ADDENDUM
TO THE GENERAL CONDITIONS AND SPECIFICATIONS

EFFECTIVE SEPTEMBER 15, 2023

The General Conditions and Specifications adopted by the Union Pacific Engineering Department on September 15, 2023, are amended by the following modifications, additions, and deletions. Provisions within this Addendum shall supersede those published in the General Conditions and Specifications dated February 21, 2022.

Sections affected are:

01 14 12 WORKING AND FLAGGING NEAR THE TRACKS
01 78 39 PROJECT RECORD DOCUMENTS
02 24 23 SOIL DISTURBANCE PROGRAM
32 17 23 PAINT STRIPING AND MARKINGS
34 11 10 RAILROAD TRACK CONSTRUCTION
34 11 27 SUBBALLAST

Additions are highlighted
Deletions are ~~struck through~~

01 14 12 WORKING AND FLAGGING NEAR THE TRACKS

MODIFIED in section: revised 9-15-2023

PART 1 - EXECUTION ~~- (NOT APPLICABLE TO THIS SPECIFICATION SECTION)~~

1.03 VEHICLE FOR FLAGGER

A. The Contractor shall provide one (1) 4WD pickup truck for flagging purposes per project location. The vehicles shall be suitable for the type of terrain typically encountered to access the project along the Railroad right-of-way and shall meet the following requirements: four-wheel drive, automatic transmission and five years or newer model year. Vehicles will be insured, fueled, and maintained by the Contractor.

01 78 39 PROJECT RECORD DOCUMENTS

REPLACED section with: revised 9-15-2023

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Providing Project Record Documents at completion of the project including:

a. Electronic Closeout Library

b. Operating and Maintenance Manual hard copies

1.02 SUBMITTALS

A. ~~The Contractor shall provide an Electronic Closeout Library to the Engineer prior to final invoice.~~ The Electronic Closeout Library shall contain (if project applicable):

1. All as-built drawings for the project including but not limited to grading, top of rail, utilities, buildings, facilities, bridges, culverts and work associated with road crossings. The drawings shall reflect all modifications made during construction. Each sheet shall be stamped "As-Built," signed and dated. Required documentation includes:

a. As-built CAD format file (base file to be provided by UP)

b. As-built pdf format file: Issued for Construction drawings annotated to show all changes made during construction.

2. All density tests and soil proctor data.

3. All concrete break tests.

4. All welding data.

5. Material certifications.

6. VERSE test reports.

7. Ultrasonic test reports on rail welds.

~~7.~~8. Operating and Maintenance (O&M) Manuals

~~8.~~9. All pile driving and drilled shaft data. Also send this data via email to pilereports@up.com with a copy to UP Project Manager.

~~9.~~10. All reviewed submittals sent to engineer during project duration.

~~10.~~11. Any DWR forms for equipment rental used on the project.

~~11.~~12. Per Section 01 33 00, the Contractor will supply the instructions, operating and maintenance instruction bulletins, complete parts lists and wiring diagrams for all panels.

~~12.~~13. Per Section 01 55 13, supply any agreements made between the Contractor and private landowners.

B. ~~Provide t~~Two (2) hard copy sets of O&M Manual's. ~~sent to the Yard Office, Terminal, or other facility designated by the Engineer, and two (2) electronic set sent to Facility Department at UPRR Headquarters. (No preferred electronic method, via FTP, CD/DVD, or flash drive).~~

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION ~~- (NOT APPLICABLE TO THIS SPECIFICATION SECTION)~~

3.01 DELIVERING DOCUMENTS

A. The Contractor shall provide the Electronic Closeout Library to the Engineer via email or, more likely, UP-compliant file transfer protocol.

B. One (1) O&M Manual hard copy shall be sent of the delivered to the Yard Office, Terminal, or other facility designated by the Engineer, and one (1) O&M Manual hard copy shall be mailed to Union Pacific Railroad c/o Facility Design, 1400 Douglas Street, MS 0910 Omaha, NE 68179-0910.

~~Part 3 –~~ C. The Electronic Closeout Library and O&M Manual hard copies shall be delivered prior to payment of final invoice

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. No separate measurement will be made for project record documents.

4.02 PAYMENT

A. Payment will be incidental the project mobilization with the following provisions:

1. Failure to submit the ~~e~~Electronic C~~e~~loseout L~~l~~ibrary and O&M Manual hard copies will result in **5% hold to the remaining 30% of the mobilization pay item.**

02 24 23 SOIL DISTURBANCE PROGRAM

REPLACED section with: revised 9-15-2023

PART 1 - GENERAL

1.01 SUMMARY

A. The purpose of the Soil Disturbance Program is to limit environmental liabilities and reduce project delays associated with soil disturbed during construction activities. This specification includes requirements for contractor compliance with the UPRR Soil Disturbance Program.

B. The contractor shall comply with this specification for the following scenarios involving soil disturbance:

1. Visual or olfactory indications of contamination are observed during any ground disturbance activity on UP property.

2. Surplus soil is anticipated during project design and in advance of soil disturbance activities. A Soil Management Plan Technical Memorandum has been assembled and provides results of the soil evaluation. The contractor shall perform soil disturbance activities as directed in the Soil Management Plan Technical Memorandum.

3. Surplus soil is not anticipated at the design ~~stage, but~~stage but is realized during project execution and/or completion and cannot be used as fill material within the project extent. A soil evaluation is required to determine if special handling of soil is necessary.

4. Areas on UP properties with documented historical soil contamination where ground disturbing activities will occur.

1.02 EXEMPTION

A. Soil may be reused on-site without restrictions if 1) All disturbed soil is reused as fill material within the designed project extent and 2) no visual or olfactory indications of contamination are observed during ground disturbance. A soil evaluation is not necessary if all conditions are met.

1.03 RELATED REQUIREMENTS

A. Section 01 33 00 Submittal Procedures

B. Section 01 35 29.13 Health, Safety, and Emergency Response Procedures for Contaminated Sites as identified.

C. Section 01 56 16 Dust Control

D. Section 02 61 13 Excavation and Handling of Contaminated Material.

E. Section 02 81 00 Transportation and Disposal of Hazardous Materials

F. Section 31 23 19 Dewatering

1.04 REFERENCED STANDARDS

A. USEPA Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods"

B. 29 CFR 1910 – Occupational Safety and Health Standards

C. 29 CFR 1926 – Safety and Health Regulations for Construction

D. 40 CFR 261 – Identification and Listing of Hazardous Waste

1.05 DEFINITIONS

A. Ground disturbance - Any work or activity that results in a disturbance of the earth, including excavating, digging, trenching, plowing, drilling, tunneling, augering, backfilling, and grading. This includes any mechanical excavation (back hoes, digging, drilling, grading) that results in penetration of the ground or manual ground penetration (hand shoveling, hand augering).

B. Hazardous soil – Soil identified as hazardous as defined in Title 40 of the Code of Federal Regulations, Chapter 261 (40 CFR 261), whether by listing or characteristic. Management of hazardous soil requires special handling.

C. Non-hazardous soil – Soil which does not meet the definition of hazardous as presented in 40 CFR 261 and is not ~~Non-RCRA~~non-RCRA hazardous soil. Non-hazardous soil may contain contaminants which present a risk to human health or the environment, may be characterized as contaminated or "Special Waste" or other definition by State regulation, and may require special handling.

D. Unrestricted use soil – Soil which does not exhibit contaminant concentrations in excess of the most conservative regulatory screening level, for the state in which the work is being performed. Unrestricted soil can be reused on UP property without restriction or can be exported off-site as clean fill to a soil wasting facility.

E. Restricted use soil – Soil which exhibits contaminant concentrations in excess of the most conservative regulatory screening ~~levels ,~~levels, for the state in which the work is being performed; note that in some states this is defined as 'Special Wastes'. Restricted use soil cannot be exported off-site as clean fill to a soil wasting facility. The soil may require disposal at a UP-approved landfill or may be available for preferential reuse at the project site.

F. Preferential Reuse – Practice of using soils which exhibit low levels of contamination as fill material within the project extent. The concentration of contaminants must be less than the state-specific screening levels for both the industrial/commercial and construction worker exposure scenarios. Reuse within the project extent is generally preferred over disposal at a landfill.

G. Export soil – Surplus soil that is not available for use within the project extent and requires removal from UP property.

H. Soil evaluation – An assessment performed by an environmental professional and comprised of soil sample collection, analysis of soil samples by an analytical testing laboratory, and data evaluation to determine the risk associated with soil contaminants, if present. Results of a soil evaluation are summarized in a Soil Management Plan Technical Memorandum.

I. Waste Management Program – UP program for management of waste materials, including soil. The program stipulates requirements associated with preliminary planning, disposal facility approval, and waste manifest and bill of lading submittal. Information regarding the UP Waste Management Program is available by emailing UPRR-WM@ghd.com.

1.06 SUBMITTALS

A. Submit as specified in Section 01 33 00 Submittal Procedures.

B. Submittals required by this Section include, but are not limited by, the following:

1. Waste Request Form for off-site disposal of contaminated soil

2. Disposal facility name and location

3. Waste manifests and bills of lading for off-site disposal of contaminated soil shall be conveyed by the Contractor to UP via the UP Waste Management Program (UPRR-WM@ghd.com)

4. Import soil facility name and location and associated laboratory analytical reports. See Appendix A – UP Soil Import Specification for State-specific laboratory analyses to be performed on all import soil.

1.07 QUALITY ASSURANCE

A. Contractor shall dispose of contaminated soil at a disposal facility or landfill which has not incurred fines, citations, or other indications of regulatory non-compliance. Contractor shall submit to the designated UP project representative prior to commencement of work the proposed disposal facility for approval.

B. Contractor shall import soil for fill material on UP property from a construction material facility which has not incurred fines, citations, or other indications of regulatory non-compliance. Contractor shall submit to the designated UP representative prior to commencement of work the proposed construction material facility for approval.

1.08 SEQUENCING AND SCHEDULING

A. Performance of a soil evaluation and assembly of a Soil Management Plan Technical Memorandum requires a minimum of 45 business days to complete. The UP Site Remediation 7007 Soil Disturbance Program Manager shall be contacted to initiate a soil evaluation, if needed.

B. Laboratory analytical reports associated with import soil qualifications require a minimum of ten (10) business days for review and approval. UP is not responsible for delays caused by an untimely request by the contractor for review of import soil analytical reports.

C. Submittal of a Waste Request Form is required as an initial activity of the UP Waste Management Program for all soils sent to a landfill or disposal facility. A minimum of five (5) days is required for review and approval of a submitted Waste Request Form.

PART 2 - PRODUCTS

2.01 SOIL MANAGEMENT PLAN TECHNICAL MEMORANDUM

A. A Soil Management Plan Technical Memorandum may be available for projects where export soil was anticipated during project design; contact 7007 Soil Disturbance Program Manager to determine if the information is available. The designated UP project representative will provide the Soil Management Plan Technical Memorandum to the contractor, if available.

B. The Soil Management Plan Technical Memorandum presents results of the soil evaluation, including but not limited to, reported contaminants, estimated volumes and locations of Unrestricted and restricted use soil, handling requirements and disposal alternatives for contaminated soil, requirements for transportation of contaminated soil, and compliance requirements for UP’s Waste Management Program.

2.02 IMPORT SOIL

A. The Contractor is responsible for providing imported soil, if needed, that is clean and free of contaminants. Prior to use, the imported soil shall be tested at the source by the Contractor.

B. Soil samples shall be collected in accordance with USEPA Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a NELAC-certified laboratory approved to perform analytical testing in the project state.

State-specific sampling requirements shall be met for all soil imported and placed on UP property. Contactor is responsible for meeting state-specific requirements with the appropriate submittal if soil will be imported to UP property. State-specific sampling requirements for import soil are provided in the UP Soil Import Specification, available in Appendix A, and from the UP Site Remediation Group 7007 Soil Disturbance Program Manager.

C. A minimum of one representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil.

D. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency of a minimum of one representative soil sample collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil.

E. Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample are below the state-specific regulatory screening values.

F. Laboratory analytical reports for import soil qualifications shall be provided to designated UP project representative as a submittal to verify the soil is free from contamination. A minimum of ten (10) business days is required for review and approval.

PART 3 - EXECUTION

3.01 INSPECTION

A. The contractor shall inspect the project extent for visual and olfactory indications of contamination prior to commencement of soil disturbance activities.

B. The contractor shall identify within the project extent those areas with restricted soil use, as presented in the Soil Management Plan Technical Memorandum.

3.02 VISUAL OR OLFACTORY INDICATIONS OF SOIL CONTAMINATION

A. The contractor shall stop work and immediately notify the designated UP project representative if visual or olfactory indications of soil contamination are observed during inspection or ground disturbance activities.

B. Soil which exhibits visual or olfactory indications of contamination shall be segregated in a soil staging area identified by the designated UP project representative and placed on polyethylene sheeting. Contaminated soil shall be stockpiled and managed according to Section 02 61 13 - Excavation and Handling of Contaminated materials.

C. The 7007 Soil Disturbance Program Manager shall be contacted for evaluation of potentially contaminated soil stockpiles. An environmental consulting firm will be assigned by the UP Site Remediation Group to evaluate potentially contaminated soil stockpiles in accordance with the UP Soil Disturbance Program. A soil evaluation will be ~~performed~~performed, and a Soil Management Plan Technical Memorandum will be assembled for handling of the soil stockpile.

3.03 SOIL DISTURBANCE FOR PROJECTS WHERE SURPLUS SOIL IS ANTICIPATED PRIOR TO COMMENCEMENT OF WORK

A. A soil evaluation is required prior to commencement of ground disturbance activities as defined where soil export is anticipated.

B. Results of the soil evaluation are presented in a Soil Management Plan Technical Memorandum.

C. The contractor shall perform soil disturbance activities as directed in the Soil Management Plan Technical Memorandum. Adherence to the Soil Management Plan Technical Memorandum is presented in Section 3.05.

D. Costs associated with transportation and disposal of contaminated soil, if present, shall be performed according to Section 02 81 00 – Transportation and Disposal of Hazardous Materials, under a separate PO from UP Site Remediation by contacting the 7007 Soil Disturbance Program Manager.

E. Unanticipated soil disturbance projects may preclude completion of a soil evaluation in advance of work. Soil shall be managed in accordance with Section 3.04.

3.04 SOIL DISTURBANCE FOR PROJECTS WHERE SURPLUS SOIL IS REALIZED DURING PROJECT EXECUTION AND/OR COMPLETION

A. The contractor shall inform the UP designated project representative if unanticipated surplus soil is expected upon completion of ground disturbance ~~activities, and~~activities and cannot be accommodated within the project design. The estimated volume of surplus soil shall be communicated to the designated UP project representative by the contractor.

B. Surplus soil shall be temporarily stockpiled at a location which minimizes disturbance to UP operations. The maximum stockpile size shall be 750 cubic yards for a single stockpile. Multiple stockpiles are required if the surplus soil exceeds 750 cubic yards.

C. The designated UP project representative shall contact UPRR Site Remediation's 7007 Soil Disturbance Program Manager to request a soil evaluation.

D. An environmental consulting firm will be assigned by UP Site Remediation to evaluate surplus soil stockpiles in accordance with the UP Soil Management Program. A soil evaluation will be performed and a Soil Management Plan Technical Memorandum will be assembled for handling of the soil stockpile.

E. Costs associated with transportation and disposal of contaminated soil, if present, shall be performed according to Section 02 81 00 – Transportation and Disposal of Hazardous Materials, under a separate PO from UP Site Remediation by contacting the 7007 Soil Disturbance Program ~~Manager .~~Manager.

3.05 ADHERENCE TO THE SOIL MANAGEMENT PLAN TECHNICAL MEMORANDUM

A. The Soil Management Plan Technical Memorandum shall present the findings of the soil evaluation and requirements for proper handling of disturbed soil.

B. Soil handling recommendations shall be strictly followed to prevent improper placement or use of contaminated soils.

C. The Soil Management Plan Technical Memorandum is certified for a period of one year from the date of the document. The Contractor shall contact their UP point of contact if the proposed soil disturbance activities will not be conducted in advance of the certification date. Contact Site Remediation's 7007 Soil Disturbance Program Manager to initiate recertification of the Soil Management Plan Technical Memorandum.

END OF SECTION

APPENDIX A – UP SOIL IMPORT SPECIFICATIONS

<u>NOTE:</u> Import soil qualifications may not be all inclusive and/or most current; Contractor shall validate at the time of work commencement the most current guidelines applicable to work location.

- **Import Soil Qualifications – Arizona**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with US Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-accredited laboratory approved to perform analytical testing in Arizona.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270
- Total Extractable Hydrocarbons by Iowa Method OA-2
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082

- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010
- pH/Corrosivity by EPA Method 9040

~~Part 3 –~~ • Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- The Arizona Department of Environmental Quality (ADEQ) Residential Soil Remediation Levels (SRLs) as published in Arizona Administrative Code Title 18, Chapter 7, Article 2, Appendix A, can be found at the following web page:

  https://apps.azsos.gov/public_services/Title_18/18-07.pdf

  - In the event that metal constituents exceed SRLs, the maximum value of the county-specific USGS dataset for ~~naturally-occurring~~naturally occurring elements will be used for comparison. These values can be obtained at the following website:

    http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the Arizona SRL criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated lab report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Arkansas**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with United States Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Arkansas.

One representative sample of the imported soil shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270
- Total Petroleum Hydrocarbons (TPH) by Texas Method TX1005
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010

- pH/Corrosivity by EPA Method 9040

~~Part 4~~ • Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- United States EPA Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites assuming Residential Land Use (http://www.epa.gov/risk/regional-screening-table) as the Arkansas Department of Environmental Quality (ADEQ) does not have state-specific criteria (https://www.adeq.state.ar.us/hazwaste/technical/risk/).

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the EPA criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated lab report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – California**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with United States Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a NELAP-Accredited laboratory approved to perform analytical testing in California.

Sampling of the imported soil shall be collected based on the stockpile volume, as follows:

VOLUME OF IMPORT SOIL	**SAMPLES PER VOLUME**
Up to 1,000 cubic yards	1 sample per 250 yards
1,001 to 5,000 cubic yards	4 samples for the first 1,000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 cubic yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) and a general description of the soil type sampled in accordance with the Unified Soil Classification System (USCS), shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination as per the recommendations from the Department of Toxic Substances Control's "Information Advisory – Clean Imported Fill Material" ~~(https://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf).~~ https://dtsc.ca.gov/information-advisory-clean-imported-fill-material-fact-sheet/

- Volatile Organic Compounds (VOCs) by 8260, combined with collection by EPA Method 5035

- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270

- Polycyclic Aromatic Hydrocarbons (PAHs) by EPA method 8310
- Total Petroleum Hydrocarbons (TPH) by modified EPA method 8015
- California Assessment Manual 17 metals (CAM 17 Metals) by EPA methods 6010 and 7471
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organophosphorus Pesticides by EPA Method 8141
- Organochlorine Pesticides by EPA Method 8081
- Chlorinated Herbicides by EPA Method 8151
- Cyanide by EPA Method 9010
- pH/Corrosivity by EPA Method 9040

~~Part 5 –~~ • Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the most conservative (lowest threshold) value when compared to the following two criteria:

1) DTSC-SL screening levels as outlined in the following link:
~~1)~~ https://dtsc.ca.gov/wp-content/uploads/sites/31/2019/04/HHRA-Note-3-2019-04.pdf ~~EPA Region 9 Regional Screening Levels: (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables)~~

   - For soil placed within 10 feet of groundwater table at the project site, use the screening level for "Resident Soil to Groundwater" with TR=1E-06 and THQ=0.1.
   - For soil placed greater than 10 feet from groundwater table at the project site, use the screening level for "Resident Soil" with TR=1E-06 and THQ=0.1.

2) San Francisco Bay Regional Water Quality Control Board (SFRWQCB) Environmental Screening Levels (ESL) Summary Tables (July 2019, Rev 2 or most recent): https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/esl.html, then
~~2)~~ request ESL Summary Tables ~~San Francisco Bay Regional Water Quality Control Board (SFRWQCB) Environmental Screening Levels (ESL) Summary Tables (Feb. 2016, Rev 3 or most recent):~~

~~(https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/esl.html, then "Summary of Soil ESLs" link)~~

- For soil placed at a depth less than 3 meters below ground surface (bgs) at the project site use the "Summary of Soil ESLs (mg/kg)" table and refer to values presented under the heading "Direct Exposure Human Health Risk Levels" and sub-heading "Res: Shallow Soil Exposure".
- For soil placed at a depth greater than 3 meters bgs at the project site use the "Summary of Soil ESLs (mg/kg)" table and refer to values presented under the heading "Direct Exposure Human Health Risk Levels" and sub-heading "Any Land Use/Any Depth Soil Exposure: Construction Worker".

In cases where an analyte is not listed in the applicable RSL table, the value from the applicable ESL table will be used; in cases where an analyte is not listed in the applicable ESL table, the value from the applicable RSL table will be used.

Analyte concentrations must be evaluated on a case-by-case basis where:

1) An analyte is not listed in either agency's screening ~~criteria~~criteria.
2) Concentrations of metals exceed screening criteria (regional background levels may be higher than screening levels)

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the criteria outlined above. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated laboratory report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Colorado**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with US Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Colorado.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270
- Total Extractable Hydrocarbons by Iowa Method OA-2
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010

- pH/Corrosivity by EPA Method 9040

~~Part 3~~ • Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- The most conservative Environmental Protection Agency (EPA) Regional Screening Levels (RSLs), as presented in https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables~~https://semspub.epa.gov/work/HQ/197414.pdf~~.

    - In the event that metal constituents exceed RSLs, the maximum value of the county-specific USGS dataset for ~~naturally-occurring~~naturally occurring elements will be used for comparison. These values can be obtained at the following website:

      http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm

    - For arsenic specific guidance in Colorado, use the following link and click on the link for "Arsenic concentrations in soil, risk management guidance for evaluating" at the bottom of the page:

      https://cdphe.colorado.gov/air-water-soil-remedial-objectives

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the EPA RSL criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated lab report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Idaho**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with US Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-accredited laboratory approved to perform analytical testing in Idaho.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260;
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270 SIM;
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6020/7471;
- ~~Part 2~~ Organophosphorus Compounds by EPA Method 8141;
- Chlorinated Herbicides by EPA Method 8151;
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082;
- Organochlorine Pesticides by EPA Method 8081;
- pH/Corrosivity by EPA Method 9045; and,
- Total and Amenable Cyanide by EPA Method 9012.

- Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- The most conservative Environmental Protection Agency (EPA) Regional Screening Levels (RSLs), as presented at the following website:

  https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables ~~https://semspub.epa.gov/work/HQ/197414.pdf~~

  - In the event that metal constituents exceed RSLs, the maximum value of the county-specific USGS dataset for ~~naturally-occurring~~naturally occurring elements will be used for comparison. These values can be obtained at the following website:

    http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm

  - In the event that petroleum-related constituents exceed RSLs, the most conservative screening levels listed in Table 2 of the 2018 Risk Evaluation Manual for Petroleum Releases shall be used for comparison. The 2018 Risk Evaluation Manual for Petroleum Releases can be found at the following website:

    https://www2.deq.idaho.gov/admin/LEIA/api/document/download/10602~~http://www.deq.idaho.gov/risk-evaluation-manual~~

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the IDEQ criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated laboratory report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Illinois**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with US Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Illinois.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Polynuclear Aromatic Hydrocarbons (PAHs) by EPA Method 8270
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010
- pH/Corrosivity by EPA Method 9040

- Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- ~~The~~ The maximum allowable concentrations in soil are presented in Illinois EPA Maximum Allowable Concentrations of Chemical Constituents in Uncontaminated Soil Used as Fill Material at Regulated Fill Operations, as defined in 35 Illinois Administrative Code (IAC) 1100 Subpart F (MACs). A summary table of the MACs can be found at the following website: ~~The most conservative soil remediation objectives (SROs) presented in Illinois EPA Tiered Approach to Corrective Action Objectives (TACO), Appendix B, Table A, *Tier 1 Soil Remediation Objectives for Residential Properties,* located in 35 IAC 742.~~
- ~~The most conservative TACO SRO values are presented in Illinois EPA *Maximum Allowable Concentrations (MACs) of Chemical Constituents in Uncontaminated Soil Used as Fill Material at Regulated Fill Operations*, as defined in 35 IAC 1100 Subpart F. A summary table of the MACs can be found at the following website:~~

  http://www.epa.state.il.us/land/ccdd/new-max-allowable-concentrations-table.pdf

  - In the event that metal constituents exceed SROs or MACs, the maximum value of the county-specific USGS dataset for ~~naturally-occurring~~naturally occurring elements will be used for comparison. These values can be obtained at the following website:

    http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the Illinois EPA criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated laboratory report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Iowa**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with US Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Iowa.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270
- Total Extractable Hydrocarbons by Iowa Method OA-2
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010

- pH/Corrosivity by EPA Method 9040

~~Part 3~~ • Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- Iowa Department of Natural Resources (IDNR) Statewide Standards for Soil, as defined by 567 IAC 137.55. A summary table of the Statewide Standards for Soil can be found at the following website:

  https://programs.iowadnr.gov/riskcalc/Home/statewidestandards.

  - In the event that metal constituents exceed Statewide Standards for Soil, the maximum value of the county-specific USGS dataset for ~~naturally-occurring~~naturally occurring elements will be used for comparison. These values can be obtained at the following website:

  http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the IDNR criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated laboratory report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Kansas**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with US Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Kansas.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270
- Total Extractable Hydrocarbons (Kansas LRH, MRH and HRH) by EPA 8015~~by Iowa Method OA-2~~
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010

- pH/Corrosivity by EPA Method 9040

~~Part 4~~ • Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- The most conservative Kansas Department of Health and Environment (KDHE) Risk-Based Standards for Kansas (RSKs) for the Residential scenario soil pathway. A summary table of KDHE RSKs can be found in Appendix A at the following website:

  https://www.kdhe.ks.gov/DocumentCenter/View/15467/Risk-based-Standards-for-Kansas-6th-Version?bidId=~~http://www.kdheks.gov/remedial/download/RSK_Manual_15.pdf~~

  - In the event that metal constituents exceed RSKs, the maximum value of the county-specific USGS dataset for ~~naturally-occurring~~naturally occurring elements will be used for comparison. These values can be obtained at the following website:

    http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the KDHE RSKs. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated laboratory report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Louisiana**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with United States Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Louisiana.

One representative sample of the imported soil shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270
- Total Petroleum Hydrocarbons (TPH) by Texas Method TX1005
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010

- pH/Corrosivity by EPA Method 9040

~~Part 5~~ • Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- Louisiana Department of Environmental Quality (LDEQ) Risk Evaluation/Corrective Action Program (RECAP) Non-Industrial Screening Standards (SSni), assuming residential (non-industrial) areas (https://deq.louisiana.gov/assets/docs/Land/RECAP/Table1.pdf).

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the LDEQ criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated lab report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Minnesota**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with: US Environmental Protection Agency (EPA) Publication No. SW-846, *"Test Evaluating Solid Wastes, Physical/Chemical Methods";* Minnesota Pollution Control Agency (MPCA) *"Soil Sample Collection and Analysis Procedure, Guidance Document c-prp4-04" (updated July 2018);* ~~and,~~and MPCA "Guidelines for *Risk-Based Guidance for the Soil – Human Health Pathway, Volume 2".* MPCA-required soil analysis shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-certified laboratory approved to perform analytical testing in Minnesota.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Polyaromatic Hydrocarbons (PAHs) by EPA method 8270
- Wisconsin DNR Modified Gasoline Range Organics (GRO) Method
- Wisconsin DNR Modified Diesel Range Organics (DRO) Method
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Pesticides MDA List 1 EPA Method 8270
- Herbicides MDA List 2 EPA Method 8321

- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010
- pH/Corrosivity by EPA Method 9040
- Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- The most conservative regulatory threshold values presented by MPCA and Minnesota Department of Agriculture (MDA). The following regulatory references are provided:

1. The MPCA most conservative Residential Soil Reference Values (SRVs), as presented in the *"Risk-Based Guidance for the Soil-Human Pathway, Volume 2"* & *"Tier 1 SRV Spreadsheet"* documents at the following web site:

   http://www.pca.state.mn.us/index.php/waste/waste-and-cleanup/cleanup/superfund/risk-based-site-evaluation-process-guidance-documents.html

   https://www.pca.state.mn.us/sites/default/files/c-r1-05.pdf

   - In the event that metal constituents exceed SRVs, the maximum value of the county-specific USGS dataset for ~~naturally-occurring~~naturally occurring elements will be used for comparison. These values can be obtained at the following website:

   http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm

2. A DRO concentration of less than 100 milligrams per kilogram (mg/kg), and a GRO concentration of less than 100 mg/kg.

3. The MDA Preliminary Soil Cleanup Goals for High Groundwater Risk, as presented in Table 1 of Guidance Document 19 at the following web site:

   https://www.mda.state.mn.us/pesticide-fertilizer/guidance-document-19-soil-cleanup-

goals

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the MPCA and MDA criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated laboratory report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Missouri**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with US Environmental Protection Agency (EPA) Publication No. SW-846, *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods;* Missouri Department of Natural Resources (MDNR) *Missouri Risk-Based Corrective Action Technical Guidance*; and MDNR *Guidelines for Soil and Groundwater Sampling – Brownfields/Voluntary Cleanup Program* (PUB2432). Soil samples shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Missouri.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Total Petroleum Hydrocarbons as Diesel and Oil Range Organics (TPH-DRO/ORO) by EPA Method 8270
- Polynuclear Aromatic Hydrocarbons by EPA Method 8270
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082

- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010
- pH/Corrosivity by EPA Method 9045

~~Part 3 –~~ • Nitrate as Nitrogen by EPA Method 353.2

~~Part 4 –~~ • Ammonia as Nitrogen by EPA Method 350.1

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- The lowest~~most conservative~~ MDNR Default Target Levels (DTLs), as published in the *Missouri Risk-Based Corrective Action Technical Guidance, Appendix B* – Table B-1. Table B-1 which outlines the lowest default target levels for all soil types and all risk pathways can be found in the technical guidance at the following website:~~. A summary table of DTLs can be found in the technical guidance at the following website:~~

https://dnr.mo.gov/document-search/missouri-risk-based-corrective-action-mrbca-technical-guidance-appendix-b-default-target-levels-tier-1-risk-based-target-levels~~http://dnr.mo.gov/env/hwp/mrbca/docs/appb-6-06.pdf~~

  - In the event that metal constituents exceed DTLs, the maximum value of the county-specific USGS dataset for ~~naturally occurring~~naturally occurring elements will be used for comparison. These values can be obtained at the following website:

    http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the MDNR or USGS criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated laboratory report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Nebraska**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with US Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Nebraska.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270
- Total Extractable Hydrocarbons by Iowa Method OA-2
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010

- pH/Corrosivity by EPA Method 9040

~~Part 5~~ • Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- The most conservative Nebraska Department of Environment and Energy (NDEE)~~Environmental Quality (NDEQ)~~ Voluntary Cleanup Program (VCP) Remediation Goals, as presented in Table A-1, *Groundwater and Soil Remediation Goals,* in Attachment 2-6 ~~A~~ of the VCP Guidance Document. The VCP Guidance document can be found at the following website:

  http://deq.ne.gov/publica.nsf/PubsForm.xsp?documentId=D243C2B56E34EA8486256F2700698997&action=openDocument

  - In the event that metal constituents exceed Soil Remediation Goals, the maximum value of the county-specific USGS dataset for ~~naturally-occurring~~naturally occurring elements will be used for comparison. These values can be obtained at the following website:

  http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm

Analytical data shall be compared to the above remediation goals to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the NDEQ criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated laboratory report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Nevada**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with US Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Nevada.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270
- Total Petroleum Hydrocarbons as Diesel and Oil Range Organics (TPH-DRO/ORO) by EPA Method 8015
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010

- pH/Corrosivity by EPA Method 9040

- Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- The most conservative Basic Comparison Levels (BCLs) for soil, as defined in the Nevada Division of Environmental Protection (NDEP) Basic Comparison Levels table. The table can be found at the following website:

https://ndep.nv.gov/resources/risk-assessment-and-toxicology-basic-comparison-levels

  - In the event that metal constituents exceed BCLs, the maximum value of the county-specific USGS dataset for ~~naturally-occurring~~naturally occurring elements will be used for comparison. These values can be obtained at the following website:

http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the NDEP criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated laboratory report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – New Mexico**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with United States Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in New Mexico.

One representative sample of the imported soil shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270
- Total Petroleum Hydrocarbons (TPH) by Texas Method TX1005
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010

- pH/Corrosivity by EPA Method 9040

~~Part 6 –~~ • Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- New Mexico Environment Department (NMED) Risk Assessment Guidance for Site Investigations and Remediation (November 2021~~July 2015~~) Residential Soil Screening Levels ~~Appendix A,~~ Table A-1, presented at the following website:

https://www.env.nm.gov/hazardous-waste/guidance-documents/

https://www.env.nm.gov/hazardous-waste/wp-content/uploads/sites/10/2021/12/NMED_SSG-VOL_I_Dec_2_2021.pdf~~https://www.env.nm.gov/wp-content/uploads/2016/11/NMED_SSG_VOL_I_March_2017_revised.pdf~~

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the NMED criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated lab report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Oklahoma**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with United States Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Oklahoma.

One representative sample of the imported soil shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270
- Total Petroleum Hydrocarbons (TPH) by Texas Method TX1005
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010

- pH/Corrosivity by EPA Method 9040

~~Part 7~~ • Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- United States EPA Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites assuming Residential Land Use and the Protection of Ground Water.~~(http://www.epa.gov/risk/regional-screening-table)~~ as the Oklahoma Department of Environmental Quality (ODEQ) does not have state-specific criteria http://www.epa.gov/risk/regional-screening-table~~(http://www.deq.state.ok.us/factsheets/LPD/RiskBasedSiteCleanup_04-2018.pdf).~~
- ODEQ does allow evaluation using a 10^{-5} cancer risk level for establishing RSLs. https://www.deq.ok.gov/wp-content/uploads/2021/02/RiskBasedSiteCleanup_03-2021.pdf
- ODEQ Total Petroleum Hydrocarbons (TPH) Tier 1 Residential Generic Cleanup Levels https://www.deq.ok.gov/wp-content/uploads/deqmainresources/RiskBasedLevelsTPH_02-2020.pdf~~(http://www.deq.state.ok.us/factsheets/LPD/RiskBasedLevelsTPH_04-2018.pdf).~~

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the EPA/ODEQ criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated lab report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Oregon**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with US Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Oregon.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Polynuclear Aromatic Hydrocarbons (PAHs) by EPA Method 8270
- Volatile Total Petroleum Hydrocarbons (TPH) by Method NWTPH-Gx
- Semi-volatile TPH by Method NWTPH-Dx
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organochlorine Pesticides by EPA Method 8081

- Cyanide by EPA Method 9010
- pH/Corrosivity by EPA Method 9040
- Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- The Clean Fill Screening Levels, as defined in the Oregon Department of Environmental Quality's (DEQ) Clean Fill Determinations guidance document.. Screening levels for metals are determined based on the background concentrations for the physiographic province in which the fill material originated. Clean fill generated in one physiographic province may not qualify as clean fill in another province with lower background metals concentrations. The fill material must be below the screening levels for the physiographic province in which it is to be deposited.. The tables can be found at the following website:

  https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf

- For background metal concentration levels in soil, as defined in the Oregon Department of Environmental Quality's (DEQ) Development of Oregon Background Metals Concentrations in Soil:

Part 3 – https://www.oregon.gov/deq/FilterDocs/DebORbackgroundMetal.pdf ~~The Clean Fill Screening Level, as defined in the Oregon Department of Environmental Quality (DEQ) Clean Fill Table for Uplands. The table can be found at the following website:~~

~~https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf~~

- ~~In the event that metal constituents exceed Clean Fill Screening Levels, the maximum value of the county-specific USGS dataset for naturally-occurring elements will be used for comparison. These values can be obtained at the following website:~~

~~http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm~~

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the Oregon DEQ criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated laboratory report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Texas**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with United States Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Texas.

One representative sample of the imported soil shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270
- Total Petroleum Hydrocarbons (TPH) by Texas Method TX1005
- Texas 11 Metals by EPA Method 6010/7471
- ~~Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471~~
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organochlorine Pesticides by EPA Method 8081

- Cyanide by EPA Method 9010
- pH/Corrosivity by EPA Method 9040

~~Part 4 –~~ • Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- Texas Commission on Environmental Quality (TCEQ) Texas Risk Reduction Program (TRRP) Tier 1 Residential Protective Concentration Levels (PCLs) assuming 0.5-acre source area. Applicable PCLs should be based on the lower concentration between the TRRP Tier 1 Residential total soil combined ($^{Tot}Soil_{Comb}$) PCL and the soil to groundwater ingestion ($^{GW}Soil_{Ing}$) PCL (https://www.tceq.texas.gov/remediation/trrp/trrppcls.html) for each constituent~~; and~~
- TCEQ Texas-Specific Soil Background Concentrations (TSBCs) (if TSBCs are greater than the applicable Residential PCLs, then the TSBC concentrations shall be used).

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the TCEQ criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated lab report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Utah**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with US Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Utah.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270
- • Total Petroleum Hydrocarbons Gasoline Range Organics C6-C10 by EPA Method 8015 or 8260
- • Total Petroleum Hydrocarbons Diesel Range Organics C10-C-28 by EPA Method 8015

- ~~•~~ Total Recoverable Petroleum Hydrocarbons by EPA Method 1664 ~~Total Extractable Hydrocarbons by Iowa Method OA-2~~

- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471

- Organophosphorus Compounds by EPA Method 8141

- Chlorinated Herbicides by EPA Method 8151

- Polychlorinated Biphenyls (PCBs) by EPA Method 8082

- Organochlorine Pesticides by EPA Method 8081

- Total and Amenable Cyanide by EPA Method 9010

- pH/Corrosivity by EPA Method 9040

~~Part 5~~ ~~•~~ Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- The most conservative Environmental Protection Agency (EPA) Regional Screening Levels (RSLs), as presented at the following website:

https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables
~~https://semspub.epa.gov/work/HQ/197414.pdf~~

  - In the event that metal constituents exceed RSLs, the maximum value of the county-specific USGS dataset for ~~naturally-occurring~~naturally occurring elements will be used for comparison. These values can be obtained at the following website:

    http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential (COCs) above the EPA RSLs criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated lab report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Washington**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with US Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Washington.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260;
- Polynuclear Aromatic Hydrocarbons (PAHs) by EPA Method 8270 SIM;
- Volatile TPH by Method NWTPH-Gx;
- Semivolatile TPH by Method NWTPH-Dx with silica gel cleanup;
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6020/7471;
- Organophosphorus Pesticides by EPA Method 8141;
- Chlorinated Herbicides by EPA Method 8151;
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082;
- Organochlorine Pesticides by EPA Method 8081;

- pH/Corrosivity by EPA Method 9045~~; and,~~

- Cyanide by EPA Method 9012~~.~~

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- The most conservative values of the Cleanup Levels and Risk Calculation (CLARC) table as described by the Washington State Department of Ecology's (Ecology) Model Toxics Control Act (MTCA) WAC 173-340, Part VII. A summary of the CLARC table can also be found at the following website:

  https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx

  - In the event that metal constituents exceed MTCA Method A Cleanup Levels, the maximum value of the county-specific USGS dataset for ~~naturally-occurring~~naturally occurring elements will be used for comparison. These values can be obtained at the following website:

  http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the Ecology criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated laboratory report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Wisconsin**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with US Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Wisconsin.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-volatile Organic Compounds (SVOCs) by EPA Method 8270C
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010
- pH/Corrosivity by EPA Method 9040

- Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- The most conservative WDNR Non-Industrial Direct Contact – Residual Contaminant Levels (DC-RCL), as defined in NR720. A calculation table can be found at the following website:

  http://dnr.wi.gov/topic/Brownfields/Professionals.html

  - In the event that metal constituents exceed DC-RCLs, the maximum value of the county-specific USGS dataset for ~~naturally-occurring~~naturally occurring elements will be used for comparison. These values can be obtained at the following website:

  http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential chemicals of concern (COCs) above the WDNR criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated laboratory report must be sent to UPRR for review and approval.

- **Import Soil Qualifications – Wyoming**

If import soil is needed, analytical testing shall be performed to ensure that the import soil is free from contamination. Costs associated with analytical testing of import soil are the responsibility of the Contractor.

Soil samples shall be collected in accordance with US Environmental Protection Agency (EPA) Publication No. SW-846, "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," and shall be analyzed by a National Environmental Laboratory Accreditation Program (NELAP)-Accredited laboratory approved to perform analytical testing in Wyoming.

One representative soil sample shall be collected for every 5,000 cubic yards (in place), or fraction thereof, of import soil. If import soil will be derived from more than one source or location, import soil qualifications must be attained from each source in accordance with the sampling frequency mentioned in this section. Approximate geographic coordinates (latitude/longitude) of the import soil sample location(s) shall be provided to Union Pacific Railroad (UPRR) in addition to the analytical data detailed below.

The following laboratory analyses shall be performed to document that imported soil is free from contamination:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270
- Total Extractable Hydrocarbons by Iowa Method OA-2
- Resource Conservation and Recovery Act (RCRA) Metals by EPA Method 6010/7471
- Organophosphorus Pesticides by EPA Method 8141
- Chlorinated Herbicides by EPA Method 8151
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Organochlorine Pesticides by EPA Method 8081
- Cyanide by EPA Method 9010

- pH/Corrosivity by EPA Method 9040

~~Part 6 –~~ • Nitrate as Nitrogen by EPA Method 4500

Imported soils shall be deemed acceptable for use if concentrations of all analytes from the representative soil sample(s) are below the following criteria:

- Wyoming Department of Environmental Quality (WDEQ) Voluntary Remediation Program (VRP) Soil and Groundwater Cleanup Levels Table as defined in the VRP Fact Sheet 12, *Soil Cleanup Levels*. A summary of the requirements from the VRP program can be found at the web links below:
  https://deq.wyoming.gov/shwd/voluntary-remediation-program/

  o VRP Fact Sheet 12B, Technical Memo #2, Background Metals has listed statewide background values for Arsenic, Lead, and Selenium.

~~http://deq.wyoming.gov/shwd/voluntary-remediation-program/resources/fact-sheets/~~

~~http://deq.wyoming.gov/media/attachments/Solid%20%26%20Hazardous%20Waste/Voluntary%20Remediation%20Program/Fact%20Sheets/FS_12_10.30.2018.pdf~~

  - In the event that metal constituents exceed Cleanup Levels, the maximum value of the county-specific USGS dataset for ~~naturally-occurring~~naturally occurring elements will be used for comparison. These values can be obtained at the following website:

    http://mrdata.usgs.gov/geochem/doc/averages/countydata.htm

- If a chemical of concern (COC) is not listed on the VRP Soil and Groundwater Cleanup Table, ~~then~~ the analyte must be below the most conservative Environmental Protection Agency (EPA) Regional Screening Levels (RSLs), as presented in https://semspub.epa.gov/work/HQ/200047.pdf~~https://semspub.epa.gov/work/HQ/197414.pdf~~

Analytical data shall be compared to the above standards to preliminarily evaluate if the import soil contains any potential (COCs) above the VRP or EPA RSLs criteria. Laboratory analytical reports shall be provided to UPRR for all imported soil to verify the soil is free from contamination. To qualify a given volume of soil for use as import soil, a copy of the associated lab report must be sent to UPRR for review and approval.

32 17 23 PAINT STRIPING AND MARKINGS

REPLACED section with: revised 9-15-2023

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Installing traffic and parking lot markings, including lines, letters, numbers, and symbols, on pavements using paint or preformed thermoplastic materials.
2. Removal of existing markings.

1.02 REFERENCED STANDARDS

A. American Association of State Highway and Transportation Officials (AASHTO)

B. Manual on Uniform Traffic Control Devices (MUTCD)

C. Federal Aviation Administration (FAA)

D. Federal Highway Administration (FWHA)

1.03 SUBMITTALS

A. Action Submittals:

1. Product Data: For each type of product indicated.

1.04 QUALITY ASSURANCE

A. The Contractor shall furnish manufacturer's certifications for each marking material to be supplied and to be used on the project. Certificates shall indicate compliance with the provisions of these Specifications.

B. The Contractor shall use a crew experienced in installing the type of pavement marking material designed and shall supply all the equipment necessary for pavement preparations and the placement of the pavement markings.

PART 2 - PRODUCT

2.01 PAINTED MARKING

A. Project Type Selection

1. Paint type selection shall be based on the project type, unless otherwise specified.

Paint Material	Container/Auto Stalls	Crane Way	Employee Parking	Pavement Symbols	Re-Striping
Epoxy	Yes	Yes	Yes	Yes	See Table
MMA	Yes	Yes	Yes	Yes	See Table
Thermoplastic	Yes	Yes	Yes	Yes	See Table
Waterborne	No	No	Yes	No	See Table
Preformed Marking	Yes	Yes	Yes	Yes	See Table

2. Marking material compatibility for re-striping.

Existing Material	Re-Stripe Material				
	Epoxy	MMA	Thermoplastic	Waterborne	Preformed Marking
Epoxy	Yes	No	No	Yes	No
MMA	No	Yes	No	Yes	No
Thermoplastic	No	No	Yes	Yes	No
Waterborne	No	No	No	Yes	No
Preformed Marking	No	No	No	No	No

~~A.~~B. Paint

1. Epoxy

a. Paint shall be a two component, minimum 99 percent solids type system conforming to the following:

1) Pigments. Component A. Percent by weight.

a) White:

(1) Titanium Dioxide, ASTM D 476, type II shall be 18percent minimum (16.5 percent minimum at 100 percent purity).

b) Yellow and Colors:

(1) Titanium Dioxide, ASTM D 476, type II shall be 14 to 17 percent.

(2) Organic yellow, other colors, and tinting as required to meet color standard.

(3) Epoxy resin shall be 75 to 79 percent.

2) Epoxy Content. Component A. The weight per epoxy equivalent, when tested in accordance with ASTM D 1652 shall be the manufacturer's target plus or minus 50.

3) Amine Number. Component B. When tested in accordance with ASTM D 2074 shall be the manufacturer's target plus or minus 50.

4) Prohibited Materials. The manufacturer shall certify that the product does not contain mercury, lead, hexavalent chromium, halogenated solvents, nor any carcinogen as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant Federal Regulations.

2. Methyl Methacrylate (MMA)

a. Paint shall be a two component, minimum 99 percent solids-type system conforming to the following:

1) Pigments. Component A. Percent by weight.

a) White:

(1) Titanium Dioxide, ASTM D 476, type II shall be 6 percent minimum.

(2) Methacrylate resin shall be 18 percent minimum.

b) Yellow and Colors:

(1) Titanium Dioxide, ASTM D476, type II shall be 6 percent minimum.

(2) Organic yellow, other colors, and tinting as required to meet color standard.

(3) Methacrylate resin shall be 18 percent minimum.

c) Prohibited Materials. The manufacturer shall certify that the product does not contain mercury, lead, hexavalent chromium, halogenated solvents, nor any carcinogen as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant Federal Regulations.

3. Thermoplastic

a. The thermoplastic material shall be composed of 100% solids. The binder shall consist of a maleic-modified glycerol ester of rosin which is homogenously blended together with all necessary prime pigments, fillers, glass beads and additives to produce a traffic striping material.

b. Pigments.

1) White:

a) Titanium Dioxide, ASTM D 476, type II shall be 10 percent minimum.

b) Titanium dioxide content will be detemined using ASTM D5380 and ASTM E1621.

2) Yellow and Colors:

a) Titanium Dioxide, ASTM D476, type II shall be 10 percent minimum.

b) Organic yellow, other colors, and tinting as required to meet color standard.

3) Other Ingredients:

a) Composition shall be determined by the manufacturer to produce a thermoplastic material containing necessary plasticizers, antioxidants, and all other additives so that thermoplastic will retain its color, viscosity and all other properties. Thermoplastic material shall be supplied in either block or granular form. Application Type/Viscosity Extruded-Viscosity grade is more suitable for screed type applicators and thicker applications (+98 mils), including recessed applications.

b) Low Viscosity grade material is used with ribbon or spray type applicators.

c) Thermoplastic material shall be formulated to meet the viscosity grade specified.

4) Prohibited Materials. The manufacturer shall certify that the product does not contain mercury, lead, hexavalent chromium, halogenated solvents, nor any carcinogen as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant Federal Regulations.

~~1.~~4. Waterborne

a. Paint shall meet the requirements of Federal Specification TT-P-1952F, Type III.

~~2. Epoxy~~

~~a. Paint shall be a two component, minimum 99 percent solids type system conforming to the following:~~

~~1) Pigments. Component A. Percent by weight.~~

~~a) White:~~

~~(1) Titanium Dioxide, ASTM D 476, type II shall be 18percent minimum (16.5 percent minimum at 100 percent purity).~~

~~b) Yellow and Colors:~~

~~(1) Titanium Dioxide, ASTM D 476, type II shall be 14 to 17 percent.~~

~~(2) Organic yellow, other colors, and tinting as required to meet color standard.~~

~~(3) Epoxy resin shall be 75 to 79 percent.~~

~~2) Epoxy Content. Component A. The weight per epoxy equivalent, when tested in accordance with ASTM D 1652 shall be the manufacturer's target plus or minus 50.~~

~~3) Amine Number. Component B. When tested in accordance with ASTM D 2074 shall be the manufacturer's target plus or minus 50.~~

~~4) Prohibited Materials. The manufacturer shall certify that the product does not contain mercury, lead, hexavalent chromium, halogenated solvents, nor any carcinogen as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant Federal Regulations.~~

~~3.~~5. Traffic paint will be furnished in the following Federal Standard 595 colors:

a. Yellow – 33538

b. Green – 34108

c. Black – 37038

d. Blue – 35180

e. Red – 31136

f. White – 37925

~~B.~~C. Glass Beads

1. Glass beads shall meet the requirements for Federal Specification TT-B-1325D, Type IV Gradation B. Glass beads shall be treated with all compatible coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment.
2. Glass beads shall be coated with the necessary coating to provide both good embedment and adhesion into the traffic paint film.
3. The glass beads shall be transparent, clean, colorless, smooth and spherical shaped, free flowing, and free of pitting or excessive air bubbles.
4. When applied at the specified rate of glass beads per gallon of traffic paint, the glass beads shall show good adherence to the paint and provide good night visibility throughout the useful life of the reflectorized traffic paint.
5. The beads shall allow sufficient capillary action to form a firm embedment when dropped on a freshly applied wet paint film.
6. The following detailed requirements shall be met:
   a. A minimum of eighty-five percent (85%) of the beads of each sieve size shall be true spheres as determined by "Standard Test for Roundness of Glass Spheres" ASTM D 1155.
   b. The glass beads shall have a refractive index of not less than 1.50 when tested according to the specification.
   c. When tested according to the specification, the specific gravity of the glass beads shall be between 2.30 and 2.50.
   d. The drop-on glass beads in a representative sample shall meet the following gradation requirements when tested in accordance with Standard Method of Tests for Sieve Analysis of Glass Spheres, ASTM Designation D 1214.

U.S. Standard Sieve No.	Amount Passing, %
12	100
16	95-100
20	35-70
30	0-5

e. The glass beads shall be resistant to acid, calcium chloride, sodium sulfide, and water when tested in accordance with the Federal Specification.

f. The glass beads shall flow freely through the dispensing equipment in any weather suitable for marking.

2.02 PREFORMED THERMOPLASTIC MARKING

A. General

1. Must be composed of an ester modified rosin resistant to degradation by motor fuels, lubricants etc. in conjunction with aggregates, pigments, binders and glass beads which have been factory produced as a finished product, and meets the requirements of the current edition of the Manual on Uniform Traffic Control Devices for Streets and Highways.

2. The thermoplastics material conforms to AASHTO designation M249, with the exception of the relevant differences due to the material being supplied in a preformed state.

3. The material must be resistant to deterioration due to exposure to sunlight, water, salt or adverse weather conditions and impervious to oil and gasoline.

B. Graded Glass Beads

1. The material must contain a minimum of thirty percent (30%) intermixed graded glass beads by weight. The intermixed beads shall be conforming to AASHTO designation M247, with minimum 80% true spheres and minimum refractive index of 1.50.

2. The material must have factory applied coated surface beads in addition to the intermixed beads at a rate of 1 lb. (± 10%) per 10 sq. ft. The factory applied coated surface beads shall have a minimum of 90% true spheres, minimum refractive index of 1.50, and meet the following gradation.

U.S. Standard Sieve No.	Retained %	Passing %
12	0 – 2	98 – 100
14	0 – 3.5	96.5 – 100
16	2 – 25	75 – 98
18	28 – 63	37 – 72
20	63 – 72	28 – 37
30	67 – 77	23 – 33
50	89 – 95	5 – 11
80	97 – 100	0 – 3

C. Pigments

1. White: The material shall be manufactured with sufficient titanium dioxide pigment to meet FHWA Docket No. FHWA-99-6190 Table 5 and Table 6 as revised and corrected.
2. Red, Blue, and Yellow: The material shall be manufactured with sufficient pigment to meet FHWA Docket No. FHWA-99-6190 Table 5 and Table 6 as revised and corrected. The yellow pigments must be organic and must be heavy-metal free.
3. Other colors: The pigments must be heavy-metal free.

PART 3 - EXECUTION

3.01 PREPARATION OF SURFACE

A. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other foreign material that would reduce the bond between the paint and the pavement.

B. The area to be painted shall be cleaned by sweeping and blowing or by other methods as required to remove all dirt, laitance, and loose materials without damage to the pavement surface.

C. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the Engineer.

D. Markings shall not be applied to Portland cement concrete pavement until the areas to be painted are clean of curing material. Sandblasting or high-pressure water shall be used to remove curing materials.

E. Existing Pavement Markings

1. Existing pavement markings which are in alignment with approximately the same location as proposed new pavement markings must be removed to the extent necessary to prepare the roadway surface for the installation of the new pavement marking material in accordance with these Specifications and the materials manufacturer's recommendations. This type of pavement marking removal is considered part of pavement marking preparation and is not a separate pay item.
2. Existing traffic pavement marking which is not in alignment with the proposed new pavement marking, normally because of a change in pavement marking design or layout, must be removed to avoid conflicting marking. This type of marking will not be removed by the preparation of the roadway surface at the location of the proposed new marking. The removal of this marking is a separate pay item
3. The removal method used should not significantly damage the pavement surface and should be determined after consideration of the type of marking material to be removed and type of pavement surface.
4. The pavement marking shall be removed to the satisfaction of the Engineer.
5. Any residue remaining after the removal of the marking shall be collected and removed from the project by the Contractor.

F. Longitudinal Marking

1. All longitudinal traffic pavement markings shall be placed in accordance with the pavement marking plan.
2. Longitudinal pavement markings shall generally be offset at least 2 inches from construction joints. Lines shall be visually straight and shall have overall widths as shown on the plan or UPRR Standard Plans. Markings shall essentially have a uniform cross section. The density and quality of markings shall be uniform throughout their thickness. The applied markings shall have no more than 5 percent, by area, of holes or voids and shall be free of blisters.
3. Existing markings are not to be used as guides for the layout of new markings, except when plans specify "Match Existing Markings".
4. The traffic lane width and other transverse dimensions on the marking plan indicate the nominal distance from existing pavement features to center of marking line, and between centers of marking lines.

G. Transverse Marking

1. Word and symbol marking, including letters, numbers, and arrows, are considered transverse marking. Transverse marking layout shall comply with the current MUTCD.

H. Cross Hatching

1. Cross hatching shall be 4 inches wide unless otherwise specified on plans.

I. Contrast Marking

1. Contractor shall install black markings as a border around proposed markings where indicated on the plans per the details in the UPRR Standard Plans to provide contrast.

3.02 APPLICATION

A. General

1. Markings shall be applied at the locations and to the dimensions and spacing shown on the plans.
2. Markings shall not be applied until the layout and condition of the surface has been approved by the Engineer.
3. All markings shall be pre-marked by the Contractor. The pre-marking shall be reviewed and approved by the UPRR prior to application of any marking material. A UPRR on-site representative will review the pre-marking on any UPRR workday, if requested, twenty-four (24) hours in advance. The pavement markings shall be installed at the approved pre-marked alignment. Deviation from the approved alignment shall not exceed 2 inches, and the total of all deviations from the approved alignment shall not exceed 1 inch per 200 feet of length nor shall any deviation be abrupt.

B. Painted Markings

1. The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate(s) shown in Table 1. The addition of thinner will not be permitted.

TABLE 1 - APPLICATION RATES FOR PAINT AND GLASS BEADS		
Paint Type	Paint Type Paint Square feet per gallon, ft^2 /gal.	Glass Beads, Type IV Pounds per gallon of paint—lb./gal.
Epoxy	90 ft2 /gal. maximum	15 lb./gal. minimum
MMA	45 ft^2/gal. maximum	15 lb./gal. minimum
Thermoplastic*	0.444 lb/LF maximum	8 lb./100 ft^2. minimum
Waterborne	90 ft2 /gal. maximum	8 lb./gal. minimum
~~Epoxy~~	~~90 ft2 /gal. maximum~~	~~15 lb./gal. minimum~~

*Thermoplastic paint application rate is in lb/LF for a typical 4" linear marking and glass bead application rate is lb/100 ft^2.

2. Paint markings shall not be installed at pavement, air, or paint temperatures less than 50°F. Waterborne paint may be heated to a maximum of 150°F.
3. Paint markings shall not be applied when wind prevents the Contractor from placing markings acceptable to the UPRR on-site representative.
4. The paint shall have a dry thickness of 12± 1 mils and shall be the width shown in the plans ±1/2", The UPRR on-site representative may take periodic samples to ensure the thickness and width of the stripe. Finished lines shall have well defined edges and lateral deviations shall not exceed 2 inches in 200 feet.
5. Equipment
    a. Longitudinal paint marking lines shall be applied with a self-propelled, riding-type line striper that shall:
        1) Be capable of applying three lines simultaneously on the left side and/or right side.
        2) Be capable of applying the traffic marking paint the width specified in the plans and to a dry thickness of 12± 1 mils that is uniform across the width and length of the stripe.
        3) Have reservoirs that keep the paint mixture smooth and even.
        4) Be equipped with an automated skip device that applies stripe and gap of a specified length with a tolerance of 3 inches per cycle of skip. This tolerance shall not be accumulated in subsequent cycles. The striper shall be able to adjust the cycle while striping to allow for matching the existing stripe.
        5) Be capable of applying the traffic marking beads to the wet paint immediately after the application of the paint at a rate required in the plans and these Specifications. The bead applicator shall be equipped with an automatic shut off synchronized with the paint flow.
6. The UPRR on-site representative may allow the use of a walk-behind type of machine with a limited quantity of markings.
7. Glass Bead Application

a. Glass beads shall be distributed upon the marked areas immediately after application of the paint.

b. A dispenser shall be furnished that is properly designed for attachment to the marking machine and suitable for dispensing glass beads.

c. Glass beads shall be applied at the rate(s) shown in Table 1.

d. Glass beads shall not be applied to black paint.

e. Glass beads shall adhere to the cured paint or all marking operations shall cease until corrections are made

8. Thermoplastic paint shall be applied at temperatures between 400° F and 450° F.

~~e.~~

C. Preformed Thermoplastic Marking Application

1. Additional Pavement Preparations

a. Asphalt

1) The materials shall be applied using the propane torch method recommended by the manufacturer.

2) The material must be able to be applied without minimum requirements for ambient and road temperatures and without any preheating of the pavement to a specific temperature. The material must be able to be applied without the use of a thermometer.

3) The pavement shall be clean, dry and free of debris.

4) Supplier must enclose application instructions in English and Spanish with each box/package only pertaining to an application method that does not require preheating of the pavement to a specific temperature before application.

b. Portland Cement Concrete

1) The same application procedure shall be used as described for Asphalt.

2) A compatible primer sealer shall be applied before application to assure proper adhesion.

c. Heating Indicators

1) The top surface of the material (same side as the factory applied surface beads) shall be regularly spaced indents.

2) The closing of these indents during application, shall act as a visual cue that the material has reached a molten state allowing for satisfactory adhesion and proper bead embedment, and as a post-application visual cue that the application procedures have been followed.

d. Skid Resistance

1) The surface, with properly applied and embedded surface beads, must provide a minimum resistance value of 45 BPN when tested according to ASTM E 303.

e. Thickness

1) The thermoplastic material along, not including topical glass beads, must be supplied at a minimum thickness of 125 mils (3.15 mm).

3.03 CLEAN-UP

A. All material used to clean or prepare the surface for application of markings shall be cleaned up and removed by the Contractor.

B. The Contractor will submit a location to dump waste for the Engineer's approval.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT AND PAYMENT

A. The removal of existing pavement markings to allow a change in pavement marking layout, or location and to remove conflicting marking will not be paid for separately, but shall be included in the cost of other items.

B. Such payment shall be considered full compensation for preparation of pavement surface, removing and disposing of all existing material, furnishing and installing marking materials including glass beads, and for all labor, equipment, tools, materials and incidentals necessary to complete in accordance with the Plans and Specifications and acceptable to the UPRR on-site representative.

C. Markings, including symbols, numbers or letters, will be paid for at the contract unit price per each marking applied according to Specifications.

D. Striping will be paid for at the contract unit price per linear foot applied according to Specifications.

34 11 10 RAILROAD TRACK CONSTRUCTION

MODIFIED in section: revised 9-15-2023

PART 3 - EXECUTION

3.01 GENERAL

A.

13. At the end of the project, the Contractor shall perform VERSE testing after destressing rail to ensure the rail was installed at specified neutral temperature. The Contractor shall support the VERSE tester with labor and equipment to remove and replace rail clips required to perform each test. The Contractor shall be responsible for replacing any damaged or lost clips and inserts. Locations for the VERSE tests will be chosen by the Engineer. Anticipate testing to occur every 500 to 1000 FT on both rails of main and siding tracks. Testing on yard and other subsidiary tracks is not required. The Engineer shall be present for each test unless waived by the Engineer. ~~The a~~Approved VERSE testers ~~is~~are:

Keith Lane

~~Pandrol - Vortok US~~Harvest Rail
~~3013 Notting Hill Court, SW~~
~~Conyers, Georgia 30094~~
Phone: (770)-262-4956
E-mail: k.lane@harvestrail.com

John Cummings
Olsson
Phone: 479-335-7316
Email: jecummings@olsson.com

The Railroad may elect to perform VERSE testing. In this case, the Contractor shall support the VERSE tester with labor and equipment to remove and replace rail clips required to perform each test.

34 11 27 SUBBALLAST

MODIFIED in section: revised 9-15-2023

PART 3 - EXECUTION

3.04 FIELD QUALITY CONTROL

A. Laboratory test results shall be submitted for approval for contractor-supplied subballast and ballast material. Testing shall comply with specifications on Union Pacific Railroad Engineering Standard Drawing 0010 and shall have been performed within six (6) months prior to placing the material.

~~A.~~B. Frequency of moisture and density tests (ASTM D2922) shall be 1 test per 1000 SY on each lift but no greater than 500' spacing on each lift for narrow grading operations.

END OF ADDENDUM