

Analysis Batch: 421262

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-2	SS-02	Soluble	Solid	8015C	420969
310-280096-3	SS-03	Soluble	Solid	8015C	420969
310-280096-4	SS-04	Soluble	Solid	8015C	420969

Metals

Prep Batch: 420676

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	7471B	
310-280096-2	SS-02	Total/NA	Solid	7471B	
310-280096-3	SS-03	Total/NA	Solid	7471B	
310-280096-4	SS-04	Total/NA	Solid	7471B	
MB 310-420676/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 310-420676/2-A	Lab Control Sample	Total/NA	Solid	7471B	
310-280096-1 MS	SS-01	Total/NA	Solid	7471B	
310-280096-1 MSD	SS-01	Total/NA	Solid	7471B	

Prep Batch: 420793

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	3050B	
310-280096-2	SS-02	Total/NA	Solid	3050B	
310-280096-3	SS-03	Total/NA	Solid	3050B	
310-280096-4	SS-04	Total/NA	Solid	3050B	
MB 310-420793/1-A ^5	Method Blank	Total/NA	Solid	3050B	
LCS 310-420793/2-A ^20	Lab Control Sample	Total/NA	Solid	3050B	
310-280096-1 MS	SS-01	Total/NA	Solid	3050B	
310-280096-1 MSD	SS-01	Total/NA	Solid	3050B	

Analysis Batch: 420907

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	7471B	420676
310-280096-2	SS-02	Total/NA	Solid	7471B	420676
310-280096-3	SS-03	Total/NA	Solid	7471B	420676
310-280096-4	SS-04	Total/NA	Solid	7471B	420676
MB 310-420676/1-A	Method Blank	Total/NA	Solid	7471B	420676
LCS 310-420676/2-A	Lab Control Sample	Total/NA	Solid	7471B	420676
310-280096-1 MS	SS-01	Total/NA	Solid	7471B	420676
310-280096-1 MSD	SS-01	Total/NA	Solid	7471B	420676

QC Association Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Metals

Analysis Batch: 421122

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	6020B	420793
310-280096-2	SS-02	Total/NA	Solid	6020B	420793
310-280096-3	SS-03	Total/NA	Solid	6020B	420793
310-280096-4	SS-04	Total/NA	Solid	6020B	420793
MB 310-420793/1-A ^5	Method Blank	Total/NA	Solid	6020B	420793
LCS 310-420793/2-A ^20	Lab Control Sample	Total/NA	Solid	6020B	420793
310-280096-1 MS	SS-01	Total/NA	Solid	6020B	420793
310-280096-1 MSD	SS-01	Total/NA	Solid	6020B	420793

General Chemistry

Analysis Batch: 420417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	Moisture	
310-280096-2	SS-02	Total/NA	Solid	Moisture	
310-280096-3	SS-03	Total/NA	Solid	Moisture	
310-280096-4	SS-04	Total/NA	Solid	Moisture	
310-280096-1 DU	SS-01	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Client Sample ID: SS-01

Lab Sample ID: 310-280096-1

Date Collected: 04/30/24 09:45
Matrix: Solid
Date Received: 05/01/24 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			421128	MZR8	EET CF	05/09/24 09:13
Total/NA	Analysis	8260D		1	421133	MZR8	EET CF	05/09/24 19:23
Total/NA	Prep	3546			420520	YU9M	EET CF	05/02/24 12:50
Total/NA	Analysis	8270E SIM		5	420603	V7YZ	EET CF	05/03/24 15:57
Total/NA	Prep	WI GRO			421306	MZR8	EET CF	05/10/24 11:43
Total/NA	Analysis	WI-GRO		1	421312	MZR8	EET CF	05/12/24 08:41
Soluble	Leach	DI Leach			420969	BW2O	EET CF	05/08/24 09:09
Soluble	Analysis	8015C		1	421109	BW2O	EET CF	05/09/24 12:06
Total/NA	Prep	WI DRO PREP			420459	YU9M	EET CF	05/02/24 09:28
Total/NA	Analysis	WI-DRO		1	420814	C3AA	EET CF	05/07/24 15:21
Total/NA	Prep	3050B			420793	KM3E	EET CF	05/07/24 10:00
Total/NA	Analysis	6020B		5	421122	NFT2	EET CF	05/08/24 18:28
Total/NA	Prep	7471B			420676	DHM5	EET CF	05/03/24 17:39
Total/NA	Analysis	7471B		1	420907	A6US	EET CF	05/07/24 10:54
Total/NA	Analysis	Moisture		1	420417	A3GU	EET CF	05/01/24 17:16

Client Sample ID: SS-02

Lab Sample ID: 310-280096-2

Date Collected: 04/30/24 10:15
Matrix: Solid
Date Received: 05/01/24 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			421128	MZR8	EET CF	05/09/24 09:13
Total/NA	Analysis	8260D		1	421133	MZR8	EET CF	05/09/24 19:46
Total/NA	Prep	3546			420520	YU9M	EET CF	05/02/24 12:50
Total/NA	Analysis	8270E SIM		5	420603	V7YZ	EET CF	05/03/24 16:17
Total/NA	Prep	WI GRO			421306	MZR8	EET CF	05/10/24 11:43
Total/NA	Analysis	WI-GRO		1	421312	MZR8	EET CF	05/12/24 09:07
Soluble	Leach	DI Leach			420969	BW2O	EET CF	05/08/24 09:09
Soluble	Analysis	8015C		1	421262	BW2O	EET CF	05/10/24 12:00
Total/NA	Prep	WI DRO PREP			420459	YU9M	EET CF	05/02/24 09:28
Total/NA	Analysis	WI-DRO		1	420814	C3AA	EET CF	05/07/24 15:32
Total/NA	Prep	3050B			420793	KM3E	EET CF	05/07/24 10:00
Total/NA	Analysis	6020B		5	421122	NFT2	EET CF	05/08/24 18:39
Total/NA	Prep	7471B			420676	DHM5	EET CF	05/03/24 17:39
Total/NA	Analysis	7471B		1	420907	A6US	EET CF	05/07/24 11:05
Total/NA	Analysis	Moisture		1	420417	A3GU	EET CF	05/01/24 17:16

Client Sample ID: SS-03

Lab Sample ID: 310-280096-3

Date Collected: 04/30/24 10:45
Matrix: Solid
Date Received: 05/01/24 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			421128	MZR8	EET CF	05/09/24 09:13
Total/NA	Analysis	8260D		1	421133	MZR8	EET CF	05/09/24 20:09

Lab Chronicle

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Client Sample ID: SS-03

Lab Sample ID: 310-280096-3

Date Collected: 04/30/24 10:45
Matrix: Solid
Date Received: 05/01/24 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			420520	YU9M	EET CF	05/02/24 12:50
Total/NA	Analysis	8270E SIM		5	420603	V7YZ	EET CF	05/03/24 16:36
Total/NA	Prep	WI GRO			421306	MZR8	EET CF	05/10/24 11:43
Total/NA	Analysis	WI-GRO		1	421312	MZR8	EET CF	05/12/24 09:33
Soluble	Leach	DI Leach			420969	BW2O	EET CF	05/08/24 09:09
Soluble	Analysis	8015C		1	421262	BW2O	EET CF	05/10/24 12:10
Total/NA	Prep	WI DRO PREP			420459	YU9M	EET CF	05/02/24 09:28
Total/NA	Analysis	WI-DRO		1	420814	C3AA	EET CF	05/07/24 15:44
Total/NA	Prep	3050B			420793	KM3E	EET CF	05/07/24 10:00
Total/NA	Analysis	6020B		5	421122	NFT2	EET CF	05/08/24 18:41
Total/NA	Prep	7471B			420676	DHM5	EET CF	05/03/24 17:39
Total/NA	Analysis	7471B		1	420907	A6US	EET CF	05/07/24 11:07
Total/NA	Analysis	Moisture		1	420417	A3GU	EET CF	05/01/24 17:16

Client Sample ID: SS-04

Lab Sample ID: 310-280096-4

Date Collected: 04/30/24 11:15
Matrix: Solid
Date Received: 05/01/24 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			421128	MZR8	EET CF	05/09/24 09:13
Total/NA	Analysis	8260D		1	421133	MZR8	EET CF	05/09/24 20:31
Total/NA	Prep	3546			420520	YU9M	EET CF	05/02/24 12:50
Total/NA	Analysis	8270E SIM		5	420603	V7YZ	EET CF	05/03/24 16:56
Total/NA	Prep	WI GRO			421465	MZR8	EET CF	05/13/24 10:56
Total/NA	Analysis	WI-GRO		1	421467	MZR8	EET CF	05/13/24 13:12
Soluble	Leach	DI Leach			420969	BW2O	EET CF	05/08/24 09:09
Soluble	Analysis	8015C		1	421262	BW2O	EET CF	05/10/24 12:21
Total/NA	Prep	WI DRO PREP			420459	YU9M	EET CF	05/02/24 09:28
Total/NA	Analysis	WI-DRO		1	420814	C3AA	EET CF	05/07/24 15:55
Total/NA	Prep	3050B			420793	KM3E	EET CF	05/07/24 10:00
Total/NA	Analysis	6020B		5	421122	NFT2	EET CF	05/08/24 18:43
Total/NA	Prep	7471B			420676	DHM5	EET CF	05/03/24 17:39
Total/NA	Analysis	7471B		1	420907	A6US	EET CF	05/07/24 11:09
Total/NA	Analysis	Moisture		1	420417	A3GU	EET CF	05/01/24 17:16

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Accreditation/Certification Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Laboratory: Eurofins Cedar Falls

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Minnesota	NELAP	019-999-319	12-31-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
8260D	5035	Solid	Dichlorofluoromethane
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

North Dakota	State	R-186	09-29-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
8015C		Solid	Ethylene glycol
8015C		Solid	Propylene glycol
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids
WI-DRO	WI DRO PREP	Solid	Diesel Range Organics (DRO)
WI-GRO	WI GRO	Solid	Wisconsin GRO

Method Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-1
SDG: DULAI 174212

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET CF
8270E SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	EET CF
WI-GRO	Wisconsin - Gasoline Range Organics (GC)	WI-GRO	EET CF
8015C	Glycols- Direct Injection (GC/FID)	SW846	EET CF
WI-DRO	Wisconsin - Diesel Range Organics (GC)	WI-DRO	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7471B	Mercury (CVAA)	SW846	EET CF
Moisture	Percent Moisture	EPA	EET CF
3050B	Preparation, Metals	SW846	EET CF
3546	Microwave Extraction	SW846	EET CF
5035	Closed System Purge and Trap	SW846	EET CF
7471B	Preparation, Mercury	SW846	EET CF
DI Leach	Deionized Water Leaching Procedure	ASTM	EET CF
WI DRO PREP	Wisconsin Extraction (Diesel Range Organics)	WI-DRO	EET CF
WI GRO	Closed System Purge and Trap	WI-GRO	EET CF

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

WI-DRO = "Modified DRO: Method For Determining Diesel Range Organics", Wisconsin DNR, Publ-SW-141, September, 1995.

WI-GRO = "Modified GRO: Method For Determining Gasoline Range Organics", Wisconsin DNR, Publ-SW-140, September, 1995.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

eurofins | Environment Testing America

310-280096 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SEH

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received. DATE 5/1/24 TIME 0915 Received By: EM

Delivery Type: ☐ UPS ☒ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes:* Cooler ID:
Multiple Coolers?	☐ Yes	☒ No	*If yes:* Cooler # _____ of _____
Cooler Custody Seals Present?	☐ Yes	☒ No	*If yes:* Cooler custody seals intact? ☐ Yes ☐ No
Sample Custody Seals Present?	☐ Yes	☒ No	*If yes:* Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present?	☐ Yes	☒ No	*If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: Y | Correction Factor (°C): 0

• Temp Blank Temperature – *If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature*

Uncorrected Temp (°C): 0.7 | Corrected Temp (°C): 0.7

• Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE: If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

Duluth Service Center #269

eurofins Environment Testing America

Client Information	Sampler: Ryan Rojus	Lab PM: Zachary Balert	Carrier Tracking No(s):	COC No:
Client Contact: Jen Force	Phone: 715-417-2507	E-Mail:	State of Origin:	Page: Page. __ of __
Company: SEH	PWSID:			Job #:
Address: 3535 Vadnais Center Dr	Due Date Requested:			
City: St Paul	TAT Requested (days): standard			
State Zip: MN 55110-3507	Compliance Project: Δ Yes Δ No			
Phone: 651-424-0535	PO #:			
Email: jforce@sehinc.com	WO #:			
Project Name: Stormwater Pond Expansion	Project #: DULAI 174212			
Site: Duluth Airport	SSOW#:			

Analysis Requested

Preservation Codes.

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA

M Hexane
N - None
O - AsNaO2
P Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U Acetone
V - MCAA
W - pH 4-5
Y Trizma
Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	VOCs by 8260	PAHs by 8270	8 RCRA Metals by 6010/7471	DRO by WDNR	GRO by WDNR	PFAS by MN Method	Ethylene + Propylene Glycols 8015	Total Number of containers	Special Instructions/Note:
			Preservation Code:												
SS-01	4/30/24	9:45	G	S			✓	✓	✓	✓	✓	✓	✓	7	
SS-02		10:15					✓	✓	✓	✓	✓	✓	✓	7	
SS-03		10:45					✓	✓	✓	✓	✓	✓	✓	7	
SS-04		11:15					✓	✓	✓	✓	✓	✓	✓	7	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		4/30/24 01:15pm			4/30/24 1315	Eurofins
2		4/30/24 1500	Eurofins	Mi	5-1-24 915	
3						

Custody Seals Intact: Δ Yes Δ No | Custody Seal No

Cooler Temperature(s) °C and Other Remarks.

Ver: 01/16/2019

5/15/2024

Login Sample Receipt Checklist

Client: Short Elliott Hendrickson, Inc. dba SEH

Job Number: 310-280096-1
SDG Number: DULAI 174212

Login Number: 280096
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Jennifer Force
Short Elliott Hendrickson, Inc. dba SEH
3535 Vadnais Center Drive
St. Paul, Minnesota 55110

Generated 6/5/2024 11:28:21 PM

JOB DESCRIPTION

Stormwater Pond Expansion
DULAI 174212

JOB NUMBER

310-280096-2

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

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Authorized for release by
Zach Bindert, Client Service Manager
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(319)277-2401

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Job ID: 310-280096-2 — Eurofins Cedar Falls

Job Narrative
310-280096-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 5/1/2024 9:15 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.7°C.

PFAS
Method 1633: The recovery for a target analyte(s) Perfluorooctanesulfonic acid (PFOS) in the laboratory control spike samples associated with the following samples: SS-01 (310-280096-1), SS-02 (310-280096-2), SS-03 (310-280096-3) and SS-04 (310-280096-4) is outside the QC acceptance limits. The client was contacted and the data is reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-280096-1	SS-01	Solid	04/30/24 09:45	05/01/24 09:15
310-280096-2	SS-02	Solid	04/30/24 10:15	05/01/24 09:15
310-280096-3	SS-03	Solid	04/30/24 10:45	05/01/24 09:15
310-280096-4	SS-04	Solid	04/30/24 11:15	05/01/24 09:15

Detection Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

Client Sample ID: SS-01 — Lab Sample ID: 310-280096-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.242	*+	0.200		ng/g	1	☼	1633	Total/NA

Client Sample ID: SS-02 — Lab Sample ID: 310-280096-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.757		0.200		ng/g	1	☼	1633	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.501	*+	0.200		ng/g	1	☼	1633	Total/NA
Perfluorooctanoic acid (PFOA)	0.265		0.200		ng/g	1	☼	1633	Total/NA
Perfluorotridecanoic acid (PFTriA)	0.613	I	0.200		ng/g	1	☼	1633	Total/NA

Client Sample ID: SS-03 — Lab Sample ID: 310-280096-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.205		0.201		ng/g	1	☼	1633	Total/NA
Perfluorooctanesulfonic acid (PFOS)	4.95	*+	0.201		ng/g	1	☼	1633	Total/NA
Perfluorotridecanoic acid (PFTriA)	0.268	I	0.201		ng/g	1	☼	1633	Total/NA

Client Sample ID: SS-04 — Lab Sample ID: 310-280096-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.482		0.200		ng/g	1	☼	1633	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.50	*+	0.200		ng/g	1	☼	1633	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

Client Sample ID: SS-01
Date Collected: 04/30/24 09:45
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-1
Matrix: Solid

Method: EPA 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	<0.799		0.799		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	<0.799		0.799		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.799		0.799		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	<0.999		0.999		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	<0.799		0.799		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	<0.999		0.999		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
NEtFOSAA	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
N-ethylperfluoro-1-octanesulfonamide	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
2-(N-ethylperfluoro-1-octanesulfonamido) ethanol	<2.00		2.00		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
NMeFOSA	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
NMeFOSAA	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
2-(N-methylperfluoro-1-octanesulfonamido) ethanol	<2.00		2.00		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<0.400		0.400		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorobutanesulfonic acid (PFBS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorobutanoic acid (PFBA)	<0.799		0.799		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorodecanesulfonic acid (PFDS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorodecanoic acid (PFDA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorododecanesulfonic acid (PFDoS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorododecanoic acid (PFDoA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	<0.400		0.400		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluoroheptanesulfonic acid (PFHpS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluoroheptanoic acid (PFHpA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	<5.00		5.00		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorohexanesulfonic acid (PFHxS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorohexanoic acid (PFHxA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<0.400		0.400		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<0.400		0.400		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorononanesulfonic acid (PFNS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorononanoic acid (PFNA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorooctanesulfonamide (FOSA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorooctanesulfonic acid (PFOS)	**0.242**	***+**	0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorooctanoic acid (PFOA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluoropentanesulfonic acid (PFPeS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluoropentanoic acid (PFPA)	<0.400		0.400		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

Client Sample ID: SS-01
Date Collected: 04/30/24 09:45
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-1
Matrix: Solid

Method: EPA 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3-Perfluoropentylpropanoic acid (5:3 FTCA)	<5.00		5.00		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluoro(2-propoxypropanoic) acid	<0.799		0.799		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	<0.999		0.999		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorotetradecanoic acid (PFTA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluorotridecanoic acid (PFTriA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1
Perfluoroundecanoic acid (PFUnA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*74.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
13C3 HFPO-DA	*88.5*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
13C4 PFBA	*92.0*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
13C3 PFBS	*91.9*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
13C6 PFDA	*88.4*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
13C4 PFHpA	*86.0*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
13C5 PFHxA	*91.4*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
13C3 PFHxS	*86.8*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
13C9 PFNA	*88.1*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
13C8 PFOA	*101*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
13C8 PFOS	*85.9*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
13C5 PFPeA	*86.6*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
13C2 PFTeDA	*70.4*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
13C7 PFUnA	*83.7*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
d5-NEtFOSAA	*89.2*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
d9-N-EtFOSE-M	*63.9*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
d5-NEtPFOSA	*64.4*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
d3-NMeFOSAA	*90.5*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
d7-N-MeFOSE-M	*67.8*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
d3-NMePFOSA	*71.5*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
M2-4:2 FTS	*91.7*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
M2-6:2 FTS	*92.4*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
M2-8:2 FTS	*90.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*
13C2 PFDoA	*80.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:37*	*1*

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

Client Sample ID: SS-02
Date Collected: 04/30/24 10:15
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-2
Matrix: Solid

Method: EPA 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	<0.799		0.799		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	<0.799		0.799		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.799		0.799		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	<0.998		0.998		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	<0.799		0.799		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	<0.998		0.998		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
NEtFOSAA	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
N-ethylperfluoro-1-octanesulfonamide	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
2-(N-ethylperfluoro-1-octanesulfonamido) ethanol	<2.00		2.00		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
NMeFOSA	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
NMeFOSAA	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
2-(N-methylperfluoro-1-octanesulfonamido) ethanol	<2.00		2.00		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<0.399		0.399		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorobutanesulfonic acid (PFBS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorobutanoic acid (PFBA)	<0.799		0.799		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorodecanesulfonic acid (PFDS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorodecanoic acid (PFDA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorododecanesulfonic acid (PFDoS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorododecanoic acid (PFDoA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	<0.399		0.399		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluoroheptanesulfonic acid (PFHpS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluoroheptanoic acid (PFHpA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	<4.99		4.99		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorohexanesulfonic acid (PFHxS)	**0.757**		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorohexanoic acid (PFHxA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<0.399		0.399		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<0.399		0.399		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorononanesulfonic acid (PFNS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorononanoic acid (PFNA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorooctanesulfonamide (FOSA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorooctanesulfonic acid (PFOS)	**0.501**	*+	0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorooctanoic acid (PFOA)	**0.265**		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluoropentanesulfonic acid (PFPeS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluoropentanoic acid (PFPA)	<0.399		0.399		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

Client Sample ID: SS-02
Date Collected: 04/30/24 10:15
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-2
Matrix: Solid

Method: EPA 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3-Perfluoropentylpropanoic acid (5:3 FTCA)	<4.99		4.99		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluoro(2-propoxypropanoic) acid	<0.799		0.799		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	<0.998		0.998		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorotetradecanoic acid (PFTA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluorotridecanoic acid (PFTriA)	**0.613**	**I**	0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1
Perfluoroundecanoic acid (PFUnA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 19:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*61.1*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
13C3 HFPO-DA	*79.1*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
13C4 PFBA	*76.5*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
13C3 PFBS	*81.1*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
13C6 PFDA	*74.5*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
13C4 PFHpA	*76.8*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
13C5 PFHxA	*85.6*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
13C3 PFHxS	*76.8*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
13C9 PFNA	*72.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
13C8 PFOA	*77.2*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
13C8 PFOS	*69.5*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
13C5 PFPeA	*78.9*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
13C2 PFTeDA	*56.5*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
13C7 PFUnA	*68.0*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
d5-NEtFOSAA	*70.8*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
d9-N-EtFOSE-M	*39.4*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
d5-NEtPFOSA	*49.6*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
d3-NMeFOSAA	*61.5*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
d7-N-MeFOSE-M	*47.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
d3-NMePFOSA	*56.0*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
M2-4:2 FTS	*81.1*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
M2-6:2 FTS	*81.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
M2-8:2 FTS	*82.9*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*
13C2 PFDoA	*66.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 19:51*	*1*

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

Client Sample ID: SS-03
Date Collected: 04/30/24 10:45
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-3
Matrix: Solid

Method: EPA 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	<0.802		0.802		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	<0.802		0.802		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.802		0.802		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	<1.00		1.00		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	<0.802		0.802		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	<1.00		1.00		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
NEtFOSAA	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
N-ethylperfluoro-1-octanesulfonamide	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
2-(N-ethylperfluoro-1-octanesulfonamido) ethanol	<2.01		2.01		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
NMeFOSA	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
NMeFOSAA	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
2-(N-methylperfluoro-1-octanesulfonamido) ethanol	<2.01		2.01		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<0.401		0.401		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorobutanesulfonic acid (PFBS)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorobutanoic acid (PFBA)	<0.802		0.802		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorodecanesulfonic acid (PFDS)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorodecanoic acid (PFDA)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorododecanesulfonic acid (PFDoS)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorododecanoic acid (PFDoA)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	<0.401		0.401		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluoroheptanesulfonic acid (PFHpS)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluoroheptanoic acid (PFHpA)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	<5.01		5.01		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorohexanesulfonic acid (PFHxS)	**0.205**		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorohexanoic acid (PFHxA)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<0.401		0.401		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<0.401		0.401		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorononanesulfonic acid (PFNS)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorononanoic acid (PFNA)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorooctanesulfonamide (FOSA)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorooctanesulfonic acid (PFOS)	**4.95**	*+	0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorooctanoic acid (PFOA)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluoropentanesulfonic acid (PFPeS)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluoropentanoic acid (PFPA)	<0.401		0.401		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

Client Sample ID: SS-03
Date Collected: 04/30/24 10:45
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-3
Matrix: Solid

Method: EPA 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3-Perfluoropentylpropanoic acid (5:3 FTCA)	<5.01		5.01		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluoro(2-propoxypropanoic) acid	<0.802		0.802		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	<1.00		1.00		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorotetradecanoic acid (PFTA)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluorotridecanoic acid (PFTriA)	**0.268**	**I**	0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1
Perfluoroundecanoic acid (PFUnA)	<0.201		0.201		ng/g	☼	05/23/24 08:36	05/27/24 20:04	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*78.7*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
13C3 HFPO-DA	*94.8*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
13C4 PFBA	*93.4*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
13C3 PFBS	*90.9*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
13C6 PFDA	*84.4*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
13C4 PFHpA	*95.0*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
13C5 PFHxA	*103*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
13C3 PFHxS	*92.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
13C9 PFNA	*91.0*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
13C8 PFOA	*101*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
13C8 PFOS	*85.9*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
13C5 PFPeA	*96.1*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
13C2 PFTeDA	*64.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
13C7 PFUnA	*86.0*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
d5-NEtFOSAA	*105*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
d9-N-EtFOSE-M	*52.2*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
d5-NEtPFOSA	*57.9*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
d3-NMeFOSAA	*83.4*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
d7-N-MeFOSE-M	*65.9*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
d3-NMePFOSA	*67.4*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
M2-4:2 FTS	*86.0*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
M2-6:2 FTS	*94.8*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
M2-8:2 FTS	*87.8*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*
13C2 PFDoA	*77.8*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:04*	*1*

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

Client Sample ID: SS-04
Date Collected: 04/30/24 11:15
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-4
Matrix: Solid

Method: EPA 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	<0.800		0.800		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	<0.800		0.800		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.800		0.800		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	<1.00		1.00		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	<0.800		0.800		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	<1.00		1.00		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
NEtFOSAA	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
N-ethylperfluoro-1-octanesulfonamide	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
2-(N-ethylperfluoro-1-octanesulfonamido) ethanol	<2.00		2.00		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
NMeFOSA	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
NMeFOSAA	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
2-(N-methylperfluoro-1-octanesulfonamido) ethanol	<2.00		2.00		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<0.400		0.400		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorobutanesulfonic acid (PFBS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorobutanoic acid (PFBA)	<0.800		0.800		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorodecanesulfonic acid (PFDS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorodecanoic acid (PFDA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorododecanesulfonic acid (PFDoS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorododecanoic acid (PFDoA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	<0.400		0.400		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluoroheptanesulfonic acid (PFHpS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluoroheptanoic acid (PFHpA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	<5.00		5.00		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorohexanesulfonic acid (PFHxS)	**0.482**		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorohexanoic acid (PFHxA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<0.400		0.400		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<0.400		0.400		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorononanesulfonic acid (PFNS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorononanoic acid (PFNA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorooctanesulfonamide (FOSA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorooctanesulfonic acid (PFOS)	**1.50**	*+	0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorooctanoic acid (PFOA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluoropentanesulfonic acid (PFPeS)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluoropentanoic acid (PFPA)	<0.400		0.400		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1

Client Sample ID: SS-04
Date Collected: 04/30/24 11:15
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-4
Matrix: Solid

Method: EPA 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3-Perfluoropentylpropanoic acid (5:3 FTCA)	<5.00		5.00		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluoro(2-propoxypropanoic) acid	<0.800		0.800		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	<1.00		1.00		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorotetradecanoic acid (PFTA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluorotridecanoic acid (PFTriA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1
Perfluoroundecanoic acid (PFUnA)	<0.200		0.200		ng/g	☼	05/23/24 08:36	05/27/24 20:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*71.0*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
13C3 HFPO-DA	*93.8*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
13C4 PFBA	*93.2*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
13C3 PFBS	*92.4*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
13C6 PFDA	*89.6*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
13C4 PFHpA	*85.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
13C5 PFHxA	*96.9*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
13C3 PFHxS	*88.4*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
13C9 PFNA	*81.4*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
13C8 PFOA	*93.6*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
13C8 PFOS	*87.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
13C5 PFPeA	*89.7*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
13C2 PFTeDA	*71.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
13C7 PFUnA	*91.4*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
d5-NEtFOSAA	*95.2*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
d9-N-EtFOSE-M	*54.5*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
d5-NEtPFOSA	*59.9*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
d3-NMeFOSAA	*79.8*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
d7-N-MeFOSE-M	*61.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
d3-NMePFOSA	*64.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
M2-4:2 FTS	*93.0*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
M2-6:2 FTS	*99.6*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
M2-8:2 FTS	*94.5*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*
13C2 PFDoA	*85.3*		*20 - 150*	*05/23/24 08:36*	*05/27/24 20:18*	*1*

Definitions/Glossary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

Qualifiers

LCMS

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
I	Value is EMPC (estimated maximum possible concentration).

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Lab Sample ID: MB 410-509656/1-A
Matrix: Solid
Analysis Batch: 510710

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 509656

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	<0.800		0.800		ng/g		05/23/24 07:24	05/27/24 14:52	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	<0.800		0.800		ng/g		05/23/24 07:24	05/27/24 14:52	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.800		0.800		ng/g		05/23/24 07:24	05/27/24 14:52	1
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	<1.00		1.00		ng/g		05/23/24 07:24	05/27/24 14:52	1
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	<0.800		0.800		ng/g		05/23/24 07:24	05/27/24 14:52	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	<1.00		1.00		ng/g		05/23/24 07:24	05/27/24 14:52	1
NEtFOSAA	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
N-ethylperfluoro-1-octanesulfonamide	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
2-(N-ethylperfluoro-1-octanesulfonamido) ethanol	<2.00		2.00		ng/g		05/23/24 07:24	05/27/24 14:52	1
NMeFOSA	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
NMeFOSAA	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
2-(N-methylperfluoro-1-octanesulfonamido) ethanol	<2.00		2.00		ng/g		05/23/24 07:24	05/27/24 14:52	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<0.400		0.400		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorobutanesulfonic acid (PFBS)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorobutanoic acid (PFBA)	<0.800		0.800		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorodecanesulfonic acid (PFDS)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorodecanoic acid (PFDA)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorododecanesulfonic acid (PFDoS)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorododecanoic acid (PFDoA)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	<0.400		0.400		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluoroheptanesulfonic acid (PFHpS)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluoroheptanoic acid (PFHpA)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	<5.00		5.00		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorohexanesulfonic acid (PFHxS)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorohexanoic acid (PFHxA)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<0.400		0.400		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<0.400		0.400		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorononanesulfonic acid (PFNS)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorononanoic acid (PFNA)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorooctanesulfonamide (FOSA)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorooctanesulfonic acid (PFOS)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorooctanoic acid (PFOA)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluoropentanesulfonic acid (PFPeS)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluoropentanoic acid (PFPA)	<0.400		0.400		ng/g		05/23/24 07:24	05/27/24 14:52	1

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: MB 410-509656/1-A
Matrix: Solid
Analysis Batch: 510710

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 509656

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3-Perfluoropentylpropanoic acid (5:3 FTCA)	<5.00		5.00		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluoro(2-propoxypropanoic) acid	<0.800		0.800		ng/g		05/23/24 07:24	05/27/24 14:52	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	<1.00		1.00		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorotetradecanoic acid (PFTA)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluorotridecanoic acid (PFTriA)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1
Perfluoroundecanoic acid (PFUnA)	<0.200		0.200		ng/g		05/23/24 07:24	05/27/24 14:52	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*71.2*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
13C3 HFPO-DA	*83.9*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
13C4 PFBA	*82.4*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
13C3 PFBS	*80.0*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
13C6 PFDA	*78.5*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
13C4 PFHpA	*77.6*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
13C5 PFHxA	*86.3*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
13C3 PFHxS	*77.1*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
13C9 PFNA	*78.2*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
13C8 PFOA	*83.0*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
13C8 PFOS	*76.3*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
13C5 PFPeA	*79.7*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
13C2 PFTeDA	*66.9*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
13C7 PFUnA	*79.6*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
d5-NEtFOSAA	*124*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
d9-N-EtFOSE-M	*60.6*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
d5-NEtPFOSA	*50.8*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
d3-NMeFOSAA	*68.6*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
d7-N-MeFOSE-M	*64.6*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
d3-NMePFOSA	*58.3*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
M2-4:2 FTS	*75.5*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
M2-6:2 FTS	*74.3*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
M2-8:2 FTS	*73.0*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*
13C2 PFDoA	*69.3*		*20 - 150*	*05/23/24 07:24*	*05/27/24 14:52*	*1*

Lab Sample ID: LCS 410-509656/2-A
Matrix: Solid
Analysis Batch: 510710

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 509656

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	9.42	9.620		ng/g		102	40 - 150
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	18.6	14.82		ng/g		80	40 - 150
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.42	9.430		ng/g		100	40 - 150
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	9.58	10.08		ng/g		105	40 - 150
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	9.34	9.837		ng/g		105	40 - 150

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LCS 410-509656/2-A
Matrix: Solid
Analysis Batch: 510710

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 509656

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	9.48	9.979		ng/g		105	40 - 150
NEtFOSAA	2.50	2.550		ng/g		102	40 - 150
N-ethylperfluoro-1-octanesulfonamide	2.50	2.716		ng/g		109	40 - 150
2-(N-ethylperfluoro-1-octanesulfonamido) ethanol	25.0	26.21		ng/g		105	40 - 150
NMeFOSA	2.50	2.576		ng/g		103	40 - 150
NMeFOSAA	2.50	2.645		ng/g		106	40 - 150
2-(N-methylperfluoro-1-octanesulfonamido) ethanol	25.0	26.27		ng/g		105	40 - 150
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	5.00	5.804		ng/g		116	40 - 150
Perfluorobutanesulfonic acid (PFBS)	2.21	2.332		ng/g		105	40 - 150
Perfluorobutanoic acid (PFBA)	10.0	10.25		ng/g		103	40 - 150
Perfluorodecanesulfonic acid (PFDS)	2.41	2.358		ng/g		98	40 - 150
Perfluorodecanoic acid (PFDA)	2.50	2.582		ng/g		103	40 - 150
Perfluorododecanesulfonic acid (PFDoS)	2.42	2.212		ng/g		91	40 - 150
Perfluorododecanoic acid (PFDoA)	2.50	2.498		ng/g		100	40 - 150
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	4.45	4.952		ng/g		111	40 - 150
Perfluoroheptanesulfonic acid (PFHpS)	2.38	2.507		ng/g		105	40 - 150
Perfluoroheptanoic acid (PFHpA)	2.50	2.616		ng/g		105	40 - 150
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	62.5	59.52		ng/g		95	40 - 150
Perfluorohexanesulfonic acid (PFHxS)	2.28	2.328		ng/g		102	40 - 150
Perfluorohexanoic acid (PFHxA)	2.50	2.509		ng/g		100	40 - 150
Perfluoro-4-methoxybutanoic acid (PFMBA)	5.00	5.255		ng/g		105	40 - 150
Perfluoro-3-methoxypropanoic acid (PFMPA)	5.00	5.614		ng/g		112	40 - 150
Perfluorononanesulfonic acid (PFNS)	2.40	2.473		ng/g		103	40 - 150
Perfluorononanoic acid (PFNA)	2.50	2.589		ng/g		104	40 - 150
Perfluorooctanesulfonamide (FOSA)	2.50	2.534		ng/g		101	40 - 150
Perfluorooctanesulfonic acid (PFOS)	2.32	2.798		ng/g		121	40 - 150
Perfluorooctanoic acid (PFOA)	2.50	2.422		ng/g		97	40 - 150
Perfluoropentanesulfonic acid (PFPeS)	2.35	2.467		ng/g		105	40 - 150
Perfluoropentanoic acid (PFPA)	5.00	5.555		ng/g		111	40 - 150
3-Perfluoropentylpropanoic acid (5:3 FTCA)	62.5	64.54		ng/g		103	40 - 150
Perfluoro(2-propoxypropanoic) acid	10.0	9.638		ng/g		96	40 - 150

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LCS 410-509656/2-A
Matrix: Solid
Analysis Batch: 510710

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 509656

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
3-Perfluoropropylpropanoic acid (3:3 FTCA)	12.5	14.18		ng/g		113	40 - 150
Perfluorotetradecanoic acid (PFTA)	2.50	2.691		ng/g		108	40 - 150
Perfluorotridecanoic acid (PFTriA)	2.50	2.749		ng/g		110	40 - 150
Perfluoroundecanoic acid (PFUnA)	2.50	2.692		ng/g		108	40 - 150

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*73.2*		*20 - 150*
13C3 HFPO-DA	*89.9*		*20 - 150*
13C4 PFBA	*89.0*		*20 - 150*
13C3 PFBS	*85.0*		*20 - 150*
13C6 PFDA	*84.2*		*20 - 150*
13C4 PFHpA	*83.1*		*20 - 150*
13C5 PFHxA	*88.2*		*20 - 150*
13C3 PFHxS	*84.8*		*20 - 150*
13C9 PFNA	*79.7*		*20 - 150*
13C8 PFOA	*84.8*		*20 - 150*
13C8 PFOS	*84.5*		*20 - 150*
13C5 PFPeA	*89.6*		*20 - 150*
13C2 PFTeDA	*73.1*		*20 - 150*
13C7 PFUnA	*81.7*		*20 - 150*
d5-NEtFOSAA	*137*		*20 - 150*
d9-N-EtFOSE-M	*66.8*		*20 - 150*
d5-NEtPFOSA	*56.5*		*20 - 150*
d3-NMeFOSAA	*77.2*		*20 - 150*
d7-N-MeFOSE-M	*68.4*		*20 - 150*
d3-NMePFOSA	*64.4*		*20 - 150*
M2-4:2 FTS	*79.9*		*20 - 150*
M2-6:2 FTS	*84.7*		*20 - 150*
M2-8:2 FTS	*78.9*		*20 - 150*
13C2 PFDoA	*80.4*		*20 - 150*

Lab Sample ID: LLCS 410-509656/3-A
Matrix: Solid
Analysis Batch: 510710

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 509656

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	1.51	1.688		ng/g		112	40 - 150
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	1.49	1.608		ng/g		108	40 - 150
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.51	1.644		ng/g		109	40 - 150
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	1.53	1.605		ng/g		105	40 - 150
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	1.49	1.710		ng/g		114	40 - 150

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LLCS 410-509656/3-A
Matrix: Solid
Analysis Batch: 510710

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 509656

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	1.52	1.545		ng/g		102	40 - 150
NEtFOSAA	0.400	0.4347		ng/g		109	40 - 150
N-ethylperfluoro-1-octanesulfonamide	0.400	0.4378		ng/g		109	40 - 150
2-(N-ethylperfluoro-1-octanesulfonamido) ethanol	4.00	4.434		ng/g		111	40 - 150
NMeFOSA	0.400	0.4391		ng/g		110	40 - 150
NMeFOSAA	0.400	0.4499		ng/g		112	40 - 150
2-(N-methylperfluoro-1-octanesulfonamido) ethanol	4.00	4.541		ng/g		114	40 - 150
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	0.800	0.8088		ng/g		101	40 - 150
Perfluorobutanesulfonic acid (PFBS)	0.354	0.4113		ng/g		116	40 - 150
Perfluorobutanoic acid (PFBA)	1.60	1.717		ng/g		107	40 - 150
Perfluorodecanesulfonic acid (PFDS)	0.386	0.3708		ng/g		96	40 - 150
Perfluorodecanoic acid (PFDA)	0.400	0.4538		ng/g		113	40 - 150
Perfluorododecanesulfonic acid (PFDoS)	0.387	0.3675		ng/g		95	40 - 150
Perfluorododecanoic acid (PFDoA)	0.400	0.4492		ng/g		112	40 - 150
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	0.712	0.8143		ng/g		114	40 - 150
Perfluoroheptanesulfonic acid (PFHpS)	0.381	0.3858		ng/g		101	40 - 150
Perfluoroheptanoic acid (PFHpA)	0.400	0.4302		ng/g		108	40 - 150
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	10.0	9.614		ng/g		96	40 - 150
Perfluorohexanesulfonic acid (PFHxS)	0.364	0.3579		ng/g		98	40 - 150
Perfluorohexanoic acid (PFHxA)	0.400	0.4310		ng/g		108	40 - 150
Perfluoro-4-methoxybutanoic acid (PFMBA)	0.800	0.8627		ng/g		108	40 - 150
Perfluoro-3-methoxypropanoic acid (PFMPA)	0.800	0.9010		ng/g		113	40 - 150
Perfluorononanesulfonic acid (PFNS)	0.384	0.4143		ng/g		108	40 - 150
Perfluorononanoic acid (PFNA)	0.400	0.4805		ng/g		120	40 - 150
Perfluorooctanesulfonamide (FOSA)	0.400	0.4334		ng/g		108	40 - 150
Perfluorooctanesulfonic acid (PFOS)	0.371	0.6951	*+	ng/g		187	40 - 150
Perfluorooctanoic acid (PFOA)	0.400	0.4576		ng/g		114	40 - 150
Perfluoropentanesulfonic acid (PFPeS)	0.375	0.3849		ng/g		103	40 - 150
Perfluoropentanoic acid (PFPA)	0.800	0.8856		ng/g		111	40 - 150
3-Perfluoropentylpropanoic acid (5:3 FTCA)	10.0	10.20		ng/g		102	40 - 150
Perfluoro(2-propoxypropanoic) acid	1.60	1.652		ng/g		103	40 - 150

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS (Continued)

Lab Sample ID: LLCS 410-509656/3-A
Matrix: Solid
Analysis Batch: 510710

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 509656

Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits		
3-Perfluoropropylpropanoic acid (3:3 FTCA)			2.00	2.186		ng/g		109	40 - 150		
Perfluorotetradecanoic acid (PFTA)			0.400	0.4802		ng/g		120	40 - 150		
Perfluorotridecanoic acid (PFTriA)			0.400	0.4776		ng/g		119	40 - 150		
Perfluoroundecanoic acid (PFUnA)			0.400	0.4311		ng/g		108	40 - 150		

Isotope Dilution	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C8 FOSA	*71.8*		*20 - 150*
13C3 HFPO-DA	*90.4*		*20 - 150*
13C4 PFBA	*85.7*		*20 - 150*
13C3 PFBS	*86.0*		*20 - 150*
13C6 PFDA	*85.9*		*20 - 150*
13C4 PFHpA	*87.4*		*20 - 150*
13C5 PFHxA	*90.0*		*20 - 150*
13C3 PFHxS	*85.7*		*20 - 150*
13C9 PFNA	*79.6*		*20 - 150*
13C8 PFOA	*89.9*		*20 - 150*
13C8 PFOS	*89.2*		*20 - 150*
13C5 PFPeA	*87.3*		*20 - 150*
13C2 PFTeDA	*75.4*		*20 - 150*
13C7 PFUnA	*91.9*		*20 - 150*
d5-NEtFOSAA	*126*		*20 - 150*
d9-N-EtFOSE-M	*71.6*		*20 - 150*
d5-NEtPFOSA	*59.3*		*20 - 150*
d3-NMeFOSAA	*75.8*		*20 - 150*
d7-N-MeFOSE-M	*71.4*		*20 - 150*
d3-NMePFOSA	*63.8*		*20 - 150*
M2-4:2 FTS	*80.8*		*20 - 150*
M2-6:2 FTS	*81.7*		*20 - 150*
M2-8:2 FTS	*81.9*		*20 - 150*
13C2 PFDoA	*81.9*		*20 - 150*

QC Association Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

LCMS

Prep Batch: 509656

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	1633 Shake	
310-280096-2	SS-02	Total/NA	Solid	1633 Shake	
310-280096-3	SS-03	Total/NA	Solid	1633 Shake	
310-280096-4	SS-04	Total/NA	Solid	1633 Shake	
MB 410-509656/1-A	Method Blank	Total/NA	Solid	1633 Shake	
LCS 410-509656/2-A	Lab Control Sample	Total/NA	Solid	1633 Shake	
LLCS 410-509656/3-A	Lab Control Sample	Total/NA	Solid	1633 Shake	

Analysis Batch: 510710

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280096-1	SS-01	Total/NA	Solid	1633	509656
310-280096-2	SS-02	Total/NA	Solid	1633	509656
310-280096-3	SS-03	Total/NA	Solid	1633	509656
310-280096-4	SS-04	Total/NA	Solid	1633	509656
MB 410-509656/1-A	Method Blank	Total/NA	Solid	1633	509656
LCS 410-509656/2-A	Lab Control Sample	Total/NA	Solid	1633	509656
LLCS 410-509656/3-A	Lab Control Sample	Total/NA	Solid	1633	509656

Lab Chronicle

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

Client Sample ID: SS-01
Date Collected: 04/30/24 09:45
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	1633 Shake			509656	DX7G	ELLE	05/23/24 08:36
Total/NA	Analysis	1633		1	510710	UUV6	ELLE	05/27/24 19:37

Client Sample ID: SS-02
Date Collected: 04/30/24 10:15
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	1633 Shake			509656	DX7G	ELLE	05/23/24 08:36
Total/NA	Analysis	1633		1	510710	UUV6	ELLE	05/27/24 19:51

Client Sample ID: SS-03
Date Collected: 04/30/24 10:45
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	1633 Shake			509656	DX7G	ELLE	05/23/24 08:36
Total/NA	Analysis	1633		1	510710	UUV6	ELLE	05/27/24 20:04

Client Sample ID: SS-04
Date Collected: 04/30/24 11:15
Date Received: 05/01/24 09:15

Lab Sample ID: 310-280096-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	1633 Shake			509656	DX7G	ELLE	05/23/24 08:36
Total/NA	Analysis	1633		1	510710	UUV6	ELLE	05/27/24 20:18

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	05-30-24
A2LA	ISO/IEC 17025	0001.01	11-30-24
Alabama	State	43200	01-31-25
Alaska	State	PA00009	06-30-24
Alaska (UST)	State	17-027	02-28-25
Arizona	State	AZ0780	03-12-25
Arkansas DEQ	State	88-00660	08-09-24
California	State	2792	11-30-24
Colorado	State	PA00009	06-30-24
Connecticut	State	PH-0746	06-30-25
DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-25
Delaware (DW)	State	N/A	01-31-25
Florida	NELAP	E87997	06-30-24
Georgia (DW)	State	C048	01-31-25
Hawaii	State	N/A	01-31-25
Illinois	NELAP	200027	01-31-25
Iowa	State	361	03-01-24 *
Kansas	NELAP	E-10151	10-31-24
Kentucky (DW)	State	KY90088	12-31-24
Kentucky (UST)	State	0001.01	11-30-24
Kentucky (WW)	State	KY90088	12-31-24
Louisiana (All)	NELAP	02055	06-30-24
Maine	State	2019012	03-12-25
Maryland	State	100	06-30-25
Massachusetts	State	M-PA009	06-30-24
Michigan	State	9930	01-31-25
Minnesota	NELAP	042-999-487	12-31-24
Mississippi	State	023	01-31-25
Missouri	State	450	01-31-25
Montana (DW)	State	0098	01-01-25
Nebraska	State	NE-OS-32-17	01-31-25
New Hampshire	NELAP	2730	01-10-25
New Jersey	NELAP	PA011	06-30-24
New York	NELAP	10670	04-01-25
North Carolina (DW)	State	42705	07-31-24
North Carolina (WW/SW)	State	521	05-29-24
North Dakota	State	R-205	01-31-24 *
Oklahoma	NELAP	9804	08-31-24
Oregon	NELAP	PA200001	09-11-24
Pennsylvania	NELAP	36-00037	01-31-25
Quebec Ministry of Environment and Fight against Climate Change	PALA	507	09-16-24
Rhode Island	State	LAO00338	12-30-24
South Carolina	State	89002	01-31-25
Tennessee	State	02838	01-31-25
Texas	NELAP	T104704194-23-46	08-31-24
USDA	US Federal Programs	525-22-298-19481	10-25-25
Vermont	State	VT - 36037	10-28-24
Virginia	NELAP	460182	06-14-25
Washington	State	C457	04-11-24 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Job ID: 310-280096-2
Project/Site: Stormwater Pond Expansion
SDG: DULAI 174212

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
West Virginia (DW)	State	9906 C	01-31-25
West Virginia DEP	State	055	07-31-25
Wyoming	State	8TMS-L	01-31-25
Wyoming (UST)	A2LA	0001.01	11-30-24

Method Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

Method	Method Description	Protocol	Laboratory
1633	Per- and Polyfluoroalkyl Substances by LC/MS/MS	EPA	ELLE
1633 Shake	Shake Extraction with SPE	EPA	ELLE

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

eurofins | Environment Testing America

310-280096 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SEH

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received. DATE 5/1/24 TIME 0915 Received By: EM

Delivery Type: ☐ UPS ☒ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes:* Cooler ID:
Multiple Coolers?	☐ Yes	☒ No	*If yes:* Cooler # _____ of _____
Cooler Custody Seals Present?	☐ Yes	☒ No	*If yes:* Cooler custody seals intact? ☐ Yes ☐ No
Sample Custody Seals Present?	☐ Yes	☒ No	*If yes:* Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present?	☐ Yes	☒ No	*If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: Y | Correction Factor (°C): 0

• Temp Blank Temperature – *If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature*

Uncorrected Temp (°C): 0.7 | Corrected Temp (°C): 0.7

• Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE: If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

Duluth Service Center #269

eurofins Environment Testing America

Client Information	Sampler: Ryan Rojus	Lab PM: Zachary Balert	Carrier Tracking No(s):	COC No:
Client Contact: Jen Force	Phone: 715-417-2507	E-Mail:	State of Origin:	Page: Page. __ of __
Company: SEH	PWSID:			Job #:
Address: 3535 Vadnais Center Dr	Due Date Requested:			
City: St Paul	TAT Requested (days): standard			
State Zip: MN 55110-3507	Compliance Project: Δ Yes Δ No			
Phone: 651-424-0535	PO #:			
Email: jforce@sehinc.com	WO #:			
Project Name: Stormwater Pond Expansion	Project #: DULAI 174212			
Site: Duluth Airport	SSOW#:			

Analysis Requested

Preservation Codes.

A - HCL, B - NaOH, C Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M Hexane, N - None, O - AsNaO2, P Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U Acetone, V - MCAA, W - pH 4-5, Y Trizma, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	VOCs by 8260	PAHs by 8270	8 RCRA Metals by 6010/7471	DRO by WDNR	GRO by WDNR	PFAS by MN Method	Ethylene + Propylene Glycols 8015	Total Number of containers	Special Instructions/Note:
			Preservation Code:												
SS-01	4/30/24	9:45	G	S			✓	✓	✓	✓	✓	✓	✓	7	
SS-02		10:15					✓	✓	✓	✓	✓	✓	✓	7	
SS-03		10:45					✓	✓	✓	✓	✓	✓	✓	7	
SS-04		11:15					✓	✓	✓	✓	✓	✓	✓	7	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		4/30/24 01:15pm			4/30/24 1315	Eurofins
2		4/30/24 1500	Eurofins	Mi	5-1-24 915	
3						

Custody Seals Intact: Δ Yes Δ No | Custody Seal No

Cooler Temperature(s) °C and Other Remarks.

Ver: 01/16/2019

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone: 319-277-2401 Fax: 319-277-2425

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bindert, Zach T	Carrier Tracking No(s):	COC No: 310-71900.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Zach.Bindert@et.eurofinsus.com	State of Origin: Minnesota	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note): NELAP - Minnesota; State - North Dakota		Job #: 310-280096-2
Address: 2425 New Holland Pike, ,	Due Date Requested: 5/29/2024			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Stormwater Pond Expansion	Project #: 31012713			
Site:	SSOW#:			

Analysis Requested

Preservation Codes: -

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	1633/1633_Shake List of 40 (EPA 1633 Draft Method)	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
SS-01 (310-280096-1)	4/30/24	09:45 Central		Solid			X	1	
SS-02 (310-280096-2)	4/30/24	10:15 Central		Solid			X	1	
SS-03 (310-280096-3)	4/30/24	10:45 Central		Solid			X	1	
SS-04 (310-280096-4)	4/30/24	11:15 Central		Solid			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
T. Bindert	5/24 1535				
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
				5/24/24 9:40	ECET

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		Raw 1.1-COR 0.5

mb

Login Sample Receipt Checklist

Client: Short Elliott Hendrickson, Inc. dba SEH

Job Number: 310-280096-2
SDG Number: DULAI 174212

Login Number: 280096
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Short Elliott Hendrickson, Inc. dba SEH

Job Number: 310-280096-2
SDG Number: DULAI 174212

Login Number: 280096
List Number: 2
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC
List Creation: 05/02/24 03:02 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Isotope Dilution Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

Method: 1633 - Per- and Polyfluoroalkyl Substances by LC/MS/MS

Matrix: Solid **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFOSA	HFPODA	PFBA	C3PFBS	C6PFDA	C4PFHA	13C5PHA	C3PFHS
Lab Sample ID	Client Sample ID	(20-150)	(20-150)	(20-150)	(20-150)	(20-150)	(20-150)	(20-150)	(20-150)
310-280096-1	SS-01	74.3	88.5	92.0	91.9	88.4	86.0	91.4	86.8
310-280096-2	SS-02	61.1	79.1	76.5	81.1	74.5	76.8	85.6	76.8
310-280096-3	SS-03	78.7	94.8	93.4	90.9	84.4	95.0	103	92.3
310-280096-4	SS-04	71.0	93.8	93.2	92.4	89.6	85.3	96.9	88.4
LCS 410-509656/2-A	Lab Control Sample	73.2	89.9	89.0	85.0	84.2	83.1	88.2	84.8
LLCS 410-509656/3-A	Lab Control Sample	71.8	90.4	85.7	86.0	85.9	87.4	90.0	85.7
MB 410-509656/1-A	Method Blank	71.2	83.9	82.4	80.0	78.5	77.6	86.3	77.1

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		C9PFNA	C8PFOA	C8PFOS	PFPeA	PFTDA	13C7PUA	d5NEFOS	NEFM
Lab Sample ID	Client Sample ID	(20-150)	(20-150)	(20-150)	(20-150)	(20-150)	(20-150)	(20-150)	(20-150)
310-280096-1	SS-01	88.1	101	85.9	86.6	70.4	83.7	89.2	63.9
310-280096-2	SS-02	72.3	77.2	69.5	78.9	56.5	68.0	70.8	39.4
310-280096-3	SS-03	91.0	101	85.9	96.1	64.3	86.0	105	52.2
310-280096-4	SS-04	81.4	93.6	87.3	89.7	71.3	91.4	95.2	54.5
LCS 410-509656/2-A	Lab Control Sample	79.7	84.8	84.5	89.6	73.1	81.7	137	66.8
LLCS 410-509656/3-A	Lab Control Sample	79.6	89.9	89.2	87.3	75.4	91.9	126	71.6
MB 410-509656/1-A	Method Blank	78.2	83.0	76.3	79.7	66.9	79.6	124	60.6

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		d5NPFSA	d3NMFOS	NMFM	d3NMFSA	M242FTS	M262FTS	M282FTS	PFDoA
Lab Sample ID	Client Sample ID	(20-150)	(20-150)	(20-150)	(20-150)	(20-150)	(20-150)	(20-150)	(20-150)
310-280096-1	SS-01	64.4	90.5	67.8	71.5	91.7	92.4	90.3	80.3
310-280096-2	SS-02	49.6	61.5	47.3	56.0	81.1	81.3	82.9	66.3
310-280096-3	SS-03	57.9	83.4	65.9	67.4	86.0	94.8	87.8	77.8
310-280096-4	SS-04	59.9	79.8	61.3	64.3	93.0	99.6	94.5	85.3
LCS 410-509656/2-A	Lab Control Sample	56.5	77.2	68.4	64.4	79.9	84.7	78.9	80.4
LLCS 410-509656/3-A	Lab Control Sample	59.3	75.8	71.4	63.8	80.8	81.7	81.9	81.9
MB 410-509656/1-A	Method Blank	50.8	68.6	64.6	58.3	75.5	74.3	73.0	69.3

Surrogate Legend

PFOSA = 13C8 FOSA
HFPODA = 13C3 HFPO-DA
PFBA = 13C4 PFBA
C3PFBS = 13C3 PFBS
C6PFDA = 13C6 PFDA
C4PFHA = 13C4 PFHpA
13C5PHA = 13C5 PFHxA
C3PFHS = 13C3 PFHxS
C9PFNA = 13C9 PFNA
C8PFOA = 13C8 PFOA
C8PFOS = 13C8 PFOS
PFPeA = 13C5 PFPeA
PFTDA = 13C2 PFTeDA
13C7PUA = 13C7 PFUnA
d5NEFOS = d5-NEtFOSAA
NEFM = d9-N-EtFOSE-M
d5NPFSA = d5-NEtPFOSA
d3NMFOS = d3-NMeFOSAA
NMFM = d7-N-MeFOSE-M
d3NMFSA = d3-NMePFOSA

Isotope Dilution Summary

Client: Short Elliott Hendrickson, Inc. dba SEH
Project/Site: Stormwater Pond Expansion

Job ID: 310-280096-2
SDG: DULAI 174212

M242FTS = M2-4:2 FTS
M262FTS = M2-6:2 FTS
M282FTS = M2-8:2 FTS
PFDoA = 13C2 PFDoA

STATEMENT OF ESTIMATED QUANTITIES

LINE NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY			FINAL QUANTITY		
				AIP ELIGIBLE FUNDING	AIP INELIGIBLE FUNDING	TOTAL	AIP ELIGIBLE FUNDING	AIP INELIGIBLE FUNDING	TOTAL
SCHEDULE A - TAXIWAY A RECONSTRUCTION - PHASE 5 (FAA - AIP)									
1	40-05	MAINTENANCE & RESTORATION OF HAUL ROADS	LS	1	0	1			
2	40-08	RESTORATION OF BATCH PLANT AND CONTRACTOR STORAGE AREAS	LS	1	0	1			
3	50-06	CONSTRUCTION LAYOUT & STAKING	LS	1	0	1			
4	60-05	FIELD OFFICE	LS	1	0	1			
5	70-08	TRAFFIC PROVISIONS/AIRPORT SECURITY & DEVICES/PHASING	LS	1	0	1			
6	70-10	ORANGE CONSTRUCTION FENCE	LF	6,630	0	6,630			
7	02 41 35	REMOVE PAVEMENT MARKING BY WATER BLASTING	SF	440	0	440			
8	02 41 35	REMOVE PAVEMENT MARKING, GROUND OFF	SF	410	0	410			
9	32 12 16	PLANT-MIXED ASPHALT PAVEMENT	TON	5,750	4,240	9,990			
10	C-100	CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)	LS	1	0	1			
11	C-102	ROCK CONSTRUCTION ENTRANCE (INCLUDES MAINTENANCE AND REMOVAL)	EA	2	0	2			
12	C-102	SILT FENCE, TYPE PREASSEMBLED (INCLUDES MAINTENANCE AND REMOVAL)	LF	17,500	0	17,500			
13	C-102	INLET PROTECTION, TYPE B (INCLUDES MAINTENANCE AND REMOVAL)	EA	20	0	20			
14	C-105	MOBILIZATION	LS	1	0	1			
15	D-701	REINFORCED CONCRETE PIPE (RCP), 12" CLASS V	LF	360	0	360			
16	D-701	REINFORCED CONCRETE PIPE (RCP), 18" CLASS III	LF	410	0	410			
17	D-701	REINFORCED CONCRETE PIPE (RCP), 36" CLASS III	LF	980	0	980			
18	D-701	REINFORCED CONCRETE PIPE (RCP), 42" CLASS III	LF	750	0	750			
19	D-701	REINFORCED CONCRETE PIPE (RCP), 48" CLASS III	LF	390	0	390			
20	D-701	REINFORCED CONCRETE PIPE (RCP), 60" CLASS V	LF	330	0	330			
21	D-705	DRAIN TILE (6" PERFORATED, INCLUDING TRENCH, BACKFILL, FABRIC)	LF	4,620	0	4,620			
22	D-705	DRAIN TILE (6" SOLID, INCLUDING TRENCH, BACKFILL)	LF	1,960	0	1,960			
23	D-751	DRAIN TILE ACCESS/INSPECTION PIT	EA	29	0	29			
24	D-751	MANHOLE / CATCH BASIN 48" DIA.	EA	3	0	3			
25	D-751	MANHOLE / CATCH BASIN 60" DIA.	EA	2	0	2			
26	D-751	MANHOLE / CATCH BASIN 72" DIA.	EA	3	0	3			
27	D-751	MANHOLE / CATCH BASIN 84" DIA.	EA	3	0	3			
28	D-751	MANHOLE / CATCH BASIN 96" DIA.	EA	1	0	1			
29	D-751	ADJUST MANHOLE / CATCH BASIN CASTING	EA	1	0	1			
30	P-610	MH-1 CAST-IN-PLACE STORM SEWER STRUCTURE	LS	1	0	1			
31	2504.603	10" DIPS HDPE Water Main SDR 11	LF	230	0	230			
32	2504.602	WATER TRACER BOX	EA	2	0	2			
33	2504.602	CONNECT TO EXISTING WATERMAIN	EA	2	0	2			
34	2504.604	3" POLYSTYRENE INSULATION	SY	10	0	10			
35	2504.602	ADJUST VALVE BOX	EA	2	0	2	1		
36	L-108-5.1	NO. 8 AWG, 5 KV, L-824, TYPE C CABLE, INSTALLED IN DUCT BANK OR CONDUIT	LF	44,250	0	44,250			
37	L-108-5.2	NO. 6 AWG, SOLID, BARE COUNTERPOISE WIRE, INSTALLED IN TRENCH, ABOVE THE DUCT BANK OR CONDUIT, INCLUDING CONNECTIONS/TERMINATIONS, GROUND RODS AND GROUND CONNECTORS	LF	11,940	0	11,940			
38	L-108-5.3	2-#8 AWG AND 1-#8 GND, XHHW, INSTALLED IN TRENCH OR CONDUIT	LF	1,700	0	1,700			
39	L-108-5.4	1/C #4 5KV UNSHIELDED XLP MV-90 CABLE, INSTALLED IN DUCT BANK OR CONDUIT	LF	1,750	0	1,750			
40	L-110-5.1	NON-ENCASED ELECTRICAL CONDUIT, 1-WAY 2-INCH, PVC SCHEDULE 40	LF	7,600	0	7,600			
41	L-110-5.2	CONCRETE ENCASED ELECTRICAL CONDUIT, 2-WAY 2-INCH, PVC SCHEDULE 40	LF	1,630	0	1,630			
42	L-110-5.3	CONCRETE ENCASED ELECTRICAL CONDUIT, 4-WAY 4-INCH, PVC SCHEDULE 40	LF	1,210	0	1,210			
43	L-110-5.4	CONCRETE ENCASED ELECTRICAL CONDUIT, 6-WAY 4-INCH, PVC SCHEDULE 40	LF	1,500	0	1,500			
44	L-110-5.5	DRAIN LINE CONNECTION TO STORM STRUCTURE	EA	10	0	10			
45	L-110-5.6	2" RIGID GALVANIZED STEEL	LF	1,100	0	1,100			

SEQ NOTES

GENERAL: TEMPORARY SANITARY FACILITIES, WATER FOR DUST CONTROL, AND TEMPORARY WATER SUPPLY FOR CONSTRUCTION OPERATIONS ARE CONSIDERED INCIDENTAL TO OTHER ITEMS OF PROJECT WORK.

GENERAL: ANY FAA, AIRPORT, PRIVATE UTILITY, OR 148TH FW CABLES THAT ARE SCHEDULED TO REMAIN SHALL BE LOCATED VIA HYDRO-EXCAVATION PRIOR TO EXCAVATING OPERATIONS. ALL UTILITIES REQUESTED TO BE LOCATED BY FAA SHALL BE HYDRO-EXCAVATED. ANTICIPATE 16-HOURS OF HYDROEXCAVATION EFFORT, INCIDENTAL TO THE EXCAVATION AND LOCATING WORK.

ITEM 1: INCLUDES INSTALLATION AND REMOVAL OF 24' WIDE TEMPORARY ASPHALT MILLINGS CONTRACTOR ACCESS ROUTE AS DESIGNATED IN PHASING PLAN.

ITEM 2: RESTORATION INCLUDES GRADING, TURF ESTABLISHMENT, AND ANY OTHER MEASURES REQUIRED TO RETURN THE AREA TO PRE-CONSTRUCTION CONDITIONS OR BETTER, AS APPROVED BY ENGINEER.

ITEM 5: INCLUDES ALL TRAFFIC CONTROL SIGNAGE, BARRICADES, TEMPORARY FENCING, TRAFFIC CONTROL DEVICES, AND ALL ITEMS PERTAINING TO SECURITY, AND PHASING.

ITEM 14: MOBILIZATION SHALL BE LIMITED TO 10-PERCENT OF THE TOTAL PROJECT COST. FURNISHING, INSTALLING, AND REMOVAL OF ELECTRICAL JUMPERS REQUIRED FOR TEMPORARY ELECTRICAL CONSTRUCTION IS CONSIDERED INCIDENTAL TO THE WORK OF MOBILIZATION.

ITEM 15-20: CONNECTIONS TO EXISTING STORM DRAIN PIPE, STRUCTURE, DRAIN TILE, INSPECTION PIT, AND CLEANOUT ARE ALL INCIDENTAL TO THESE PAY ITEMS.

ITEM 21-22: CONNECTIONS TO EXISTING STORM DRAIN PIPE, STRUCTURE, DRAIN TILE, INSPECTION PIT, AND CLEANOUT ARE ALL INCIDENTAL TO THESE PAY ITEMS. ALL ITEMS REQUIRED FOR DRAIN TILE (TRENCHING, FILTER MATERIAL, FABRIC, CONNECTIONS, BACKFILLING, AND ASSOCIATED COMPACTION) ARE INCIDENTAL TO ITEM.

ITEM 23-28: CONNECTIONS TO EXISTING STORM DRAIN PIPE, STRUCTURE, DRAIN TILE, INSPECTION PIT, AND CLEANOUT ARE ALL INCIDENTAL TO THESE PAY ITEMS.

ITEM 29: WORK INCLUDES ADJUSTMENT OF EXISTING STRUCTURE CASTING TO FINISHED GRADE, INCLUDING ANY REQUIRED MODIFICATIONS TO EXISTING STRUCTURE AND INSTALLATION OF NEW CASTING.

ITEM 30: DEWATERING REQUIRED FOR INSTALLATION OF CAST-IN-PLACE STRUCTURE IS CONSIDERED INCIDENTAL TO WORK OF THIS BID ITEM. 1

ITEM 31-35: THE 2019 EDITION OF THE CITY OF DULUTH PUBLIC WORKS AND UTILITIES DEPARTMENT STANDARD CONSTRUCTION SPECIFICATIONS AND ALL AMENDMENTS SHALL APPLY TO WATER MAIN CONSTRUCTION.

ITEM 36-45: NO PRICE ADJUSTMENT WILL BE MADE BASED ON PERCENTAGE OF QUANTITY USED. THE ENGINEER WILL PROVIDE A NOTICE TO PROCEED SPECIFICALLY FOR WIRE & CABLE ITEMS PRIOR TO ORDERING TO ENSURE THE CORRECT AMOUNT IS OBTAINED.

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SEH

DULUTH INTERNATIONAL AIRPORT

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

Jarrod R. Nelson, PE
DATE MAY 29, 2024 LICENSE NO. 28794

DULUTH INTERNATIONAL AIRPORT (DLH)

TAXIWAY A
RECONSTRUCTION - PHASE 5

DULUTH, MINNESOTA

MARK	DATE	DESCRIPTION
1	6/20/2024	ADDENDUM 1

REVISIONS

SEH FILE NO. DULAI_174212
STATE PROJECT NO. A6901-22X
ISSUE DATE MAY 29, 2024
DESIGNED BY JN
DRAWN BY AA

SHEET TITLE
STATEMENT OF ESTIMATED QUANTITIES

SHEET
G5.03

STATEMENT OF ESTIMATED QUANTITIES

LINE NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY			FINAL QUANTITY		
				AIP ELIGIBLE FUNDING	AIP INELIGIBLE FUNDING	TOTAL	AIP ELIGIBLE FUNDING	AIP INELIGIBLE FUNDING	TOTAL
SCHEDULE A - TAXIWAY A RECONSTRUCTION - PHASE 5 (FAA - AIP)									
46	L-125-5.1	REMOVAL OF EXISTING AIRFIELD ELECTRICAL	LS	1	0	1			
47	L-125-5.2	L-861T(L) MEDIUM INTENSITY TAXIWAY EDGE LIGHT (WITHOUT ARCTIC KIT), BLUE LENS INSTALLED ON NEW L-867-B GALVANIZED BASE CAN (INCLUDES FIXTURE, TRANSFORMER, AND BASE CAN)	EA	76	0	76			
48	L-125-5.3	L-861T(L) TAXIWAY EDGE LIGHT TEMPORARILY INSTALLED INCLUDING NEW ISOLATION TRANSFORMER	EA	20	0	20			
49	L-125-5.4	L-867-B GALVANIZED BASE CAN WITH BASE PLATE COVER	EA	28	0	28			
50	L-125-5.5	L-868-B GALVANIZED BASE CAN WITH BASE PLATE COVER	EA	3	0	3			
51	L-125-5.6	L-858(L) GUIDANCE SIGN, SIZE 2, INCLUDING FOUNDATION, ISOLATION TRANSFORMER, WIRE, BASE CAN, AND CONDUIT	EA	12	0	12			
52	L-125-5.7	L-829 4KW CONSTANT CURRENT REGULATOR	EA	1	0	1			
53	L-125-5.8	TEMPORARILY REMOVE EXISTING RUNWAY LIGHT FIXTURE, BASE CAN, CABLE, CONDUIT, AND ISOLATION TRANSFORMER, AND REPLACE LIGHT FIXTURE ON NEW L-868-B BASE CAN WITH NEW ISOLATION TRANSFORMER IN LATER PHASE	EA	1	0	1			
54	L-125-5.9	PRECAST AIRCRAFT-RATED ELECTRICAL HANDHOLE	EA	10	0	10			
55	L-125-5.10	L-858(L) GUIDANCE SIGN, SIZE 2, TEMPORARILY INSTALLED TO PAVEMENT INCLUDING ISOLATION TRANSFORMER, AND WIRE	EA	1	0	1			
56	P-101	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LF	750	0	750			
57	P-101	REMOVE BITUMINOUS PAVEMENT (FULL DEPTH)	SY	28,280	0	28,280			
58	P-101	MILL BITUMINOUS PAVEMENT (2")	SY	370	0	370			
59	P-101	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LF	1,040	0	1,040			
60	P-101	REMOVE CONCRETE PAVEMENT (FULL DEPTH)	SY	1,430	0	1,430			
61	P-101	REMOVE STORM PIPE	LF	2,300	0	2,300			
62	P-101	REMOVE STORM STRUCTURE	EA	4	0	4			
63	P-101	REMOVE DRAIN TILE CLEANOUT	EA	15	0	15			
64	P-101	REMOVE WATER MAIN PIPE	LF	240	0	240			
65	P-101	REMOVE DRAIN TILE	LF	5,400	0	5,400			
66	P-151	CLEARING AND GRUBBING	ACRE	0.4	0	0.4			
67	P-152	COMMON EXCAVATION (EV)	CY	47,600	11,900	59,500			
68	P-152	UNCLASSIFIED OVER EXCAVATION (EV) (INCLUDES REMOVAL AND REPLACEMENT OF UNSUITABLE MATERIAL WITH SUITABLE MATERIAL (P-154) AS DIRECTED BY ENGINEER, AND ALSO INCLUDES SUBGRADE PROOF ROLLING)	CY	1,000	0	1,000			
69	P-152	MUCK EXCAVATION (EV)	CY	350	0	350			
70	P-152	SUBGRADE PREPARATION (INCLUDES SUBGRADE PROOF ROLLING)	SY	35,230	15,310	50,540			
71	P-152	ROCK EXCAVATION	CY	50	0	50			
72	P-152	POND EXCAVATION	CY	2,970	0	2,970	1		
73	P-154	GRANULAR BORROW (CV)	CY	17,750	6,890	24,640			
74	P-154	GEOTEXTILE FABRIC, TYPE 7	SY	36,990	16,080	53,070			
75	P-209	CRUSHED AGGREGATE BASE COURSE (CV)	CY	7,250	2,820	10,070			
76	P-401	BITUMINOUS SURFACE COURSE	TON	1,000	120	1,120			
77	P-401	BITUMINOUS BASE COURSE	TON	950	120	1,070			
78	P-403	BITUMINOUS SURFACE COURSE	TON	1,280	120	1,400			
79	P-403	BITUMINOUS BASE COURSE	TON	1,280	120	1,400			
80	P-501	CEMENT CONCRETE PAVEMENT, 13"	SY	14,410	14,700	29,110			
81	P-501	CEMENT CONCRETE PAVEMENT, REINFORCED 13"	SY	5,000	0	5,000			
82	P-603	BITUMINOUS TACK COAT	GAL	1,780	810	2,590			
83	P-604	COMPRESSION JOINT SEALS FOR CONCRETE	LF	26,770	15,910	42,680			
84	P-605	JOINT SEALING FILLER	LF	1,740	0	1,740			
85	P-620	RUNWAY & TAXIWAY PAVEMENT MARKING	SF	28,970	0	28,970			
86	P-620	REFLECTIVE MEDIA	LB	1,740	0	1,740			
87	T-901	SEEDING (INCLUDING FERTILIZER)	ACRE	18.8	0	18.8			
88	T-905	SELECT TOPSOIL BORROW (IMPORT) (CV)	CY	100	0	100			
89	T-908	HYDROMULCHING	ACRE	18.8	0	18.8			
90	02 60 10-1	DISPOSAL OF CONTAMINATED SOIL	TON	200	0	200			
91	02 60 10-2	REMOVAL AND DISPOSAL OF OIL/WATER FROM FUEL PIPE REMOVAL	GAL	200	0	200			
92	02 60 10-3	REMOVAL AND DISPOSAL OF FUEL PIPE	LS	1	0	1			
93	02 60 10-4	REMOVAL AND DISPOSAL OF PIPE VAULT	LS	1	0	1			
94	02 60 10-5	DEWATERING	LS	1	0	1	1		
95	02 60 10-6	REMOVAL AND DISPOSAL OF OIL SLUDGE FROM FUEL PIPE AND PIPE VAULT	GAL	100	0	100			
96	02 82 20-1	REGULATED ASBESTOS REMOVAL	LS	1	0	1			
97	02 82 20-2	REGULATED ASBESTOS REMOVAL - PETROLEUM PIPING	LF	50	0	50			

SEQ NOTES

ITEM 46-55: NO PRICE ADJUSTMENT WILL BE MADE BASED ON PERCENTAGE OF QUANTITY USED. THE ENGINEER WILL PROVIDE A NOTICE TO PROCEED SPECIFICALLY FOR WIRE & CABLE ITEMS PRIOR TO ORDERING TO ENSURE THE CORRECT AMOUNT IS OBTAINED.

ITEM 57: WORK INCLUDES REMOVAL OF BITUMINOUS PAVEMENT AND ANY UNDERLYING CONCRETE PAVEMENT LAYERS, REGARDLESS OF ACTUAL PAVEMENT THICKNESS ENCOUNTERED. APPENDIX A GEOTECHNICAL REPORT REFLECTS EXISTING COMPOSITE PAVEMENT SECTIONS WERE OBSERVED IN SOIL BORINGS AND PAVEMENT CORES FOR PAVEMENTS SOUTH OF TAXIWAY A. WORK INCLUDES SALVAGING OF 50 DUMP TRUCK LOADS OF ASPHALT MILLINGS ON SITE AND INSTALLING AT THE TEMPORARY CONTRACTOR ACCESS ROUTE JUST NORTH OF THE SRE APRON AND APPLYING TO THE NORTHERLY GRAVEL ACCESS ROAD DIRECTLY SOUTH OF THE PHASE 5B STORMWATER RETENTION BASIN SITE TO FORTIFY THE ACCESS ROUTE FOR CONSTRUCTION HAULING PURPOSES.

ITEM 61: REQUIRED PIPE/STRUCTURE BULKHEADS ARE INCIDENTAL TO PIPE REMOVAL.

ITEM 67: SEE EARTHWORK SUMMARY ON SHEET G5.05.

ITEM 68: SEE EARTHWORK SUMMARY ON SHEET G5.05. ITEM INCLUDES MATERIAL EXCAVATED BELOW THE TYPICAL SECTION, AS DIRECTED BY ENGINEER. EXCAVATED MATERIAL TO BECOME PROPERTY OF CONTRACTOR, REPLACEMENT OF EXCAVATED MATERIAL WITH SUITABLE GRANULAR MATERIAL WILL BE INCIDENTAL TO THE UNCLASSIFIED OVER EXCAVATION.

ITEM 69-73: SEE EARTHWORK SUMMARY ON SHEET G5.05.

ITEM 88: ALL ON-SITE STRIPPING, SALVAGING, STOCKPILING, REPLACING AND SPREADING QUANTITY WILL BE PAID FOR UNDER COMMON EXCAVATION PRIOR TO THE PLACEMENT OF TOPSOIL BORROW (OBTAINED OFF-SITE) BY CONTRACTOR.

ITEM 90: DISPOSAL OF CONTAMINATED SOIL AT A MINNESOTA-PERMITTED INDUSTRIAL OR SOLID WASTE LANDFILL INCLUDES SECURING LANDFILL DISPOSAL APPROVAL AND PROVIDING COPIES OF MANIFESTS AND WEIGHT TICKETS.

ITEM 91: REMOVAL AND DISPOSAL OF OIL/WATER FROM FUEL PIPE BY A MPCA-CERTIFIED CONTRACTOR AT AN APPROPRIATELY PERMITTED FACILITY.

ITEM 92-93: REMOVAL AND DISPOSAL OF FUEL PIPING AND FUEL VAULT BY A MPCA-CERTIFIED CONTRACTOR AT AN APPROPRIATELY PERMITTED FACILITY. INCLUDES SUBMITTING MPCA TEN-DAY ADVANCE NOTICE AND UST NOTIFICATION FORM. FUEL PIPING IS REPORTED TO CONSIST OF COATED STEEL INCLUDING AN 8-INCH FUEL TRANSFER PIPE AND A 6-INCH DEFUELING LINE LOCATED 5 TO 8 FEET BELOW GRADE. A 5-FOOT DIAMETER FUEL VAULT IS ALSO PRESENT.

ITEM 94: REMOVAL AND DISPOSAL OF CONTAMINATED GROUNDWATER AND/OR CONTAMINATED STORMWATER. INCLUDES OBTAINING DEWATERING DISCHARGE PERMITS AND PREPARING REQUIRED DOCUMENTATION REPORTS.

ITEM 95: REMOVAL AND DISPOSAL OF OIL SLUDGE FROM FUEL PIPE AND PIPE VAULT BY AN MPCA-CERTIFIED CONTRACTOR AT AN APPROPRIATELY PERMITTED FACILITY.

ITEM 96-97: REGULATED ASBESTOS REMOVAL OF ASBESTOS CONTAINING MATERIAL ELECTRICAL LINE ASSOCIATED WITH FUEL PIPE.

GENERAL: TEMPORARY SANITARY FACILITIES, WATER FOR DUST CONTROL, TEMPORARY WATER ARE CONSIDERED INCIDENTAL TO THE PROJECT.

1

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SEH

DULUTH INTERNATIONAL AIRPORT

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

Jarrod R. Nelson, PE

DATE MAY 29, 2024 LICENSE NO. 26794

DULUTH INTERNATIONAL AIRPORT (DLH)

TAXIWAY A RECONSTRUCTION - PHASE 5

DULUTH, MINNESOTA

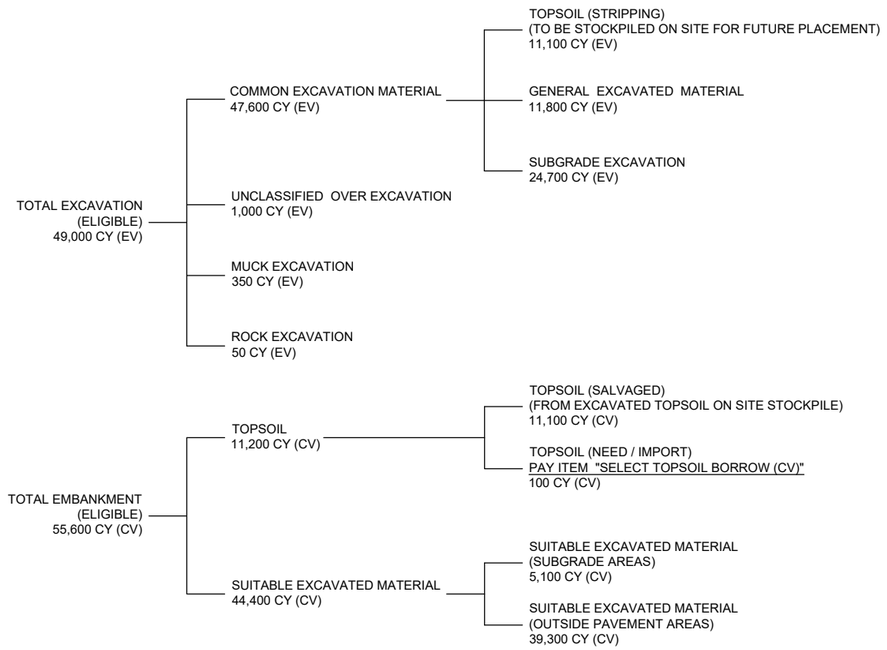
MARK	DATE	REVISIONS
1	6/20/2024	ADDENDUM 1

SEH FILE NO. DULAI_174212
STATE PROJECT NO. A6901-22X
ISSUE DATE MAY 29, 2024
DESIGNED BY JN
DRAWN BY ---

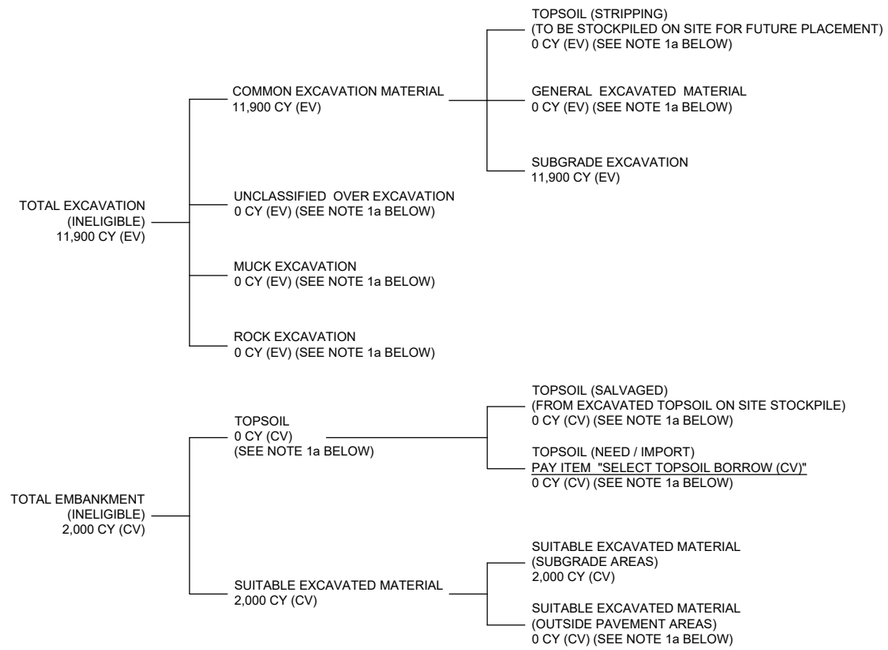
SHEET TITLE
STATEMENT OF ESTIMATED QUANTITIES

SHEET
G5.04

EARTHWORK SUMMARY
(ELIGIBLE FOR AIP FUNDING)



EARTHWORK SUMMARY
(INELIGIBLE FOR AIP FUNDING)



INELIGIBLE TABLE NOTES:

1a. ALL GRADING NEEDS OUTSIDE PAVEMENT AREAS REGARDLESS OF ELIGIBLE OR INELIGIBLE PAVEMENT LIMITS WOULD BE THE SAME.

EARTHWORK NOTES:

1. THE VOLUMES SHOWN IN THE SUMMARY, COMPACTED VOLUME (CV), AS THE MATERIAL LIES AFTER COMPACTION HAS BEEN APPLIED AND THE EXCAVATED VOLUME (EV), AS THE MATERIAL LIES IN IT'S NATURAL COMPACTED STATE PRIOR TO BEING EXCAVATED, **DO NOT** INCLUDE THE LOOSE VOLUME (LV) OF MATERIAL NEEDED TO MEET COMPACTION OR THE ACTUAL LOOSE VOLUME OF MATERIAL AFTER EXCAVATION. IN ORDER TO ESTIMATE THE MATERIAL NEEDED FOR AREAS OF COMPACTION AN ESTIMATED 130% WOULD NEED TO BE ADDED TO THE COMPACTED VOLUME (CV) SHOWN. IN ORDER TO CALCULATE THE EXCAVATED LOOSE VOLUME (LV) MATERIAL TO BE RE-USED OR HAULED OFF SITE A FACTOR OF 115% WOULD NEED TO BE ADD TO THE EXCAVATED VOLUME (EV) SHOWN. THE ESTIMATED PERCENTAGES OF 130% SHRINKAGE FACTOR FROM LOOSE VOLUME (LV) TO COMPACTED VOLUME (CV) AND 115% EXPANSION FACTOR FROM EXCAVATED VOLUME (EV) TO LOOSE VOLUME (LV) ARE FOR INFORMATION ONLY. QUANTITIES TO BE MEASURED BY SURVEY OF AGREED UPON BY FIELD ENGINEER.
2. EXCAVATIONS SHALL BE DEFINED AS FOLLOWS:
   "SUBGRADE EXCAVATION" = ALL AREAS REQUIRING EXCAVATION TO MEET PROPOSED SUBGRADE ELEVATION BELOW PAVEMENT AREAS. THIS EXCAVATION INCLUDES THE REMOVAL OF THE EXISTING AGGREGATE BASE MATERIAL.
   "UNCLASSIFIED OVER EXCAVATION" = ADDITIONAL AREAS BELOW PROPOSED SUBGRADE NOT MEETING COMPACTION SPECIFICATIONS. REMOVAL AND REPLACEMENT OF UNSUITABLE MATERIAL WITH SUITABLE MATERIAL (P-154) SHALL BE INCLUDED IN THIS PAY ITEM AS DIRECTED BY THE ENGINEER.
   "GENERAL EXCAVATED MATERIAL" = ALL AREAS REQUIRING EXCAVATION TO MEET PROPOSED SUBGRADE ELEVATION OUTSIDE THE PAVEMENT LIMITS.
3. EMBANKMENT "SUITABLE EXCAVATED MATERIAL" SHALL ONLY BE USED IF MATERIAL MEETS COMPACTION SPECIFICATIONS.
4. STRIPPING, ON SITE STOCKPILING AND PLACING OF ALL TOPSOIL (INCLUDING MIXING AND PLACEMENT OF IMPORTED TOPSOIL) WILL BE PAID FOR UNDER COMMON EXCAVATION. EXCESS STOCKPILED TOPSOIL SHALL BE DISPOSED OF OFF THE AIRPORT PROPERTY. NO EXCESS STOCKPILED TOPSOIL SHALL BE WASTED ON THE AIRPORT SITE UNLESS APPROVED BY AIRPORT OPERATIONS. EXCESS STOCKPILED TOPSOIL OFF SITE DISPOSAL OR RELOCATION WITH APPROVAL FROM AIRPORT OPERATIONS SHALL BE PAID FOR UNDER COMMON EXCAVATION.
5. EXCAVATION OR FIELD GRADING QUANTITIES OUTSIDE OF THE GRADING LIMITS SHALL BE DETERMINED QUANTITIES FROM A TOPOGRAPHIC SURVEY FROM BEFORE & AFTER THE WORK. THE SURVEY DATA SHALL BE SUBMITTED TO THE ENGINEER.
6. UNCLASSIFIED OVER EXCAVATION QUANTITIES ARE ESTIMATES ONLY. QUANTITIES FOR PAYMENT MUST BE JUSTIFIED FROM A TOPOGRAPHIC SURVEY FROM BEFORE & AFTER THE WORK OR AS AGREED UPON BY THE ENGINEER. THE SURVEY DATA SHALL BE SUBMITTED TO THE ENGINEER.
7. MUCK EXCAVATION AND ROCK EXCAVATION QUANTITIES ARE ESTIMATES ONLY. QUANTITIES FOR PAYMENT MUST BE JUSTIFIED FROM A TOPOGRAPHIC SURVEY FROM BEFORE & AFTER THE WORK OR AS AGREED UPON BY THE ENGINEER. THE SURVEY DATA SHALL BE SUBMITTED TO THE ENGINEER. WORK FOR THESE BID ITEMS INCLUDES REPLACEMENT WITH SUITABLE EXCAVATED MATERIAL. (1)
8. EXCAVATION WASTE MATERIAL REMOVED FROM THE CONSTRUCTION AREA SHALL BE DISPOSED OF OFF THE AIRPORT PROPERTY. NO MATERIAL SHALL BE WASTED ON THE AIRPORT SITE UNLESS APPROVED BY AIRPORT OPERATIONS. WASTE AND DISPOSAL AREAS SHALL BE SEEDED AND RESTORED IN A SMOOTH, GRADED AND DRAINABLE CONDITION. BORROW AREAS, IF REQUIRED, SHALL BE LOCATED AS DIRECTED BY THE FIELD ENGINEER AND / OR AIRPORT OPERATIONS AND SHALL ALSO BE RESTORED IN A SMOOTH GRADED AND DRAINABLE CONDITION.
9. ELIGIBLE AND INELIGIBLE SCHEDULE CLARIFICATION. THE USE OF ELIGIBLE AND INELIGIBLE SCHEDULES IS FOR GRANT FUNDING PURPOSES ONLY. BOTH SCHEDULES WILL BE INCLUDED IN THE PROJECT. DETERMINATION OF QUANTITIES FOR EACH SCHEDULE WILL BE BY SURVEY, CALCULATION, OR AGREEMENT BETWEEN CONTRACTOR AND ENGINEER.

GRADING NOTES:

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE PUBLIC STREETS AND ACCESS ROUTES IN THE VICINITY OF THE JOB SITE CLEAN AND FREE OF ROCKS, SOILS AND DEBRIS. SWEEP DAILY, AND WITHIN 3 HOURS OF NOTICE BY ENGINEER.
11. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL PROPERTY CORNERS. ANY PROPERTY CORNERS DISTURBED OR DAMAGED BY GRADING ACTIVITIES SHALL BE RESET BY A PROFESSIONAL LAND SURVEYOR LICENSED IN THE SATE OF MINNESOTA, AT THE CONTRACTOR'S EXPENSE.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING DOWNSTREAM EROSION AND SILTATION DURING ALL PHASES OF CONSTRUCTION. EROSION CONTROL MEASURE SHALL BE IN PLACE PRIOR TO BEGINNING SOIL DISTURBING ACTIVITIES.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR FOLLOWING PROCEDURES AND REQUIREMENTS OUTLINED IN THE STORM WATER POLLUTION PREVENTION PLAN AND THE NPDES GENERAL PERMIT STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY.
14. NUMEROUS EROSION CONTROL FEATURES MAY EXIST ON THE PROJECT SITE. CONTRACTOR SHALL KEEP AS MANY OF THOSE FEATURES IN PLACE AS POSSIBLE, UNTIL THE SITE IS STABILIZED WHEN GROWN IS FULLY REESTABLISHED.

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DULUTH INTERNATIONAL AIRPORT

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Jarrod R. Nelson, PE
DATE _____ LICENSE NO. 26794

DULUTH INTERNATIONAL AIRPORT (DLH)

TAXIWAY A
RECONSTRUCTION - PHASE 5

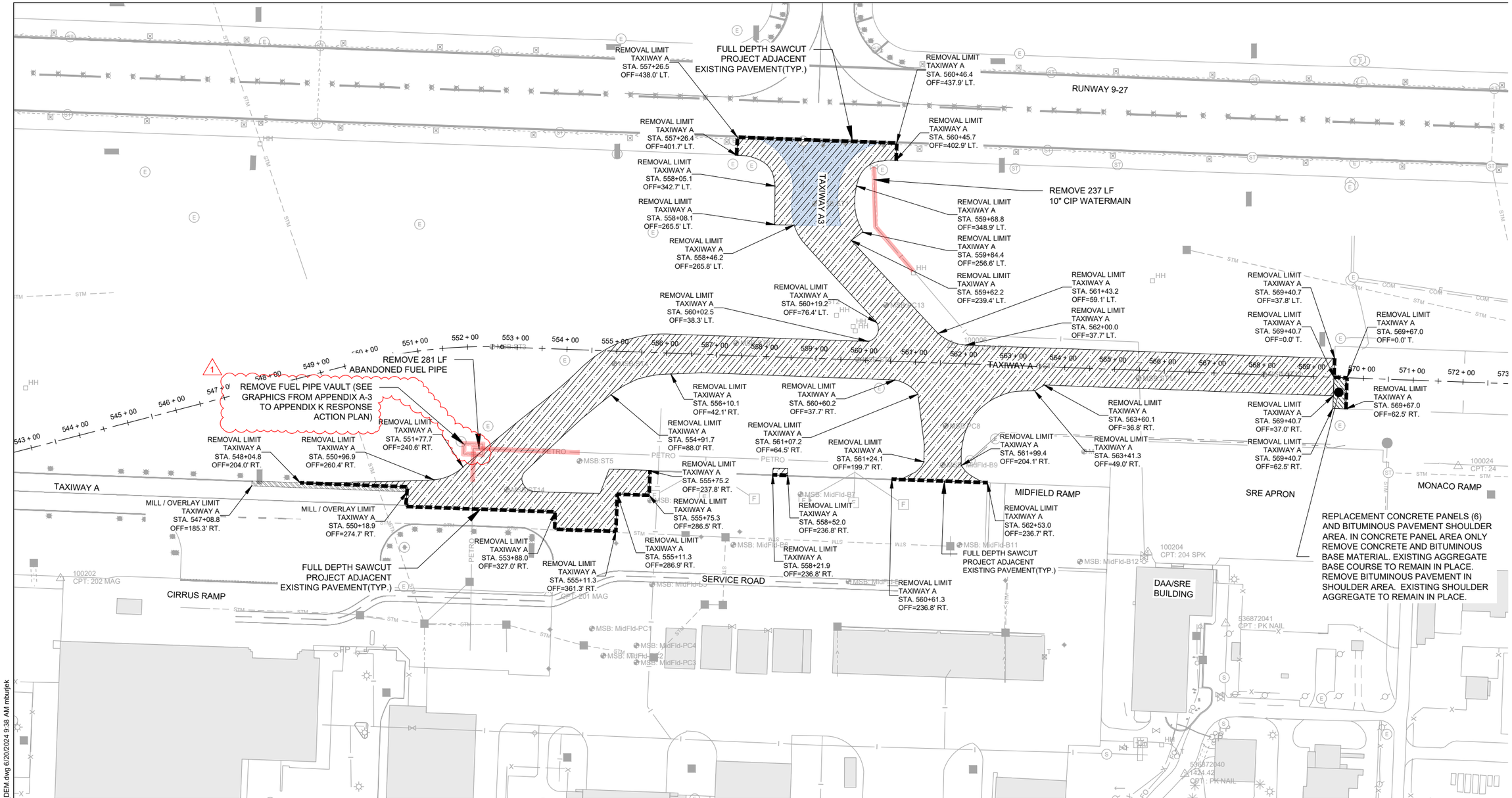
DULUTH, MINNESOTA

MARK	DATE	REVISIONS
1	6/20/2024	ADDENDUM 1

SEH FILE NO.	DULAI_174212
STATE PROJECT NO.	A6901-22X
ISSUE DATE	MAY 29, 2024
DESIGNED BY	JN
DRAWN BY	SWB

SHEET TITLE
EARTHWORK SUMMARY

SHEET
G5.05



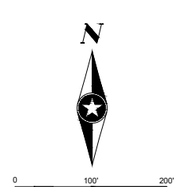
DEMOLITION PLAN

EXISTING UTILITY LEGEND

- FULL DEPTH BITUMINOUS PAVEMENT REMOVAL
- EXISTING CONCRETE PANELS (6) AND BITUMINOUS SHOULDER REMOVAL AREA
- EXISTING ASPHALT TRANSITION MILLING / 2" BITUMINOUS OVERLAY AREA
- FULL DEPTH SAWCUT
- FULL DEPTH CONCRETE PAVEMENT REMOVAL
- REMOVE EXISTING UTILITIES

NOTES:

1. CONTRACTOR SHALL PROTECT ALL AIRFIELD LIGHTING, ELECTRICAL CIRCUITRY, COMPONENTS AND NAVAIDS TO REMAIN. PLACE REFLECTIVE CONE OVER RUNWAY LIGHTS TO ENHANCE VISIBILITY AND PROTECTION. ANY DAMAGE CAUSED TO AIRFIELD LIGHTING OR NAVAIDS BY THE CONTRACTOR SHALL BE REPAIRED TO ORIGINAL CONDITION OR BETTER AT NO ADDITIONAL COSTS.
2. SUBSURFACE UTILITIES NOT NOTED FOR REMOVAL, INCLUDING SANITARY SEWER AND ELECTRICAL DUCTS TO BE PROTECTED BY CONTRACTOR. ANY DAMAGED UTILITIES TO BE REPAIRED BY CONTRACTOR AT NO COST TO OWNER. NOT ALL UTILITIES MAY BE SHOWN ON THE PLAN. CONTRACTOR IS REQUIRED TO COMPLETE LOCATE PRIOR TO REMOVALS.
3. ALL PAVEMENT REMOVED SHALL BE PERFORMED SUCH THAT NO DAMAGE IS DONE TO ADJACENT PAVEMENTS AND/OR UNDERLYING BASE LAYERS. DAMAGE TO PAVEMENTS AND UNDERLYING BASE LAYERS TO REMAIN CAUSED BY CONTRACTOR SHALL BE REPAIRED AT THE DIRECTION OF THE ENGINEER AT NO ADDITIONAL COST.
4. ALL SURFACES (PAVEMENT, TURF, OR OTHERS) SHALL BE RESTORED TO THEIR PRECONSTRUCTION CONDITION OR BETTER TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST.
5. ALL PAVEMENT MATERIAL REMOVED SHALL BE DISPOSED OF OFF SITE EXCEPT AS NOTED.
6. SEE ELECTRICAL SHEETS FOR DEMOLITION PLANS AND ADDITIONAL REMOVAL DETAILS AND REQUIREMENTS ASSOCIATED WITH LIGHTING AND CONDUIT.
7. SEE STORM SEWER AND PAVEMENT MARKING SHEETS FOR REMOVALS RELATED TO THOSE ITEMS.
8. ALL SAWCUTS ARE TO BE FULL DEPTH.



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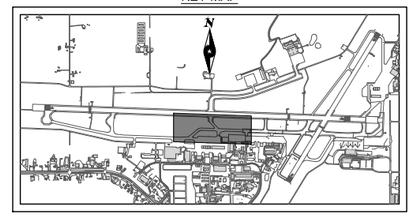

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Jarrod R. Nelson, PE — DATE — LICENSE NO. 25794

DULUTH INTERNATIONAL AIRPORT (DLH)
TAXIWAY A
RECONSTRUCTION - PHASE 5
DULUTH, MINNESOTA

MARK	DATE	DESCRIPTION
1	6/20/2024	ADDENDUM 1

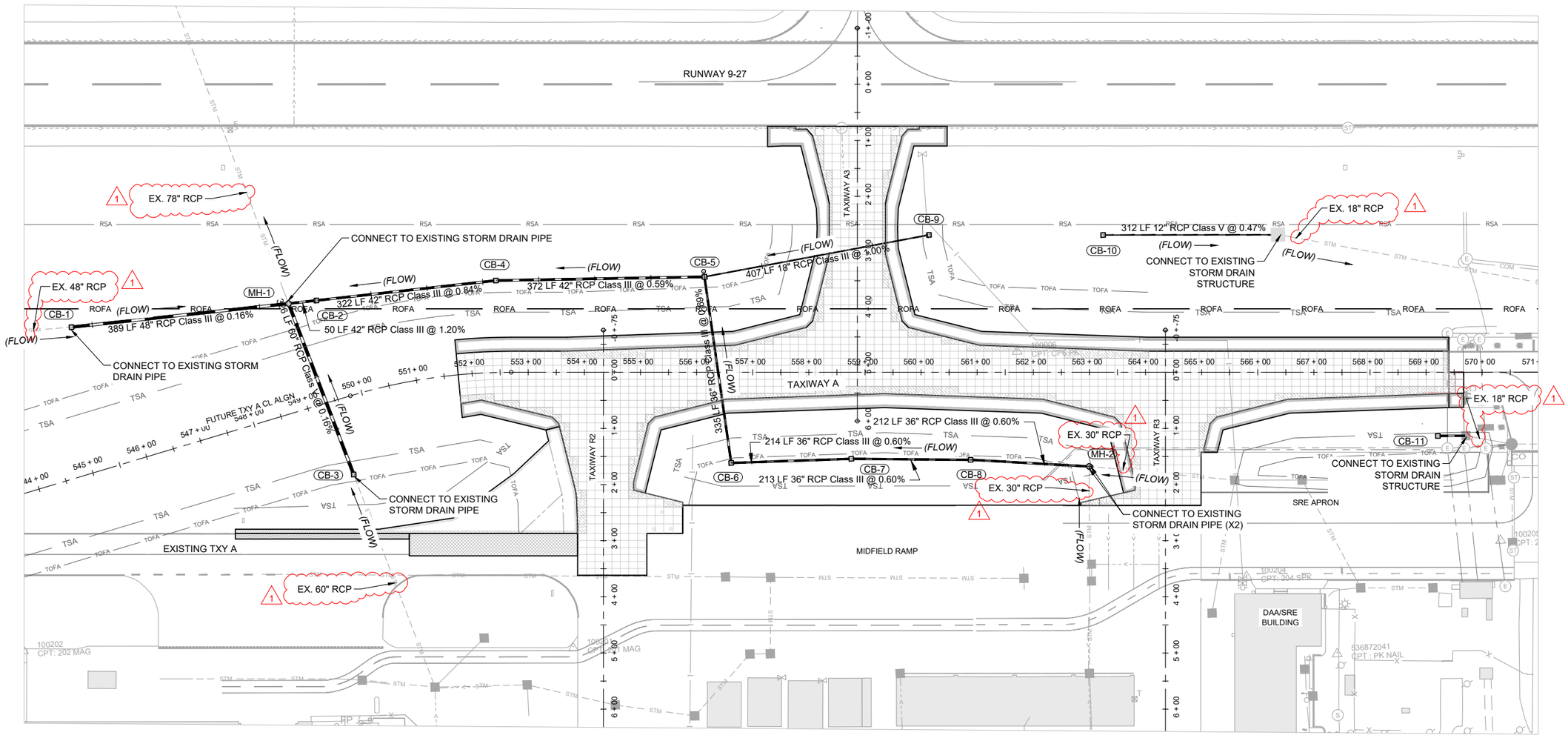
REVISIONS

SEH FILE NO. DULAL_174212
STATE PROJECT NO. A6901-22X
ISSUE DATE MAY 29, 2024
DESIGNED BY JN
DRAWN BY LZ

SHEET TITLE
DEMOLITION PLAN

SHEET
C0.50

x:\AE\D\DULAI\174212\5-final-dsgn\51-drawings\65-aviation\Plans\DLH-174212_DEM.dwg 6/20/2024 9:38 AM mburjek

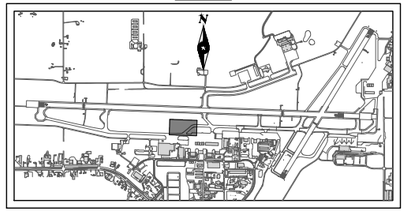


STORM SEWER PLAN (OVERALL PHASE 5 PLAN)

LEGEND

- RUNWAY SAFETY AREA
- RUNWAY OBJECT FREE AREA
- TAXIWAY SAFETY AREA
- PROPOSED GRADING LIMIT
- PROPOSED STORM PIPE
- PROPOSED STORM CATCH BASIN
- PROPOSED MANHOLE
- PROPOSED DRAIN TILE (6" PERFORATED)
- PROPOSED DRAIN TILE (6" SOLID)
- PROPOSED INSPECTION PIT
- EXISTING STORM PIPE
- EXISTING STORM CATCH BASIN
- EXISTING STORM MANHOLE
- EXISTING LIGHT
- EXISTING DRAIN TILE
- EXISTING DRAIN TILE CLEAN OUT

KEY MAP



0 100 200

NOTES:

1) NOT ALL UTILITIES HAVE BEEN SHOWN FOR CLARITY. SEE ELECTRICAL PLANS FOR ADDITIONAL UTILITIES NOT SHOWN.
2) CONTRACTOR SHALL VERIFY ALL EXISTING PIPES, CATCH BASIN AND MANHOLE INVERTS AND ALL OTHER ELEVATIONS FOR TIE IN TO PROPOSED CONDITIONS PRIOR TO ORDERING MATERIALS.
3) ALL MATERIALS REQUIRED TO MAKE STORM CONNECTIONS TO EITHER EXISTING OR PROPOSED PIPES / STRUCTURES SHALL BE CONSIDERED INCIDENTAL TO THE STORM ITEM.
4) BULKHEADS WILL BE INCIDENTAL TO REMOVAL OF PIPE ITEM.
5) SEAL STRUCTURE WILL BE INCIDENTAL TO ADJUST STRUCTURE CASTING ITEM.
6) SEE DRAIN TILE SHEETS X THRU X FOR DRAIN TILE CONNECTIONS TO STORM STRUCTURES.
7) SEE DEMOLITION PLAN - UTILITIES SHEETS X AND X FOR STORM DRAIN REMOVALS.
8) WORK WITHIN OBJECT FREE AREAS AND SAFETY AREAS SHALL BE COORDINATED WITH AIRPORT AUTHORITY FOR APPROPRIATE CLOSURE LIMITS AND DATES TO OPTIMIZE AIRPORT OPERATIONS.

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Jarrod R. Nelson

Jarrod R. Nelson, PE — DATE MAY 29, 2024 — LICENSE NO. 25794

DULUTH INTERNATIONAL AIRPORT (DLH)

TAXIWAY A RECONSTRUCTION - PHASE 5

DULUTH, MINNESOTA

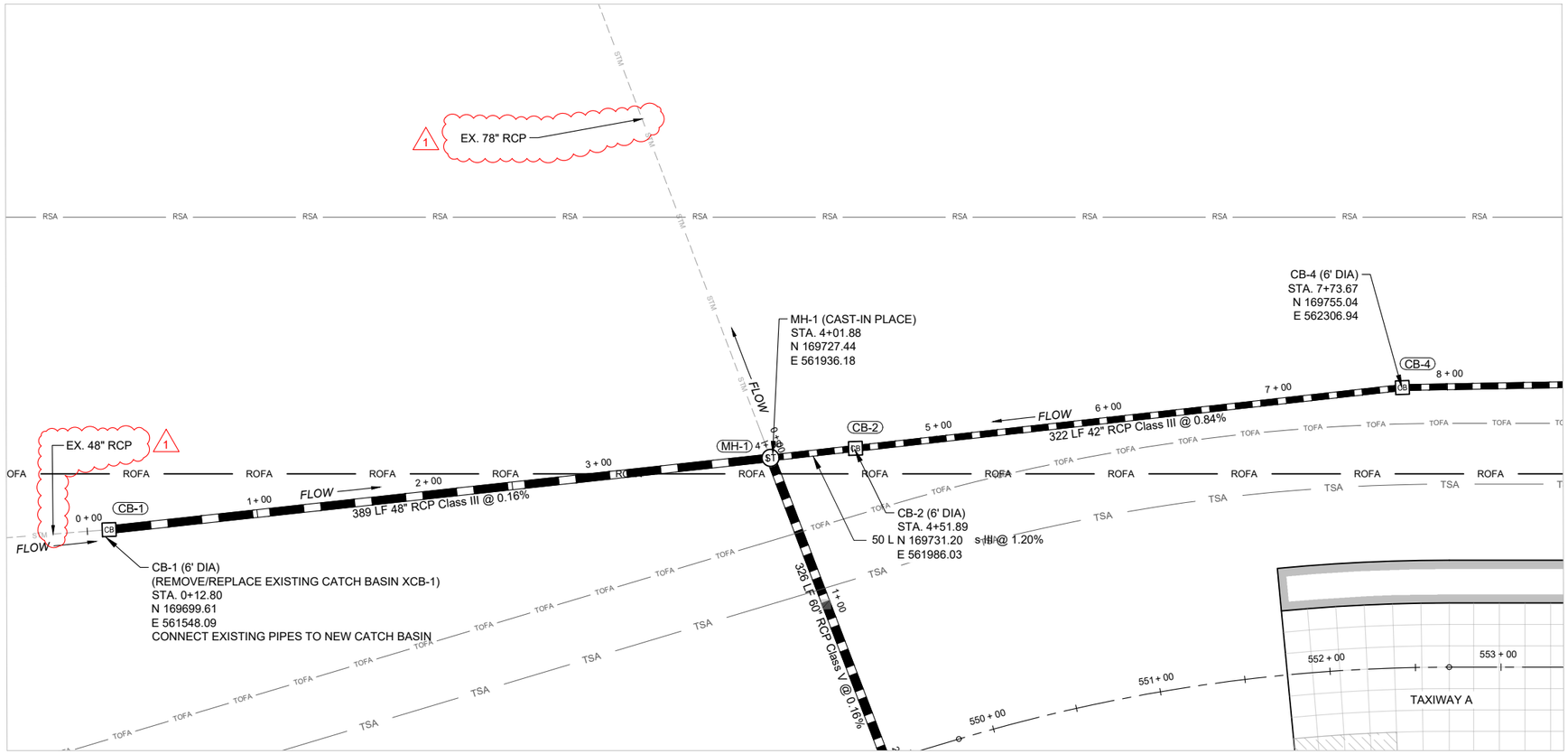
MARK	DATE	REVISIONS
1	6/20/2024	ADDENDUM 1

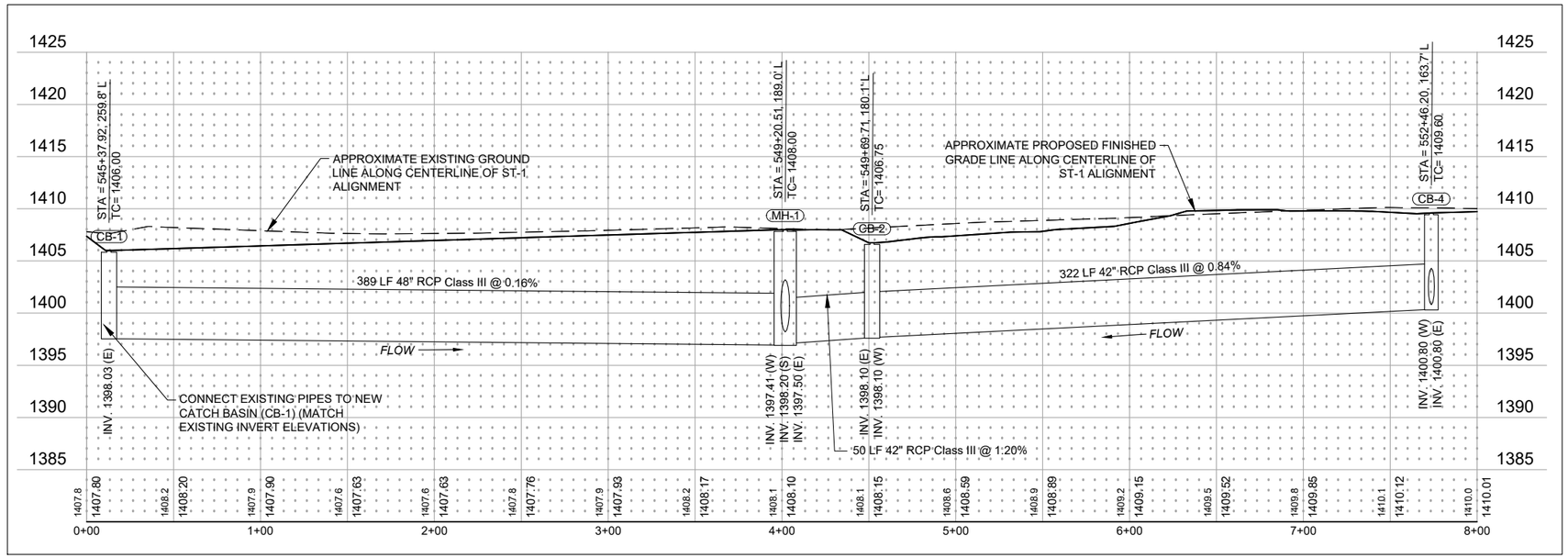
SEH FILE NO. DULAI_174212
STATE PROJECT NO. A6901-22X
ISSUE DATE MAY 29, 2024
DESIGNED BY JN
DRAWN BY AA

SHEET TITLE
STORM SEWER PLAN

SHEET
C5.01

x:\AE\D\DULAI\174212\5-final-dsgn\51-drawings\65-aviation\Plans\DLH-174212_TXY A - STRM PL.dwg 6/19/2024 3:02 PM mburjek





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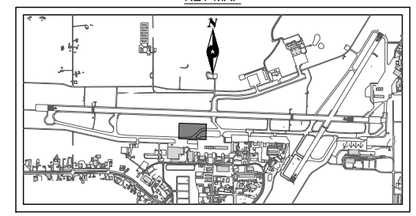

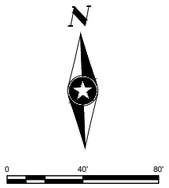

LEGEND

- RUNWAY SAFETY AREA
- RUNWAY OBJECT FREE AREA
- TAXIWAY SAFETY AREA
- PROPOSED GRADING LIMIT
- PROPOSED STORM PIPE
- PROPOSED STORM CATCH BASIN
- PROPOSED MANHOLE
- PROPOSED DRAIN TILE (6" PERFORATED)
- PROPOSED DRAIN TILE (6" SOLID)
- PROPOSED INSPECTION PIT
- EXISTING STORM PIPE
- EXISTING STORM CATCH BASIN
- EXISTING STORM MANHOLE
- EXISTING LIGHT
- EXISTING DRAIN TILE
- EXISTING DRAIN TILE CLEAN OUT

NOTES:

1) NOT ALL UTILITIES HAVE BEEN SHOWN FOR CLARITY. SEE ELECTRICAL PLANS FOR ADDITIONAL UTILITIES NOT SHOWN.
2) CONTRACTOR SHALL VERIFY ALL EXISTING PIPES, CATCH BASIN AND MANHOLE INVERTS AND ALL OTHER ELEVATIONS FOR TIE IN TO PROPOSED CONDITIONS PRIOR TO ORDERING MATERIALS.
3) ALL MATERIALS REQUIRED TO MAKE STORM CONNECTIONS TO EITHER EXISTING OR PROPOSED PIPES / STRUCTURES SHALL BE CONSIDERED INCIDENTAL TO THE STORM ITEM.
4) BULKHEADS WILL BE INCIDENTAL TO REMOVAL OF PIPE ITEM.
5) SEAL STRUCTURE WILL BE INCIDENTAL TO ADJUST STRUCTURE CASTING ITEM.
6) SEE DRAIN TILE SHEETS C7.00 THRU C7.04 FOR DRAIN TILE CONNECTIONS TO STORM STRUCTURES.
7) SEE DEMOLITION PLAN - UTILITIES SHEETS C0.50 AND C5.00 FOR STORM DRAIN REMOVALS.
8) WORK WITHIN OBJECT FREE AREAS AND SAFETY AREAS SHALL BE COORDINATED WITH AIRPORT AUTHORITY FOR APPROPRIATE CLOSURE LIMITS AND DATES TO OPTIMIZE AIRPORT OPERATIONS.

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Jarrod R. Nelson

Jarrod R. Nelson, PE
DATE MAY 29, 2024
LICENSE NO. 26794

DULUTH INTERNATIONAL AIRPORT (DLH)

TAXIWAY A RECONSTRUCTION - PHASE 5

DULUTH, MINNESOTA

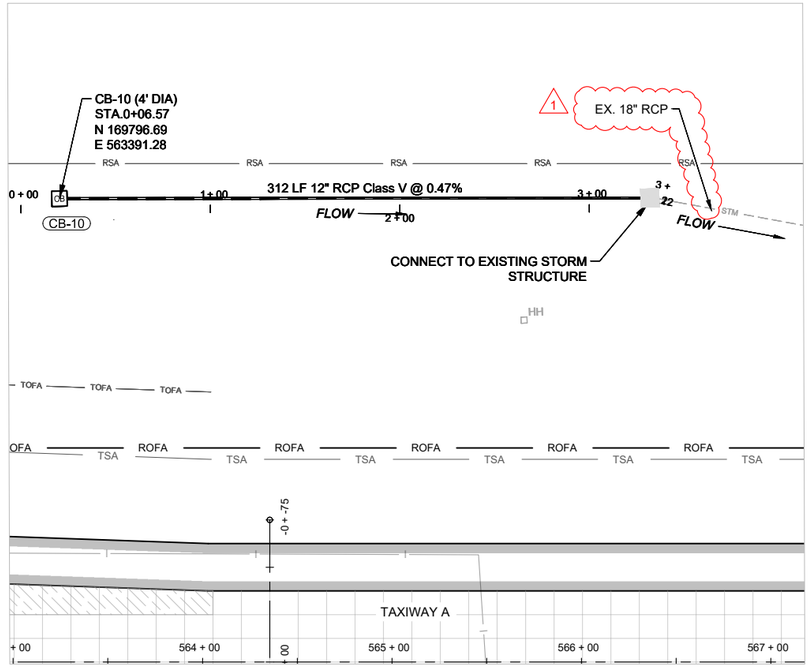
MARK	DATE	DESCRIPTION
1	6/20/2024	ADDENDUM 1

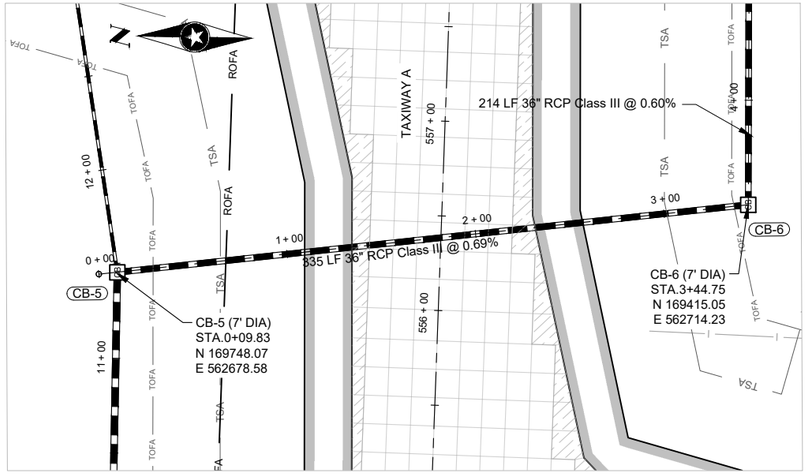
REVISIONS

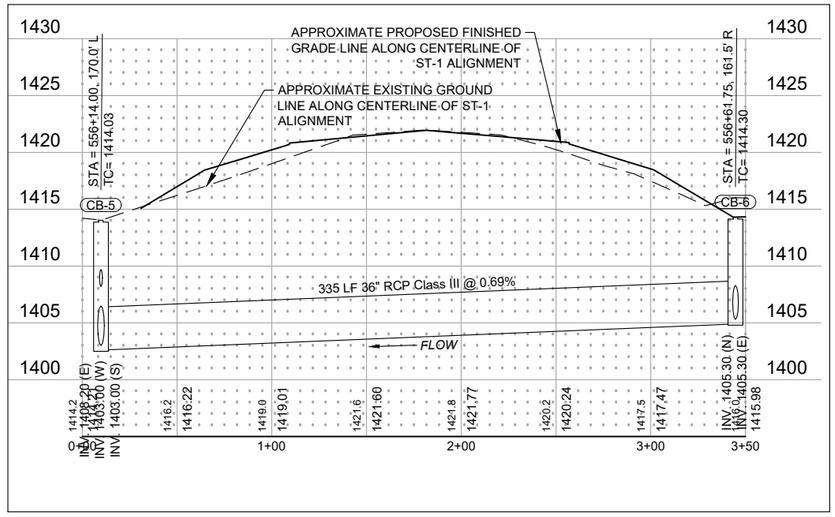
SEH FILE NO. DULAI_174212
STATE PROJECT NO. A6901-22X
ISSUE DATE MAY 29, 2024
DESIGNED BY JN
DRAWN BY AA

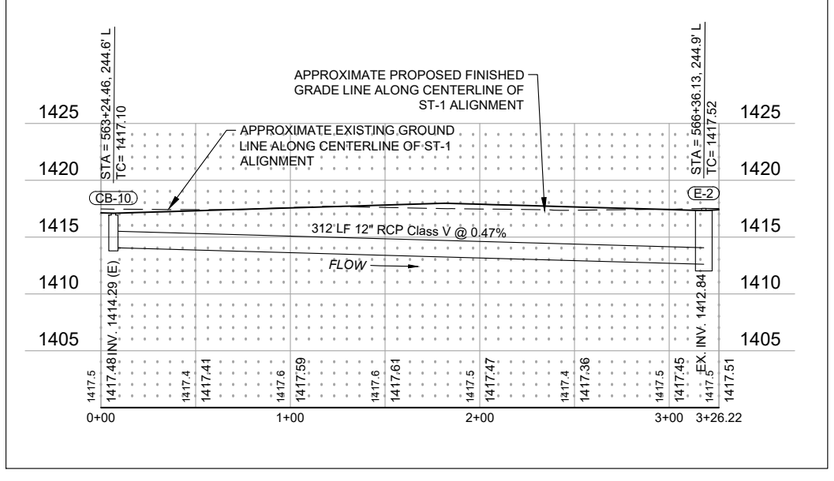
SHEET TITLE
STORM SEWER PLAN

SHEET
C5.02









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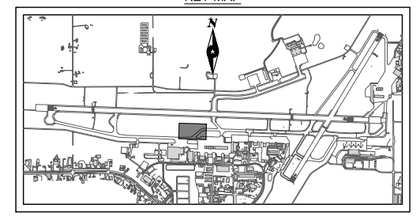

0 40' 80'

LEGEND

- RUNWAY SAFETY AREA
- ROFA — RUNWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- PROPOSED GRADING LIMIT
- PROPOSED STORM PIPE
- CB — PROPOSED STORM CATCH BASIN
- ST — PROPOSED MANHOLE
- PROPOSED DRAIN TILE (6" PERFORATED)
- PROPOSED DRAIN TILE (6" SOLID)
- PROPOSED INSPECTION PIT
- STM — EXISTING STORM PIPE
- EXISTING STORM CATCH BASIN
- ST — EXISTING STORM MANHOLE
- EXISTING LIGHT
- UD — EXISTING DRAIN TILE
- CO — EXISTING DRAIN TILE CLEAN OUT

NOTES:

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Jarrod R. Nelson
DATE MAY 29, 2024 LICENSE NO. 26794

DULUTH INTERNATIONAL AIRPORT (DLH)
TAXIWAY A
RECONSTRUCTION - PHASE 5
DULUTH, MINNESOTA

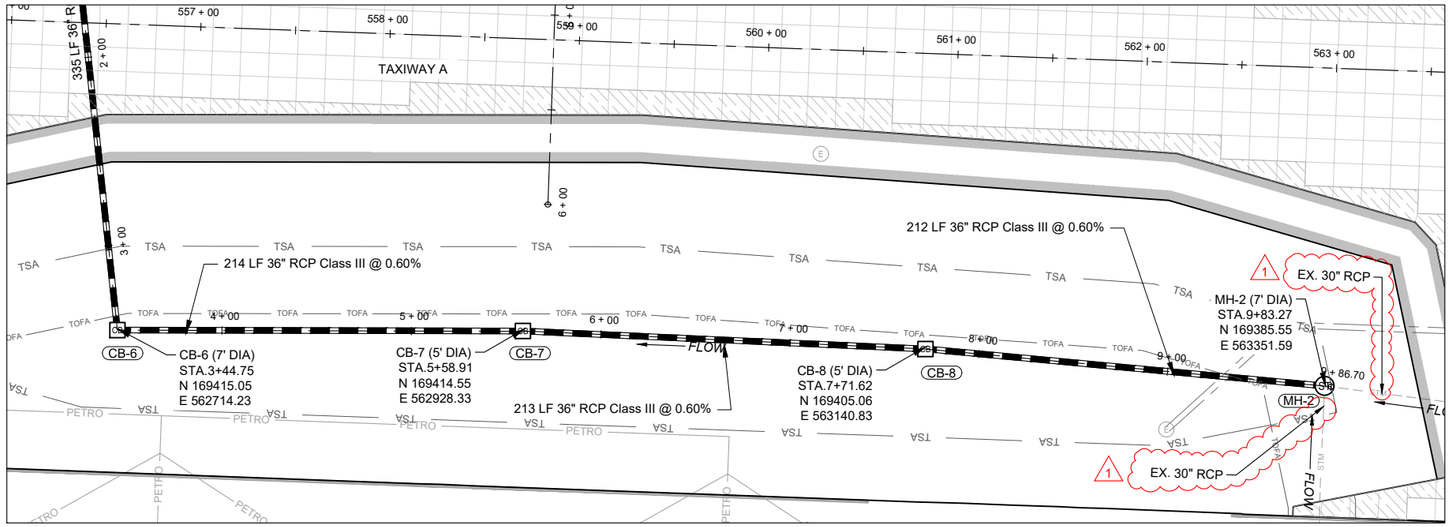
MARK	DATE	DESCRIPTION
1	6/20/2024	ADDENDUM 1

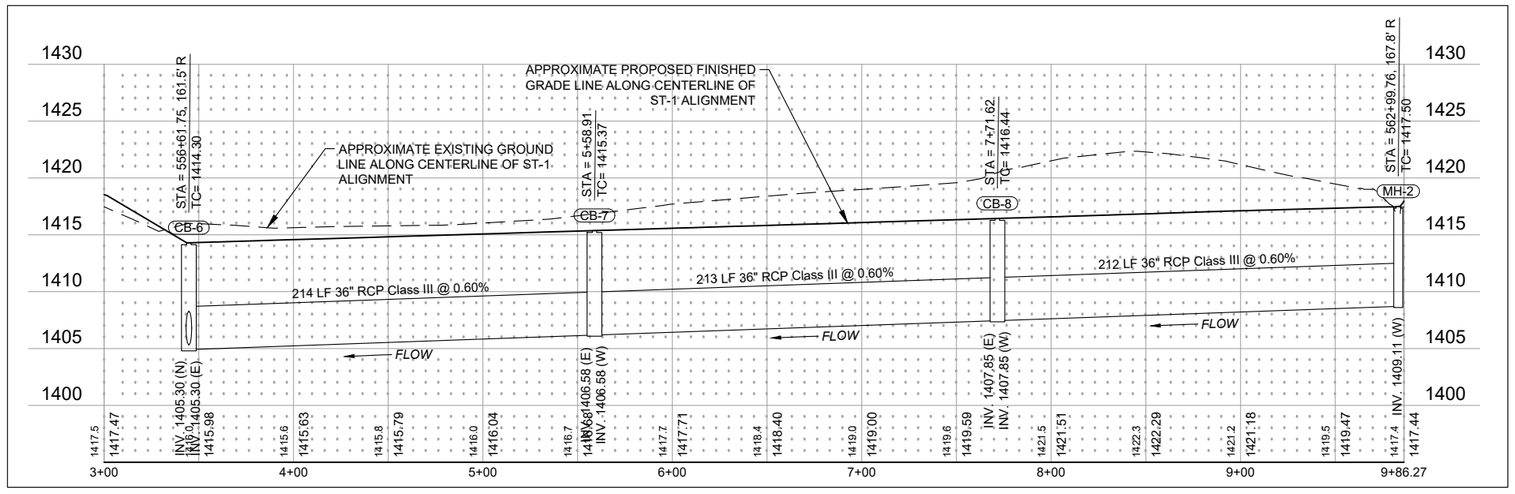
REVISIONS

SEH FILE NO. DULAI_174212
STATE PROJECT NO. A6901-22X
ISSUE DATE MAY 29, 2024
DESIGNED BY JN
DRAWN BY AA

SHEET TITLE
STORM SEWER PLAN

SHEET
C5.04





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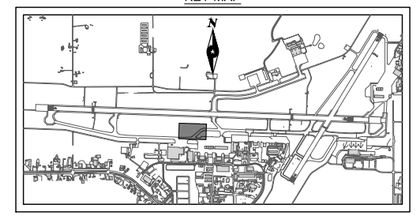

0 40' 80'

LEGEND

- RUNWAY SAFETY AREA
- RUNWAY OBJECT FREE AREA
- TAXIWAY SAFETY AREA
- PROPOSED GRADING LIMIT
- PROPOSED STORM PIPE
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3) ALL MATERIALS REQUIRED TO MAKE STORM CONNECTIONS TO EITHER EXISTING OR PROPOSED PIPES / STRUCTURES SHALL BE CONSIDERED INCIDENTAL TO THE STORM ITEM.
4) BULKHEADS WILL BE INCIDENTAL TO REMOVAL OF PIPE ITEM.
5) SEAL STRUCTURE WILL BE INCIDENTAL TO ADJUST STRUCTURE CASTING ITEM.
6) SEE DRAIN TILE SHEETS C7.00 THRU C7.04 FOR DRAIN TILE CONNECTIONS TO STORM STRUCTURES.
7) SEE DEMOLITION PLAN - UTILITIES SHEETS C0.50 AND C5.00 FOR STORM DRAIN REMOVALS.
8) WORK WITHIN OBJECT FREE AREAS AND SAFETY AREAS SHALL BE COORDINATED WITH AIRPORT AUTHORITY FOR APPROPRIATE CLOSURE LIMITS AND DATES TO OPTIMIZE AIRPORT OPERATIONS.

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DULUTH INTERNATIONAL AIRPORT

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Jarrod R. Nelson

Jarrod R. Nelson, PE
DATE MAY 29, 2024
LICENSE NO. 26794

DULUTH INTERNATIONAL AIRPORT (DLH)

TAXIWAY A RECONSTRUCTION - PHASE 5

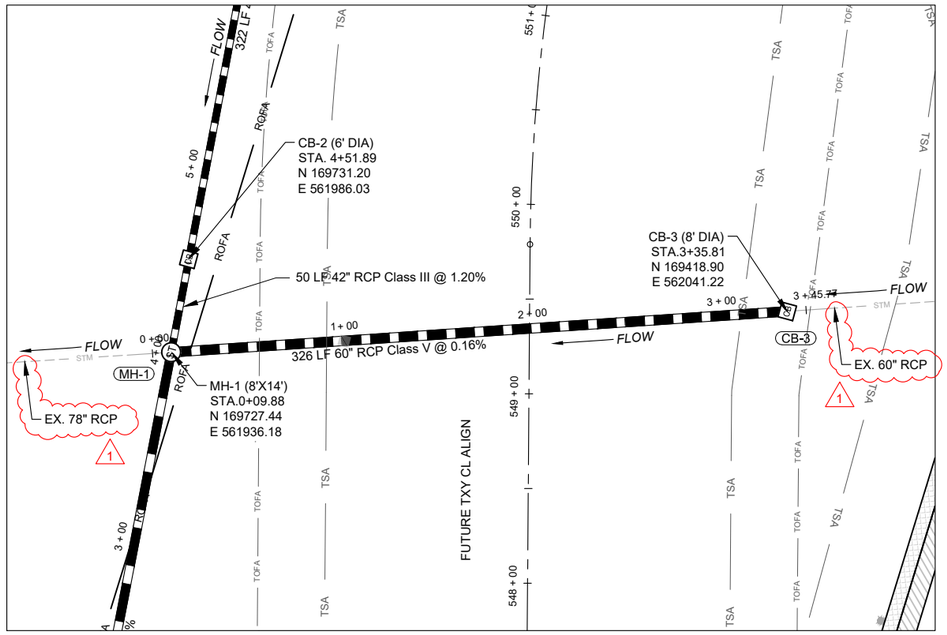
DULUTH, MINNESOTA

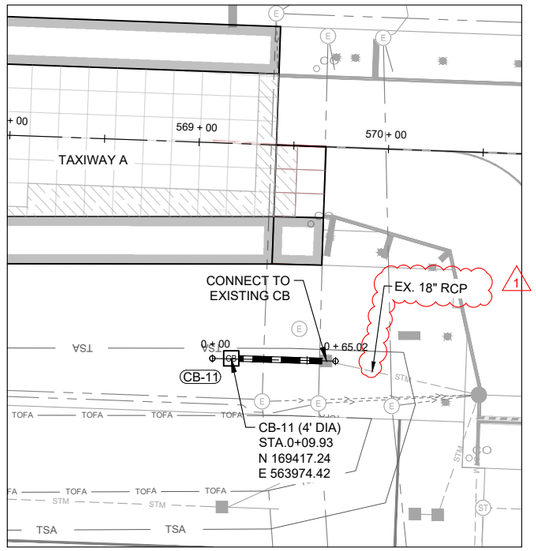
MARK	DATE	DESCRIPTION
1	6/20/2024	ADDENDUM 1

SEH FILE NO. DULA1_174212
STATE PROJECT NO. A8901-22K
ISSUE DATE MAY 29, 2024
DESIGNED BY JN
DRAWN BY AA

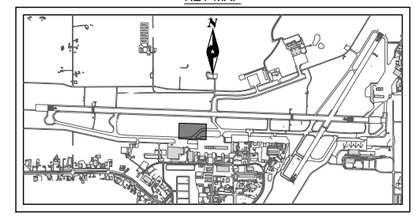
SHEET TITLE
STORM SEWER PLAN

SHEET
C5.05





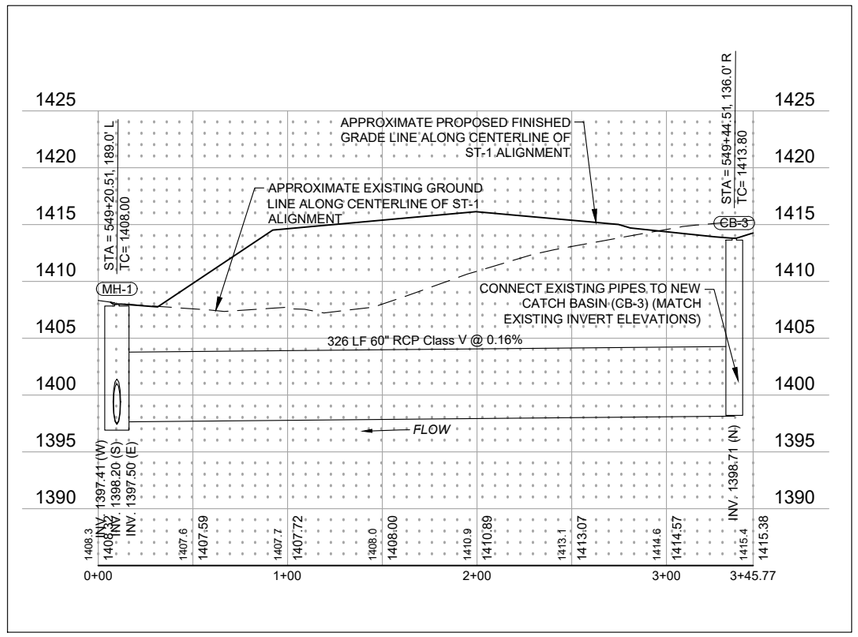
KEY MAP

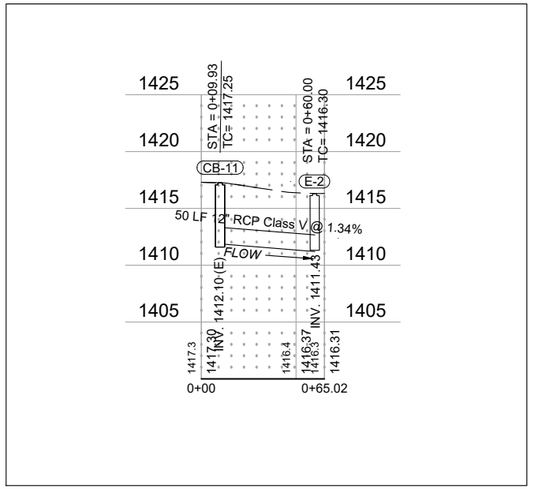


0 40' 80'

LEGEND

- RUNWAY SAFETY AREA
- RUNWAY OBJECT FREE AREA
- TAXIWAY SAFETY AREA
- PROPOSED GRADING LIMIT
- PROPOSED STORM PIPE
- PROPOSED STORM CATCH BASIN
- PROPOSED MANHOLE
- PROPOSED DRAIN TILE (6" PERFORATED)
- PROPOSED DRAIN TILE (6" SOLID)
- PROPOSED INSPECTION PIT
- EXISTING STORM PIPE
- EXISTING STORM CATCH BASIN
- EXISTING STORM MANHOLE
- EXISTING LIGHT
- EXISTING DRAIN TILE
- EXISTING DRAIN TILE CLEAN OUT





NOTES:

1) NOT ALL UTILITIES HAVE BEEN SHOWN FOR CLARITY. SEE ELECTRICAL PLANS FOR ADDITIONAL UTILITIES NOT SHOWN.
2) CONTRACTOR SHALL VERIFY ALL EXISTING PIPES, CATCH BASIN AND MANHOLE INVERTS AND ALL OTHER ELEVATIONS FOR TIE IN TO PROPOSED CONDITIONS PRIOR TO ORDERING MATERIALS.
3) ALL MATERIALS REQUIRED TO MAKE STORM CONNECTIONS TO EITHER EXISTING OR PROPOSED PIPES / STRUCTURES SHALL BE CONSIDERED INCIDENTAL TO THE STORM ITEM.
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Jarrod R. Nelson, PE
DATE MAY 29, 2024 LICENSE NO. 26794

DULUTH INTERNATIONAL AIRPORT (DLH)

TAXIWAY A RECONSTRUCTION - PHASE 5

DULUTH, MINNESOTA

MARK	DATE	DESCRIPTION
1	6/20/2024	ADDENDUM 1

REVISIONS

SEH FILE NO. DULAI_174212
STATE PROJECT NO. A6901-22X
ISSUE DATE MAY 29, 2024
DESIGNED BY JN
DRAWN BY ---

SHEET TITLE
STORM SEWER PLAN

SHEET
C5.06

x:\AE\D\DULAI\174212\5-final-dsgn\51-drawings\65-aviation\Plans\DLH-174212_TXY A - STRM PL.dwg 6/19/2024 3:02 PM mburjek

STORM SEWER - STRUCTURE SCHEDULE

Name	Reference Alignment	Structure Station	Structure Diameter	Structure Offset (Ft.)	Structure Northing	Structure Easting	Insertion Rim Elevation (Ft.)	Sump Elevation (Ft.)	Rim To Sump Height (Inches)	Invert Elevation 1 - Pipe In (Ft.)	Invert Elevation 2 - Pipe In (Ft.)	Invert Elevation 3 - Pipe In (Ft.)	Invert Elevation 1 - Pipe Out (Ft.)
CB-1	TXY A CL Algn	545+37.92	72"	-259.78	169699.61	561548.09	1406.00	1398.03	7.97				1397.41
CB-2	TXY A CL Algn	549+69.71	72"	-180.11	169731.20	561986.03	1406.75	1398.10	8.65	1398.10			1398.10
CB-3	TXY A CL Algn	549+44.51	96"	136.03	169418.90	562041.22	1413.80	1398.71	15.09				1398.71
CB-4	TXY A CL Algn	552+46.20	84"	-163.75	169755.04	562306.94	1409.60	1400.80	8.80	1400.80			1400.80
CB-5	TXY A CL Algn	556+14.00	84"	-170.00	169748.07	562678.58	1414.03	1403.00	11.03	1408.20	1403.00		1403.00
CB-6	TXY A CL Algn	556+61.75	84"	161.50	169415.05	562714.23	1414.30	1405.30	9.00	1405.30			1405.30
CB-7	TXY A CL Algn	558+75.73	60"	154.20	169414.55	562928.33	1415.37	1406.58	8.79	1406.58			1406.58
CB-8	TXY A CL Algn	560+88.44	84"	155.94	169405.06	563140.83	1416.44	1407.85	8.59	1407.85			1407.85
CB-9	TXY A CL Algn	560+14.11	48"	-244.59	169808.03	563081.15	1417.75	1412.25	5.50				1412.25
CB-10	TXY A CL Algn	563+24.46	48"	-244.55	169796.69	563391.28	1417.10	1414.29	2.81				1414.29
CB-11	TXY A CL Algn	569+21.03	48"	113.40	169417.24	563974.42	1417.25	1412.10	5.15				1412.10
MH-1	TXY A CL Algn	549+20.51	SEE SHEET 5.10	-189.02	169727.44	561936.18	1408.00	1397.41	10.59	1398.03	1398.20	1397.50	
MH-2	TXY A CL Algn	562+99.76	84"	167.76	169385.55	563351.59	1417.50	1409.11	8.39				1409.11

1

STORM SEWER - PIPE SCHEDULE

Name	Description	Flows From Structure	Flows to Structure	Pipe Slope (%)	Start Invert Elevation (Ft.)	End Invert Elevation (Ft.)	3D Length - Center to Center (Ft.)	Pipe Pay Length (Ft.)
ST-(1)	60" RCP Class III	CB-3	MH-1	-0.16%	1398.71	1398.2	325.94	328
ST-(2)	36" RCP Class III	MH-2	CB-8	-0.60%	1409.11	1407.85	211.66	216
ST-(3)	36" RCP Class III	CB-6	CB-5	-0.69%	1405.3	1403	334.93	336
ST-(4)	18" RCP Class III	CB-9	CB-5	-1.00%	1412.25	1408.2	407.02	408
ST-(5)	42" RCP Class III	CB-5	CB-4	-0.59%	1403	1400.8	371.72	376
ST-(6)	42" RCP Class III	CB-4	CB-2	-0.84%	1400.8	1398.1	321.80	328
ST-(7)	42" RCP Class III	CB-2	MH-1	-1.20%	1398.10	1397.5	50.00	56
ST-(8)	12" RCP Class III	CB-10		-0.47%	1414.291363	1412.84	311.68	312
ST-(9)	48" RCP Class III	MH-1	CB-1	0.16%	1397.41	1398.03	389.08	392
ST-(10)	36" RCP Class III	CB-8	CB-7	-0.60%	1407.85	1406.58	212.72	216
ST-(11)	36" RCP Class III	CB-7	CB-6	-0.60%	1406.58	1405.3	214.11	216
ST-(12)	12" RCP Class III	CB-11	E-2	-1.34%	1412.10	1411.43	49.99	56

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Jarrod R. Nelson, PE

LICENSE NO. 26794

DATE

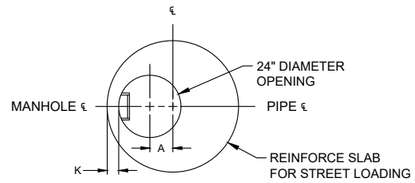
DULUTH INTERNATIONAL AIRPORT (DLH)
TAXIWAY A
RECONSTRUCTION - PHASE 5
DULUTH, MINNESOTA

MARK	DATE	REVISIONS
1	6/20/2024	ADDENDUM 1

SEH FILE NO. DULAI_174212
STATE PROJECT NO. A6901-22X
ISSUE DATE MAY 29, 2024
DESIGNED BY JN
DRAWN BY ---

SHEET TITLE
STORM SEWER SCHEDULE

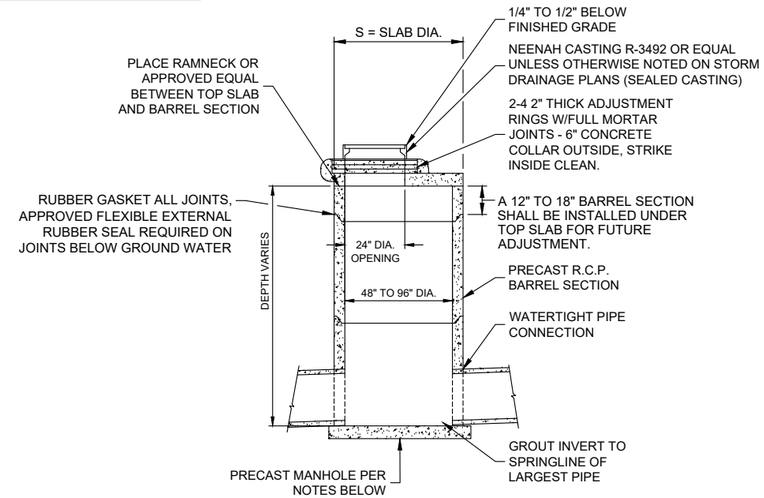
SHEET
C5.07



COVER SLAB

DIMENSION CHART

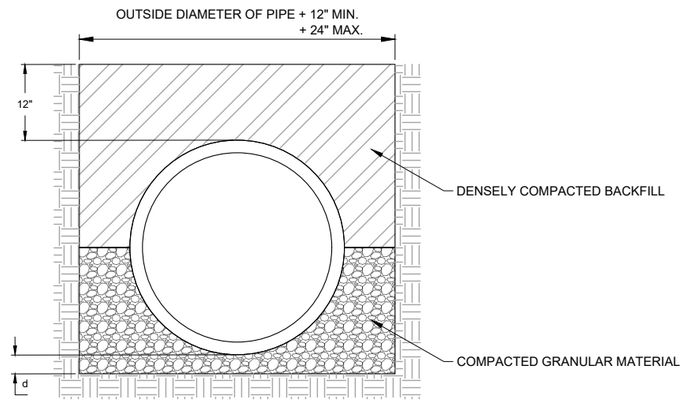
	MANHOLE TYPE				
	B	C	D	E	F
DIA.	48"	60"	72"	84"	96"
A	9.5"	15.5"	21.5"	27.5"	34.5"
S	58"	72"	86"	100"	114"
K	7.5"	8.5"	9.5"	10.5"	10.5"



CATCH BASIN / MANHOLE (24" DIA. OPENING)

NOTES:

1. CONTRACTOR SHALL VERIFY ALL EXISTING PIPES, INLETS, MANHOLE INVERTS AND ALL OTHER ELEVATIONS FOR TIE IN TO PROPOSED CONDITIONS.
2. STRUCTURES SHALL BE PRECAST CONCRETE CONFORMING TO REQUIREMENTS OF ITEM D-701, AC 150/5320-5D AND ASTM C 858; STANDARD SPECIFICATION FOR UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES.
3. STRUCTURES AND CASTING FRAMES SHALL MEET ALL REQUIRED AIRPORT AIRCRAFT DESIGN LOADS.
4. SHOP DRAWINGS SUBMITTALS SHALL BE FURNISHED WITH SEALED ENGINEERING CALCULATIONS BY AN ENGINEER LICENSED TO PRACTICE IN THE STATE OF MINNESOTA.
5. SEE STORM DRAINAGE PLANS FOR ADDITIONAL INFORMATION AND DETAILS.
6. WORK WITHIN TAXIWAY "A" (TOFA & TSA) SHALL BE COORDINATED WITH AIRPORT AND AIRLINE AUTHORITIES FOR APPROPRIATE CLOSURE LIMITS AND DATES TO OPTIMIZE AIRPORT OPERATIONS.



DEPTH OF BEDDING MATERIAL BELOW PIPE	
INNER PIPE DIA.	d
27" & SMALLER	3"
30" TO 60"	4"
66" & LARGER	6"

LEGEND

B_C = OUTSIDE DIAMETER
d = DEPTH OF BEDDING MATERIAL BELOW PIPE

NOTES:

1. IN ROCK TRENCHES MIN. d IS 6" BELOW PIPE BELL AND MIN. TRENCH WIDTH IS 36".
2. USE REPLACEMENT BACKFILL IN AREAS SPECIFIED ON PLANS AND SPEC.

CLASS B TRENCH BEDDING FOR REINFORCED CONCRETE PIPE

1

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DATE MAY 29, 2024 LICENSE NO. 26794

DULUTH INTERNATIONAL AIRPORT (DLH)

TAXIWAY A RECONSTRUCTION - PHASE 5

DULUTH, MINNESOTA

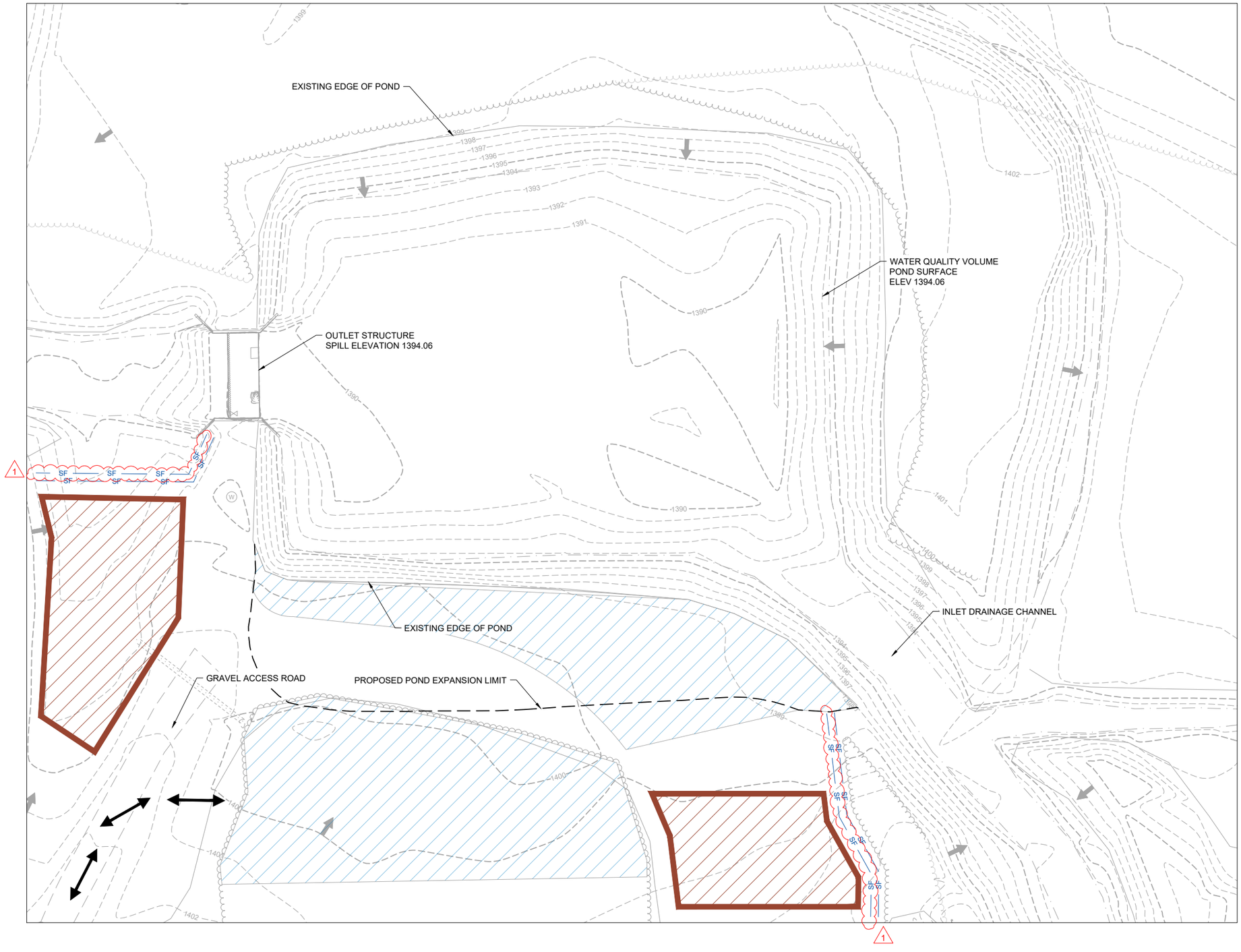
MARK	DATE	DESCRIPTION
1	6/20/2024	ADDENDUM 1

REVISIONS

SEH FILE NO.	DULAI_174212
STATE PROJECT NO.	A6901-22X
ISSUE DATE	MAY 29, 2024
DESIGNED BY	JN
DRAWN BY	---

SHEET TITLE
STORM SEWER DETAILS

SHEET
C5.07A



N

10 0 10 20
scale 5 feet

LEGEND

- EXISTING CONTOURS
- ESTIMATED AREA OF CLEARING AND GRUBBING: 0.38 AC
- CONTRACTOR STORAGE AREAS
- SF — SILT FENCE
- HAUL ROUTE

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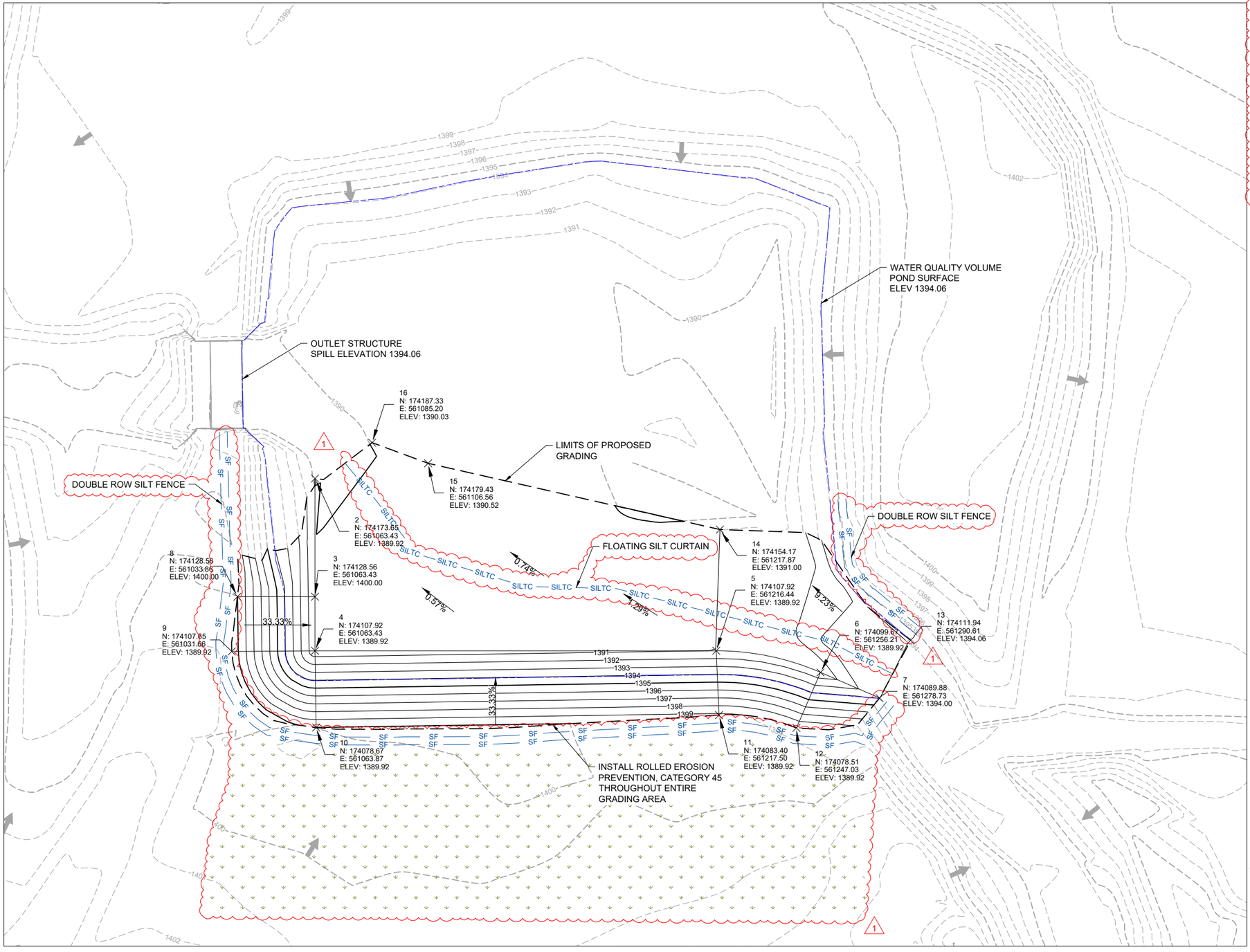
STATE PROJECT NO. A6901-22X
ISSUE DATE MAY 29, 2024
DESIGNED BY JN
DRAWN BY MAB

SHEET TITLE
POND EXPANSION - EXISTING CONDITIONS

SHEET
C5.08



PROPOSED POND EXPANSION PLAN

NOTES:

1. EXCAVATION WORK SHALL COMMENCE AT SOUTH SIDE OF EXISTING POND AND THEN PROCEED TO THE SOUTH. EXCAVATION AT THE EASTERLY END OF THE SITE SHALL BE PERFORMED LAST TO MINIMIZE DURATION OF DISTURBANCE TO INLET DRAINAGE CHANNEL.
2. NO EXCAVATION SHALL BE PERFORMED DURING OVERLY WET CONDITIONS OR WITHIN 24 HOURS IN ADVANCE OF A RAINFALL EVENT.
3. CONTRACTOR IS REPONSIBLE FOR SWEEPING OF PAVEMENT ROADS TO MAINTAIN CLEAN ROADWAYS.
4. EXCAVATION, HAULING AWAY, AND DISPOSING OF MATERIALS OFF SITE SHALL BE PAID FOR WITH BID ITEM P-152 POND EXCAVATION (EV).
5. SEE APPENDIX L OF THE PROJECT MANUAL REFLECTING RESULTS OF EXISTING SOILS TESTING FROM STORMWATER POND SITE.
6. WATER QUALITY VOLUME DETERMINED AT THE TOP OF SPILL ELEVATION OF THE EXISTING OUTLET STRUCTURE (1394.06)
7. EXISTING POND VOLUME AT ELEVATION 1394.06 = 2.18 AC-FT.
8. PROPOSED POND VOLUME AT ELEVATION 1394.06 = 2.88 AC-FT.
9. ADDED DESIGN WATER QUALITY VOLUME 0.70 AC-FT.

PROPOSED SURFACE POINT TABLE

POINT #	ELEVATION	NORTHING	EASTING
2	1389.920	174173.6505	561063.4285
3	1400.000	174128.5574	561063.4285
4	1389.920	174107.9205	561063.4285
5	1389.920	174107.9205	561216.4442
6	1389.920	174099.6748	561256.2079
7	1394.000	174089.8774	561278.7292
8	1400.000	174128.5574	561033.8649
9	1389.920	174107.6455	561031.6647
10	1389.920	174078.6730	561063.8671
11	1389.920	174083.4013	561217.4979
12	1389.920	174078.5055	561247.0337
13	1394.060	174111.9363	561290.6093
14	1391.000	174154.1663	561217.8662
15	1390.522	174179.4346	561106.5637
16	1390.033	174187.3290	561085.1974

LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- POND SURFCE
- SF — SILT FENCE
- TURF RESTORATION
- SILTC — SILT CURTAIN

EARTHWORKS:

CUT: 2995 CUYD
FILL: 25 CUYD
NET: 2970 CUYD

N

10 0 10 20
scale 5 feet

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Jarod R. Nelson

Jarod R. Nelson, PE
DATE MAY 29, 2024 LICENSE NO. 28794

DULUTH INTERNATIONAL AIRPORT (DLH)
TAXIWAY A
RECONSTRUCTION - PHASE 5
DULUTH, MINNESOTA

MARK	DATE	DESCRIPTION
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STATE PROJECT NO. A6901-22X
ISSUE DATE MAY 29, 2024
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DRAWN BY DH

SHEET TITLE
PROPOSED POND EXPANSION PLAN

SHEET
C5.09

GENERAL STRUCTURAL NOTES

GOVERNING BUILDING CODE:

2020 Minnesota State Building Code
2018 International Building Code as adopted and amended by the state building code

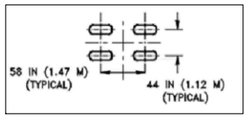
DESIGN CODES AND STANDARDS:

ACI Manual of Concrete Practice
ACI 318, 301 Building Code Requirements & Specifications for Structural Concrete

DESIGN LOADS:

1. Live load:

   Basis of Design — Boeing 747-400 (Boeing Doc No D6-58326-1 Rev E)
   Design Main Gear — 170,900 LB - thus:



   Design Tire — 100,000 LB @ 250 psi (USDOT AC No 150/5320-6G)

2. Lateral Earth Pressure Loads:
   a. Live load surcharge (vertical) — 1141 PSF (4 x Design Main Gear over 600SF)
   b. Soil properties
      i. Unit Weight — 137 PCF
      ii. At Rest Earth Coefficient, Ko — 0.45
3. Seismic loads: NA per MSBC

DESIGN / CONSTRUCTION CRITERIA

1. The contractor shall verify dimensions and conditions before construction and notify the engineer of any discrepancies, inconsistencies, or difficulties affecting the work before proceeding.
2. The contractor shall coordinate all disciplines, verifying size and location of openings called for on civil, mechanical, electrical or other drawings prior to submitting shop drawings (all required openings may not be shown on these structural drawings). Conflicts, inconsistencies, or other items affecting structural work shall be called to engineer's attention before proceeding.
3. The contractor shall supply all temporary means necessary to safely perform the work and support structural elements without damage until concrete has reached strength. The engineer is not responsible for construction means or methods.
4. Job site safety (including excavations) is the sole responsibility of the general contractor and their subcontractors.

EXISTING CONSTRUCTION

1. Before proceeding with any work, the contractor shall familiarize themself with existing conditions. It shall be the contractor's responsibility to design, provide, and erect all necessary bracing, shoring and other safeguards to maintain all parts of the existing work in a safe condition during the process of demolition and construction and to protect from damage those portions of the existing work which are to remain.
2. Any existing construction damaged in the removal of adjacent elements shall be replaced at the contractor's expense.

FOUNDATIONS

1. CAUTION: Existing underground utilities may exist anywhere on the site. Notify owner and Gopher One-Call (800) 252-1166 prior to disturbing any grade or excavation.
2. Material Definitions and Gradations:
   a. Non-frost-susceptible fill
      - 100% passing 1" sieve
      - < 50% passing #40 sieve
      - < 6% passing #200 sieve
      - < 2% organic content
   b. Aggregate Base
      - 100% passing 1" sieve
      - 70-100% passing 3/4" sieve
      - 45-90% passing 3/8" sieve
      - 35-80% passing #4 sieve
      - 20-65% passing #10 sieve
      - 10-35% passing #40 sieve
      - 3-10% passing #200 sieve
      - < 2% organic content
      - Large aggregates through #4 have minimum 25% fractured faces or crushed (per gradation)
   c. Granular Structural Backfill
      - 100% passing 1" sieve
      - 0-65% passing #10 sieve
      - 0-65% passing #40 sieve
      - 0-10% passing #200 sieve
      - < 2% organic content
3. Structural foundation consists of a matt slab on 6" Aggregate Base, on existing soils capable of safely supporting 2,000 PSF. A licensed geotechnical engineer shall be present during construction to test, inspect and verify assumed soil conditions.
4. Below grade walls shall be backfilled with Granular Structural Backfill or Non-Frost Susceptible Fill (as defined above) within 2 feet of the wall.
5. Place fill in 8-inch loose lifts and compact to 98 percent Standard Proctor beneath foundations and 95 percent otherwise, or as directed by the on-site geotechnical engineer. Compaction and material requirements of the civil and/or pavement engineer supersede the backfill requirements provided in these general structural notes.
6. Place backfill at equally on all sides of underground structures to prevent displacement or structural damage.
7. Contractor shall provide for dewatering at excavations.
8. Do not place concrete on frozen ground, nor allow ground beneath foundations to freeze. All foundation work shall be placed on substrate approved and tested by geotechnical engineer of record.

CONCRETE

1. An independent testing agency shall cast 4 six inch test cylinders for each 75 cubic yards of each concrete mix placed or for each day's operation, whichever is the lesser amount. The testing agency shall cast, cure, and test the specimens in accordance with ASTM C31 and ASTM C39.
2. The contractor shall be responsible for the design of formwork to comply with the dimensions indicated on the plans, maintaining proper alignment during concrete pouring operations.
3. All concrete shall meet the following requirements:
   - Compressive Strength — f'c = 6,000 PSI min at 28 days
   - Water / (cement + pozzolan) ratio — 0.45 max (0.40 max if exposed to sulfates)
4. Concrete exposed to frost (including foundation walls) shall be air entrained 6% +/- 1.5%.
5. Do not add water to concrete at the jobsite without written approval of the SER.
6. No chloride containing admixtures are allowed.
7. All concrete is normal weight.
8. Cement shall be Portland cement type 1 conforming to ASTM C150 or Portland Limestone Cement type 1L conforming to ASTM C595. Up to 30% cement can be replaced with flyash and up to 50% with GGBFS (50% combined max.). Aggregate for normal weight concrete shall conform to ASTM C33. Water is to be potable or demonstrated to have no harmful effects on concrete. Fly ash shall be demonstrated by test to contain minimum 18 percent CAO.
9. Measured from the time water and cement are batched together, no more than 90 minutes shall elapse until concrete is placed.
10. Wet cure (poly and burlap or proprietary blankets kept moist daily) for a minimum of 7 days. Spray-on curing compounds shall not be used as a substitute for wet curing without written permission of the SER except as follows. Spray-on curing compounds may be substituted for wet curing in areas not visible in the final condition When spray-on curing compounds are used, they should be applied in two layers perpendicular to each other and according to manufacturer's instructions.
11. No uncoated aluminum items shall be embedded in any concrete.
12. Concrete shall be placed without construction joints except where specifically shown on drawings or on shop drawings approved by the engineer. The contractor shall submit shop drawings showing construction joint locations to the engineer for approval.
13. Chamfer all exposed corners of concrete 3/4"x3/4".

WATERSTOPS

1. Waterstops shall be 4-inch PVC center-bulb ribbed type unless noted otherwise.
2. At splices, miter all intersecting connections at 45 degrees and use a manufacturer approved heating iron to make full contact butt joints.
3. For construction joints between cast-in-place concrete and precast concrete (i.e. pipes), use hydrophilic waterstops.

REINFORCING STEEL

1. All concrete is reinforced concrete unless specifically called out as unreinforced. Reinforce all concrete not otherwise shown with same steel as in similar sections or typical details.
2. All reinforcing steel shall conform to the requirements of ASTM A615 grade 60 steel. Reinforcing steel shall not be welded.
3. Clear minimum cover of concrete over reinforcing steel shall be as follows unless specifically noted otherwise:
   - 3" Concrete cast against and permanently exposed to soil
   - 2" All other concrete unless noted otherwise (U.N.O.) on plans.
4. Bar support accessories shall be as specified in latest edition of the ACI detailing handbook and the concrete reinforcing steel institute design handbook. Maximum accessory spacing shall be 4'-0" on center maximum. Support rebar and standees shall not be taken from design reinforcing.

SHOP DRAWING REVIEW

1. Short Elliott Hendrickson Inc. (SEH) will review the general contractor's (GC) shop drawings and related submittals (as indicated below) with respect to the ability of the detailed work, when complete, to be a properly functioning integral element of the overall structural system designed by SEH. In general, submittals will not be reviewed for correct quantities or construction considerations. SEH shall review shop drawings and related materials with comments provided that each submission has met the requirements herein. SEH shall return without comment unrequired material or submissions without GC approval stamp
2. Prior to submittal of a shop drawing or any related material to SEH, the GC shall:
   - Review each submission for conformance with the means, methods, techniques, sequences and operations of construction and safety precautions and programs incidental thereto, all of which are the sole responsibility of the GC.
   - Review and approve each submission.
   - Stamp each submission as approved.
3. SEH shall assume that no submission comprises a variation from the contract documents unless the GC advises SEH with written documentation. Should SEH require more than ten (10) working days to perform the review, SEH shall so notify the GC. Submittals shall include drawings and related material (if any) as indicated below.
   - Concrete mix designs and material certificates including admixtures, compounds applied to the concrete after placement, and associated product data. See specifications.
   - Aggregate tests and concrete test history for each mix design, with the submission of concrete mix designs.
   - Reinforcing steel shop drawings including erection drawings and bending details.
   - Cast-iron manhole steps.
   - Cast-iron manhole casting.

SPECIAL INSPECTION

1. Special inspection and testing is required according to the table on the first general sheet of the structural drawings. Contractor shall coordinate with SER, testing agency and geotechnical engineer throughout the project.
   - Special Inspections shall be performed in accordance with IBC Chapter 17.
   - Special Inspection of reinforcing steel and anchor rod placement shall be performed prior to concrete placement or during anchor rod installation for adhesive anchors.
   - Continuous inspection during concrete placement is required.
   - Conduct concrete slump tests in accordance with ASTM C143.
   - Obtain set of a four (4) concrete test cylinders each time concrete is placed. Make test cylinders in accordance with ASTM C39.
   - Reports of Special Inspections shall be provided, at the frequency noted above, to the Owner, Contractor, and Engineer of Record by the firm contracted to perform Special Inspections.
   - Special Inspection criteria in these general structural notes applies to vault structure slabs and foundation walls only. See civil drawings and specifications for non-structural slab on grade and site work concrete requirements.

REQUIRED SPECIAL INSPECTION AND TESTS

DESCRIPTION OF WORK PER IBC CHAPTER 17	INSPECTION FREQUENCY: CONTINUOUS	INSPECTION FREQUENCY: PERIODIC	TESTING: YES	TESTING: NO	N/A
CONCRETE CONSTRUCTION					
1. INSPECT REINFORCEMENT		X		X	
2. VERIFY USE OF REQUIRED DESIGN MIX		X		X	
3. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE		X	X		
4. INSPECT CONCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES		X		X	
5. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES		X		X	
6. VERIFY IN-SITU CONCRETE STRENGTH PRIOR TO REMOVAL OF SHORES AND FORMS FOR STRUCTURAL SLABS		X	X		
7. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED		X		X	
SOILS					
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATION ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY		X	X		
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL		X	X		
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS		X	X		
4. VERIFY USE OF PROPER MATERIALS, DENSITIES, AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL	X		X		
5. PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY		X	X		

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DULUTH INTERNATIONAL AIRPORT

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Joel Rector, PE
DATE MAY 29, 2024 LICENSE NO. XXXX

DULUTH INTERNATIONAL AIRPORT (DLH)
TAXIWAY A
RECONSTRUCTION - PHASE 5
DULUTH, MINNESOTA

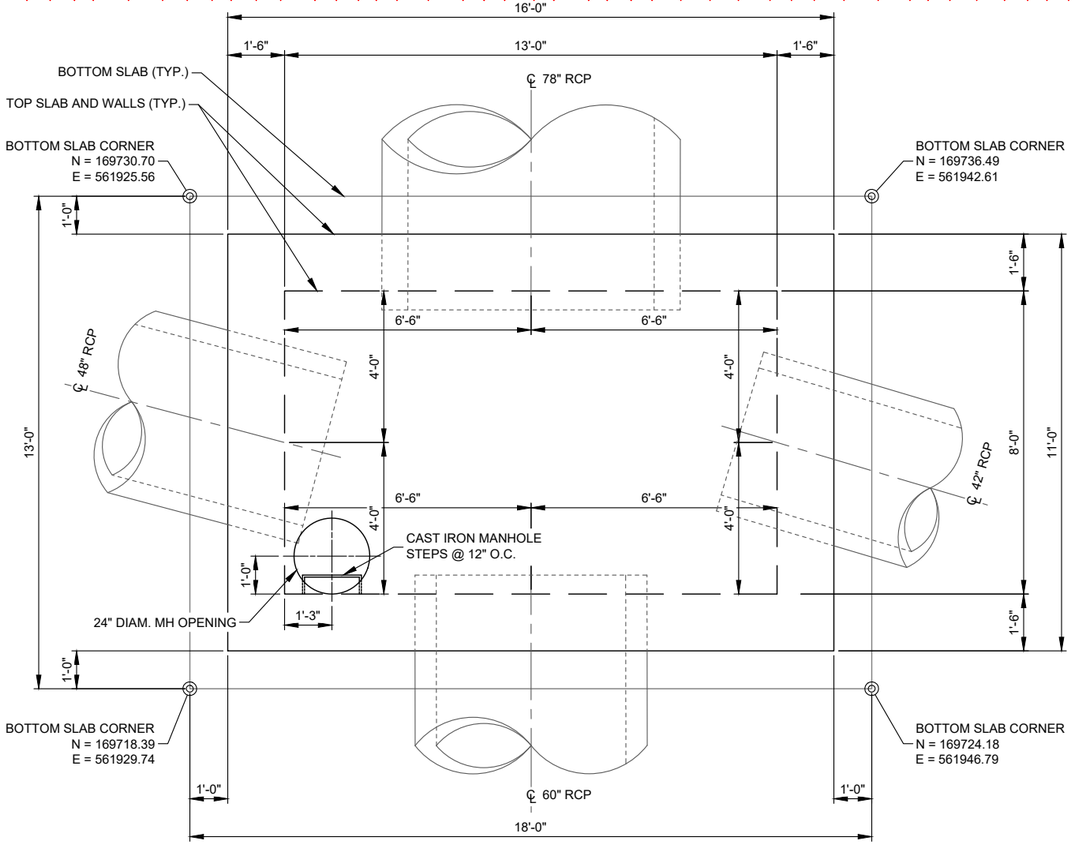
MARK	DATE	DESCRIPTION
1	6/20/2024	ADDENDUM 1

REVISIONS

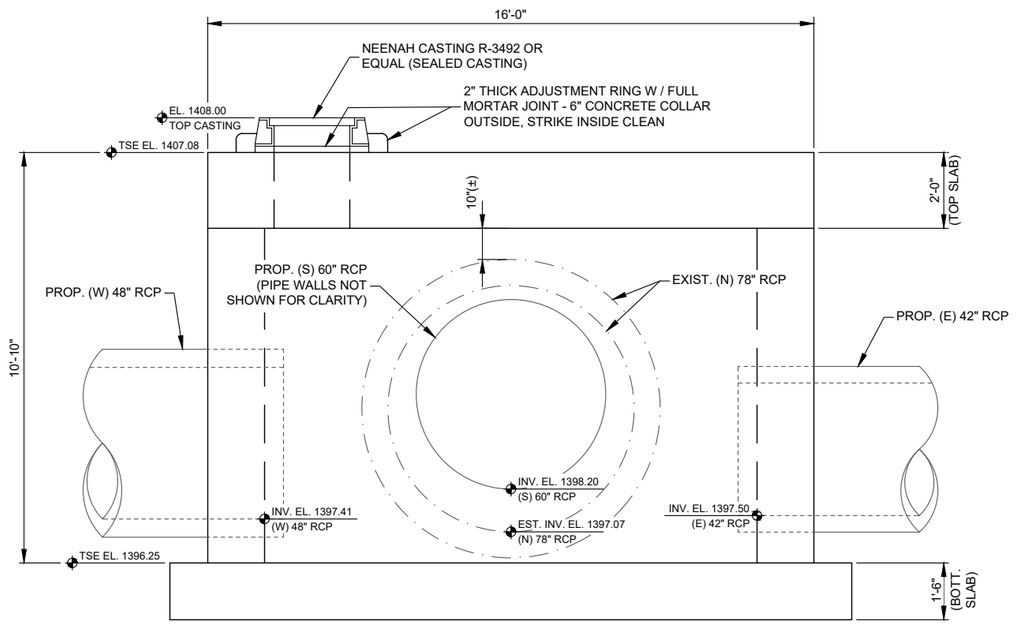
SEH FILE NO. DULAI_174212
STATE PROJECT NO. A690-122X
ISSUE DATE MAY 29, 2024
DESIGNED BY JR
DRAWN BY SWB

SHEET TITLE
(MH-1)
CAST-IN-PLACE
GENERAL NOTES

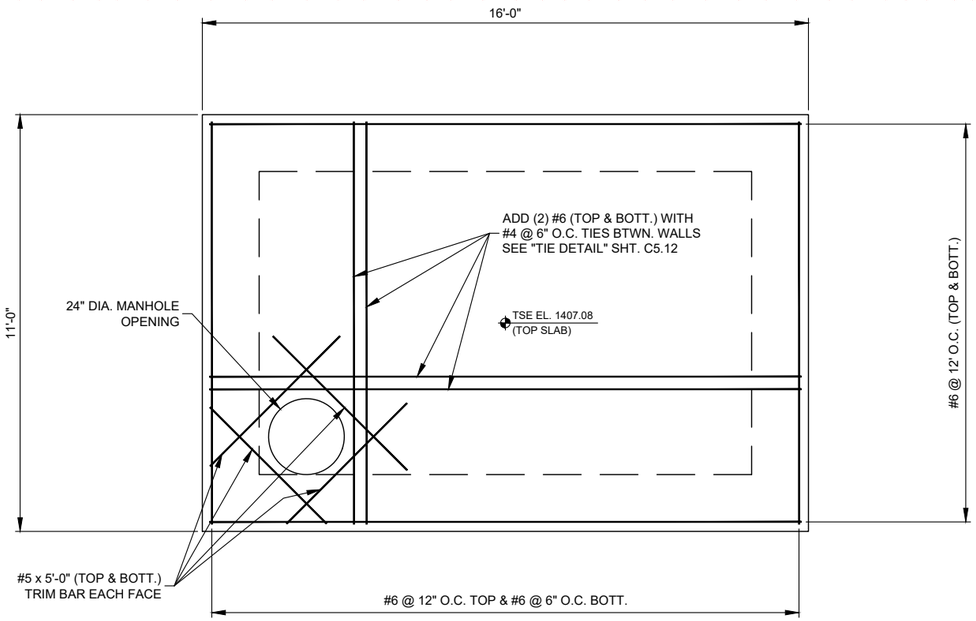
SHEET
C5.10



MANHOLE STRUCTURE - GENERAL PLAN VIEW LAYOUT

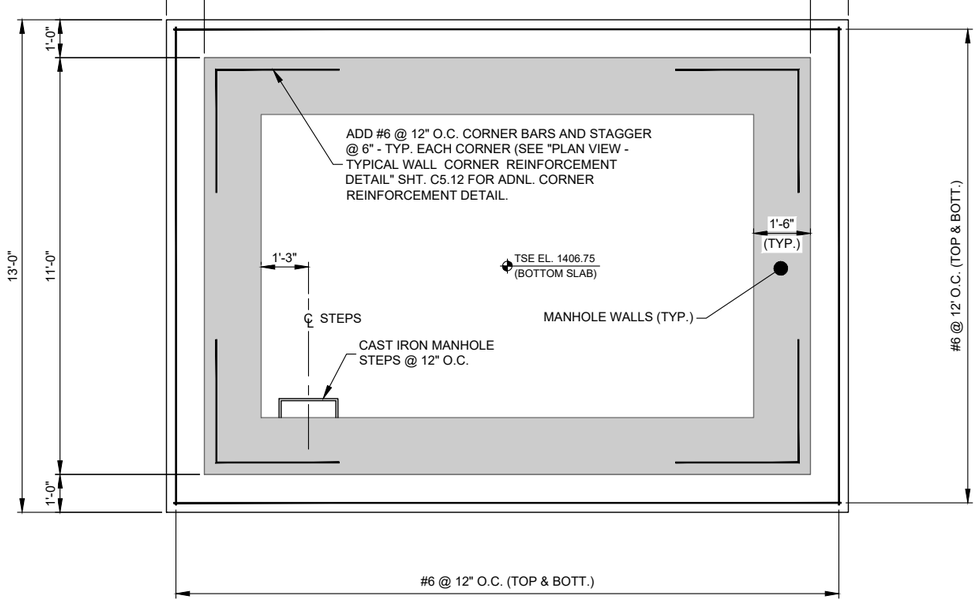


MANHOLE STRUCTURE - GENERAL ELEVATION VIEW



TOP SLAB REINFORCEMENT PLAN

(SEE "TYPICAL WALL, TOP & BOTTOM SLAB REINFORCING SECTION" SHT. C5.12
FOR WALL REINFORCING PROJECTIONS INTO TOP SLAB)



BOTTOM SLAB REINFORCEMENT PLAN

(SEE "TYPICAL WALL, TOP & BOTTOM SLAB REINFORCING SECTION" SHT. C5.12
FOR WALL REINFORCING PROJECTIONS INTO BOTTOM SLAB)

TOP & BOTTOM REINFORCEMENT PLAN NOTES:

1. PIPE PENETRATIONS NOT SHOWN, SEE GENERAL PLAN AND ELEVATION VIEWS THIS SHEET FOR SIZE AND LOCATION. ALSO, SEE STORM SEWER PLAN SHEETS C5.01 - C5.07 FOR ADDITIONAL INFORMATION.
2. STOP (OR FIELD CUT) REINFORCEMENT AT OPENINGS.

1

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DULUTH INTERNATIONAL AIRPORT

DULUTH INTERNATIONAL AIRPORT (DLH)

TAXIWAY A
RECONSTRUCTION - PHASE 5

DULUTH, MINNESOTA

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Joel Rector, PE
DATE MAY 29, 2024 LICENSE NO. XXXX

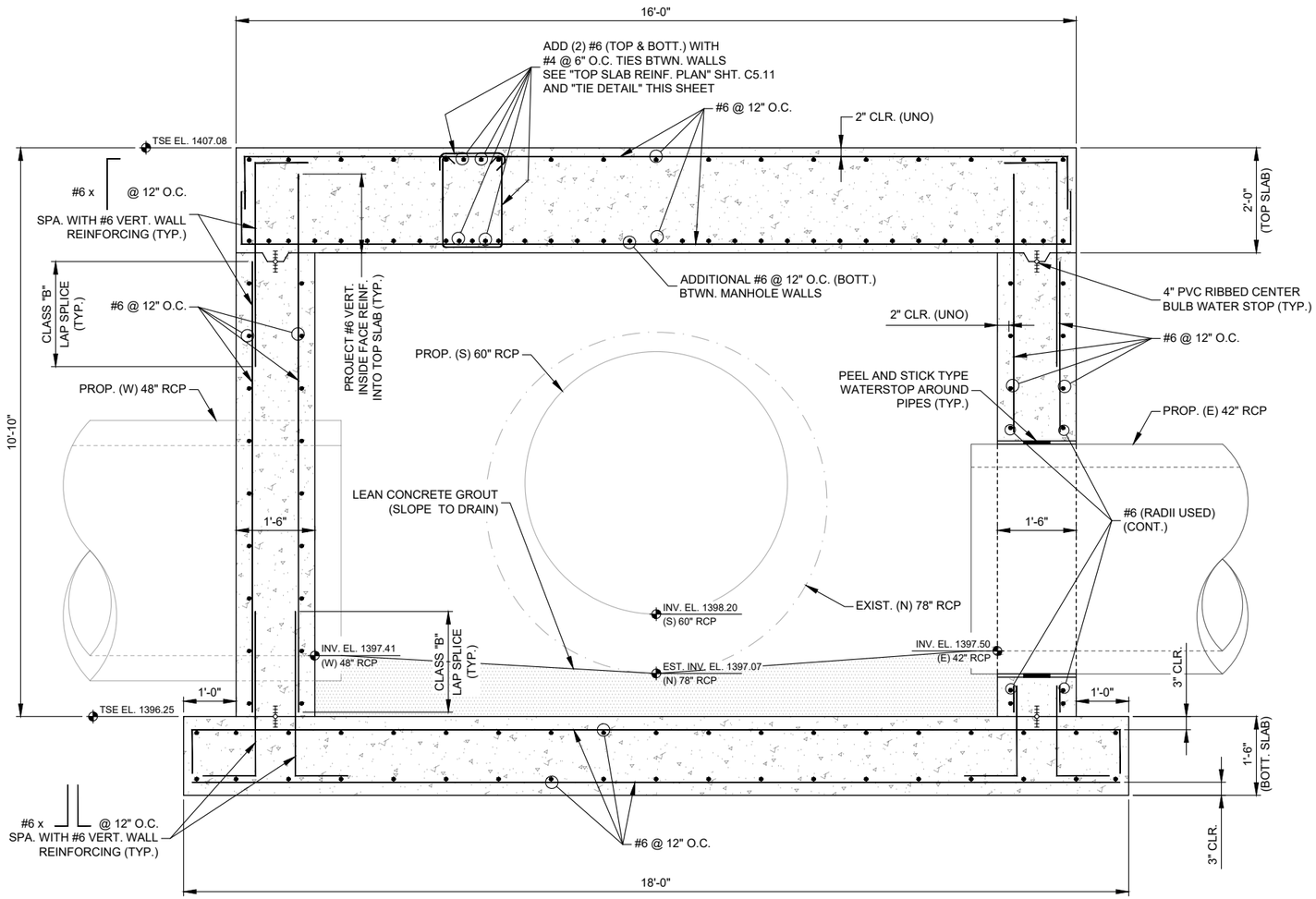
MARK	DATE	DESCRIPTION
1	6/20/2024	ADDENDUM 1

REVISIONS

SEH FILE NO. DULAI_174212
STATE PROJECT NO. A6901-22X
ISSUE DATE MAY 29, 2024
DESIGNED BY JR
DRAWN BY SWB

SHEET TITLE
(MH-1)
CAST-IN-PLACE
DETAILS

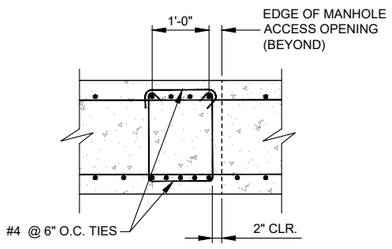
SHEET
C5.11



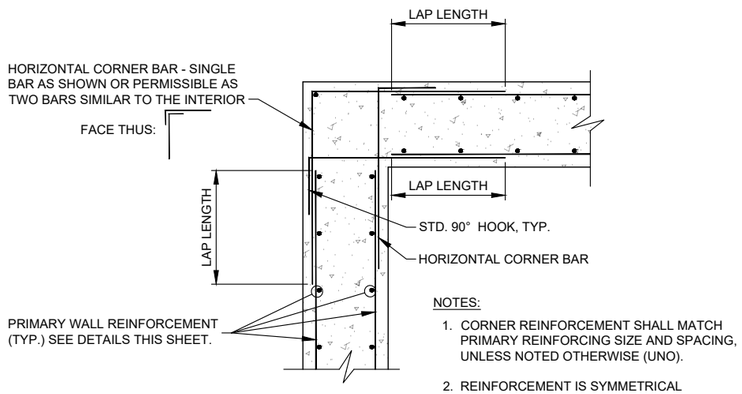
TYPICAL WALL, TOP & BOTTOM SLAB REINFORCEING SECTION

NOTES:

1. FOR ADDITIONAL PIPE PENETRATION INFORMATION, SEE GENERAL PLAN AND ELEVATION VIEWS SHEET C5.11. ALSO, SEE STORM SEWER PLAN SHEETS C5.01 - C5.07 FOR ADDITIONAL INFORMATION.
2. STOP (OR FIELD CUT) REINFORCEMENT AT PIPE OPENINGS.



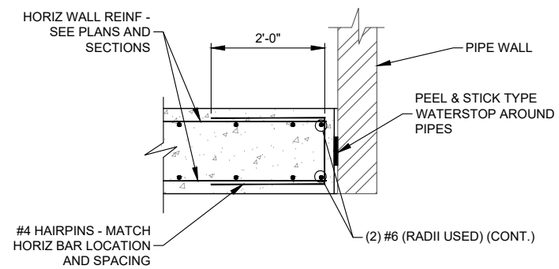
TIE DETAIL



NOTES:

1. CORNER REINFORCEMENT SHALL MATCH PRIMARY REINFORCING SIZE AND SPACING, UNLESS NOTED OTHERWISE (UNO).
2. REINFORCEMENT IS SYMMETRICAL

PLAN VIEW - TYPICAL WALL CORNER
REINFORCEMENT DETAIL



TYPICAL DETAIL AT PIPE OPENINGS

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DULUTH INTERNATIONAL AIRPORT

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Joel Reddor, PE

DATE MAY 29, 2024 LICENSE NO. XXXX

DULUTH INTERNATIONAL AIRPORT (DLH)

TAXIWAY A
RECONSTRUCTION - PHASE 5

DULUTH, MINNESOTA

MARK	DATE	DESCRIPTION
1	6/20/2024	ADDENDUM 1

REVISIONS

SEH FILE NO. DULA1_174212
STATE PROJECT NO. A690-122X
ISSUE DATE MAY 29, 2024
DESIGNED BY JR
DRAWN BY SWB

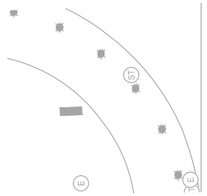
SHEET TITLE
(MH-1)
CAST-IN-PLACE
DETAILS

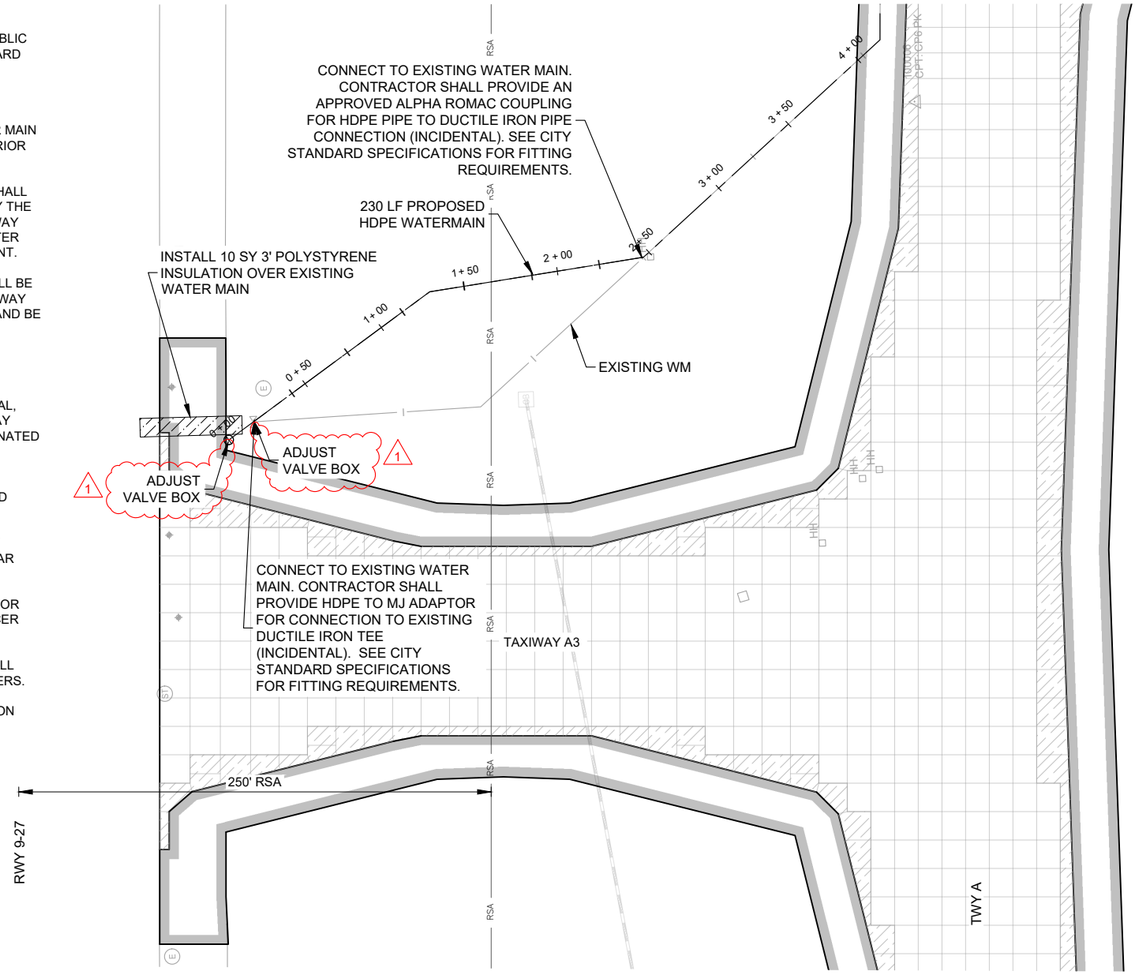
SHEET
C5.12

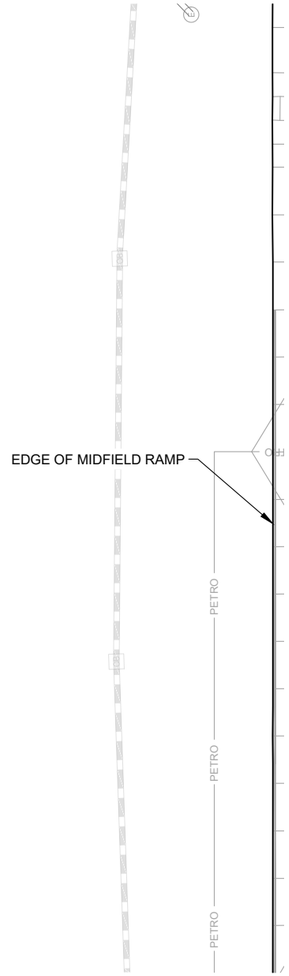
1

CONSTRUCTION NOTES:

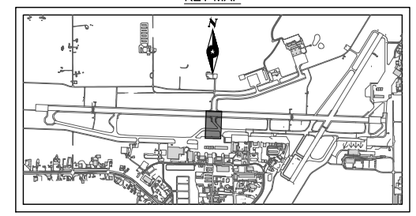
1. THE 2019 EDITION OF THE CITY OF DULUTH PUBLIC WORKS AND UTILITIESS DEPARTMENT STANDARD CONSTRUCTION SPECIFICATIONS AND ALL AMENDMENTS SHALL APPLY TO WATER MAIN CONSTRUCTION.
2. CONTRACTOR SHALL VERIFY EXISTING WATER MAIN CONNECTION ELEVATIONS AND LOCATIONS PRIOR TO CONSTRUCTION (INCIDENTAL)
3. A SEPARATE DURATION OF CONSTRUCTION SHALL OCCUR IN ADVANCE AT A TIME DESGNATED BY THE ENGINEER FOR POTHOLING WITHIN THE RUNWAY SAFETY AREA TO CONFIRM THE EXISTING WATER MAIN ELEVATION NEAR THE RUNWAY PAVEMENT.
4. HDPE WATER MAIN PIPE CONFIGURATION SHALL BE ASSEMBLED ON GRADE OUTSIDE OF THE RUNWAY SAFETY AREA IN ADVANCE OF INSTALLATION AND BE TESTED FOR PRESSURE AND BACTERIA IN ACCORDANCE WITH CITY OF DULUTH CONSTRUCTION SPECIFICATIONS.
5. REQUIRED EXCAVATION, WATER MAIN INSTALLATION, EXISTING WATER MAIN REMOVAL, AND BACKFILL INSIDE OF DESIGNATED RUNWAY SAFETY AREA SHALL OCCUR AT A TIME DESIGNATED BY THE ENGINEEER.
6. CONTRACTOR SHALL PROVIDE SUPPORT FOR EXISTING UTILITY CROSSINGS WITH PROPOSED WATER MAIN (INCIDENTAL)
7. CONTRACTOR SHALL NOTIFY PRIVATE UTILITY COMPANIES PRIOR TO WORK PERFORMED NEAR PRIVATE UTILITIES (INCIDENTAL)
8. PROVIDE TRACER WIRE AND TRACER BOXES FOR WATER MAIN PER THE SPECIFICATIONS. TRACER WIRE IS INCIDENTAL TO WORK.
9. PROVIDE MIN. 1.5' VERTICAL SEPARATION AT ALL WATER MAIN CROSSINGS WITH GRAVITY SEWERS.
10. PROVIDE MINIMUM 10' HORIZONTAL SEPARATION BETWEEN WATER MAIN AND GRAVITY SEWER SYSTEMS.

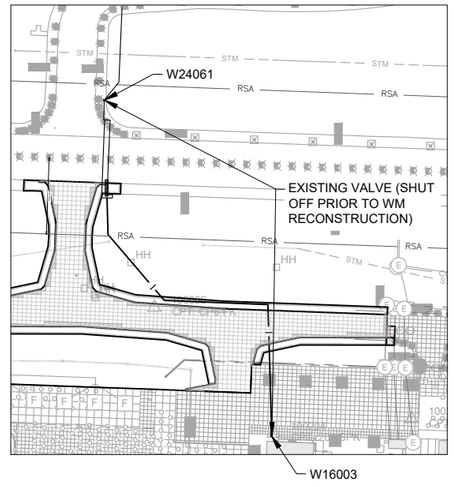




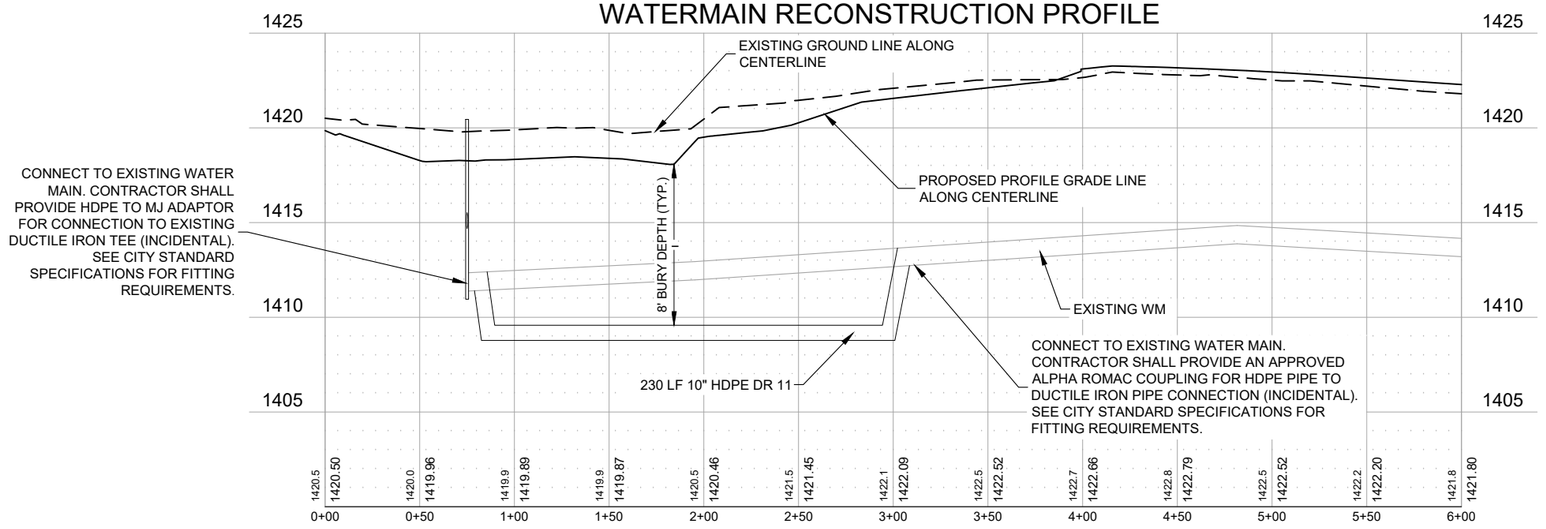


KEY MAP





WATERMAIN RECONSTRUCTION PROFILE



LEGEND

RSA	RUNWAY SAFETY AREA
ROFA	RUNWAY OBJECT FREE AREA
	PROPOSED GRADING LIMIT
P-BUR	EXISTING BURIED POWER
COM	EXISTING BURIED PHONE
	PROPOSED STORM PIPE
CB	PROPOSED STORM CATCH BASIN
ST	PROPOSED STORM MANHOLE
	EXISTING PAVEMENT EDGE
STM	EXISTING STORM PIPE
FM	EXISTING SANITARY PIPE
	EXISTING STORM CATCH BASIN
ST	EXISTING STORM MANHOLE
	EXISTING TAXIWAY LIGHT
	EXISTING RUNWAY LIGHT
	EXISTING BORING
E	EXISTING ELECTRICAL MANHOLE
	EXISTING LIGHTED SIGN
	EXISTING INSPECTION PIT
E	EXISTING ELECTRICAL CIRCUIT

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Jarrod R. Nelson

Jarrod R. Nelson, PE
DATE MAY 29, 2024
LICENSE NO. 25794

MARK	DATE	DESCRIPTION
1	6/20/2024	ADDENDUM 1

REVISIONS

SEH FILE NO.	DULAI_174212
STATE PROJECT NO.	A6901-22X
ISSUE DATE	MAY 29, 2024
DESIGNED BY	JN
DRAWN BY	---

DULUTH INTERNATIONAL AIRPORT (DLH)

TAXIWAY A RECONSTRUCTION - PHASE 5

DULUTH, MINNESOTA

SHEET TITLE
WATER MAIN RECONSTRUCTION

SHEET
C6.00

DULUH INTERNATIONAL AIRPORT (DLH)
TAXIWAY A RECONSTRUCTION, PHASE 5
IFB ENGINEER'S ESTIMATE
SEH No. DULAI 174212
6/20/2024

LINE NO.	ITEM NO.	ITEM DESCRIPTION	TOTAL ESTIMATED QUANTITIES	UNIT	SCHEDULE
1	40-05	MAINTENANCE & RESTORATION OF HAUL ROADS	LS	1	SCHEDULE A - BASE BID
2	40-08	RESTORATION OF BATCH PLANT AND CONTRACTOR STORAGE AREAS	LS	1	SCHEDULE A - BASE BID
3	50-06	CONSTRUCTION LAYOUT & STAKING	LS	1	SCHEDULE A - BASE BID
4	60-05	FIELD OFFICE	LS	1	SCHEDULE A - BASE BID
5	70-08	TRAFFIC PROVISIONS/AIRPORT SECURITY & DEVICES/PHASING	LS	1	SCHEDULE A - BASE BID
6	70-10	ORANGE CONSTRUCTION FENCE	LF	6,630	SCHEDULE A - BASE BID
7	02 41 35	REMOVE PAVEMENT MARKING BY WATER BLASTING	SF	440	SCHEDULE A - BASE BID
8	02 41 35	REMOVE PAVEMENT MARKING, GROUND OFF	SF	410	SCHEDULE A - BASE BID
9	32 12 16	PLANT-MIXED ASPHALT PAVEMENT	TON	9,990	SCHEDULE A - BASE BID
10	C-100	CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)	LS	1	SCHEDULE A - BASE BID
11	C-102	ROCK CONSTRUCTION ENTRANCE (INCLUDES MAINTENANCE AND REMOVAL)	EA	2	SCHEDULE A - BASE BID
12	C-102	SILT FENCE, TYPE PREASSEMBLED (INCLUDES MAINTENANCE AND REMOVAL)	LF	17,500	SCHEDULE A - BASE BID
13	C-102	INLET PROTECTION, TYPE B (INCLUDES MAINTENANCE AND REMOVAL)	EA	20	SCHEDULE A - BASE BID
14	C-105	MOBILIZATION	LS	1	SCHEDULE A - BASE BID
15	D-701	REINFORCED CONCRETE PIPE (RCP), 12" CLASS V	LF	360	SCHEDULE A - BASE BID
16	D-701	REINFORCED CONCRETE PIPE (RCP), 18" CLASS III	LF	410	SCHEDULE A - BASE BID
17	D-701	REINFORCED CONCRETE PIPE (RCP), 36" CLASS III	LF	980	SCHEDULE A - BASE BID
18	D-701	REINFORCED CONCRETE PIPE (RCP), 42" CLASS III	LF	750	SCHEDULE A - BASE BID
19	D-701	REINFORCED CONCRETE PIPE (RCP), 48" CLASS III	LF	390	SCHEDULE A - BASE BID
20	D-701	REINFORCED CONCRETE PIPE (RCP), 60" CLASS V	LF	330	SCHEDULE A - BASE BID
21	D-705	DRAIN TILE (6" PERFORATED, INCLUDING TRENCH, BACKFILL, FABRIC)	LF	4,620	SCHEDULE A - BASE BID
22	D-705	DRAIN TILE (6" SOLID, INCLUDING TRENCH, BACKFILL)	LF	1,960	SCHEDULE A - BASE BID
23	D-751	DRAIN TILE ACCESS/INSPECTION PIT	EA	29	SCHEDULE A - BASE BID
24	D-751	MANHOLE / CATCH BASIN 48" DIA.	EA	3	SCHEDULE A - BASE BID
25	D-751	MANHOLE / CATCH BASIN 60" DIA.	EA	2	SCHEDULE A - BASE BID
26	D-751	MANHOLE / CATCH BASIN 72" DIA.	EA	3	SCHEDULE A - BASE BID
27	D-751	MANHOLE / CATCH BASIN 84" DIA.	EA	3	SCHEDULE A - BASE BID
28	D-751	MANHOLE / CATCH BASIN 96" DIA.	EA	1	SCHEDULE A - BASE BID
29	D-751	ADJUST MANHOLE / CATCH BASIN CASTING	EA	1	SCHEDULE A - BASE BID
30	P-610	MH-1 CAST-IN-PLACE STORM SEWER STRUCTURE	LS	1	SCHEDULE A - BASE BID
31	2504.603	10” DIPS HDPE Water Main SDR 11	LF	230	SCHEDULE A - BASE BID
32	2504.602	WATER TRACER BOX	EA	2	SCHEDULE A - BASE BID
33	2504.602	CONNECT TO EXISTING WATERMAIN	EA	2	SCHEDULE A - BASE BID
34	2504.604	3" POLYSTYRENE INSULATION	SY	10	SCHEDULE A - BASE BID
35	2504.602	ADJUST VALVE BOX	EA	2	SCHEDULE A - BASE BID
36	L-108-5.1	NO. 8 AWG, 5 KV, L-824, TYPE C CABLE, INSTALLED IN DUCT BANK OR CONDUIT	LF	44,250	SCHEDULE A - BASE BID
37	L-108-5.2	NO. 6 AWG, SOLID, BARE COUNTERPOISE WIRE, INSTALLED IN TRENCH, ABOVE THE DUCT BANK OR CONDUIT, INCLUDING CONNECTIONS/TERMINATIONS, GROUND RODS AND GROUND CONNECTORS	LF	11,940	SCHEDULE A - BASE BID
38	L-108-5.3	2-#8 AWG AND 1-#8 GND, XHHW, INSTALLED IN TRENCH OR CONDUIT	LF	1,700	SCHEDULE A - BASE BID
39	L-108-5.4	1/C #4 5KV UNSHIELDED XLP MV-90 CABLE, INSTALLED IN DUCT BANK OR CONDUIT	LF	1,750	SCHEDULE A - BASE BID
40	L-110-5.1	NON-ENCASED ELECTRICAL CONDUIT, 1-WAY 2-INCH, PVC SCHEDULE 40	LF	7,600	SCHEDULE A - BASE BID

41	L-110-5.2	CONCRETE ENCASED ELECTRICAL CONDUIT, 2-WAY 2-INCH, PVC SCHEDULE 40	LF	1,630	SCHEDULE A - BASE BID
42	L-110-5.3	CONCRETE ENCASED ELECTRICAL CONDUIT, 4-WAY 4-INCH, PVC SCHEDULE 40	LF	1,210	SCHEDULE A - BASE BID
43	L-110-5.4	CONCRETE ENCASED ELECTRICAL CONDUIT, 6-WAY 4-INCH, PVC SCHEDULE 40	LF	1,500	SCHEDULE A - BASE BID
44	L-110-5.5	DRAIN LINE CONNECTION TO STORM STRUCTURE	EA	10	SCHEDULE A - BASE BID
45	L-110-5.6	2” RIGID GALVANIZED STEEL	LF	1,100	SCHEDULE A - BASE BID
46	L-125-5.1	REMOVAL OF EXISTING AIRFIELD ELECTRICAL	LS	1	SCHEDULE A - BASE BID
47	L-125-5.2	L-861T(L) MEDIUM INTENSITY TAXIWAY EDGE LIGHT (WITHOUT ARCTIC KIT), BLUE LENS INSTALLED ON NEW L-867-B GALVANIZED BASE CAN (INCLUDES FIXTURE, TRANSFORMER, AND BASE CAN)	EA	76	SCHEDULE A - BASE BID
48	L-125-5.3	L-861T(L) TAXIWAY EDGE LIGHT TEMPORARILY INSTALLED INCLUDING NEW ISOLATION TRANSFORMER	EA	20	SCHEDULE A - BASE BID
49	L-125-5.4	L-867-B GALVANIZED BASE CAN WITH BASE PLATE COVER	EA	28	SCHEDULE A - BASE BID
50	L-125-5.5	L-868-B GALVANIZED BASE CAN WITH BASE PLATE COVER	EA	3	SCHEDULE A - BASE BID
51	L-125-5.6	L-858(L) GUIDANCE SIGN, SIZE 2, INCLUDING FOUNDATION, ISOLATION TRANSFORMER, WIRE, BASE CAN, AND CONDUIT	EA	12	SCHEDULE A - BASE BID
52	L-125-5.7	L-829 4KW CONSTANT CURRENT REGULATOR	EA	1	SCHEDULE A - BASE BID
53	L-125-5.8	TEMPORARILY REMOVE EXISTING RUNWAY LIGHT FIXTURE, BASE CAN, CABLE, CONDUIT, AND ISOLATION TRANSFORMER, AND REPLACE LIGHT FIXTURE ON NEW L-868-B BASE CAN WITH NEW ISOLATION TRANSFORMER IN LATER PHASE	EA	1	SCHEDULE A - BASE BID
54	L-125-5.9	PRECAST AIRCRAFT-RATED ELECTRICAL HANDHOLE	EA	10	SCHEDULE A - BASE BID
55	L-125-5.10	L-858(L) GUIDANCE SIGN, SIZE 2, TEMPORARILY INSTALLED TO PAVEMENT INCLUDING ISOLATION TRANSFORMER, AND WIRE	EA	1	SCHEDULE A - BASE BID
56	P-101	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LF	750	SCHEDULE A - BASE BID
57	P-101	REMOVE BITUMINOUS PAVEMENT (FULL DEPTH)	SY	28,280	SCHEDULE A - BASE BID
58	P-101	MILL BITUMINOUS PAVEMENT (2")	SY	370	SCHEDULE A - BASE BID
59	P-101	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LF	1,040	SCHEDULE A - BASE BID
60	P-101	REMOVE CONCRETE PAVEMENT (FULL DEPTH)	SY	1,430	SCHEDULE A - BASE BID
61	P-101	REMOVE STORM PIPE	LF	2,300	SCHEDULE A - BASE BID
62	P-101	REMOVE STORM STRUCTURE	EA	4	SCHEDULE A - BASE BID
63	P-101	REMOVE DRAIN TILE CLEANOUT	EA	15	SCHEDULE A - BASE BID
64	P-101	REMOVE WATER MAIN PIPE	LF	240	SCHEDULE A - BASE BID
65	P-101	REMOVE DRAIN TILE	LF	5,400	SCHEDULE A - BASE BID
66	P-151	CLEARING AND GRUBBING	ACRE	0.4	SCHEDULE A - BASE BID
67	P-152	COMMON EXCAVATION (EV)	CY	59,500	SCHEDULE A - BASE BID
68	P-152	UNCLASSIFIED OVER EXCAVATION (EV) (INCLUDES REMOVAL AND REPLACEMENT OF UNSUITABLE MATERIAL WITH SUITABLE MATERIAL (P-154) AS DIRECTED BY ENGINEER, AND ALSO INCLUDES SUBGRADE PROOF ROLLING)	CY	1,000	SCHEDULE A - BASE BID
69	P-152	MUCK EXCAVATION (EV)	CY	350	SCHEDULE A - BASE BID
70	P-152	SUBGRADE PREPARATION (INCLUDES SUBGRADE PROOF ROLLING)	SY	50,540	SCHEDULE A - BASE BID
71	P-152	ROCK EXCAVATION	CY	50	SCHEDULE A - BASE BID
72	P-152	POND EXCAVATION	CY	2,970	SCHEDULE A - BASE BID
73	P-154	GRANULAR BORROW (CV)	CY	24,640	SCHEDULE A - BASE BID
74	P-154	GEOTEXTILE FABRIC, TYPE 7	SY	53,070	SCHEDULE A - BASE BID
75	P-209	CRUSHED AGGREGATE BASE COURSE (CV)	CY	10,070	SCHEDULE A - BASE BID
76	P-401	BITUMINOUS SURFACE COURSE	TON	1,120	SCHEDULE A - BASE BID
77	P-401	BITUMINOUS BASE COURSE	TON	1070	SCHEDULE A - BASE BID
78	P-403	BITUMINOUS SURFACE COURSE	TON	1400	SCHEDULE A - BASE BID
79	P-403	BITUMINOUS BASE COURSE	TON	1400	SCHEDULE A - BASE BID
80	P-501	CEMENT CONCRETE PAVEMENT, 13"	SY	29,110	SCHEDULE A - BASE BID
81	P-501	CEMENT CONCRETE PAVEMENT, REINFORCED 13"	SY	5,000	SCHEDULE A - BASE BID
82	P-603	BITUMINOUS TACK COAT	GAL	2,590	SCHEDULE A - BASE BID
83	P-604	COMPRESSION JOINT SEALS FOR CONCRETE	LF	42,680	SCHEDULE A - BASE BID
84	P-605	JOINT SEALING FILLER	LF	1,740	SCHEDULE A - BASE BID
85	P-620	RUNWAY & TAXIWAY PAVEMENT MARKING	SF	28,970	SCHEDULE A - BASE BID
86	P-620	REFLECTIVE MEDIA	LB	1,740	SCHEDULE A - BASE BID
87	T-901	SEEDING (INCLUDING FERTILIZER)	ACRE	18.8	SCHEDULE A - BASE BID
88	T-905	SELECT TOPSOIL BORROW (IMPORT) (CV)	CY	100	SCHEDULE A - BASE BID

89	T-908	HYDROMULCHING	ACRE	18.8	SCHEDULE A - BASE BID
90	02 60 10-1	DISPOSAL OF CONTAMINATED SOIL	TON	200	SCHEDULE A - BASE BID
91	02 60 10-2	REMOVAL AND DISPOSAL OF OIL/WATER FROM FUEL PIPE REMOVAL	GAL	200	SCHEDULE A - BASE BID
92	02 60 10-3	REMOVAL AND DISPOSAL OF FUEL PIPE	LS	1	SCHEDULE A - BASE BID
93	02 60 10-4	REMOVAL AND DISPOSAL OF PIPE VAULT	LS	1	SCHEDULE A - BASE BID
94	02 60 10-5	DEWATERING	LS	1	SCHEDULE A - BASE BID
95	02 60 10-6	REMOVAL AND DISPOSAL OF OIL SLUDGE FROM FUEL PIPE AND PIPE VAULT	GAL	100	SCHEDULE A - BASE BID
96	02 82 20-1	REGULATED ASBESTOS REMOVAL	LS	1	SCHEDULE A - BASE BID
97	02 82 20-2	REGULATED ASBESTOS REMOVAL - PETROLEUM PIPING	LF	50	SCHEDULE A - BASE BID
98	01 71 13	MOBILIZATION	LS	1	SCHEDULE B - BASE BID
99	50-06	CONSTRUCTION LAYOUT & STAKING	LS	1	SCHEDULE B - BASE BID
100	70-08	TRAFFIC PROVISIONS/AIRPORT SECURITY & DEVICES/	LS	1	SCHEDULE B - BASE BID
101	40-05	MAINTENANCE & RESTORATION OF HAUL ROADS	LS	1	SCHEDULE B - BASE BID
102	C-102-5.3	FILTER LOG, TYPE WOOD FIBER BIOROLL (INCL. MAINTENANCE)	LF	60	SCHEDULE B - BASE BID
103	D-705	DRAIN TILE (6" PERFORATED, INCLUDING TRENCH, BACKFILL, FABRIC)	LF	125	SCHEDULE B - BASE BID
104	P-152	COMMON EXCAVATION (EV)	CY	228	SCHEDULE B - BASE BID
105	P-152	SUBGRADE OVER-EXCAVATION	CY	10	SCHEDULE B - BASE BID
106	P-152	SUBGRADE PREPARATION	SY	255	SCHEDULE B - BASE BID
107	P-154	SELECT GRANULAR MATERIALS (CV) (12 INCHES THICK)	CY	170	SCHEDULE B - BASE BID
108	P-209	CRUSHED AGGREGATE BASE COURSE (CV) (8 INCHES THICK)	CY	48	SCHEDULE B - BASE BID
109	P-209	CRUSHED AGGREGATE BASE COURSE (CV) (12 INCHES THICK)	CY	13	SCHEDULE B - BASE BID
110	P-501	CONCRETE APRON (8-INCH)	SY	220	SCHEDULE B - BASE BID
111	P-501	CONCRETE APRON (10-INCH)	SY	40	SCHEDULE B - BASE BID
112	40-05	MAINTENANCE & RESTORATION OF HAUL ROADS	LS	1	SCHEDULE C - BASE BID
113	40-08	RESTORATION OF CONTRACTOR STORAGE AREAS	LS	1	SCHEDULE C - BASE BID
114	50-06	CONSTRUCTION LAYOUT & STAKING	LS	1	SCHEDULE C - BASE BID
115	70-08	TRAFFIC PROVISIONS/AIRPORT SECURITY & DEVICES/PHASING	LS	1	SCHEDULE C - BASE BID
116	02 41 35	REMOVE PAVEMENT MARKING BY WATER BLASTING	SF	500	SCHEDULE C - BASE BID
117	31 34 10	GEOTEXTILE FABRIC, TYPE 7	SY	2600	SCHEDULE C - BASE BID
118	C-102	ROCK CONSTRUCTION ENTRANCE (INCLUDES MAINTENANCE AND REMOVAL)	EA	1	SCHEDULE C - BASE BID
119	C-102-5.2	SILT FENCE, TYPE PREASSEMBLED (INCLUDES MAINTI	LF	500	SCHEDULE C - BASE BID
120	C-102-5.5	INLET PROTECTION, TYPE B (INCLUDES MAINTENANCE	EA	4	SCHEDULE C - BASE BID
121	C-105	MOBILIZATION	LS	1	SCHEDULE C - BASE BID
122	P-101	REMOVE AND DISPOSE OF FUEL LINE	LS	1	SCHEDULE C - BASE BID
123	D-705	DRAIN TILE (6" PERFORATED, INCLUDING TRENCH, BA	LF	680	SCHEDULE C - BASE BID
124	P-101	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LF	500	SCHEDULE C - BASE BID
125	P-101	REMOVE CONCRETE PAVEMENT (FULL DEPTH)	SY	2550	SCHEDULE C - BASE BID
126	P-152	UNCLASSIFIED EXCAVATION (EV)	CY	1750	SCHEDULE C - BASE BID
127	P-152	UNCLASSIFIED OVER-EXCAVATION (EV) (IF NEEDED)	CY	100	SCHEDULE C - BASE BID
128	P-152	SUBGRADE PREPARATION	SY	2600	SCHEDULE C - BASE BID
129	P-154	SUBBASE COURSE	CY	875	SCHEDULE C - BASE BID
130	P-209	CRUSHED AGGREGATE BASE COURSE (CV)	CY	800	SCHEDULE C - BASE BID
131	P-501	CEMENT CONCRETE PAVEMENT, 12"	SY	2050	SCHEDULE C - BASE BID
132	P-501	CEMENT CONCRETE PAVEMENT, REINFORCED 12"	SY	515	SCHEDULE C - BASE BID
133	P-604	COMPRESSION JOINT SEALS FOR CONCRETE	LF	3300	SCHEDULE C - BASE BID
134	P-620	TEMPORARY PAVEMENT MARKING	SF	520	SCHEDULE C - BASE BID
135	P-620	PERMANENT PAVEMENT MARKING (INCL. REFLECTIVE BEADS)	SF	500	SCHEDULE C - BASE BID
136	31 34 10	GEOTEXTILE FABRIC, TYPE 7	SY	300	SCHEDULE D - ALTERNATE
137	P-101	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LF	260	SCHEDULE D - ALTERNATE
138	P-101	REMOVE CONCRETE PAVEMENT (FULL DEPTH)	SY	300	SCHEDULE D - ALTERNATE
139	P-152	UNCLASSIFIED EXCAVATION (EV)	CY	220	SCHEDULE D - ALTERNATE
140	P-152	UNCLASSIFIED OVER-EXCAVATION (EV) (IF NEEDED)	CY	20	SCHEDULE D - ALTERNATE
141	P-152	SUBGRADE PREPARATION	SY	300	SCHEDULE D - ALTERNATE
142	P-154	SUBBASE COURSE	CY	110	SCHEDULE D - ALTERNATE
143	P-209	CRUSHED AGGREGATE BASE COURSE (CV)	CY	100	SCHEDULE D - ALTERNATE
144	P-501	CEMENT CONCRETE PAVEMENT, 12"	SY	230	SCHEDULE D - ALTERNATE
145	P-501	CEMENT CONCRETE PAVEMENT, REINFORCED 12"	SY	60	SCHEDULE D - ALTERNATE
146	P-604	COMPRESSION JOINT SEALS FOR CONCRETE	LF	530	SCHEDULE D - ALTERNATE