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*Contract Documents*

# **South Minneapolis Residential Soil Contamination Site**

USEPA – Region 5

Volume I of I

**Specifications and Drawings**

**Project No. 377419**

May 2009





SOUTH MINNEAPOLIS RESIDENTIAL SOIL CONTAMINATION SITE  
USEPA-REGION 5

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**END OF SECTION**



**SECTION 01 11 00**  
**SCOPE OF WORK**

**PART 1 GENERAL**

- 1.01 SCOPE OF WORK (SOW) or WORK: The Work includes remediation and restoration of 487 residential properties with arsenic contaminated soils. The SOW may increase or decrease in residential properties requiring remediation. The unit prices included in the Bid Form shall hold firm for variances up to 15 percent for properties requiring remediation. The task activities for satisfying the performance requirements for this project are specified herein, shown in the enclosed Standard Details and Property Layout Drawings, and summarized as follows:
- A. Management of all Lower Tier Subcontractors and vendor activities onsite during the execution of this Work.
  - B. Coordination with other Subcontractors.
  - C. Site preparation, including preparation of storage and staging area(s). Installing temporary facilities and controls as indentified in Section 01 50 00, Temporary Facilities and Controls.
  - D. Securing staging and storage areas as specified in Section 01 50 00, Temporary Facilities and Controls.
  - E. Working with the Contractor and property owner to develop a property specific plan.
  - F. Site layout and establish control points to verify excavation limits are within property boundaries, document preconstruction and post-construction elevations and grades, depth of the excavations, and calculation of the excavated volume. Document control points for physical features including concrete walks, patios, foundations, porches, etc.
  - G. Coordinating utility locates and installation of erosion control at residential properties.
  - H. Site clearing, including removal of identified trees, vegetation, debris, and fencing, as required in Section 31 10 00, Site Clearing and Grubbing. and protecting designated vegetation at residential properties.
  - I. Excavation of approximately 52,000 tons of soil with elevated levels of arsenic from designated properties, as specified in Section 31 23 16, Excavation.

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- J. Transportation of waste to a licensed disposal facility approved by the Contractor, as specified in Section 31 23 16, Excavation.
  - K. Installation of demarcation fabric in the base of the excavation at properties as directed by the Contractor and as specified in Section 31 23 23, Fill and Backfill.
  - L. Backfill of excavated area with specified material in Section 31 23 23, Fill and Backfill and Section 32 91 13, Topsoil Preparation.
  - M. Planting of replacement trees, shrubs, and perennials as specified in Section 32 93 00, Trees, Shrubs and Perennials.
  - N. Restoration of excavated surfaces and Work areas according to plan. Restoration includes seeding excavated or disturbed areas in accordance with Section 32 92 00 Turfs and Grasses, and watering to establish grass and new plantings. Restoration also includes the repair of damaged surfaces or other required actions as specified in Section 32 10 01 Site Restoration.
  - O. Maintain positive community relations.
  - P. Specific Tasks Not Mentioned: Specific tasks not mentioned or completely detailed in this SOW that are necessary or normally required as part of the Work described shall be performed by the Subcontractor as incidental Work without extra costs to Contractor, as if fully detailed. The expense for such Work shall be included in the applicable lump sum and unit prices for the Work described.
- 1.02 ROLES: Defined for all sections included in this Remedial Design for the South Minneapolis Residential Soil Contamination Site.
- A. Owner: U.S. Environmental Protection Agency, Region 5 (USEPA).
  - B. Property Owner: Property owner of individual property with the in Residential Soil Contamination Site, South Minneapolis in Minneapolis, Minnesota.
  - C. Resident: Person(s) residing at the property.
  - D. Contractor: Construction Management Firm that the USEPA has contracted with to complete the remedial action.

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- E. Earthwork Subcontractor: Responsible for completing the Work described, including but not limited to site preparation, clearing and grubbing, excavation, and transportation and disposal, installation of demarcation fabric where required, backfill and compaction, rough and final grade, and property restoration. The Earthwork Subcontractor will be subcontracted to the Contractor.
- F. Security Subcontractor: Lower-tier Subcontractor responsible for security of Contractor/Subcontractor staging and storage area(s) during non-Work hours. The Security Subcontractor will be subcontracted to the Earthwork Subcontractor.
- G. Survey Subcontractor: Responsible for establishing reference points and performing preconstruction, post-excavation and post-construction surveys to document grade and calculate excavation volumes . The Survey Subcontractor will be subcontracted to the Contractor.
- H. Landscape Subcontractor: Responsible for completing Work associated with Sections 32 92 00 Turf and Grasses and 32 93 00 Trees, Shrubs and Perennials. The Landscaping Subcontractor will be subcontracted to the Contractor.
- I. Subcontractor: Where Subcontractor is referred to in the singular, it shall refer to each separate Subcontractor as applicable.
- J. Lower-Tier Subcontractor: A subcontractor retained by one of the Subcontractors.
- K. Analytical Laboratory: Responsible for analysis of samples from the borrow sources and properties undergoing remediation. Waste characterization or other samples will be analyzed as directed by the Contractor. The Analytical Laboratory will be subcontracted to the Contractor.

1.03 QUALIFICATIONS

- A. Subcontractors licensed, insured, and bonded to operate in the state of Minnesota shall perform the Work using local labor trades and comply with all applicable federal, state, county, and local laws and regulations. The most stringent of these regulations shall apply in any situation requiring clarification.

1.04 SUBMITTALS PRIOR TO AWARD

- A. Prior to contract award, Subcontractors will be required to submit a certificate of insurance naming U.S. Environmental Protection Agency and Contractor as

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additional insured and waivers of subrogation against USEPA and Contractor, in accordance with the Contract. All certificates of insurance, as well as bonds, shall be either executed by or countersigned by a licensed resident agent of the surety or insurance company having its place of business in the State of Minnesota. Further, the said surety or insurance company shall be duly licensed and qualified to do business in the State of Minnesota.

- B. Prior to contract award, the Subcontractors will be required to submit the following:
1. Completed certification of compliant drug policy.
  2. Subcontractor's site-specific health and safety plan and Activity Hazard Analysis (AHA) worksheets.
  3. Proof of training and medical monitoring programs.
  4. Material safety data sheets (MSDSs).
  5. Copies of Subcontractors' and business licenses as required by state and local statutes.

1.05 SUBMITTALS AFTER AWARD

- A. The selected Subcontractors shall provide the following before the commencement of any Work onsite:
1. Current hazardous waste site training and medical surveillance documentation for all field personnel, as necessary.
  2. Project Schedule and schedule narrative of Subcontractor's approach in performing the Work. The narrative will identify equipment, labor resources, crews and subcontracts. The narrative will also discuss project coordination.
  3. Contractor Quality Control Plan.
  4. Work Plan.
  5. Storm Water Management Plan.
  6. Waste Management Plan.
- B. Provide the following submittals during execution of the Work:
1. Daily reports (Subcontractor production report, Subcontractor quality control report, AHAs, and soil excavation/transportation log, waste disposal log, weight tickets) during the field operations period.
  2. Summary of remedial actions completed at each property, including any deviations from the specified SOW.
  3. Weekly updated schedule of values.
  4. Progress schedule and narrative report.

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5. As-built redline drawings of all excavation areas with lateral and vertical limits of excavation. Beginning and ending elevation of excavation areas confirmed and documented using survey.
6. A table documenting information on wastes managed, including quantities generated at each location and disposition of wastes.
7. Action and informational submittals required by the technical specification.

1.06 APPLICABLE REGULATIONS

A. General: Work shall comply with all Federal, State and local regulations, and with the latest edition of applicable sections of the following regulations, standards, and codes:

1. American National Standards Institute (ANSI).
2. American Society for Testing and Materials (ASTM).
3. Building Code of America.
4. National Electric Code (NEC).
5. National Electrical Manufacturer's Association (NEMA) Code.
6. National Fire Protection Association (NFPA) Standards.
7. Occupational Safety and Health Act.
8. Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.120.
9. Underwriter's Laboratory (UL).
10. Minneapolis Code of Ordinances.
11. City of Minneapolis Special Provisions.
12. Minnesota Statutes.
13. Minnesota Department of Transportation (MnDOT).
14. Minnesota Pollution Control Agency (MPCA).
15. United States Environmental Protection Agency (USEPA).
16. Other applicable state and local codes and regulations.

B. Regulatory Framework:

1. This Work is part of the USEPA's Superfund Program and is governed by CERCLA. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

2. A Storm Water Management Plan will be required for this Work and will be drafted by the Contractor and discussed with the City of Minneapolis and applicable agencies. The Earthwork Subcontractor will be required to finalize and submit the Storm Water Management Plan for approval and implement erosion control measures as best management practices for controlling erosion, regardless of other requirements.
3. The actions described in this SOW are not likely to result in any atmospheric discharges that would require either notification or permitting under the Clean Air Act (CAA). Under the CAA, temporary sources are not considered stationary sources and therefore are not regulated by the provision set forth in the act; however, any emission or escape into the open air can be declared a public nuisance. To avoid the nuisance rule, best management practices (i.e., periodic wetting of the area) shall be implemented by the Earthwork Subcontractor during the completion of the soil excavation activities.

#### 1.07 HEALTH AND SAFETY

- A. A copy of Contractor's health and safety plan (HASP) will be supplied to the awarded Subcontractors for reference. The Subcontractor shall provide its own health and safety procedures for the performance of the Subcontractor's activities. The primary chemical of concern for this project is arsenic that is contained within the soil that will be excavated during this project. The Subcontractor is responsible for the health and safety of its own personnel and any of its Lower-Tier Subcontractors' personnel at the project site, and shall provide, for all its own personnel and any of its Lower-Tier Subcontractors' personnel, all health and safety equipment required to comply with the Subcontractor's Safety Procedures and that are necessary to complete the Work.
- B. Health & Safety Incentive Fee. The Subcontractors shall be committed to the health and safety program and will strive for an incident free project by meeting the project Safety Performance Standards. The amount of the incentive fee will be determined based on health and safety performance over durations of the project as defined under 01 29 00 Payment Procedures.
- C. Failure to comply with the appropriate health and safety procedures outlined in the Contractor HASP and the Subcontractor's safety procedures, as determined by Contractor's representative, shall be considered grounds for a Stop Work Order. The Subcontractor shall remedy failure of compliance, as directed and approved by Contractor, before resuming Work. The Subcontractor will not be paid for the time occurring after notice of Stop

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Work Order and before resuming Work and may be responsible for Contractor costs during the downtime.

D. Responsibilities:

1. The Subcontractors are responsible for the health and safety of their employees. Each company shall designate one site employee as the "Designated Safety Coordinator" (DSC) who shall interface with the Contractor Site Safety and Health Specialist (SSHS) in matters of site safety.
2. The Health and Safety Program has three objectives: 1) to protect personnel onsite, 2) to comply with applicable (federal, state, and local) health and safety regulations and 3) minimize health and safety liabilities.
3. All employees shall follow, as a minimum, the requirements of OSHA 29 CFR 1910 and 29 CFR 1926.

E. Guidelines:

1. Personal Protective Equipment:
  - a. General Requirements:
    - 1) Responsibilities (29 CFR 1910.132):
      - a) Employees must use all personal protective equipment (PPE) that maintains their exposure within acceptable limits as defined in the HASP.
      - b) Employers shall ensure that employees receive training in and have knowledge of the use and maintenance of all PPE that is required to maintain their exposure within acceptable limits.
    - 2) Employees shall be physically able and medically determined qualified to use the PPE and safety equipment that may be required in their job duties.
    - 3) PPE and safety equipment shall be tested, inspected, and maintained in serviceable and sanitary condition.
      - a) Defective equipment shall not be used.
      - b) Records of any tests or inspection shall be available for inspection by Contractor.
    - 4) For hazardous waste operations, Subcontractors shall abide by 29 CFR 1910.120, Appendix B.
  - b. Minimum Requirements for Appropriate Personal Protective Equipment:
    - 1) Clothing Protection: Employees shall wear high-visibility vest and clothing suitable for the weather and Work conditions: the minimum for field work shall be shirt, long

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- trousers, and coveralls and boot covers if in direct contact with the contaminated soil.
- 2) Foot Protection (29 CFR 1910.136): Steel-toed boots must be leather and must be in compliance with ANSI Z41-1991. Overboots must be worn anytime a liquid hazard is encountered.
  - 3) Hand Protection (29 CFR 1910.138):
    - a) Employees involved in activities which subject the hands to injury (for example, cuts, abrasions, punctures, burns, chemical irritants, or toxins) shall use hand protection appropriate for the hazard. All jobs requiring basic hand protection shall use leather Work gloves.
    - b) Jobs that encounter oils, acids, or caustics shall use Neoprene gloves.
    - c) Jobs that encounter petroleum products shall use polyvinyl chloride (PVC)-coated gloves.
    - d) Jobs that require protection from a variety of chemicals or splash protection shall use Nitrile gloves.
    - e) Jobs that require hand operation of equipment shall use anti-vibration gloves.
  - 4) Eye and Face Protection (29 CFR 1910.133): Safety glasses, goggles, and splash shields must be in compliance with ANSI Z87.1-1989 standards. Employees shall be provided with eye and face protective equipment when machines or operations present potential for eye or face injury from physical, chemical, or radiation agents.
  - 5) Head Protection (29 CFR 1910.135): All jobs that require head protection shall use hard hats that comply with ANSI Z89-1986. Employees shall be provided with head protection on all construction sites and must wear hard hats at all times.
  - 6) Hearing Protection (29 CFR 1910.95): Employees shall be provided hearing protection when subject to sounds above 85 decibels (dB).
  - 7) Employees exposed to vehicular or equipment traffic, including signal persons or spotters shall wear apparel marked with a reflectorized or high-visibility material (that is, safety vests).

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- c. Minimum Requirements for Site Safety:
  - 1) Safety color code for marking physical hazards (29 CFR 1910.144) shall include the following:
    - a) Caution tape shall be at a minimum of 3 inches wide, yellow, and the words "CAUTION" spelled out legibly in black.
    - b) Safety cans or other portable containers of flammable liquids shall be in compliance.
  - 2) All signs and tags shall be in compliance with 29 CFR 1910.145.
  - 3) Fencing will be required around excavations (29 CFR 1926.501).
2. Outline for the Site-specific Health and Safety Plan:
  - a. Activity Hazard Analysis:
    - 1) All definable features of Work will be addressed with an activity hazard analysis (AHA) prior to beginning each activity. This chart looks at principal steps of the operation, potential safety/health hazards for each step, and recommended controls for each hazard. In addition, a listing of equipment to be used onsite, inspection requirements, and training requirements for operation of equipment shall be included.
    - 2) Analyses will define the activities being performed, identify the sequences of Work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level.
    - 3) Work will not begin until the hazard analysis for each Work activity has been reviewed and accepted by Contractor.
  - b. Training requirements are as follows (29 CFR 1910.120.(e)):
    - 1) 40-hour hazardous waste training.
    - 2) 8-hour hazardous waste refresher training within the last 12 months.
    - 3) Site-specific training including names of personnel and alternates responsible for site safety and health; safety, health, and other hazards identified in the AHA; use of PPE; Work practices to minimize risks from hazards; medical surveillance requirements and recognition of symptoms and signs which might indicate overexposure to hazards; and decontamination procedures.
    - 4) Surveyors: 24-hour hazardous waste training plus 8-hour hazardous waste refresher training within the last 12 months.

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- c. Personal Protective Equipment: A specific list of PPE to be used by Subcontractor employees for each site task and operation plus the assigned level of protection and criteria for upgrading or downgrading a task shall be included.
- d. Medical Surveillance:
  - 1) As a minimum, list the requirements for annual and any site-specific physical requirements for contaminants of concern on the site.
  - 2) Provide name, route map, and contact number for emergency medical services available in case of a suspected exposure or emergency.
- e. Site Control: Implement appropriate site controls to isolate areas with hazardous substances or physical hazards before Work begins. Establish Work zones, use of the “buddy” system, site communications including emergency signals, and identification of standard operating procedures.
- f. Decontamination:
  - 1) Written procedures will be developed and implemented before and during site activities based upon actual site conditions. Decontamination procedures may change throughout the project.
  - 2) All personnel leaving the exclusion area will perform the required decontamination. The Subcontractor DSC will observe these operations and ensure proper decontamination procedures are being followed. These procedures follow every time personnel leave the site for breaks, food, and at the end of the Work period.
  - 3) All equipment leaving the site and solvents used for decontamination shall be decontaminated or disposed of in a method specified in the HASP.
  - 4) PPE will be cleaned or disposed of in a method specified in the HASP.
- g. Emergency response plan shall include the following:
  - 1) Pre-emergency planning including designation of personnel roles, responsibilities, emergency recognition, safe places of refuge or gathering, evacuation routes, emergency decontamination procedures, alerting procedure, and availability of first aid and medical treatment.
  - 2) Site emergency equipment including first aid kits, 15-minute eyewash, 20-pound fire extinguishers, bloodborne pathogen kit, emergency map, designated emergency vehicle, and listing of trained first aid and CPR personnel.

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- 3) Procedures for reporting incidents, emergency communications, and testing of the site emergency notification system.
  - 4) Post-emergency evaluation, an evaluation looking at how resources came into play, response of outside sources, and steps to improve the process.
  - h. Confined Space Entry, if Required by Site Activities: This includes the specific procedure following 29 CFR 1910.146, including training, site isolation, permit procedures, air monitoring, and emergency rescue.
  - i. Spill Containment Program:
    - 1) Written spill containment program that is targeted at the quantities and types of material brought to the site by the Subcontractor or as a result of stockpiling or tankage of site materials.
    - 2) Spill control materials in adequate quantities to control solid or liquid spills.
    - 3) Drums or containers for recovery of spilled material or rapidly available local resources to provide these materials.
  - j. Activity Hazard Analyses:
    - 1) The Subcontractor shall prepare a AHA to review the hazards posed and required hazard control procedures for each day's planned activities.
    - 2) During the daily safety meeting, the Subcontractor's supervisor shall brief their Work crew on the AHA, which shall include the day's planned tasks, tools, equipment, and materials that will be used, along with hazards posed and required hazard control procedures for each day's planned activities.
3. References:
- a. CH2M HILL Health and Safety Program Plan.
  - b. OSHA 29 CFR 1910, General Industry Standards.
  - c. OSHA 29 CFR 1926, Construction Industry Standards.

1.08 CONTRACT TIME

- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

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- B. Substantial Completion:
1. Substantial Completion for each property shall occur when preliminary punch list Work has been completed and the Residential Post-Construction Meeting is conducted with the property owners, Contractor and USEPA.
  2. Residential Post-Construction meetings will be scheduled on predetermined days each month during construction to facilitate coordination of multiple meetings and final inspections at the same time.
  3. The Work is to be performed in 3 construction seasons. Partial Project Substantial Completion will be provided at the end of each construction season and will include properties approved by the Contractor as substantially complete.
  4. Project Substantial Completion shall occur when remediation and restoration is complete for all properties, include maintenance, watering and punch list work complete and property owners have signed off on work.
- C. Days to Achieve Project Substantial Completion and Final Payment: The Work is funded under the American Recovery and Reinvestment Act (ARRA). As a result, a minimum of 70 percent of the Work is expected to be completed by March 2011. To meet this requirement, the remedial action must be completed at 340 residential properties by the end of the 2010 construction season. Remedial construction at all of the residential properties requiring cleanup (487 residential properties) and Project Substantial Completion shall be completed by the end of the 2011..

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**

**SECTION 01 26 00**  
**CONTRACT MODIFICATION PROCEDURES**

**PART 1 GENERAL**

1.01 PROPOSAL REQUESTS

- A. Contractor may, in anticipation of ordering an addition, deletion, or revision to the Work, request Subcontractor to prepare a detailed proposal of cost and times to perform contemplated change.
- B. Proposal request will include reference number for tracking purposes and detailed description of and reason for proposed change, and such additional information as appropriate and as may be required for Subcontractor to accurately estimate cost and time impact on Project.
- C. Proposal request is for information only. Subcontractor is neither authorized to execute proposed change nor to stop Work in progress as result of such request.
- D. Subcontractor's written proposal shall be transmitted to Contractor promptly, but not later than 14 days after Subcontractor's receipt of Contractor's written request. Proposal shall remain firm for a maximum period of 45 days after receipt by Contractor.
- E. A request for proposal or Subcontractor's failure to submit such proposal within the required time period will not justify a Claim for an adjustment in Contract Price or Contract Times (or Milestones).

1.02 CLAIMS

- A. Include, at a minimum:
  - 1. Specific references including (i) Drawing numbers, (ii) Specification section and article/paragraph number, and (iii) Submittal type, Submittal number, date reviewed, Contractor's comment, as applicable, with appropriate attachments.
  - 2. Stipulated facts and pertinent documents, including photographs and statements.
  - 3. Interpretations relied upon.

4. Description of (i) nature and extent of Claim, (ii) who or what caused the situation, (iii) impact to the Work and Work of others, and (iv) discussion of claimant's justification for requesting a change to price or times or both.
5. Estimated adjustment in price claimant believes it is entitled to with full documentation and justification.
6. Requested Change in Contract Times: Include at least (i) Progress Schedule documentation showing logic diagram for request, (ii) documentation that float times available for Work have been used, and (iii) revised activity logic with durations including sub-network logic revisions, duration changes, and other interrelated schedule impacts, as appropriate.
7. Documentation as may be necessary as set forth below for Work Change Directive, and as Contractor may otherwise require.

### 1.03 WORK CHANGE DIRECTIVES

#### A. Procedures:

1. Contractor will:
  - a. Initiate, including a description of the Work involved and any attachments.
  - b. Affix signature, demonstrating Contractor's recommendation.
  - c. Transmit five copies to Owner for authorization.
2. Owner will:
  - a. Affix signature, demonstrating approval of the changes involved.
  - b. Return four copies to Contractor, who will retain one copy, send one copy to the Resident Project Representative or other field representative, and forward two copies to Subcontractor.
3. Upon completion of Work covered by the Work Change Directive or when final Contract Times and Contract Price are determined, Subcontractor shall submit documentation for inclusion in a Change Order.
4. Subcontractor's documentation shall include but not be limited to:
  - a. Appropriately detailed records of Work performed to enable determination of value of the Work.
  - b. Full information required to substantiate resulting change in Contract Times and Contract Price for Work. On request of Contractor, provide additional data necessary to support documentation.
  - c. Support data for Work performed on a unit price or Cost of the Work basis with additional information such as:
    - 1) Dates Work was performed, and by whom.

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- 2) Time records, wage rates paid, and equipment rental rates.
- 3) Invoices and receipts for materials, equipment, and subcontracts, all similarly documented.

B. Effective Date of Work Change Directive: Date of signature by Owner, unless otherwise indicated thereon.

1.04 CHANGE ORDERS

A. Procedure:

1. Contractor will prepare electronic files of proposed Change Order and transmit such with Contractor's written recommendation and request to Subcontractor for signature.
2. Subcontractor shall, upon receipt, either: (i) promptly sign and retain file, and return an electronic copy to the Contractor for Owner's signature, or (ii) return unsigned copy with written justification for not executing Change Order.
3. Contractor will, upon receipt of Subcontractor signed electronic copy, promptly forward Contractor's written recommendation and partially executed files for Owner's signature, or if Subcontractor fails to execute the Change Order, Contractor will promptly so notify Owner and transmit Subcontractor's justification to Owner.
4. Upon receipt of Subcontractor-executed Change Order, Owner will promptly either:
  - a. Execute Change Order, returning electronic files to the Contractor; or
  - b. Return to Contractor unsigned files with written justification for not executing Change Order.
5. Upon receipt of Owner-executed Change Order, Contractor will distribute electronic files to the Subcontractor, Resident Project Representative or other field representative, or if Owner fails to execute the Change Order, Contractor will promptly so notify Subcontractor and transmit Owner's justification to Subcontractor.
6. Upon receipt of Owner-executed Change Order, Subcontractor shall:
  - a. Perform Work covered by Change Order.
  - b. Revise Schedule of Values to adjust Contract Price and submit with next Application for Payment.
  - c. Revise Progress Schedule to reflect changes in Contract Times, if any, and to adjust times for other items of Work affected by change.
  - d. Enter changes in Project record documents after completion of change related Work.

- B. In signing a Change Order, Owner and Subcontractor acknowledge and agree that:
1. Stipulated compensation (Contract Price or Contract Times, or both) set forth includes payment for (i) the Cost of the Work covered by the Change Order, (ii) Subcontractor's fee for overhead and profit, (iii) interruption of Progress Schedule, (iv) delay and impact, including cumulative impact, on other Work under the Contract Documents, and (v) extended overheads.
  2. Change Order constitutes full mutual accord and satisfaction for the change to the Work.
  3. Unless otherwise stated in the Change Order, all requirements of the original Contract Documents apply to the Work covered by the Change Order.

1.05 COST OF THE WORK

- A. Rental of construction equipment and machinery and the parts thereof having a replacement value in excess of \$1,000, whether owned by Subcontractor or rented or leased from others, shall meet the following requirements:
1. Full rental costs for leased equipment shall not exceed rates listed in the Rental Rate Blue Book published by Equipment Watch, San Jose, California, as adjusted to the regional area of the Project and as most favorable rate to the client. Owned equipment costs shall not exceed the single shift rates established in the Cost Reference Guide (CRG) also published by Equipment Watch. The most recent published edition in effect at commencement of actual equipment use shall be used.
  2. Rates shall apply to equipment in good Working condition. Equipment not in good condition, or larger than required, may be rejected by Contractor or accepted at reduced rates.
  3. Leased Equipment: For equipment leased or rented in arm's length transactions from outside vendors, maximum rates shall be determined by the following actual usage/Blue Book Payment Category:
    - a. Less than 8 hours: Hourly Rate.
    - b. 8 or more hours but less than or equal to 5 work days: Daily Rate.
    - c. 6 or more work days but less than or equal to 15 work days: Weekly Rate.
    - d. 16 work days or more: Monthly Rate.
  4. Arm's length rental and lease transactions are those in which the firm involved in the rental or lease of equipment is not associated with, owned by, have common management, directorship, facilities and/or stockholders with the firm renting the equipment.

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5. Leased Equipment in Use: Actual equipment use time documented by Contractor shall be the basis that equipment was on and utilized at the Project Site. In addition to the leasing rate above, equipment operational costs shall be paid at the estimated hourly operating cost rate set forth in the Blue Book if not already included in the lease rate. Hours of operation shall be based upon actual equipment usage to the nearest quarter hour, as recorded by Contractor.
6. Leased Equipment, When Idle (Standby): Idle or standby equipment is equipment onsite or in transit to and from the Work Site and necessary to perform the Work under the modification, but not in actual use. Idle equipment time, as documented by Contractor, shall be paid at the leasing rate determined above, excluding operational costs.
7. Owned and Other Equipment in Use: Equipment rates for owned equipment or equipment provided in other than arm's length transaction shall not exceed the single shift total hourly costs rate developed in accordance with the CRG and as modified herein for multiple shifts. This total hourly rate will be paid for each hour the equipment actually performs Work. Hours of operation shall be based upon actual equipment usage as recorded by Contractor. This rate shall represent payment in full for Subcontractor's direct costs.
8. Owned and Other Equipment, When Idle (Standby): Equipment necessary to be onsite to perform the Work on single shift operations, but not utilized, shall be paid for at the ownership hourly expense rate developed in accordance with the CRG, provided its presence and necessity onsite has been documented by Contractor. Payment for idle time of portions of a normal workday, in conjunction with original contract Work, will not be allowed. In no event shall idle time claimed in a day for a particular piece of equipment exceed the normal Work or shift schedule established for the Project. It is agreed that this rate shall represent payment in full for Subcontractor's direct costs. When Contractor determines that the equipment is not needed to continuously remain at the Work Site, payment will be limited to actual hours in use.
9. Owned and Other Equipment, Multiple Shifts: For multiple shift operations, the CRG single shift total hourly costs rate shall apply to the operating equipment during the first shift. For subsequent shifts, up to 2 in a 24-hour day, operating rate shall be the sum of the total hourly CRG operating cost and 60 percent of the CRG ownership and overhaul expense. Payment for idle or standby time for second and third shifts shall be 20 percent of the CRG ownership and overhaul expense.
10. When necessary to obtain owned equipment from sources beyond the Project limits, the actual cost to transfer equipment to the Work Site and return it to its original location will be allowed as an additional item of expense. Move-in and move-out allowances will not be made for

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equipment brought to the Project if the equipment is also used on original Contract or related Work.

11. If the move-out destination is not to the original location, payment for move-out will not exceed payment for move-in.
12. If move is made by common carrier, the allowance will be the amount paid for the freight. If equipment is hauled with Subcontractor's own forces, rental will be allowed for the hauling unit plus the hauling unit operator's wage. If equipment is transferred under its own power, the rental will be 75 percent of the appropriate total hourly costs for the equipment, without attachments, plus the equipment operator's wage.
13. Charges for time utilized in servicing equipment to ready it for use prior to moving and similar charges will not be allowed.
14. When a breakdown occurs on any piece of owned equipment, payment shall cease for that equipment and any other owned equipment idled by the breakdown.
15. If any part of the Work is shut down by Owner, standby time will be paid during non-operating hours if diversion of equipment to other Work is not practicable. Contractor reserves the right to cease standby time payment when an extended shutdown is anticipated.
16. If a rate has not been established in the CRG for owned equipment, Subcontractor may:
  - a. If approved by Contractor, use the rate of the most similar model found, considering such characteristics as manufacturer, capacity, horsepower, age, and fuel type, or
  - b. Request Equipment Watch to furnish a written response for a rate on the equipment, which shall be presented to Contractor for approval; or
  - c. Request Contractor to establish a rate.

1.06 FIELD ORDER

- A. Contractor will issue Field Orders to the Subcontractor.
- B. Effective date of the Field Order shall be the date of signature by Contractor, unless otherwise indicated thereon.
- C. Subcontractor shall acknowledge receipt by signing and returning one copy to Contractor.
- D. Field Orders will be incorporated into subsequent Change Orders, as a no-cost change to the Contract.

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**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**



**SECTION 01 29 00  
PAYMENT PROCEDURES**

**PART 1 GENERAL**

1.01 SUBMITTALS

- A. Informational Submittals:
  - 1. Schedule of Values: Submit on form approved by Contractor.
  - 2. Schedule of Estimated Progress Payments:
    - a. Submit with initially acceptable Schedule of Values.
    - b. Submit adjustments thereto with Application for Payment.
  - 3. Application for Payment.
  - 4. Final Application for Payment.

1.02 SCHEDULE OF VALUES

- A. On a weekly basis, update and provide documentation to support the accuracy of the Schedule of Values.
- B. Unit Price Work: Reflect unit price quantity and price breakdown from conformed Bid Form.
- C. Lump Sum Work:
  - 1. List bonds and insurance premiums, mobilization, demobilization, preliminary and detailed progress schedule preparation, project coordination and contract closeout separately.
  - 2. Provide adequate breakdown of lump sum work specified in sections "Scope of Work" and "Temporary Facilities and Controls," distributed for payment over the construction duration.
- D. An unbalanced or front-end loaded schedule will not be acceptable.
- E. Summation of the complete Schedule of Values representing all the Work shall equal the Contract Price.

1.03 SCHEDULE OF ESTIMATED PROGRESS PAYMENTS

- A. Show estimated payment requests throughout Contract Times aggregating initial Contract Price.

1.04 APPLICATION FOR PAYMENT

- A. Transmittal Summary Form: Attach Summary Form with each detailed Application for Payment and include Request for Payment of Materials on Hand as applicable. Execute certification by authorized officer of Subcontractor.
- B. Use detailed Application for Payment Form suitable to Contractor.
- C. Preparation:
  - 1. Round values to nearest dollar.
  - 2. Submit Application for Payment, including a Transmittal Summary Form and detailed Application for Payment Form and such supporting data as may be requested by Contractor.

1.05 MEASUREMENT—GENERAL

- A. Whenever pay quantities of material are determined by weight, weight or load slip shall be obtained from weigher and delivered to Contractor's representative at point of delivery of material.
- B. Vehicles used to haul material being paid for by weight shall be weighed empty daily and at such additional times as required by Contractor. Each vehicle shall bear a plainly legible identification mark.
- C. Excavation and backfill quantities will be based on ground elevations. Field surveys will be made by Contractor to confirm accuracy of actual elevations.
- D. Units of measure shown on Bid Form shall be as follows, unless specified otherwise.

<b>Item</b>	<b>Method of Measurement</b>
CY	Cubic Yard—Field Measure by Contractor within limits specified or shown
EA	Each—Field Count by Contractor
GAL	Gallon—Field Measure by Contractor
HR	Hour
LB	Pound(s)—Weight Measure by Scale
LF	Linear Foot—Field Measure by Contractor
LS	Lump Sum

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<u>Item</u>	<u>Method of Measurement</u>
SF	Square Foot
TON	Ton—Weight Measure by Scale (2,000 pounds)

1.06 PAYMENT

- A. Payment for all Lump Sum Work shown or specified in Contract Documents is included in the Contract Price. Payment will be based on a percentage complete basis for each line item of the accepted Schedule of Values.

1.07 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

- A. Payment will not be made for following:
1. Loading, hauling, and disposing of rejected material.
  2. Rejected loads of material, including material rejected after it has been placed by reason of failure of Subcontractor to conform to provisions of Contract Documents.
  3. Material not unloaded from transporting vehicle.
  4. Defective Work not accepted by Contractor.
  5. Material remaining on hand after completion of Work.

1.08 PARTIAL PAYMENT FOR STORED MATERIALS

- A. Partial Payment: No partial payments will be made for materials stored. Payment will be made only for materials incorporated in Work.

1.09 INCENTIVE

- A. The Earthwork and Landscaping Subcontractor will be eligible for performance based incentives based on health and safety, quality, schedule, and property owner/resident satisfaction. Each metric shall be equally weighted at 25 percent of the eligible performance incentive for each construction season. The eligible performance incentive fee is equal to 5 percent of the subcontract costs incurred for each construction season, excluding transportation and disposal and material costs for fill and topsoil.
- B. Health and Safety Incentive Fee: The Subcontractor shall be committed to the health and safety program and will strive for an incident free project by meeting the Safety Performance Standards.

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- C. Quality Incentive Fee: The quality of the Subcontractor work shall be evaluated by the amount of rework required, environmental violations, notices issued or other appropriate quality indicators.
- D. Schedule Incentive Fee: The Subcontractor will preserve the Schedule Incentive Fee by meeting the schedule for completion of their Work and coordinating so as to not cause delay in Work of other Subcontractors.
- E. Property Owner/Tenant Satisfaction Incentive Fee: A Property Owner/Tenant Satisfaction Incentive Fee may be awarded to the Subcontractor based on overall performance. A post construction survey consisting of approximately 10 questions will be taken with each Property Owner/Tenant to determine their satisfaction with the Subcontractor's overall performance. The questions will address the standard of care in dealing with the Property Owner/Tenant, courteousness of the Subcontractor's personnel, quality of work and satisfaction rating.
- F. Payment of Incentive Fees: Payment of the Incentive Fees will be made upon partial substantial completion of all project work for each construction season and at submission of the subsequent request for payment.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**

**SECTION 01 31 13**  
**PROJECT COORDINATION**

**PART 1 GENERAL**

1.01 SUBMITTALS

A. Informational:

1. Job Hazard Analysis or Activity Hazard Analysis (JHA or AHA).
2. Utility locate tickets:
  - a. Documentation of completed utility locates shall be print outs of cleared tickets from the Gopher State One-Call web-based interface.
  - b. Submit one copy, within 2 days prior to beginning excavation activities.

B. Action:

1. Property Sketch showing Existing Conditions.
  - a. Submit (2) 8 ½x11 or 11x17 drawings within three (3) days after the Initial Residential Preconstruction Meeting.
2. Property Sketch showing Restoration and Replacement Plan.
  - a. Submit (2) 8 ½x11 or 11x17 drawings within three (3) days after the Initial Residential Preconstruction Meeting.
3. Survey Documentation.
  - a. Submit sketch or coordinates with elevation to determine excavation depth and volume, backfill volume and post construction grade.

1.02 UTILITY NOTIFICATION AND COORDINATION

- A. The Earthwork Subcontractor will coordinate utility clearance through the local one-call system (Gopher State One call). The Earthwork Subcontractor shall verify that utilities have been identified and marked prior to beginning excavation on each property and protect the utilities from damage during construction.
- B. The Earthwork Subcontractor shall notify applicable utilities prior to commencing Work and if damage occurs, or if conflicts or emergencies arise during Work.
  1. Minnesota 811:
    - a. Telephone: 1-800-252-1166.

1.03 PROPERTY ACCESS AND SERVICES

- A. The Contractor will obtain property owner-signed access agreements and verify current property ownership.
- B. Do not proceed with Work at project site without completing the preconstruction meeting and obtaining Owner's and Contractor's advance approval of the SOW, conditions, and duration of such Work.
- C. During construction, it is expected that relocation of objects, materials, and trash will be necessary. Interfering objects that will require removal, storage or disposal will be identified and documented in the preconstruction meeting with the Property Owner, Earthwork Subcontractor, Contractor, and Resident as appropriate.
- D. Two points of continuous access for residents and Property Owners will be maintained when possible with one point of continuous access at all times. Schedule and conduct activities to enable access and egress to homes by Residents and Property Owners.
- E. Openings in fences, created by the Subcontractor for construction access or other purposes, shall be secured at the end of each day.
- F. Perform Work continuously and as required to prevent interruption of services to residential homes (U.S. Postal deliveries, visitors, and others).
- G. Plan and coordinate Work in and around the street and alleys to allow city services such as street cleaning and garbage pickup.
- H. Coordinate street parking for excavation and backfill equipment.
- I. Do not close lines, open or close valves, or take other action which would affect the operation of existing systems without authorization from Utility and Contractor.
- J. When necessary, provide various temporary services, utilities, connections, access, and similar items to maintain continuous operations for Property Owners and residents.

1.04 RESIDENTIAL PRECONSTRUCTION MEETINGS

- A. Residential Preconstruction Meeting: The Contractor and Earthwork Subcontractor will attend Residential Preconstruction Meetings with the Property Owner and Resident, as appropriate, onsite at the property where

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Work will be performed. During the meetings, information will be gathered to clearly define the limits of excavation, removals (trees, shrubs, plantings and other) and new placements.

1. During the initial meeting, the Contractor shall take video records and photographs of the physical site, structures, fencing, poles, trees, shrubs, concrete sidewalks and slabs showing their condition prior to start of the Work.
2. The Contractor and Earthwork Subcontractor will make notations by hand on the property sketch during the initial meeting and will include additional notes, concerns and understandings discussed with the Property Owner. The Contractor will provide a base property sketch for each property upon award of the contract.
3. The Contractor will collect soil samples for analysis by x-ray fluorescence (XRF) with subsequent laboratory analysis, if necessary, to determine if areas around trees, in boulevards, or other areas identified by the Property Owner require remedial action.
4. If plants are located within the excavation area as defined during the Initial Residential Preconstruction Meeting, the Contractor will instruct the Landscape Subcontractor to identify the plants that will be removed within the limits of excavation prior to the second meeting with the Property Owner. The Landscape Subcontractor shall visit the property and identify the plants within 5 days notice from the Contractor, unless otherwise directed. The Landscape Subcontractor will submit a plant inventory to the Contractor within 2 days of the property visit.
5. The Earthwork Subcontractor will incorporate the hand notations on the sketch into an electronic format. The Contractor, Earthwork Subcontractor and Property Owner will review the finalized sketch, notes, and inventories for the property, and sign the sketch and Property Owner Agreement during a second meeting indicating concurrence and approval to proceed.

B. Examination:

1. Complete a thorough examination of pre-existing conditions including existing buildings, structures, fences and other improvements in vicinity of Work, as applicable, which could be damaged by construction operations or limit access for equipment.
2. Schedule of Work.
3. Access.
4. Removals.
5. Restoration.
6. Security.
7. Other Conditions.

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C. Documentation:

1. Contractor will complete Residential Survey Form/Checklist.
2. Property Owner Agreement describes the property and Work to be performed that is signed by the Property Owner, Earthwork Subcontractor and Contractor.
3. A drawing, to scale, of site features and extents of excavation for each property will be provided to the Earthwork Subcontractor by Contractor at the time of contract award. After the Initial Residential Preconstruction Meeting, the Earthwork Subcontractor will be required to revise and submit for approval a minimum of (2) 8 ½x11 or 11x17 drawings for each property showing, at a minimum, the following information:
  - a. Drawing #1 – Existing Conditions:
    - 1) Site features.
    - 2) Excavation area(s) and proposed access to the area(s).
    - 3) Location of benchmark and beginning elevation of excavation area(s).
    - 4) Location of utilities and other site hazards.
    - 5) Proposed fence removal (length and type).
    - 6) Tree, shrub, garden and/or other vegetation removal or protection.
  - b. Drawing #2 – Restoration:
    - 1) Proposed restoration and replacement of fencing in-kind and pre-selected landscape features.
    - 2) Restoration and Replacement Notes.
  - c. Each drawing will be reviewed and approved by Contractor prior to authorization for beginning Work at the individual property.
4. Documentation (e.g., photographs, videos, drawings) shall be used as indisputable evidence in ascertaining whether and to what extent damage occurred as a result of Subcontractor's operations, and is for the protection of Property Owners, adjacent property owners, Subcontractor, Contractor, and Owner.

1.05 ACTIVITY HAZARD ANALYSIS:

- A. AHA drawings will be prepared by the Earthwork Subcontractor, using Drawing #1—Existing Conditions, submitted and reviewed before starting Work at each address. The drawing(s) will identify planned access, structures, clearing, grubbing, and excavation limits along with overhead and underground utility locations and other site specific hazards.

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1.06 CONSTRUCTION PHOTOGRAPHS

- A. Contractor will photographically document the phases of the project including Preconstruction, Construction progress, and Post-construction using digital equipment. A description of the photos to be taken will be discussed during the Residential Preconstruction Meeting.
- B. Post-Construction:
  - 1. Following construction and with the Request for Substantial Completion at each Residential Project Site, the Contractor will take a minimum of 8 digital exposures of each yard at the Construction Site and 4 digital exposure of each area adjacent to perimeter of Construction Site.
  - 2. Particular emphasis shall be directed to structures both inside and outside the Site.
- C. Digital Images by Contractor:
  - 1. Will be archived using a commercially available photo management system.
  - 2. Photos shall be documented by Preconstruction, Construction, and Post-construction.
  - 3. Labeled with project name, property address, and Owner's name, and week and year images were produced.
  - 4. Maintained with a project photo log and photo log for each disc.

1.07 AUDIO-VIDEO RECORDINGS BY CONTRACTOR

- A. During the Residential Preconstruction Meetings and prior to beginning Work on Construction Site or of a particular area of the Work, and again within 5 days following date of Substantial Completion, the Contractor shall video-graph Construction Site and properties adjacent to construction site.
- B. Video shall focus emphasis on physical condition of existing vegetation, structures, sidewalks and pavements within limits of the Work and areas adjacent to and within the right-of-way or easement, including preconstruction conditions of street surfaces, curbs and storm sewers, and on Subcontractor storage and staging areas.
- C. Video Format and Quality:
  - 1. Digital (DVD, DVD-R, DVD+R) format, with sound.
  - 2. Video:
    - a. Bright, sharp, and clear images with accurate colors, free of distortion and other forms of picture imperfections.

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- b. Electronically, and accurately display the month, day, year, and time of day of the recording.
- 3. Audio:
  - a. Audio documentation shall be done clearly, precisely, and at a moderate pace.
  - b. Indicate date, project name, and a brief description of the location of the recording, including:
    - 1) Residential address.
    - 2) Street names or easements.
    - 3) Direction of coverage, including engineering stationing, if applicable.

1.08 REFERENCE POINTS AND SURVEYS

A. Services provided by Survey Subcontractor:

- 1. Furnish all labor, equipment, and materials required to perform Work. Work shall be completed in compliance with current Federal, State, and Local regulations and in accordance with standard industry practices.
- 2. Locate established bench marks to tie into and document elevations before, during, and after construction.
- 3. Establish horizontal reference points with temporary bench marks and reference points for Subcontractor's use as necessary to lay out and record Work.
- 4. Survey No. 1: Provide horizontal and vertical control of site, structures, fences, and limits of excavation prior to starting work. Verify the extents of excavation are located within the property boundaries as determined by posts or markers identifying property corners or legal property description at the direction of the Contractor.
- 5. Survey No. 2: Record actual bottom of excavation points and horizontal limits prior to beginning fill and backfill operations. Calculate excavated volumes of work performed.
- 6. Survey No. 3: Provide spot elevations to show physical features, breaks, and grade (as determined by the Contractor) following backfilling. Both vertical and horizontal control of structures shall be included.
- 7. The following are minimum standards of accuracy for the Work: Horizontal and vertical coordinates shall be accurate to within +/- 0.01 ft at each location.

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B. Survey Subcontractor's Responsibilities:

1. Provide competent employee(s), tools, stakes, and other equipment and materials required to:
  - a. Provide survey and measurements required to locate property boundaries.
  - b. Check and establish elevations of existing yard and drainage conditions prior to excavation.
  - c. Maintain complete accurate log of survey as it progresses.
  - d. Measurements of excavation for removed volume purposes.
  - e. Provide survey and measurement required to document positive drainage following site restoration.
  - f. Calculate excavation and backfill volume based on measurements for quality checks with Earthwork Subcontractor's calculated volumes.
2. Submit survey documentation, volume calculations and drawings upon completion of work for each property, within seven days of the survey.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**



**SECTION 01 31 19**  
**PROJECT MEETINGS**

**PART 1 GENERAL**

1.01 GENERAL

- A. Subcontractors shall participate in specified project meetings as required herein. The meetings include a pre-construction conference, scheduling meetings, residential preconstruction meetings, residential post-construction meetings, daily tailgate meetings, weekly progress meetings, other meetings that may be determined necessary during the construction period and final post-construction meeting.
- B. Contractor will schedule physical arrangements for meetings throughout progress of the Work, prepare meeting agenda with regular participant input and distribute with written notice of each meeting, preside at meetings, record notes to include significant proceedings and decisions, and reproduce and distribute copies of notes within 5 days after each meeting to participants and parties affected by meeting decisions.

1.02 PRECONSTRUCTION CONFERENCE

- A. Subcontractor shall attend a one-time mandatory preconstruction conference, which will be in Minneapolis, Minnesota prior to mobilization. The exact date and time will be determined at the time of Contract Award. Subcontractor shall be prepared to discuss the following subjects, as a minimum:
  - 1. Required schedules.
  - 2. Status of Bonds and insurance.
  - 3. Sequencing of critical path Work items.
  - 4. Progress payment procedures.
  - 5. Project changes and clarification procedures.
  - 6. Use of Site, access, office and storage areas, security and temporary facilities.
  - 7. Subcontractor's health and safety plan and representative.
  - 8. Status of permits, license or required approvals.
  - 9. Status of submittals.
  - 10. Maintaining required records.
  - 11. Job Hazard Analysis.
  - 12. Subcontractor Key Personnel Information and Points of Contact for 24 hours per day, 7 days per week.
  - 13. Subcontractor Quality Assurance/Quality Control Plan.

B. Attendees will include:

1. Owner's representatives.
2. Minnesota Department of Agriculture (MDA) representatives.
3. Subcontractor's project manager.
4. Subcontractor's resident superintendent.
5. Subcontractor's quality control representative.
6. Subcontractors' representatives whom Subcontractor may desire or Contractor may request to attend.
7. Contractor's representatives.
8. Others as appropriate.

1.03 PRELIMINARY SCHEDULE REVIEW MEETING

- A. Schedule: A preliminary schedule review meeting will be conducted at the time of the Preconstruction Conference. The Work is funded under the American Recovery and Reinvestment Act (ARRA). As a result, a minimum of 70 percent of the Work must be completed by March 2011. To meet this requirement, the remedial action must be completed at 340 residential properties by the end of the 2010 construction season. The overall goal of the project is to complete excavation, backfill, and restoration activities at 487 residential properties on or before December 31, 2011. The Subcontractor shall immediately notify Contractor of any changes to required work hours to achieve the milestone schedule durations for performing each activity. Extended work hours or different work hours shall be coordinated with and approved by Contractor.

1.04 RESIDENTIAL PRECONSTRUCTION MEETINGS

- A. An initial Residential Preconstruction meeting will be conducted with the Property Owners several weeks before mobilization to the property to discuss schedule, access, remediation, removals, restoration, and security. During the preconstruction meeting a copy of the construction drawings will be provided. Contractor will coordinate and lead the meetings with the Property Owners and if possible, the residents, and Earthwork Subcontractor. Meetings may be scheduled outside of normal working hours and on weekends to accommodate the Property Owners' schedules. All parties will be required at all meetings until details are concluded. Details will include video/photo documentation of preconstruction conditions, an inventory of property that will require relocation, determination of presence of plants including trees, shrubs and perennials within the excavation area for later identification by the Landscaping Subcontractor, and mark-up of construction drawings for current property features.

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- B. A second Preconstruction Meeting shall be performed within approximately 1 week of mobilization to the property. The Contractor and Earthwork Subcontractor will meet with the Property Owner and Resident, if necessary, at the property to confirm the sketch, made during the first site visit and converted into AutoCAD or a similar format. The property inventory list will also be confirmed and the current Property Owner will be given a copy of the photo documentation taken during the initial Preconstruction Meeting. The plant inventory prepared as necessary by the Landscaping Subcontractor after the initial Preconstruction Meeting will be confirmed with the Property Owner. At the conclusion of the second Residential Preconstruction Meeting, the Property Owner, the Contractor, and the Earthwork Subcontractor will all sign the access agreement and the final sketch authorizing the Work to be performed at that property.

1.05 DAILY TAILGATE MEETINGS

- A. Daily tailgate meetings shall be conducted every workday morning at 7 a.m. Central time with Contractor. Attendees required for this meeting will be determined at the pre-construction meeting. The designated personnel (including lower-tier Subcontractors) shall attend these meetings. Documentation of the meeting shall be provided to Contractor by 10 a.m. that same day.
- B. Daily tailgate meetings shall discuss the following subjects, as a minimum:
  - 1. The work planned for the day.
  - 2. Changes in work assignment.
  - 3. Health and safety issues.
  - 4. Quality issues.
  - 5. Review problems encountered the previous day.
  - 6. Review and sign the AHA prior to beginning any Work onsite.

1.06 WEEKLY PROGRESS MEETINGS

- A. Subcontractor shall attend regular progress meetings at the site, conducted weekly to review construction progress, progress schedule, sample collection and submissions schedule, contract modifications, and other matters that require discussion and resolution.

1.07 RESIDENTIAL POST CONSTRUCTION MEETING

- A. Residential Post-Construction meetings will be conducted with Property Owners and if possible, the Residents following completion of restoration to review acceptability of completed Work and to develop punch list items as required. During the meeting a copy of the edited survey notes and

construction drawings will be reviewed showing information gathered during the Residential Preconstruction Meeting. Contractor will coordinate and lead the meetings with the Property Owner, Earthwork Subcontractor and Landscaping Subcontractor in attendance at the property address. Meetings may be scheduled outside of normal Working hours and on weekends to accommodate the Property Owner and Resident's schedule.

- B. The subcontractor(s) will correct the items on each punch list within 7 work days of receipt of the punch list. After the completion of the punch list items, an EPA representative and the Contractor will meet with the Property Owner to perform a final inspection. Final inspections will be scheduled on predetermined days each month during construction to coordinate multiple final inspections at a time. The restored Work will be documented by the Contractor using photographs and video. The property owner and resident, if applicable, will also be asked to evaluate the performance of the subcontractors. Upon acceptance of the Work, all parties will provide their signature to the Property Owner Agreement signing off that the work is complete. If the Property Owner is unwilling to sign off at this time, they will be required to sign off at the end of the 1-year warranty period.

#### 1.08 PROJECT POST-CONSTRUCTION MEETING

- A. Subcontractor shall attend a mandatory post-construction meeting, which will be scheduled after completion of field activities but prior to Subcontractor demobilization. The purpose of this final inspection/meeting is to close out any punchlist items, discuss schedule for demobilization, and delivery of all required deliverables.

#### 1.09 COMMUNITY RELATIONS MEETINGS

- A. One public meeting will occur before mobilization begins. Up to two (2) public meetings will be held during each construction season to present progress made. Public meetings will be held within the boundaries of the South Minneapolis site when possible.
  - 1. Contractor will arrange for meeting venue.
  - 2. Contractor will advertise for meetings.
  - 3. Contractor will prepare meeting materials.

#### 1.10 OTHER MEETINGS

- A. In accordance with Contract Documents and as may be required by Owner and Contractor.

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**PART 2      PRODUCTS (NOT USED)**

**PART 3      EXECUTION (NOT USED)**

**END OF SECTION**



**SECTION 01 32 00**  
**CONSTRUCTION PROGRESS DOCUMENTATION**

**PART 1 GENERAL**

1.01 SUBMITTALS

A. Informational Submittals:

1. A Preliminary Progress Schedule shall be submitted with the Subcontractor's proposal.
2. Detailed Progress Schedule:
  - a. Submit at least 5 days prior to preconstruction conference.
  - b. Submit an Updated Progress Schedule at each update, in accordance with Article Detailed Progress Schedule.
3. Submit with Each Progress Schedule Submission:
  - a. Subcontractor's certification that Progress Schedule submission is actual schedule being utilized for execution of the Work.
  - b. Disk file compatible with Microsoft Office Project 2003, unless otherwise approved by Contractor.
  - c. Progress Schedule: 3 legible copies.
  - d. Narrative Progress Report: Same number of copies as specified for Progress Schedule.
  - e. Progress Quantity Chart(s).
4. Prior to final payment, submit a final Updated Progress Schedule.

1.02 SCHEDULE COORDINATION

- A. Project is divided into multiple subcontracts with each contract awarded separately. The Contractor will develop and maintain a master Progress Schedule utilizing individual Progress Schedules prepared by each Subcontractor as submitted to the Contractor under this section.
- B. The construction schedule will be reviewed during the weekly progress meetings.
- C. Where Subcontractor is referred to in the singular, it shall refer to each of the separate Subcontractor as applicable.

1.03 PRELIMINARY PROGRESS SCHEDULE

- A. The schedule shall show major Work activities, beginning with Notice to Proceed. The major Work activities will include project coordination,

mobilization, remediation at each property and other activities through Final Completion.

- B. Show activities including, but not limited to the following:
  - 1. Notice to Proceed.
  - 2. Permits.
  - 3. Preconstruction Conference.
  - 4. Project Mobilization Activities.
  - 5. Residential Preconstruction Meetings.
  - 6. Specified Work Sequences and Construction Constraints.
  - 7. Contract Milestone and Completion Dates.
  - 8. Residential Post Construction Meetings.
  - 9. Project Close-out Summary.
  - 10. Demobilization Summary.
- C. The Preliminary Progress Schedule shall show Work approach, sequences and constraints. This schedule data will be used by the Subcontractor in preparation of the Detailed Progress Schedule.
- D. Format: In accordance with Article Progress Schedule—Critical Path Network.

#### 1.04 DETAILED PROGRESS SCHEDULE

- A. Five (5) days prior to the Preconstruction Conference, submit Detailed Progress Schedule beginning with Notice to Proceed and continuing through Final Completion.
- B. Show the duration and sequences of activities required for complete performance of the Work reflecting means and methods chosen by Subcontractor.
- C. When accepted by Contractor, Detailed Progress Schedule will replace Preliminary Progress Schedule and become Baseline Schedule. Subsequent revisions will be considered as Updated Progress Schedules.
- D. Format: In accordance with Article Progress Schedule—Critical Path Network.
- E. Update every 2 weeks to reflect actual progress and occurrences to date, including weather delays.

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1.05 PROGRESS SCHEDULE—CRITICAL PATH NETWORK

- A. General: Comprehensive computer-generated schedule using CPM, generally as outlined in Associated General Subcontractors of America (AGC) 580, “Construction Project Planning and Scheduling Guidelines.” If a conflict occurs between the AGC publication and this Specification, this Specification shall govern.
- B. Contents:
1. Schedule shall begin with the date of Notice to Proceed and conclude with the date of Final Completion.
  2. Identify Work calendar basis using days as a unit of measure.
  3. Show complete interdependence and sequence of construction and Project-related activities reasonably required to complete the Work.
  4. Identify the Work of separate stages and other logically grouped activities, and clearly identify critical path of activities.
  5. Reflect sequences of the Work, restraints, delivery windows, review times, Contract Times and Project Milestones set forth in the Agreement and this section.
  6. Include as applicable, at a minimum:
    - a. Obtaining permits, submittals for early product procurement, and long lead time items.
    - b. Mobilization and other preliminary activities.
    - c. Residential Preconstruction, Residential Construction, and Post Construction meetings.
    - d. Specified Work sequences, constraints, and Milestones, including Substantial Completion date(s) Subcontract Work.
    - e. Remediation activities.
    - f. Landscape Work and plantings.
    - g. Maintenance.
    - h. Project closeout and cleanup.
    - i. Demobilization.
  7. No activity duration, exclusive of those for permitting, mobilization, maintenance and demobilization, shall be more than 7 days, unless otherwise approved.
- C. Network Graphical Display:
1. Color print on 11x17 paper.
  2. Title Block: Show name of Project, Owner, date submitted, revision or update number, and the name of the scheduler. Updated schedules shall indicate data date.

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3. Identify horizontally across top of schedule the time frame by year, month, and day.
4. Identify each activity with a unique number and a brief description of the Work associated with that activity.
5. Indicate the critical path.
6. Show, at a minimum, the controlling relationships between activities.
7. Plot activities on a time-scaled basis, with the length of each activity proportional to the current estimate of the duration.
8. Plot activities on an early start basis unless otherwise requested by Contractor.
9. Provide a legend to describe standard and special symbols used.

D. Schedule Report:

1. On 8-1/2-inch by 11-inch white paper, unless otherwise approved.
2. List information for each activity in tabular format, including at a minimum:
  - a. Activity Identification Number.
  - b. Activity Description.
  - c. Original Duration.
  - d. Remaining Duration.
  - e. Early Start Date (Actual start on Updated Progress Schedules).
  - f. Early Finish Date (Actual finish on Updated Progress Schedules).
  - g. Late Start Date.
  - h. Late Finish Date.
  - i. Total Float.
3. Sort reports, in ascending order, as listed below:
  - a. Activity number sequence with predecessor and successor activity.

1.06 PROGRESS OF THE WORK

A. Updated Progress Schedule shall reflect:

1. Progress of Work to within 5 working days prior to submission.
2. Approved changes in Work scope and activities modified since submission.
3. Delays in Submittals or resubmittals, deliveries, or Work.
4. Adjusted or modified sequences of Work.
5. Other identifiable changes.
6. Revised projections of progress and completion.
7. Report of changed logic.

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1.07 NARRATIVE PROGRESS REPORT

A. Format:

1. Organize same as Progress Schedule.
2. Identify, on a cover letter, reporting period, date submitted, and name of author of report.

B. Contents:

1. Number of days worked over the period, work force on hand, construction equipment on hand (including utility vehicles such as pickup trucks, maintenance vehicles, stake trucks).
2. General progress of Work, including a listing of activities started and completed over the reporting period, mobilization/demobilization of Subcontractors, and major milestones achieved.
3. Subcontractor's plan for management of Site (e.g., lay down and staging areas, construction traffic), utilization of construction equipment, buildup of trade labor, and identification of potential Contract changes.
4. Identification of new activities and sequences as a result of executed Contract changes.
5. Documentation of weather conditions over the reporting period, and any resulting impacts to the Work.
6. Description of actual or potential delays, including related causes, and the steps taken or anticipated to mitigate their impact.
7. Changes to activity logic.
8. Changes to the critical path.
9. Identification of, and accompanying reason for, any activities added or deleted since the last report.
10. Steps taken to recover the schedule from Subcontractor-caused delays.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**



**SECTION 01 33 00**  
**SUBMITTAL PROCEDURES**

**PART 1 GENERAL**

1.01 DEFINITIONS

- A. Action Submittal: Written and graphic information submitted by Subcontractor that requires Contractor's approval.
- B. Informational Submittal: Information submitted by Subcontractor that does not require Contractor's approval.

1.02 PROCEDURES

- A. Direct submittals to Contractor at the following address, unless specified otherwise.
  - 1. To be determined and provided during the preconstruction meeting.
- B. Transmittal of Submittal:
  - 1. Subcontractor shall:
    - a. Review each submittal and check for compliance with Contract Documents.
    - b. Stamp each submittal with uniform approval stamp before submitting to Contractor.
      - 1) Stamp to include Project name, submittal number, Specification number, Subcontractor's reviewer name, date of Subcontractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with Contract Documents.
      - 2) Contractor will not review submittals that do not bear Subcontractor's approval stamp and will return them without action.
  - 2. Complete, sign, and transmit with each submittal package, one Transmittal of Subcontractor's Submittal form attached at end of this section.
  - 3. Identify each submittal with the following:
    - a. Numbering and Tracking System:
      - 1) Sequentially number each submittal.
      - 2) Resubmission of submittal shall have original number with sequential alphabetic suffix.

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- b. Specification section and paragraph to which submittal applies.
  - c. Date of transmittal.
  - d. Names of Contractor, Subcontractor or Supplier, and manufacturer as appropriate.
4. Identify and describe each deviation or variation from Contract Documents.
- C. Resubmittals: Clearly identify each correction or change made.
- D. Incomplete Submittals: Engineer will return entire submittal for Subcontractor's revision if preliminary review deems it incomplete.

1.03 ACTION SUBMITTALS

- A. Prepare and submit Action Submittals required by individual Specification sections.
- B. Shop Drawings:
- 1. Copies: 1 hardcopy unless requested otherwise by the Contractor, and one reproducible electronic copy on CD, except copyrighted documents.
  - 2. Identify and Indicate:
    - a. Critical field dimensions and relationships to other critical features of Work. Note dimensions established by field measurement.
    - b. Project-specific information drawn accurately to scale.
  - 3. Product Data: Provide as specified in individual Specifications.
- C. Samples:
- 1. Copies: One, unless otherwise specified in individual Specifications.
  - 2. Preparation: Mount, display, or package Samples in manner specified to facilitate review of quality. Attach label on unexposed side that includes the following:
    - a. Manufacturer name.
    - b. Model number.
    - c. Material.
    - d. Sample source.

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- D. Action Submittal Dispositions: Contractor will review, mark, and stamp as appropriate, and distribute marked-up copies as noted:
1. Approved:
    - a. Subcontractor may incorporate product(s) or implement Work covered by submittal.
    - b. Distribution:
      - 1) One copy retained in Contractor's file.
      - 2) Remaining copies returned to Subcontractor appropriately annotated.
  2. Approved as Noted:
    - a. Subcontractor may incorporate product(s) or implement Work covered by submittal, in accordance with Contractor's notations.
    - b. Distribution:
      - 1) One copy retained in Contractor's file.
      - 2) Remaining copies returned to Subcontractor appropriately annotated.
  3. Partial Approval, Resubmit as Noted:
    - a. Make corrections or obtain missing portions, and resubmit.
    - b. Except for portions indicated, Subcontractor may begin to incorporate product(s) or implement Work covered by submittal, in accordance with Contractor's notations.
    - c. Distribution:
      - 1) One copy retained in Contractor's file.
      - 2) Remaining copies returned to Subcontractor appropriately annotated.
  4. Revise and Resubmit:
    - a. Subcontractor may not incorporate product(s) or implement Work covered by submittal.
    - b. Distribution:
      - 1) One copy retained in Contractor's file.
      - 2) Remaining copies returned to Subcontractor appropriately annotated.

1.04 INFORMATIONAL SUBMITTALS

- A. General:
1. Copies: Submit three copies, unless otherwise indicated in individual Specification section.
  2. Refer to individual Specification sections for specific submittal requirements.
  3. Contractor will review each submittal. If submittal meets conditions of the Contract, Contractor will forward copies to appropriate parties. If

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Contractor determines submittal does not meet conditions of the Contract and is therefore considered unacceptable, Contractor will retain one copy and return remaining copies with review comments to Subcontractor, and require that submittal be corrected and resubmitted.

- B. Application for Payment: In accordance with Section 01 29 00, Payment Procedures.
- C. Certificates:
  - 1. General:
    - a. Provide notarized statement that includes signature of entity responsible for preparing certification.
    - b. Signed by officer or other individual authorized to sign documents on behalf of that entity.
  - 2. Installer: Prepare written statements on manufacturer's letterhead certifying that installer complies with requirements as specified in individual Specification sections.
  - 3. Material Test: Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
  - 4. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by Laws and Regulations or governing agency or specified in individual Specification sections.
- D. Contract Closeout Submittals: In accordance with Section 01 77 00, Closeout Procedures by the Subcontractor.
- E. Contractor-Design Data:
  - 1. List of assumptions.
  - 2. List of performance and design criteria.
  - 3. Calculations.
  - 4. List of applicable codes and regulations.
  - 5. Information requested in individual Specification section.
- F. Manufacturer's Instructions: Written or published information that documents manufacturer's recommendations, guidelines, and procedures in accordance with individual Specification sections.
- G. Operation and Maintenance Data: As required in Section 32 93 00, Trees, Shrubs and Perennials and 32 92 00, Turf and Grasses.

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H. Schedules:

1. Schedule of Submittals: Prepare separately or in combination with Progress Schedule as specified in Section 01 32 00, Construction Progress Documentation.
  - a. Show for each, at a minimum, the following:
    - 1) Specification section number.
    - 2) Identification by numbering and tracking system as specified under Paragraph Transmittal of Submittal.
    - 3) Estimated date of submission to Contractor, including reviewing and processing time.
  - b. On a monthly basis, submit updated schedule to Contractor if changes have occurred or resubmittals are required.
2. Schedule of Values: In accordance with Section 01 29 00, Payment Procedures.
3. Schedule of Estimated Progress Payments: In accordance with Section 01 29 00, Payment Procedures.
4. Progress Schedules: In accordance with Section 1 32 00, Construction Progress Documentation.

I. Special Guarantee: Supplier's written guarantee as required in individual Specification sections.

J. Submittals Required by Laws, Regulations, and Governing Agencies:

1. Submit promptly notifications, reports, certifications, payrolls, and otherwise as may be required, directly to the applicable federal, state, or local governing agency or their representative.
2. Transmit to Contractor for their records one copy of correspondence and transmittals (to include enclosures and attachments) between Contractor and governing agency.

K. Test and Inspection Reports:

1. General: Shall contain signature of person responsible for test or report.
2. Field: As a minimum, include the following:
  - a. Project title and number.
  - b. Date and time.
  - c. Record of temperature and weather conditions.
  - d. Identification of product and Specification section.
  - e. Type and location of test, Sample, or inspection, including referenced standard or code.
  - f. Date issued, testing laboratory name, address, and telephone number, and name and signature of laboratory inspector.

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- g. If test or inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.
- h. Provide interpretation of test results, when requested by Contractor.
- i. Other items as identified in individual Specification sections.

L. Training Data: In accordance with Section 01 11 00, Scope of Work.

1.05 SUPPLEMENTS

A. The supplements listed below, following “End of Section”, are part of this Specification.

- 1. Forms: Transmittal of Subcontractor’s Submittal.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**

**TRANSMITTAL OF CONTRACTOR'S SUBMITTAL**  
(ATTACH TO EACH SUBMITTAL)

DATE: \_\_\_\_\_

**TO:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Submittal No.: \_\_\_\_\_

New Submittal       Resubmittal

Project: \_\_\_\_\_

Project No.: \_\_\_\_\_

Specification Section No.: \_\_\_\_\_

**(Cover only one section with each transmittal)**

Schedule Date of Submittal: \_\_\_\_\_

**FROM:** \_\_\_\_\_  
 Contractor

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**SUBMITTAL TYPE:**     Shop Drawing                       Sample                       Informational

**The following items are hereby submitted:**

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Spec. and Para. No.	Drawing or Brochure Number	Contains Variation to Contract	
				No	Yes

Contractor hereby certifies that (i) Contractor has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies.

By: \_\_\_\_\_  
 Contractor (Authorized Signature)



**SECTION 01 42 13**  
**ABBREVIATIONS AND ACRONYMS**

**PART 1 GENERAL**

1.01 REFERENCE TO STANDARDS AND SPECIFICATIONS OF TECHNICAL SOCIETIES

- A. Reference to standards and specifications of technical societies and reporting and resolving discrepancies associated therewith shall be as provided in Article 3 of the General Conditions, and as may otherwise be required herein and in the individual Specification sections.
- B. Work specified by reference to published standard or specification of government agency, technical association, trade association, professional society or institute, testing agency, or other organization shall meet requirements or surpass minimum standards of quality for materials and workmanship established by designated standard or specification.
- C. Where so specified, products or workmanship shall also meet or exceed additional prescriptive or performance requirements included within Contract Documents to establish a higher or more stringent standard of quality than required by referenced standard.
- D. Where two or more standards are specified to establish quality, product and workmanship shall meet or exceed requirements of most stringent.
- E. Where both a standard and a brand name are specified for a product in Contract Documents, proprietary product named shall meet or exceed requirements of specified reference standard.
- F. Copies of standards and specifications of technical societies:
  - 1. Copies of applicable referenced standards have not been bound in these Contract Documents.
  - 2. Where copies of standards are needed by Contractor, obtain a copy or copies directly from publication source and maintain in an orderly manner at the Site as Work Site records, available to Contractor's personnel, Subcontractors, Owner, and Engineer.

1.02 ABBREVIATIONS

- A. Abbreviations for trade organizations and government agencies: Following is a list of construction industry organizations and government agencies to

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which references may be made in the Contract Documents, with abbreviations used.

1.	AA	Aluminum Association
2.	AABC	Associated Air Balance Council
3.	AAMA	American Architectural Manufacturers Association
4.	AASHTO	American Association of State Highway and Transportation Officials
5.	ABMA	American Bearing Manufacturers' Association
6.	ACI	American Concrete Institute
7.	AEIC	Association of Edison Illuminating Companies
8.	AGA	American Gas Association
9.	AGMA	American Gear Manufacturers' Association
10.	AI	Asphalt Institute
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AITC	American Institute of Timber Construction
14.	ALS	American Lumber Standards
15.	AMCA	Air Movement and Control Association
16.	ANSI	American National Standards Institute
17.	APA	APA – The Engineered Wood Association
18.	API	American Petroleum Institute
19.	APWA	American Public Works Association
20.	AHRI	Air-Conditioning, Heating, and Refrigeration Institute
21.	ASA	Acoustical Society of America
22.	ASABE	American Society of Agricultural and Biological Engineers
23.	ASCE	American Society of Civil Engineers
24.	ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
25.	ASME	American Society of Mechanical Engineers
26.	ASNT	American Society for Nondestructive Testing
27.	ASSE	American Society of Sanitary Engineering
28.	ASTM	ASTM International
29.	AWI	Architectural Woodwork Institute
30.	AWPA	American Wood Preservers' Association
31.	AWPI	American Wood Preservers' Institute
32.	AWS	American Welding Society
33.	AWWA	American Water Works Association
34.	BHMA	Builders Hardware Manufacturers' Association
35.	CBM	Certified Ballast Manufacturer

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36.	CDA	Copper Development Association
37.	CGA	Compressed Gas Association
38.	CISPI	Cast Iron Soil Pipe Institute
39.	CMAA	Crane Manufacturers' Association of America
40.	CRSI	Concrete Reinforcing Steel Institute
41.	CS	Commercial Standard
42.	CSA	Canadian Standards Association
43.	CSI	Construction Specifications Institute
44.	DIN	Deutsches Institut für Normung e.V.
45.	DIPRA	Ductile Iron Pipe Research Association
46.	EIA	Electronic Industries Alliance
47.	EJCDC	Engineers Joint Contract Documents' Committee
48.	ETL	Electrical Test Laboratories
49.	FAA	Federal Aviation Administration
50.	FCC	Federal Communications Commission
51.	FDA	Food and Drug Administration
52.	FEMA	Federal Emergency Management Agency
53.	FIPS	Federal Information Processing Standards
54.	FM	FM Global
55.	Fed. Spec.	Federal Specifications (FAA Specifications)
56.	FS	Federal Specifications and Standards (Technical Specifications)
57.	GA	Gypsum Association
58.	GANA	Glass Association of North America
59.	HI	Hydraulic Institute
60.	HMI	Hoist Manufacturers' Institute
61.	IBC	International Building Code
62.	ICBO	International Conference of Building Officials
63.	ICC	International Code Council
64.	ICEA	Insulated Cable Engineers' Association
65.	IFC	International Fire Code
66.	IEEE	Institute of Electrical and Electronics Engineers, Inc.
67.	IESNA	Illuminating Engineering Society of North America
68.	IFI	Industrial Fasteners Institute
69.	IGMA	Insulating Glass Manufacturer's Alliance
70.	IMC	International Mechanical Code
71.	INDA	Association of the Nonwoven Fabrics Industry
72.	IPC	International Plumbing Code
73.	ISA	Instrumentation, Systems, and Automation Society

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74.	ISO	International Organization for Standardization
75.	ITL	Independent Testing Laboratory
76.	JIC	Joint Industry Conferences of Hydraulic Manufacturers
77.	MIA	Marble Institute of America
78.	MIL	Military Specifications
79.	MMA	Monorail Manufacturers' Association
80.	MSS	Manufacturer's Standardization Society
81.	NAAMM	National Association of Architectural Metal Manufacturers
82.	NACE	NACE International
83.	NBGQA	National Building Granite Quarries Association
84.	NEBB	National Environmental Balancing Bureau
85.	NEC	National Electrical Code
86.	NECA	National Electrical Contractor's Association
87.	NEMA	National Electrical Manufacturers' Association
88.	NESC	National Electrical Safety Code
89.	NETA	InterNational Electrical Testing Association
90.	NFPA	National Fire Protection Association
91.	NHLA	National Hardwood Lumber Association
92.	NICET	National Institute for Certification in Engineering Technologies
93.	NIST	National Institute of Standards and Technology
94.	NRCA	National Roofing Contractors Association
95.	NRTL	Nationally Recognized Testing Laboratories
96.	NSF	NSF International
97.	NSPE	National Society of Professional Engineers
98.	NTMA	National Terrazzo and Mosaic Association
99.	NWWDA	National Wood Window and Door Association
100.	OSHA	Occupational Safety and Health Act (both Federal and State)
101.	PCI	Precast/Prestressed Concrete Institute
102.	PEI	Porcelain Enamel Institute
103.	PPI	Plastic Pipe Institute
104.	PS	Product Standards Section-U.S. Department of Commerce
105.	RMA	Rubber Manufacturers' Association
106.	RUS	Rural Utilities Service
107.	SAE	Society of Automotive Engineers
108.	SDI	Steel Deck Institute
109.	SDI	Steel Door Institute
110.	SJI	Steel Joist Institute

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111. SMACNA	Sheet Metal and Air Conditioning Contractors National Association
112. SPI	Society of the Plastics Industry
113. SSPC	The Society for Protective Coatings
114. STI/SPFA	Steel Tank Institute/Steel Plate Fabricators Association
115. SWI	Steel Window Institute
116. TEMA	Tubular Exchanger Manufacturers' Association
117. TCA	Tile Council of North America
118. TIA	Telecommunications Industry Association
119. UBC	Uniform Building Code
120. UFC	Uniform Fire Code
121. UL	Underwriters Laboratories Inc.
122. UMC	Uniform Mechanical Code
123. USBR	U.S. Bureau of Reclamation
124. WCLIB	West Coast Lumber Inspection Bureau
125. WI	Wood Institute
126. WWPA	Western Wood Products Association

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF SECTION**



**SECTION 01 45 16.13**  
**SUBCONTRACTOR QUALITY CONTROL**

**PART 1 GENERAL**

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this Section:

1. ASTM International (ASTM):
  - a. D3740, Evaluation of Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
  - b. E329, Use in the Evaluation of Testing and Inspection Agencies as Used in Construction.

1.02 DEFINITIONS

A. Contractor Quality Control (CQC): The means by which Subcontractor ensures that the construction complies with the requirements of the Contract.

1.03 SUBMITTALS

A. Informational Submittals:

1. CQC Report Format.
2. CQC Plan: Submit, not later than 30 days after receipt of Notice to Proceed.
3. CQC Report: Submit a daily signed electronic document within 24 hours.

1.04 CONTRACTOR'S QUALITY ASSURANCE

A. All Work is subject to Contractor's quality assurance inspection and testing at all locations and at all reasonable times before acceptance to ensure strict compliance with the terms of the Contract Documents.

B. Contractor's quality assurance inspections and tests are for the sole benefit of Contractor and do not:

1. Relieve Subcontractor of responsibility for providing adequate quality control measures;
2. Relieve Subcontractor of responsibility for damage to or loss of the material before acceptance;
3. Constitute or imply acceptance; or

- 4. Affect the continuing rights of Contractor after acceptance of the completed Work.
- C. The presence or absence of a quality assurance inspector does not relieve Subcontractor from any Contract requirement.
- D. Promptly furnish all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by Contractor.
- E. Contractor may charge Subcontractor for any additional cost of inspection or test when Work is not ready at the time specified by Subcontractor for inspection or test, or when prior rejection makes re-inspection or retest necessary. Quality assurance inspections and tests will be performed in a manner that will not unnecessarily delay the Work.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION**

3.01 GENERAL

- A. Maintain an adequate inspection system and perform such inspections as will ensure that the Work conforms to the Contract Documents.
- B. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product that complies with the Contract Documents. The system shall cover all excavation and restoration, operations, both onsite and offsite, including Work by subcontractors, fabricators, suppliers and purchasing agents, and shall be keyed to the proposed construction sequence.

3.02 COORDINATION MEETING

- A. After the Preconstruction Conference, but before start of construction, and prior to acceptance of the CQC Plan, schedule a meeting with Contractor and Owner to discuss the quality control system.
- B. Develop a mutual understanding of the system details, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite Work, and the interrelationship of Contractor's management and control with the Owner's Quality Assurance.

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- C. There may be occasions when subsequent conferences may be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures that may require corrective action by Subcontractor.

3.03 QUALITY CONTROL ORGANIZATION

A. CQC System Manager:

1. Designate an individual within Subcontractor's organization who will be responsible for overall management of CQC and have the authority to act in CQC matters for the Subcontractor.
2. CQC System Manager may perform other duties on the Project.
3. CQC System Manager shall be an experienced construction person, with a minimum of 3 years construction experience on similar type Work.
4. CQC System Manager shall report to the Subcontractor's project manager or someone higher in the organization. Project manager in this context shall mean the individual with responsibility for the overall quality and production management of the Project.
5. CQC System Manager shall be onsite during construction; periods of absence may not exceed 2 weeks at any one time.
6. Identify an alternate for CQC System Manager to serve with full authority during the System Manager's absence. The requirements for the alternate will be the same as for designated CQC System Manager.

B. CQC Staff:

1. Designate a CQC staff, available at the Site at all times during progress, with complete authority to take any action necessary to ensure compliance with the Contract. CQC staff members shall be subject to acceptance by Contractor.
2. CQC staff shall take direction from CQC System Manager in matters pertaining to QC.
3. CQC staff must be of sufficient size to ensure adequate QC coverage of Work phases, work shifts, and work crews involved in the construction. These personnel may perform other duties, but must be fully qualified by experience and technical training to perform their assigned QC responsibilities and must be allowed sufficient time to carry out these responsibilities.
4. The actual strength of the CQC staff may vary during any specific Work period to cover the needs of the Project. Add additional staff when necessary for a proper CQC organization.

- C. Organizational Changes: Obtain Contractor's acceptance before replacing any member of the CQC staff. Requests for changes shall include name, qualifications, duties, and responsibilities of the proposed replacement.

### 3.04 QUALITY CONTROL PHASING

- A. CQC shall include at least three phases of control to be conducted by CQC System Manager for all definable features of Work, as follows:
  - 1. Preparatory Phase:
    - a. Notify Contractor at least 48 hours in advance of beginning any of the required action of the preparatory phase.
    - b. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The CQC System Manager shall instruct applicable CQC staff as to the acceptable level of workmanship required in order to meet Contract requirements.
    - c. Document the results of the preparatory phase meeting by separate minutes prepared by the CQC System Manager and attached to the QC report.
    - d. Perform prior to beginning Work on each definable feature of Work:
      - 1) Review applicable Contract Specifications.
      - 2) Review applicable Contract Drawings.
      - 3) Verify that all materials and/or equipment have been tested, submitted, and approved.
      - 4) Verify that provisions have been made to provide required control inspection and testing.
      - 5) Examine the Work area to verify that all required preliminary Work has been completed and is in compliance with the Contract.
      - 6) Perform a physical examination of required materials, equipment, and sample Work to verify that they are on hand, conform to approved Shop Drawing or submitted data, and are properly stored.
      - 7) Review the appropriate activity hazard analysis to verify safety requirements are met.
      - 8) Review procedures for constructing the Work, including repetitive deficiencies.
      - 9) Document construction tolerances and workmanship standards for that phase of the Work.
      - 10) Check to verify that the plan for the Work to be performed, if so required, has been accepted by Contractor.

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2. Initial Phase:
  - a. Accomplish at the beginning of a definable feature of Work:
    - 1) Notify Contractor at least 48 hours in advance of beginning the initial phase.
    - 2) Perform prior to beginning Work on each definable feature of Work:
      - a) Review minutes of the preparatory meeting.
      - b) Check preliminary Work to verify compliance with Contract requirements.
      - c) Verify required control inspection and testing.
      - d) Establish level of workmanship and verify that it meets minimum acceptable workmanship standards.
      - e) Resolve all differences.
      - f) Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
    - 3) Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the QC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.
    - 4) The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.
3. Follow-up Phase:
  - a. Perform daily checks to verify continuing compliance with Contract requirements, including control testing, until completion of the particular feature of Work.
  - b. Daily checks shall be made a matter of record in the CQC documentation and shall document specific results of inspections for all features of Work for the day or shift.
  - c. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of Work that will be affected by the deficient Work. Constructing upon or concealing nonconforming Work will not be allowed.
4. Additional Preparatory and Initial Phases: Additional preparatory and initial phases may be conducted on the same definable features of Work as determined by Contractor if the quality of ongoing Work is unacceptable; or if there are changes in the applicable QC staff or in the onsite production supervision or work crew; or if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

3.05 CONTRACTOR QUALITY CONTROL PLAN

A. General:

1. Plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used.
2. An interim plan for the first 30 days of operation will be considered.
3. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of Work to be started.
4. Work outside of the features of Work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of Work to be started.

B. Content:

1. Plan shall cover the intended CQC organization for the entire Contract and shall include the following, as a minimum:
  - a. Organization: Description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff will implement the three-phase control system (see Section 3.04 QC Phasing) for all aspects of the Work specified.
  - b. CQC Staff: The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a QC function.
  - c. Letters of Authority: A copy of a letter to the CQC System Manager signed by an authorized official of the firm, describing the responsibilities and delegating sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop Work which is not in compliance with the Contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities and responsibilities. Copies of these letters will also be furnished to Owner.
  - d. Submittals: Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers and purchasing agents.
  - e. Testing: Control, verification and acceptance testing procedures for each specific test to include the test name, frequency, specification paragraph containing the test requirements, the personnel and laboratory responsible for each type of test, and an estimate of the number of tests required.

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- f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests, including documentation.
  - g. Procedures for tracking deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.
  - h. Reporting procedures, including proposed reporting formats; include a copy of the CQC report form.
- C. Acceptance of Plans: Acceptance of the Subcontractor's basic and addendum CQC plans is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. Contractor reserves the right to require Subcontractor to make changes in the CQC plan and operations including removal of personnel, as necessary, to obtain the quality specified.
- D. Notification of Changes: After acceptance of the CQC plan, Subcontractor shall notify Contractor, in writing, a minimum of 7 calendar days prior to any proposed change. Proposed changes are subject to acceptance by Contractor.

3.06 CONTRACTOR QUALITY CONTROL REPORT

- A. Prepare a CQC report daily for each day on site. Account for all days throughout the life of the Contract. Reports shall be signed and dated by CQC System Manager. Include copies of test reports and copies of reports prepared by QC staff.
- B. Maintain current records of quality control operations, activities, and tests performed, including the Work of subcontractors and suppliers.
- C. Records shall be on an acceptable form and shall be a complete description of inspections, the results of inspections, daily activities, tests, and other items, including, but not limited to, the following:
  - 1. Subcontractor and their areas of responsibility.
  - 2. Operating equipment with hours worked, idle, or down for repair.
  - 3. Work performed today, giving location, description, and by whom. When a network schedule is used, identify each phase of Work performed each day by activity number.
  - 4. Test and/or control activities performed with results and references to specifications/plan requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.
  - 5. Material received with statement as to its acceptability and storage.

6. Identify submittals reviewed, with Subcontract reference, by whom, and action taken.
7. Offsite surveillance activities, including actions taken.
8. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
9. List instructions given/received and conflicts in Drawings and/or Specifications.
10. Subcontractor's verification statement.
11. Indicate a description of trades working on the Project; the number of personnel working; weather conditions encountered; and any delays encountered.
12. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in file work and workmanship comply with the Subcontract.

### 3.07 SUBMITTAL QUALITY CONTROL

- A. Submittals shall be as specified in Section 01 33 00, Submittal Procedures. The CQC organization shall be responsible for certifying that all submittals are in compliance with the Contract requirements.

### 3.08 TESTING QUALITY CONTROL

- A. Testing Procedure:
  1. Perform tests specified or required to verify that control measures are adequate to provide a product which conforms to Contract requirements. Perform the following activities and record the following data:
    - a. Verify testing procedures comply with contract requirements.
    - b. Verify facilities and testing equipment are available and comply with testing standards.
    - c. Check test instrument calibration data against certified standards.
    - d. Verify recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
    - e. Documentation:
      - 1) Record results of all tests taken, both passing and failing, on the CQC report for the date taken.
      - 2) Include specification paragraph reference, location where tests were taken, and the sequential control number identifying the test.
      - 3) Actual test reports may be submitted later, if approved by Contractor, with a reference to the test number and date taken.

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- 4) Provide directly to Contractor an information copy of tests performed by an offsite or commercial test facility. Test results shall be signed by an engineer registered in the state where the tests are performed as applicable.
- 5) Failure to submit timely test reports, as stated, may result in nonpayment for related Work performed and disapproval of the test facility for this Contract.

B. Testing Laboratories: Laboratory facilities, including personnel and equipment, utilized for testing soils, concrete, asphalt and steel shall meet criteria detailed in ASTM D3740 and ASTM E329, and be accredited by the American Association of Laboratory Accreditation (AALA), National Institute of Standards and Technology (NIST), National Voluntary Laboratory Accreditation Program (NVLAP), the American Association of State Highway and Transportation Officials (AASHTO), or other approved national accreditation authority. Personnel performing concrete testing shall be certified by the American Concrete Institute (ACI).

3.09 COMPLETION INSPECTION

- A. CQC System Manager shall conduct an inspection of the Work at the completion of all Work or any milestone established by a completion time stated in the Contract.
- B. Punchlist:
  1. CQC System Manager shall develop a punchlist of items which do not conform to the Contract requirements.
  2. Include punchlist in the CQC report, indicating the estimated date by which the deficiencies will be corrected.
  3. CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected and so notify the Owner.
  4. These inspections and any deficiency corrections required will be accomplished within the time stated for completion of the entire Work or any particular increment thereof if the Project is divided into increments by separate completion dates.

**END OF SECTION**



**SECTION 01 50 00**  
**TEMPORARY FACILITIES AND CONTROLS**

**PART 1 GENERAL**

1.01 SUBMITTALS

A. Submittals by Earthwork Subcontractor:

1. Copies of permits and approvals for construction as required by Laws and Regulations and governing agencies.
2. Temporary Construction Submittals:
  - a. Subcontractor and Contractor's field office and staging area plans.
  - b. Fencing and protective barrier locations and details.
3. Temporary Control Submittals:
  - a. Stormwater Management Plan: Submit information outlining best management practices or measures to prevent stormwater contamination and respond to unexpected spills.
  - b. Environmental Control Plan: Submit information outlining measures to be taken for prevention of soil erosion, dust, noise and other environmental concerns.
  - c. Transportation Plan: Submit information for intended haul routes to and from the staging and storage area(s). Routes to and from the residential properties shall generally be shortest route available.
  - d. Traffic Control and Routing Plans: As specified herein, and proposed revisions thereto.
4. Excavation Water Submittals: Laboratory results as required and in accordance with applicable laws and regulations.

1.02 PROTECTION OF WORK AND PROPERTY

A. General:

1. Perform Work within right-of-way and easements in a systematic manner that minimizes inconvenience to property owners and the public.
2. No residence or business shall be cut off from vehicular traffic, unless special arrangements have been made and approved by the Contractor.
3. Maintain in continuous service all existing oil and gas pipelines, underground power, telephone or communication cable, water mains, irrigation lines, sewers, poles and overhead power, and all other utilities encountered along line of the Work, unless other arrangements

satisfactory to the Contractor and to owners of said utilities have been made.

4. Where completion of the Work requires temporary or permanent removal or relocation of existing utility, coordinate all activities with owner of said utility and perform all work to their satisfaction.
5. Protect, shore, brace, support, and maintain underground pipes, conduits, drains, and other underground utility construction uncovered or otherwise affected by construction operations.
6. Keep fire hydrants and water control valves free from obstruction and available for use at all times.
7. In areas where Earthwork Subcontractor's operations are adjacent to or near a utility, such as gas, telephone, television, electric power, water, sewer, or irrigation system, and such operations may cause damage or inconvenience, suspend operations until arrangements necessary for protection have been made by Earthwork Subcontractor.
8. Notify property owners and utility offices that may be affected by construction operation at least 2 days in advance. Before exposing a utility, obtain utility owner's permission. Should service of utility be interrupted due to Earthwork Subcontractor's operation, notify proper authority immediately. Cooperate with said authority in restoring service as promptly as possible and bear costs incurred.
9. Do not impair operation of existing sewer system. Prevent construction material, pavement, concrete, earth, volatile and corrosive wastes, and other debris from entering sewers, pump stations, or other sewer structures.
10. The Earthwork Subcontractor is responsible for repair or replacement of damage caused as a result of construction activities. This responsibility also includes secondary damage caused by the event.
11. Unless approved by Contractor, the Earthwork Subcontractor shall maintain original Site drainage.

### 1.03 VEHICULAR TRAFFIC

- A. Traffic Control Plan: Earthwork Subcontractor personnel shall adhere to approved traffic control plans prepared by the Subcontractor. Changes to this plan shall be made only by written approval of appropriate public authority and the Contractor. Earthwork Subcontractor shall secure approvals for necessary changes so as not to delay progress of the Work.
- B. Traffic Routing Plan: Earthwork Subcontractor shall show sequences of construction affecting use of roadways, time required for each phase of the Work, and phasing of operations to provide necessary access, and plans for signing, barricading, or other measures to provide passages for pedestrians and vehicles.

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1.04 TEMPORARY CONTROLS

- A. Earthwork Subcontractor shall provide safety and environmental controls during remediation-related construction activities to protect the public, workers, and environment and ensure that all work is performed in a manner that meets the intent of federal, state, and local environmental regulations.
- B. Earthwork Subcontractor shall install, and maintain temporary soil erosion and sediment control measures to prevent erosion during earthwork activities at residential properties. The work shall include the furnishing of all labor, materials, tools, and equipment to perform the work and services necessary as herein specified.
  - 1. Erosion control shall be performed in accordance with the Storm Water Management Plan.
  - 2. Soil erosion stabilization and sedimentation control may consist of construction of temporary erosion control such as inlet protection, silt fences, erosion bales, etc.
    - a. Inlet protection shall be installed at the nearest downgradient storm sewer inlet.
    - b. Silt fence shall be installed at excavation areas where slope is present greater than 1V:5H.
  - 3. Temporary soil erosion and sediment control measures at residential properties shall be removed by the Earthwork Subcontractor at the completion of the watering period or after a satisfactory 70 percent stand of grass is established. The Landscaping Subcontractor shall remove silt fence during hydroseeding and hydromulching activities.
- C. Landscaping Subcontractor shall install temporary soil erosion and sediment control measures at residential properties during and after hydroseeding. These erosion and sediment control measures may consist of the following elements:
  - 1. Tackifier and hydromulch.
  - 2. Erosion control blanket installed as specified after seeding. Erosion control blanket is required where the slope exceeds 1V:3H.
  - 3. The Landscaping Subcontractor shall remove silt fence, if present, during hydroseeding and hydromulching activities.

- D. Earthwork Subcontractor shall install, maintain, and remove temporary erosion and sediment control measures to prevent erosion at the staging area.
  - 1. Soil erosion stabilization and sedimentation control shall consist of the following elements:
    - a. Construction of temporary erosion control such as silt fences, erosion bales, etc.
    - b. Temporary Stockpile Covering: Placement and maintenance of reinforced black plastic covering over stockpiles.

## **PART 2 PRODUCTS**

### **2.01 TEMPORARY STOCKPILE COVERING**

- A. Material shall be reinforced black plastic, 6 mil minimum. Refer to Temporary Stockpile Covering (Detail 3125-140).

### **2.02 SILT FENCE**

- A. Fabric shall be minimum 15 mils thick, with a tensile strength of 120 pounds, and with an equivalent opening size of 170 (U.S. Standard Sieve).

### **2.03 STRAW MULCH/BALES**

- A. Threshed straw of oats, wheat, barley, or rye, free from seed of noxious weeds, or clean salt hay.

### **2.04 OTHER EROSION AND SEDIMENT CONTROL ITEMS**

- A. Products suggested by the Earthwork Subcontractor and approved by the Contractor to prevent erosion and control sediment.

### **2.05 HIGH-VISIBILITY FENCE**

- A. As specified in Section 31 23 16, Excavation.

### **2.06 BARRICADES AND LIGHTS**

- A. As required to perform Work.

### **2.07 SIGNS AND EQUIPMENT**

- A. As specified below and/or recommended by Subcontractor and approved by the Contractor.

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2.08 CONTRACTOR'S FIELD OFFICE

- A. Provide furnished office space as specified for the exclusive use of Contractor and Owner representatives.
- B. Ownership of equipment furnished under this article will remain, unless otherwise specified, that of Subcontractor.
- C. Equipment furnished shall be new or like new in appearance and function.
- D. Minimum Features:
  - 1. 110-volt light and wall plugs.
  - 2. Fluorescent ceiling lights.
  - 3. Electric heating and self-contained air conditioning unit, properly sized for location and conditions.
  - 4. Railed stairways and landings at entrances, if applicable.
  - 5. Exterior doors:
    - a. Number: Two
    - b. Type: Solid core.
    - c. Locks: Cylindrical, keyed alike with 6 sets of keys.
    - d. Floor Space: Minimum 720 square feet.
    - e. Minimum Layout: Two private offices, one storage room, and one common room.
  - 6. Private Offices: Two, each equipped as described below.
    - a. Two (2) 30 x 60 inch desks or equivalent built in desks.
    - b. Two (2) five castor base chairs with adjustable height, back, seat and arms.
    - c. Two (2) four drawer steel filing cabinets with lock.
    - d. One (1) bookshelf 36 inches wide by 48 inches tall.
    - e. One (1) phone and two (2) phone lines.
  - 7. Common Area: One, equipped as described below.
    - a. One (1) 30 x 60 inch desk.
    - b. One (1) five castor base chair with adjustable height, back, seat and arms.
    - c. Two (2) folding tables, 36 x 72 inches with 12 steel folding chairs.
    - d. One (1) four drawer steel filing cabinets with lock.
    - e. Copier/scanner/printer/fax:
      - 1) Document feed.
      - 2) Auto duplex.
      - 3) Stapler/sorter.
      - 4) Able to print 8-1/2 x11 and 11x17 black and white.
      - 5) To include all maintenance, repair and supplies.
    - f. Digital answering machine with 3 mailboxes.

- g. Wireless router
  - 1) Wireless-N.
  - 2) Minimum 4 ports.
  - 3) 64-/128-bit WEP (Wired Equivalent Privacy).
  - 4) WPA and WPA2 (Wi-Fi Protected Access).
  - 5) Network address translation (NAT) firewall.
- 8. Storage Room:
  - a. Keyed differently from exterior lock (3 sets of keys)
  - b. 48 linear feet of shelving, 18 inches deep.
- 9. Phones:
  - a. Three (3) phones, each with:
    - 1) Two (2) incoming/outgoing lines
    - 2) Conference speaker.
  - b. Four (4) phone lines, with two (2) jacks in each private office for phone service and all four (4) lines to the common area.
- 10. Two (2) 10-lb carbon dioxide fire extinguishers
- 11. Associated services, including:
  - a. Electric
  - b. Telephone
  - c. Internet
  - d. Drinking water
  - e. Waste for general office debris.
  - f. Cleaning Service: Weekly.

## **PART 3 EXECUTION**

### **3.01 MOBILIZATION**

- A. This task will consist of mobilizing Earthwork Subcontractor personnel, equipment, any lower-tier Subcontractors, and materials to the project site. The Earthwork Subcontractor will be responsible for coordinating and making arrangements for storage and laydown areas for construction equipment, temporary storage of Property Owners' and Residents' objects and materials, and plants and trees.
- B. The Earthwork Subcontractor shall install erosion control measures according to best management practices and the Stormwater Management Plan, and also prepare a vehicle decontamination area and a soil storage area that are designed to contain runoff from these activities.
  - 1. Coordination and scheduling of mobilization activities will be discussed with Contractor in detail during the preconstruction meeting.

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- C. Mobilization shall include, but not be limited to, these principal items:
1. Obtaining required permits.
  2. Mobilizing Subcontractor and Contractor's field office and equipment required for operations onto Site.
  3. Secure facilities to store and protect Property Owners' and Residents' moved objects and materials during construction.
  4. Installing temporary construction power, wiring, and lighting facilities.
  5. Providing onsite communication facilities, including telephones and high speed internet.
  6. Providing onsite sanitary facilities and potable water facilities as specified and as required by Laws and Regulations, and governing agencies.
  7. Arranging for Subcontractor's storage yard.
  8. Posting OSHA required notices and establishing safety programs and procedures.
  9. Having Earthwork Subcontractor's superintendent at the Site full time.

3.02 TEMPORARY UTILITIES

- A. Power:
1. No electric power is available at the residential sites.
  2. Earthwork Subcontractor shall provide portable generators for required power at the sites or arrange for hook up at the field trailer or office.
  3. Earthwork Subcontractor shall arrange for electrical hook-ups at the field office and staging areas. Cost of electric power will be borne by Earthwork Subcontractor.
- B. Water: Subcontractor is not allowed to use water from the residence. Subcontractor shall make arrangements for and bear costs of providing water required for construction purposes and for drinking by construction personnel during construction.
- C. Sanitary and Personnel Facilities: Earthwork Subcontractor shall provide and maintain facilities for Owner, Contractor, and Subcontractor's employees and subcontractors, and all other onsite employers' employees. Service, clean, and maintain facilities and enclosures.
- D. Telephone Service: Earthwork Subcontractor shall arrange and provide onsite telephone service for Owner, Contractor and Earthwork Subcontractor as needed for use during construction. Earthwork Subcontractor shall pay costs of installation, removal and monthly bills.

3.03 PROTECTION OF WORK AND PROPERTY

A. Staging Earthwork Area Security:

1. Earthwork Subcontractor shall erect a temporary security fence for protection of the staging area, equipment and materials as specified in Section 32 31 13, Chain Link Fence and Gates and maintain fence throughout construction period. Obtain Contractor's written permission before removal of temporary security fencing.
2. Earthwork Subcontractor shall retain a Security Subcontractor to prevent theft, damages, or losses incurred at the staging area, residential properties undergoing remedial actions or temporary access site(s) during non-work hours.
3. Earthwork Subcontractor is also responsible to obtain and bear the costs of any other security measures deemed necessary, including security personnel or other measures. The Owner and Contractor are not responsible for theft, damages or losses incurred at the storage area or at the temporary access sites.

B. Barricades and Lights:

1. Provide as required by the Vehicle Code and in sufficient quantity to safeguard public and the Work.
2. Provide as necessary to prevent unauthorized entry to construction areas and affected roads, streets, and alleyways, inside and outside of fenced area, and as required to ensure public safety and the safety of Subcontractor's employees, other employer's employees, and others who may be affected by the Work.
3. Provide to protect existing and adjacent properties from potential damage.
4. Locate to enable access by property owners.
5. Protect streets, roads, highways, and other public thoroughfares that are closed to traffic by effective barricades with acceptable warning signs.
6. Locate barricades at the nearest intersecting public thoroughfare on each side of the blocked section in accordance with governing requirements.
7. Illuminate barricades and obstructions with warning lights from sunset to sunrise.

C. Signs and Equipment:

1. Conform to requirements of manual published by the Minnesota Department of Transportation.
2. Traffic Cones: Provide to delineate traffic lanes to guide and separate traffic movements.

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3. High-Level Warning Flag Units: Provide two in advance of traffic approaching the Work, each displaying three flags mounted at a height of 9 feet.
4. DETOUR Signs: Provide two, right arrow or left arrow, placed as approved by Contractor.
5. RIGHT or LEFT LANE CLOSED AHEAD Signs: Provide two, place in advance of lane to be closed.
6. Provide at obstructions, such as material piles and equipment.
7. Use to alert general public of construction hazards, which would include surface irregularities, unramped walkways, grade changes, and trenches or excavations in roadways and in other public access areas.
8. Place signs in the residential property during construction activities. The sign should be located outside the extents of the excavation. The sign shall include the U.S. EPA logo and read:  
U.S. EPA Superfund Site Cleanup.  
For questions or issues, please call (Contractor office trailer).

D. Existing Structures:

1. Where Subcontractor contemplates removal of small structures such as mailboxes, signposts, and other objects/structures that interfere with Subcontractor's operations, obtain approval of Property Owner and Contractor. Survey the location of the structure prior to its removal.
2. Move mailboxes to temporary locations accessible to postal service.
3. Replace items removed in their original location and a condition equal to or better than original.

E. Waterways: Keep ditches, culverts, and natural drainages continuously free of construction materials and debris.

F. Dewatering: Construct, maintain, and operate sumps, pumps, or other temporary diversion and protection works. Furnish materials required, install, maintain, and operate necessary pumping and other equipment for the environmentally safe removal and disposal of water from the various parts of the Work. Maintain foundations and parts of the Work free from water.

G. Archaeological Finds:

1. General: Should finds of an archaeological or paleontological nature be made within the limits of the Site, immediately notify Owner and Contractor. Continue the Work in other areas without interruption.

3.04 TEMPORARY CONTROLS

A. Air Pollution Control:

1. Minimize air pollution from construction operations.
2. Burning of waste materials, rubbish, or other debris will not be permitted on or adjacent to Site.
3. Conduct earthwork and trucking operations to minimize dust. Strictly adhere to applicable environmental regulations for dust prevention.

B. Noise Control:

1. Noise Control Ordinance: City of Minneapolis Municipal Code.
2. Noise Control Plan: Propose plan to mitigate construction noise and to comply with noise control ordinances, including method of construction, equipment to be used, and acoustical treatments.
3. In accordance with the City of Minnesota Municipal Code, standard hours for operation of construction equipment are Monday through Friday from 7:00 a.m. to 6 p.m. Approvals must be obtained if work is required outside of these hours.

C. Water Pollution Control:

1. Comply with procedures outlined in U.S. Environmental Protection Agency manuals entitled, "Guidelines for Erosion and Sedimentation Control Planning" and "Implementation, Processes, Procedures, and Methods to Control Pollution Resulting from All Construction Activity," and "Erosion and Sediment Control-Surface Mining in Eastern United States and other applicable guidance documents or regulations." Earthwork Subcontractor will prepare a storm water pollution prevention plan for this project. The Subcontractor shall comply with the provisions of this plan.
2. Do not dispose of volatile wastes in storm or sanitary drains. Disposal of wastes into streams or waterways without Contractor approval is prohibited. Provide acceptable containers for collection and disposal of stormwater, waste materials, debris, and rubbish.

D. Erosion, Sediment, and Flood Control:

1. Provide, maintain, and operate temporary facilities to control erosion and sediment releases, and to protect the Work and existing facilities from flooding during construction period.

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2. To reduce erosion, and control stormwater runoff and runoff during construction activities, the following structural and nonstructural best management practices shall be implemented:
  - a. Minimize the area of bare soil exposed at one time (that is, phased excavation).
  - b. Minimize the amount of time an excavation is open.
  - c. Stabilizing cut-and-fill slopes.
  - d. Perimeter controls (such as drainage diversions).
  - e. Sediment basins and traps.
  - f. Silt fences at excavations.
  - g. Site restoration (for example, regrading, mulching, and seeding, or repaving with asphalt or concrete).
3. Prepare site only after adequate erosion and sediment controls are in place as discussed during the preconstruction meeting. Earthwork Subcontractor will identify duration excavation will remain open and what will be required.

E. Dust Control:

1. The Earthwork Subcontractor shall be responsible for controlling the dust and airborne dirt generated by construction activities. Water or other suppression means shall be used as needed to control dust.
2. All excavation activities shall be performed in a manner that limits blowing dust and tracking of mud onto site access roads. Dust control measures may include vacuuming, water spraying, and sweeping or other methods allowed under local regulations. Roads shall be swept daily or when requested by Contractor to keep clean and free of mud and dust material from construction activities.
3. Acceptable performance for dust abatement is a maximum annual particulate matter concentration of  $75 \mu\text{g}/\text{m}^3$  and a mean concentration of  $60 \mu\text{g}/\text{m}^3$  according to Minnesota Rule 7009.0080.

3.05 VEHICULAR TRAFFIC

- A. Comply with Laws and Regulations regarding closing or restricting use of public streets or highways. No public or private road shall be closed, except by written permission of proper authority. Assure the least possible obstruction to traffic and normal commercial pursuits.
- B. Conduct the Work to interfere as little as possible with public travel, whether vehicular or pedestrian.
- C. Whenever it is necessary to cross, close, or obstruct roads, driveways, and walks, whether public or private, provide and maintain suitable and safe

detours, or other temporary expedients for accommodation of public and private travel.

- D. Road Closures: Maintain satisfactory means of exit for persons residing or having occasion to transact business along route of the Work. If it is necessary to close off roadway or alley providing sole vehicular access to property for periods greater than 2 hours, provide written notice to each Property Owner and Contractor so affected 3 days prior to such closure. In such cases, closings of up to 4 hours may be allowed with Contractor approval.
- E. When flaggers and guards are required by regulation or when deemed necessary for safety, furnish them with approved orange wearing apparel and other regulation traffic control devices.
- F. Notify fire department and police department at least 48 hours before closing the street or portion thereof. Notify said departments when streets are again passable for emergency vehicles. Do not block off emergency vehicle access to consecutive arterial crossings or dead-end streets, in excess of 300 linear feet, without written permission from fire department. Conduct operations with the least interference to fire equipment access, and at no time prevent such access. Furnish Contractor's night emergency telephone numbers to police department.
- G. Coordinate traffic routing with that of others working in same or adjacent areas.

### 3.06 SURFACE WATER CONTROL IN EXCAVATIONS

- A. Provide, operate, and maintain water control systems of sufficient size and capacity to limit water collection in excavations and permit backfilled to final grade and permanent erosion control materials are installed. Install temporary coverings overnight, where possible, to prevent stormwater from contacting soils in open excavations.
- B. If an excavation is unable to covered and standing water is present in the excavation when backfill must occur, Subcontractor will containerize and store water at staging area. The Contractor will sample the water for disposal to an appropriate facility or discharge by the Subcontractor.
- C. Remove surface runoff controls when no longer needed.
- D. Provide supplemental ditches and sumps only as necessary to collect water from rain events. Do not use ditches and sumps as primary means of water control.

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3.07 DISPOSAL OF EXCAVATION WATER

- A. The Contractor will characterize excavation water as required by applicable laws and regulations.
- B. Discharge water as required by the City of Minneapolis and Contractor and in manner that will not cause contamination, erosion, or flooding, or otherwise damage existing facilities, completed Work, or adjacent property.

3.08 CLEANING DURING CONSTRUCTION

- A. Unless otherwise directed by the Contractor, the Earthwork Subcontractor shall use street-sweeping equipment to sweep roadways, alleys, or other areas affected by the Work on a daily basis from the onset of excavation until seeding is complete at a residential property. Street sweeping equipment shall contain debris after sweeping, through either mechanical means or with a vacuum, to minimize fugitive dust emissions.

3.09 DECONTAMINATION OF EQUIPMENT AND PERSONNEL

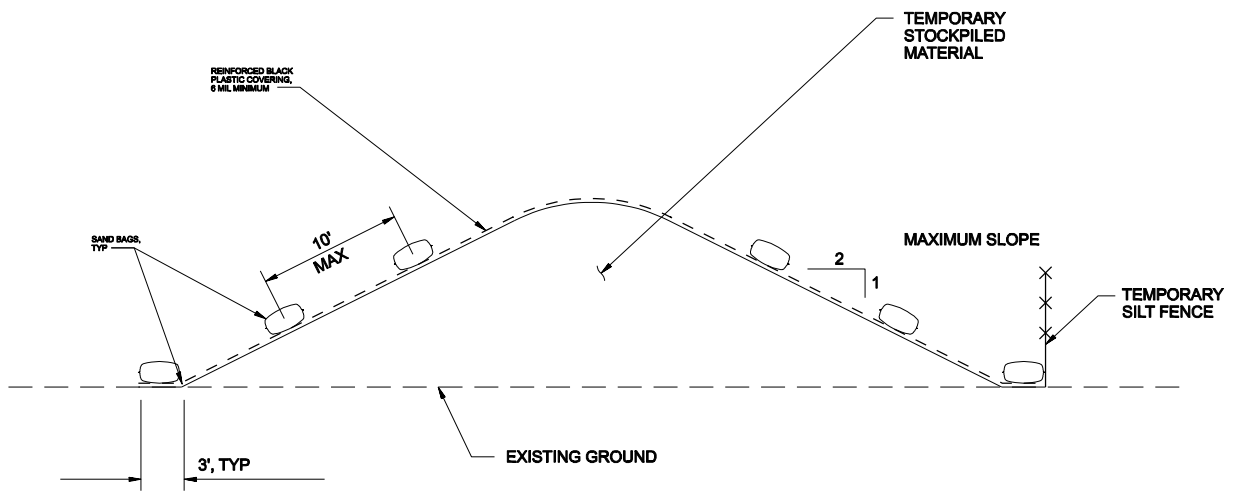
- A. Field equipment that has come into contact with any potentially contaminated material shall be decontaminated using a dry method of cleaning. The equipment shall be visually inspected for signs of contamination, and the cleaning procedure shall be repeated until the equipment is visually clean. All contaminated equipment shall be cleaned until no contamination is visible before leaving the site. All equipment decontamination shall be documented in the field logbooks.

3.10 DEMOBILIZATION

- A. Upon completion of Work each construction season, all field equipment, temporary facilities, and other miscellaneous items (for example, barricades, caution tapes, and signs) resulting from or used during field operations shall be removed.
- B. All wastes and general construction debris generated by construction activities shall be properly disposed of offsite prior to demobilization.

**END OF SECTION**





**NOTES:**

1. ALL SEAMS SHALL BE TAPED OR WEIGHTED DOWN FULL LENGTH. ALL SEAMS SHALL HAVE A MINIMUM 12" OVERLAP.
2. SEAMS PARALLEL TO THE SLOPE CONTOUR SHALL HAVE THE UPHILL SHEET OVERLAP THE DOWN HILL SHEET.
3. NO SURFACE RUN-OFF SHALL BE ALLOWED TO RUN UNDER THE PLASTIC COVERING.
4. DRAINAGE FROM AREAS COVERED BY REINFORCED PLASTIC SHEETING SHALL BE CONTROLLED SUCH THAT NO DISCHARGE OCCURS DIRECTLY ONTO UNCONTROLLED DISTURBED AREAS OF THE CONSTRUCTION SITE.

**TEMPORARY STOCKPILE COVERING**  
PROPERTY IMPROVEMENTS  
SOUTH MINNEAPOLIS RESIDENTIAL SOIL CONTAMINATION SITE

**CH2MHILL**



**SECTION 01 77 00**  
**CLOSEOUT PROCEDURES BY THE SUBCONTRACTOR**

**PART 1 GENERAL**

1.01 SUBMITTALS

A. Informational Submittals:

1. Submit prior to application for final payment.
  - a. Record Documents: All remaining record documents not previously submitted.
  - b. Special bonds, Guarantees, and Service Agreements.
  - c. Consent of Surety to Final Payment: As required in General Terms and Conditions.
  - d. Releases or Waivers of Liens and Claims: As required in General Terms and Conditions.
  - e. Releases from Agreements.
  - f. Final Invoice for Payment: Submit in accordance with Contract Terms and Conditions.

1.02 RECORD DOCUMENTS

A. Quality Assurance:

1. Furnish qualified and experienced person, whose duty and responsibility shall be to maintain record documents.
2. Accuracy of Records:
  - a. Record changes within Construction Drawings, making legible and accurate entries on each sheet of Drawings and other documents where such entry is required to show change.
  - b. Purpose of Project record documents is to document factual information regarding aspects of the Work.
3. Make entries as Work progresses.
4. Prior to submitting each request for progress payment, request review and approval of current status of record documents. Failure to properly maintain update and submit record documents may result in a deferral by Contractor to recommend whole or any part of Subcontractor's Application for Payment, either partial for final.

1.03 RELEASES FROM AGREEMENTS

- A. Furnish written releases from Property Owners or public agencies where side agreements or special easements have been made, or where Subcontractor's operations have not been kept within construction limits.
- B. In the event Subcontractor is unable to secure written releases:
  - 1. Inform Contractor of the reasons.
  - 2. Contractor or its representatives will examine the Site, and Contractor will direct Subcontractor to complete the Work that may be necessary to satisfy terms of the side agreement or special easement.
  - 3. Should Subcontractor refuse to perform this Work, Contractor reserves right to have it done by separate contract and deduct cost of same from Contract Price, or require Subcontractor to furnish a satisfactory bond in a sum to cover legal Claims for damages.
  - 4. When Contractor is satisfied that the Work has been completed in agreement with Contract Documents and terms of side agreement or special easement, right is reserved to waive requirement for written release if: (i) Subcontractor's failure to obtain such statement is due to grantor's refusal to sign, and this refusal is not based upon any legitimate Claims that Subcontractor has failed to fulfill terms of side agreement or special easement, or (ii) Subcontractor is unable to contact or has had undue hardship in contacting grantor.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION**

3.01 MAINTENANCE OF RECORD DOCUMENTS

- A. General:
  - 1. Following award of the Work, Contractor will provide electronic drawing files of the residential sites and a database of property addresses.
  - 2. Record information concurrently with construction progress.
  - 3. Redline markups of approved construction documents will be accepted as Record Drawings.
- B. Preservation:
  - 1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

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2. Make documents and Samples available at all times for observation by Contractor.

C. Making Entries on Drawings:

1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.
  - a. Color Coding:
    - 1) Green when showing information deleted from Drawings.
    - 2) Red when showing information added to Drawings.
    - 3) Blue and circled in blue to show notes.
2. Date entries.
3. Call attention to entry by “cloud” drawn around area or areas affected.
4. Legibly mark to record actual changes made during construction.

**END OF SECTION**



**SECTION 31 10 00**  
**SITE CLEARING AND GRUBBING**

**PART 1 GENERAL**

1.01 DEFINITIONS

- A. Interfering or Objectionable Material: Temporary trash, rubbish, and junk; vegetation and other organic matter, whether alive, dead, or decaying.
- B. Clearing: Removal of interfering or objectionable material lying on or protruding above ground surface, including trees, stumps, roots and shrubs, and grass.
- C. Grubbing: Removal of vegetation and other organic matter including trees, stumps, roots, shrubs and grasses.
- D. Obstructions: Swing sets, decks, benches, stairs, landscaping features, ground cover materials and borders, and other movable encumbrances to soil excavation.
- E. Excavation Limits: Areas, as shown or specified, within which Work is to be performed.
- F. Permanent Structures: Buildings, sheds, gazebos, swimming pools, flag poles and similar structures.

1.02 SUBMITTALS

- A. Action Submittals: Drawings clearly showing clearing, grubbing limit. Drawings will be marked during the initial site visit and approved by the Contractor and property owner during the second property visit.
- B. Activity Hazard Analysis (AHA): AHA drawings will be prepared, submitted and reviewed before starting work at each property.

1.03 SCHEDULING AND SEQUENCING

- A. The excavation areas shall be surveyed by Survey Subcontractor to establish preconstruction control points, and existing elevations. The excavation areas shall be marked in a manner to allow identification and inspection during execution of the work.
- B. Prepare Site only after adequate security, safety, and erosion and sediment controls are in place as discussed during the Residential Preconstruction

Meeting and specified in other sections. The removal of erosion control measures at residential properties shall be performed by the Earthwork Subcontractor at the end of the watering period or after grass has reached a satisfactory 70 percent stand unless otherwise specified.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION**

**3.01 GENERAL**

- A. Site preparation shall include removal or protection of trees, shrubs, vegetation, and encumbrances to soil excavation. The excavation areas shall be marked in a manner to allow identification and inspection during execution of the Work.
- B. This work includes removing sections of fencing and gates as necessary to allow access for the soil removal and restoration areas for each property. Fencing will remain in place where possible. Where necessary, fencing shall be removed in a manner to protect it for reinstallation and reuse. Actual reuse will be based on site-specific evaluation of conditions. Fence openings made during for access shall be secured at the end of each work day to provide an equivalent level of security during non-working hours. All fencing not reused shall be disposed of and replaced in-kind by the Earthwork Subcontractor during restoration. The Earthwork Subcontractor shall provide secure temporary storage during construction at the staging area.
- C. Tree stumps and roots required to be removed are considered contaminated and shall be mulched and disposed of with the soil. Trees, shrubs and other aboveground vegetation required to be removed shall be disposed of at a disposal facility approved by the Contractor. Surface debris such as bricks, concrete pieces and other materials that will not be stored and reused, shall be segregated, cleaned of soil and vegetation and disposed of as non-contaminated waste. The scope of this Work shall be included in the unit price per ton provided in the Bid Form and validated by weight tickets.
- D. Take necessary measures to protect existing buildings, utilities, fencing (that has not been removed and trees or other vegetation) on or adjacent to the site from construction activities.
- E. Ensure that stormwater runon/runoff control is installed, and erosion controls in place according to the Stormwater Management Plan and best management practices prior to excavation. Stormwater runon/runoff controls shall, at a minimum, prevent migration to storm sewers, street gutters, streets, sidewalks, and driveways.

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- F. Obstructions, including outdoor play equipment, benches, and other encumbrances to soil excavation, shall be tagged and removed from the property or relocated to an area of property unaffected by Work. Obstructions removed from the property shall be securely stored and returned upon completion of restoration.
- G. Obstructions including landscaping features and borders are to be removed and stored for reuse or replaced as part of the restoration work, with like kind materials during restoration.
- H. Contractor shall be notified when special landscaping features such as active sprinkler systems, electrical, plumbing and drain tile is encountered within the limits of excavation. Contractor will provide direction for proceeding with the work.
- I. During construction, precautions shall be taken as necessary to prevent the generation of dust and particulate. Acceptable performance for dust abatement is a maximum annual particulate matter concentration of  $75 \mu\text{g}/\text{m}^3$  and a mean concentration of  $60 \mu\text{g}/\text{m}^3$  according to Minnesota Rule 7009.0080.

3.02 UTILITY NOTIFICATION AND COORDINATION

- A. Coordinate the Work with various utilities within Project limits. Notify applicable utilities if damage occurs or if conflicts or emergencies arise during Work.
  - 1. Utility Locator: Gopher State One-Call.
    - a. Telephone: 800-252-1166.
  - 2. Electricity Company: Xcel Energy.
    - a. Telephone: 1-800-895-1999.
  - 3. Water Department: Minneapolis Water Department – Emergency Services.
    - a. Telephone: 612-673-5600.
  - 4. Sewer Department: Minneapolis Sewer & Storm Drain Department.
    - a. Telephone: 612-673-5625.

3.03 LIMITS

- A. Clearing, grubbing and excavation is not to extend beyond excavation limits established on documents and drawings finalized during the residential preconstruction meeting.
- B. Manually remove all grasses or groundcover that remains between the excavation and the permanent structure or fence.

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3.04 REMOVAL OF INTERFERING OR OBJECTIONABLE MATERIALS

- A. Remove rubbish, trash and junk from entire area within site limits as agreed during the residential preconstruction meeting.
- B. Temporary relocation of large items, such as vehicles, shall be coordinated with the property owner.

3.05 REMOVAL OF INTERFERING PLANTINGS

- A. Remove shrubs and trees that are designated for removal or create an interference to construction activities.
- B. Record sufficient information to uniquely identify each plant removed for accurate replacement.

3.06 CLEARING

- A. Clear areas within excavation limits shown or specified.
- B. Trees less than 4 inches in diameter at breast height as measured per Section 32 93 00, Trees, Shrubs and Perennials, shall be removed unless otherwise directed by Contractor. Trees greater than 2 inches in diameter must be removed by a licensed tree service in the City of Minneapolis.
- C. Trees equal to or larger than 4 inches in diameter at breast height shall not be removed unless otherwise directed by Contractor. Trees shall be systematically cut up and removed in pieces from the top down by a licensed tree service in the City of Minneapolis.
- D. Cut off shrubs, brush, weeds, and grasses to within 2 inches of ground surface.

3.07 GRUBBING

- A. Grub areas within excavation limits shown or specified.

3.08 DISPOSAL

- A. Clearing and Grubbing Debris Interfering and Objectionable Material:
  - 1. Dispose of debris offsite, which may consist of above ground plant materials, rubbish, trash materials and junk. Large items, such as vehicles, will not be disposed of and only temporarily relocated after coordination with the property owner.
  - 2. Woody debris and root mass may be chipped. Chips will be mixed with soil and disposed.

**END OF SECTION**

**SECTION 31 23 16  
EXCAVATION**

**PART 1 GENERAL**

1.01 DEFINITIONS

- A. Common Excavation: Removal of material not classified as rock excavation.
- B. Permanent Structures: Buildings, sheds, gazebos, swimming pools, flagpoles and similar structures.

1.02 SUBMITTALS

- A. Excavation Plan, detailing:
  - 1. Methods and sequencing of excavation.
  - 2. Proposed location of stockpiled excavated material, if required.
  - 3. Numbers, types and sizes of equipment proposed.
  - 4. Anticipated difficulties and proposed resolutions.

1.03 QUALITY ASSURANCE

- A. Provide adequate control to avoid unauthorized overexcavation.

1.04 WEATHER LIMITATIONS

- A. Excavation shall not be performed during inclement weather.
- B. Excavated material that may be stockpiled in the staging area shall be covered and protected during inclement weather.

1.05 SEQUENCING AND SCHEDULING

- A. Complete applicable work requirements of Section 01 11 00, Scope of Work and Section 01 50 00 Temporary Facilities and Controls prior to excavation.
- B. Site Clearing and Grubbing: Complete applicable Work specified in Section 31 10 00, Site Clearing and Grubbing, prior to excavating.
- C. Subcontractor shall sequence work to minimize the time that excavations remain open. No more than 5 properties shall have open excavations concurrently without approval from the Contractor.

- D. In accordance with the City of Minneapolis Municipal Code, standard hours for operation of construction equipment are Monday through Friday from 7a.m. to 6p.m.

**PART 2 PRODUCTS**

2.01 HIGH-VISIBILITY FENCE

- A. Orange high density polyethylene.
- B. Thirty-six inches in height.

**PART 3 EXECUTION**

3.01 GENERAL

- A. Means and methods of access to soil excavation areas will be determined on a property-specific basis. Width of access is limited in many locations and may not allow conventional equipment to be used. Therefore, the scope may include use of mechanical equipment and/or manual equipment, depending on width of access to the excavation area or potential for damage with mechanical equipment. Earthwork Subcontractor shall determine the best method to access and excavate the properties.
- B. Boundaries of the Work estimated for each site is provided in the document "South Minneapolis Final Design Documents." Actual excavation boundaries will be determined on a property-specific basis during Residential Preconstruction Meetings with concurrence from the Property Owner. Excavate to the lines shown.
- C. Depth of the Work for each site is estimated in the document "South Minneapolis Final Design Documents." Actual depth will be determined during excavation by Contractor sampling and analysis using x-ray fluorescence. If test results indicate soils remain with impacts above the subsurface arsenic remediation goal of 95 mg/kg, additional soil will be excavated, as directed by the Contractor. At the direction of the Contractor, excavation shall continue in 1-foot increments with until the Contractor indicates the extent of the excavation has been reached. Over-excavation tolerance is plus 0.1 foot, and under-excavation tolerance is minus 0.0 foot, except where dimensions or grades are shown or specified as maximum or minimum. Contractor may limit the depth of excavation if it is believed that further excavation may result in damage to structures or safety hazards.

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- D. Remove or protect obstructions as shown and as specified in Section 01 50 00, Temporary Facilities and Controls, Article Protection of Work and Property.
- E. Orange plastic construction barrier fence, minimum 36-inch height, shall be installed around the excavation perimeter using steel "T" post spaced at 6-foot centers to separate pedestrian traffic from the work. The fence will be installed around open excavations before the end of each work day. The fence will be re-used where possible from property to property.
- F. Do not overexcavate without written authorization of Contractor.
- G. Hand dig within 2 feet of underground utility markings to verify actual location of the utility, and make provisions to support and protect utilities during excavation and backfill.
- H. Limits of construction for soil excavation are as follows (not inclusive of all limits):
  - 1. One (1) foot away from permanent structures and fences, plus excavation at a 1:1 slope away from the permanent structure or fence.
  - 2. One (1) foot away from property lines. Excavation may proceed across a property line into a right-of-way if it serves as part of that yard.
  - 3. Mechanical excavation is not allowed within the drip line of designated trees; only manual excavation is permitted within the drip line.
  - 4. When the Subcontractor is satisfied that an excavation is to the specified lines and grades and Contractor sampling and analysis indicate extents of excavation have been reached, Contractor will authorize the Subcontractor to proceed with backfilling of the excavation.
- I. Do not pile excavated material adjacent to excavations.
- J. Excavated materials shall not be allowed to be stockpiled overnight except at the staging area with proper controls in place.
- K. Do not pile excavated material directly on the street surface or adjacent property.
- L. Immediately notify Contractor if latent differing site conditions are encountered during construction. Such conditions include french drains, drain tile, unknown electrical and plumbing lines, and other similar conditions.

3.02 EXCAVATION AT OR ADJACENT TO PROTECTED TREES AND SHRUBS

A. Trees and Plantings:

1. Protect from damage and preserve trees, shrubs, and other plants outside excavation limits and within limits where designated on the Drawings to remain undisturbed.
  - a. No trees equal to or greater than 4 inches in diameter at breast height shall be removed without written approval of Contractor.
  - b. Provide and maintain temporary barricades around trees.
  - c. Employ manual excavation as necessary to minimize tree injury. Manual excavation within the tree drip line shall be to a depth of 6-inches or until roots impede digging.
  - d. The limits of manual excavation begin 2 feet from the circumference of the tree trunk out to the drip line of the tree. Take care to prevent damage to the tree root system.
  - e. Cover temporarily exposed roots with wet burlap, and keep burlap moist until soil is replaced around roots.
  - f. Water vegetation as necessary to maintain health.
  - g. Do not stockpile materials or permit traffic within drip lines of trees.
2. In event of damage to bark, trunks, limbs, or roots of plants that are not designated for removal, treat damage by corrective pruning, bark tracing, application of a heavy coating of tree paint, and other accepted horticultural and tree surgery practices.
3. Replace each tree that dies as a result of construction activities with a 2-inch caliper tree of the same species as approved by Contractor.
4. Dispose of removed trees and vegetation at a facility approved by the Contractor.

3.03 REMOVAL OF EXCAVATED MATERIAL

- A. This task includes transporting the excavated material from the property. Properties may be adjacent to a city sidewalk, boulevard, and one- or two-way city street in the front. Properties may be adjacent to a one lane alley or another property in the back. Subcontractor shall determine the best method to load the excavated soil for transporting to the designated disposal site. The Subcontractor shall perform work as outlined and approved in the Transportation Plan.
- B. Subcontractor shall provide means and methods to remove and transport excavated material for disposal.

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3.04 STOCKPILING EXCAVATED MATERIAL

- A. Excavated material may be staged for disposal and stockpiled at a preapproved fenced and secured staging area(s) if excavated material can not be loaded into the disposal container.
- B. Post signs identifying material stockpiled. Post signs that are readable from all directions of approach to each stockpile. Signs should be clearly worded and readable.
- C. Confine stockpiles to within approved storage area.
- D. Do not stockpile excavated materials near or over existing utilities, facilities, adjacent property, or completed Work.
- E. A Stormwater Management Plan shall be developed and implemented at the storage area to protect against stockpile runoff.

3.05 LOADING OF EXCAVATED MATERIAL

- A. The scope of this task includes all moving, handling and loading of excavated material for transportation. The sequence of moving, handling and loading of trucks is to be addressed in the Subcontractor's Transportation Plan. Trucks shall be fully loaded, within allowable hauling weight limits, prior to transporting the excavated materials to the approved licensed disposal facility.
- B. Trucks shall be loaded in an area with temporary ground covering, such as a tarp, where possible to minimize the potential for soil to spill into roadways.

3.06 TRANSPORTATION AND DISPOSAL

- A. The exterior of each transportation vehicle and load of waste shall be visually inspected and all loose soil/material removed and collected before leaving the site. Each truckload shall be covered with a fully functioning tarp system that satisfies local, county, state and federal regulations before leaving the site and during transportation. Transportation of nonhazardous wastes shall be completed by a transporter licensed for commercial transportation. Soil waste removed from the site shall be transported and disposed of at a Contractor-approved facility.
- B. Waste characterization samples will be collected from excavated soil. The Contractor will collect and analyze one soil sample for TCLP for every 500 ton of soil excavated.
- C. The quantities of waste shall be recorded by documented weighing at the above disposal facility. For each load of material, weight measurements will

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be obtained for each full and empty container or dump truck. Disposal quantities will be based on the difference of weight measurements between the full and empty container or dump truck. Copies of haul tickets shall be signed and provided to Contractor on a daily basis.

- D. The following procedures also will be observed when transporting wastes offsite:
1. Transporting waste materials shall comply with requirements of MNDOT Standard Specifications.
  2. Minimize impacts to general public traffic.
  3. Repair road damage caused by construction and/or hauling traffic.
  4. Clean up material spilled in transit.
  5. Follow safety and spill response procedures.
  6. Use sealed trucks transporting liquids or wet materials.
  7. No materials from other projects shall be combined with materials from this site.
  8. Comply with Traffic Control Plan.

**END OF SECTION**

**SECTION 31 23 23  
FILL AND BACKFILL**

**PART 1 GENERAL**

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. ASTM International (ASTM):
    - a. C117, Standard Test Method for Materials Finer Than 75-Micrometers (No. 200) Sieve in Mineral Aggregates by Washing.
    - b. C136, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
    - c. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
    - d. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
    - e. D4254, Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
    - f. D6938 - 08a Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods.

1.02 DEFINITIONS

- A. Relative Compaction:
1. Ratio, in percent, of as-compacted field dry density to laboratory maximum dry density as determined in accordance with ASTM D698.
  2. Apply corrections for oversize material to either as-compacted field dry density or maximum dry density, as determined by Contractor.
- B. Optimum Moisture Content:
1. Determined in accordance with ASTM Standard specified to determine maximum dry density for relative compaction.
  2. Determine field moisture content on basis of fraction passing 3/4-inch sieve.
- C. Relative Density: Calculated in accordance with ASTM D4254 based on maximum index density and minimum index density determined in accordance with ASTM D4253 and ASTM D4254, respectively.

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- D. Completed Course: A course or layer that is ready for next layer or next phase of Work.
- E. Lift: Loose (uncompacted) layer of material.
- F. Well-Graded:
  - 1. A mixture of particle sizes with no specific concentration or lack thereof of one or more sizes.
  - 2. Does not define numerical value that must be placed on coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters.
  - 3. Used to define material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.
- G. Influence Area: Area within planes sloped downward and outward at 45-degree angle from horizontal measured from:
  - 1. 1 foot outside outermost edge at base of foundations or slabs.
  - 2. 1 foot outside outermost edge at surface of roadways, shoulder or sidewalk.
  - 3. 2 foot outside exterior at spring line of pipes or culverts.
- H. Borrow soils utilized for this project are described in two classifications and are as follows:
  - 1. Backfill (-6 inches to maximum-10 feet): "Clean Fill" with CL or ML (MnDOT) Classification.
  - 2. Topsoil (-6 inches to surface finish grade in yards and -18 inches to surface finish grade in gardens): as defined in Section 32 91 13 Topsoil Preparation.
- I. Imported Material: Materials obtained from sources offsite, suitable for specific use.
- J. Fill: Materials obtained from approved sources offsite, suitable for specified use.
- K. Standard Specifications: When referenced in this section, shall mean Minnesota Department of Transportation Standard Specifications, latest edition.

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1.03 SUBMITTALS

- A. Action Submittals:
  - 1. Earthwork Subcontractor shall identify borrow source(s) for sampling and approval by Contractor. Samples collected by the Contractor will be analyzed for the following:
    - a. Chemical analyses of source materials.
    - b. Gradation analyses of source materials.
  - 2. Earthwork Subcontractor compaction test results.
- B. Informational Submittals: Manufacturer's data sheets for compaction equipment.

1.04 QUALITY ASSURANCE

- A. Notify Contractor when:
  - 1. Whenever subgrade is ready for backfilling or when backfilling operations are resumed after a period of inactivity.
  - 2. Soft or loose subgrade materials are encountered.
  - 3. Fill material appears to be deviating from Specifications.
- B. Subcontractor shall perform 1 compaction test in place per lift per excavation area. Contractor will perform compaction testing for quality assurance on a random basis in a manner to minimize interruption to backfill and compaction operations.

1.05 SEQUENCING AND SCHEDULING

- A. Complete applicable Work specified in Section 31 10 00, Site Clearing, and Section 31 23 16, Excavation, prior to placing fill or materials.
- B. Complete Work specified in this Section and Section 32 91 13, Topsoil Preparation within 7 days of the onset of excavation at a property.

**PART 2 PRODUCTS**

2.01 SOURCE QUALITY CONTROL

- A. The Contractor will collect samples for target compound list (TCL) organics and target analyte list (TAL) metals when identifying borrow source(s) to be used for fill material. The Contractor will also collect one TCL organics and TAL metals sample per 1,000 yd<sup>3</sup> of fill material. The fill will meet the

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Minnesota Pollution Control Agency (MPCA) Tier 1 Soil Reference Values (SRV) to be certified as “clean”.

2.02 BACKFILL

- A. The backfill material shall consist of natural soils that include fine or coarse grained soils, clay, clayey sand, and other natural-approved material. The material shall be suitably graded. One gradation test per source per material shall be required to be submitted for approval before material is supplied to the site. The use of an essentially one-size material will not be permitted unless approved.
- B. Backfill material shall be free from rocks larger than 3 inches, from roots, peat and other organic matter, ashes, cinders, trash, debris, and other deleterious materials.
- C. Backfill containing more than 10 percent gravel, stones, or shale particles is unacceptable.

2.03 GRANULAR FILL (IF REQUIRED)

- A. In accordance with MnDOT Standard Specification 3149 – Granular Material:
  - 1. Granular borrow, for general use in embankment or backfill construction, may be any pit-run or crusher-run material that is so graded from coarse to fine that, the ratio of the portion passing the 75  $\mu\text{m}$  (# 200) sieve divided by the portion passing the 25.0 mm (1 inch) sieve may not exceed 20 percent by mass.
  - 2. The material shall not contain oversize salvaged bituminous particles or stone, rock, or concrete fragments in excess of the quantity or size permissible for placement as specified.
- B. Free from dirt, clay balls, and organic material.

2.04 WATER FOR MOISTURE CONDITIONING

- A. Free of hazardous or toxic contaminants, or contaminants deleterious to proper compaction.
- B. The Subcontractor must supply water for moisture conditioning. Water may not be used from the residence.

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2.05 DETECTABLE MARKING TAPE

- A. Products or approved equivalent:
  - 1. Pro-Line® Detectable Marking Tape.
  - 2. Terra Tape® Sentry Line™
- B. 4-inches wide, red in color.
- C. Printed to read “CAUTION: POTENTIAL DANGER OF ARSENIC CONTAMINATION BELOW.”

2.06 DEMARCATION FABRIC

- A. Orange high density polyethylene, snow fence.
- B. Mifari® orange delineation geotextile or approved equivalent.

**PART 3 EXECUTION**

3.01 GENERAL

- A. Keep placement surfaces free of water, debris and foreign materials during placement and compaction of fill and backfill materials.
- B. This work includes transportation and installation of all material to the project site.
- C. Backfill material will be placed at various depth intervals up to the depth of topsoil specified in Section 32 91 13, Topsoil Preparation. Backfill will be compacted to 90 percent maximum dry density as determined by ASTM D698 (Standard Proctor) in no greater than 6-inch lifts. Compaction shall not exceed 95 percent maximum dry density. The backfilled areas shall be compacted in a manner that prevents differential settlement, sink holes, subsidence, etc., and shall warrant against same for 1 year. All work associated with repairing backfilled areas shall be the responsibility of the Subcontractor.
- D. Backfill shall not be placed in excavations with standing water or unstable subgrade conditions. Backfill shall be placed in a manner that does not disturb or damage surrounding structures or utilities. The backfilled areas shall be graded away from structures to suit the elevation of the surrounding area and such that there will be no ponding of water.

- E. Place and spread backfill materials in horizontal lifts of uniform thickness, in a manner that avoids segregation, and compact each lift to specified densities prior to placing succeeding lifts. Slope lifts only where necessary to conform to final grades or as necessary to keep placement surfaces drained of water.
- F. During backfilling, keep level of backfill around each structure even.
- G. Do not place backfill, if material is frozen, or if surface upon which backfill is to be placed is frozen.
- H. Do not use sections of prepared ground surface as haul roads. Protect prepared subgrade from traffic.
- I. Maintain prepared ground surface in finished condition until next course is placed.
- J. Tolerances:
  - 1. Final Lines and Grades: Within a tolerance of 0.1 foot unless dimensions or grades are shown or specified otherwise.
  - 2. Grade to establish and maintain slopes and drainage as shown.
- K. Settlement: Correct and repair any subsequent damage to structures, pavements, curbs, slabs, piping and other facilities, caused by settlement of backfill material, including during maintenance period.

### 3.02 DEMARCATION FABRIC

- A. Place demarcation fabric in the bottom of the excavation at properties as directed by the Contractor. This will serve as a horizontal barrier where arsenic concentrations are above the action level of 95 mg/kg in the post-excavation soil sample as determined by Contractor testing.
- B. Demarcation fabric will be placed flat in the bottom of the excavation with seams overlapping a minimum of 6-inches and with material placed a minimum of 6-inches on the sides.
- C. Detectable marking tape shall be placed on top of the demarcation fabric on 3-foot centers.

### 3.03 BACKFILL

- A. Adjacent to Roads, Driveways, Foundations and Sidewalks, Facilities: Within influence area adjacent to or beneath structures, sidewalks, slabs, pavements, curbs, piping, conduits, and other facilities, backfill with material approved by

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Contractor. Specified material includes backfill or granular fill as determined appropriate by Contractor. Place fill in lifts of 6-inch maximum thickness and compact each lift to minimum of 90 percent relative compaction as determined in accordance with ASTM D698.

- B. Other Areas: Backfill with backfill material to lines and grades shown, with proper allowance for topsoil thickness. Place in lifts of 6-inch maximum thickness and compact each lift to minimum 90 percent relative compaction as determined in accordance with ASTM D698.

3.04 SITE TESTING

A. Gradation:

1. One sample from each 1,000 yd<sup>3</sup> of finished product or more often as determined by Contractor, if variation in gradation is occurring, or if material appears to depart from Specifications.
2. If test results indicate material does not meet Specification requirements, terminate material placement until corrective measures are taken.
3. Remove material placed in Work that does not meet Specification requirements.

3.05 REPLACING OVEREXCAVATED MATERIAL

A. Replace excavation carried below grade lines shown or established by Contractor as follows:

1. Beneath Fill or Backfill: Same material as specified for overlying fill or backfill.

**END OF SECTION**



**SECTION 32 10 01  
SITE RESTORATION**

**PART 1 GENERAL**

1.01 SUBMITTALS

- A. Action Submittals:
  - 1. Copies of permits and approvals for construction as required by Laws and Regulations and governing agencies.
  - 2. Samples.
  - 3. Results of inspections or testing existing systems.
- B. Informational Submittals: Manufacturer's Instructions or data sheets for replacement materials.

1.02 SEQUENCING AND SCHEDULING

- A. The Work of this Specification shall not commence until the Contractor has approved materials and methods proposed for restoration.
- B. Include the Work of this Specification in the progress schedule, as specified in Section 01 32 00, Construction Progress Documentation.
- C. Site restoration shall be complete within 7 days of the start of excavation activities described in Section 31 23 16, Excavation.

1.03 TESTING

- A. Sprinkler systems, electrical, piping, and plumbing located within or near the limits of excavation will be inspected and tested as appropriate to determine if damage occurred during the remediation.
- B. Testing may include verifying the system is functional or other appropriate means.
- C. Testing shall be coordinated with and observed by the Contractor.

**PART 2 PRODUCTS**

2.01 TO BE DETERMINED TO MATCH EXISTING MATERIALS AND FINISHES

**PART 3 EXECUTION**

3.01 GENERAL

- A. Site restoration shall include reinstallation of removed obstructions, repairs to permanent structures, and repair or replacement of property disturbed or damaged during or as a result of the Earthwork Subcontractors construction activities.
- B. Site restoration shall also include the removal of temporary controls with the exception of erosion control measures.

3.02 RESTORATION

- A. After completion of topsoil preparation, the Earthwork Subcontractor shall reinstall fencing, landscaping features, and other obstructions removed from the property and stored offsite. Materials will be reinstalled to an equivalent or better quality. Any materials that are damaged and cannot be reinstalled shall be replaced with new materials of like-kind with matching finishes as possible.
- B. The Earthwork Subcontractor will return items to the property from storage area after reinstallation of removed fencing sections. Any Subcontractor-damaged items shall be repaired or replaced as directed by Contractor. The condition of equipment and materials prior to removal from the property will be based on photographic and video documentation.

3.03 REPAIRS

- A. Residential Property:
  - 1. Damage to private property, including but not limited to, fencing, private utilities, and permanent structures, shall be repaired by the Earthwork Subcontractor in accordance with manufacturer's instructions, local codes and ordinances, and other applicable regulations and as approved by the Contractor.
  - 2. Repairs will be performed to an equivalent or better quality than the original. Repairs shall be made with like-kind materials with matching finishes as possible.

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3. Repairs may be performed by the Earthwork Subcontractor if qualified, or the Earthwork Subcontractor shall retain a qualified party to perform the repairs.
  4. Damaged items may be replaced by the Earthwork Subcontractor with new undamaged items as approved by Contractor.
- B. City-Owned Property:
1. The Earthwork Subcontractor shall repair sidewalks, curb and gutter, trees or other City property damaged by the Earthwork Subcontractor or as a result of their construction activities. Repairs shall be performed in accordance with the MnDOT Standard Specifications for Construction amended as appropriate with the City of Minneapolis Special Provisions or other applicable ordinances or regulations.
  2. Repairs will be performed by the Earthwork Subcontractor, if qualified, or the Earthwork Subcontractor will retain a qualified party to perform the repairs.
- C. Utilities:
1. The Earthwork Subcontractor shall notify the applicable utilities if damage occurs during their work.
    - a. Electric and Gas: Xcel Energy  
Phone: 1-800-895-1999
    - b. Water: Minneapolis Water Department-Emergency Services  
Phone: 612-673-5600
    - c. Sewer: Minneapolis Sewer and Storm Drain Department  
Phone: 612-673-5625
- D. Costs to repair damages will be borne by the Earthwork Subcontractor if they were the result of negligence, such as insufficient clearances or lack of or insufficient protection around property.

3.04 CLEANUP

- A. Temporary controls shall be removed from the residential property after topsoil preparation is complete, fencing has been reinstalled, and other property features have been restored.
- B. Silt fence will remain in place for removal by the Landscape Subcontractor during hydroseeding and hydromulching activities. Other erosion control measures, such as inlet protection, shall be removed by the Earthwork Subcontractor after the establishment of a 70 percent stand of grass.

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- C. Debris, rubbish and excess materials shall be removed from the property for storage at the staging area or disposal, as appropriate. Local regulations regarding hauling and disposal shall apply.

**END OF SECTION**

**SECTION 32 31 13**  
**CHAIN LINK FENCES AND GATES**

**PART 1 GENERAL**

1.01 GENERAL

- A. This Work includes transportation and installation of chain link fence around staging, storage and laydown area(s). Fencing at residential properties shall be restored in accordance with Section 32 10 01, Site Restoration.
- B. Reinstallation of fencing at residential properties shall be performed by the Earthwork Subcontractor in accordance with Section 31 10 01B Site Restoration.
- C. Items specified within this section to be completed by the Earthwork Subcontractor.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
  - 1. ASTM International (ASTM):
    - a. A392, Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
    - b. C94/C94M, Standard Specification for Ready-Mixed Concrete.
    - c. C387, Standard Specifications for Packaged, Dry, Combined Materials for Mortar and Concrete.
    - d. F552, Standard Terminology Relating to Chain Link Fencing.
    - e. F567, Standard Practice for Installation of Chain-Link Fence.
    - f. F626, Standard Specification for Fence Fittings.
    - g. F900, Standard Specification for Industrial and Commercial Swing Gates.
    - h. F1083, Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.

1.03 DEFINITIONS

- A. Terms as defined in ASTM F552.

1.04 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:

a. Product Data: Include construction details, material descriptions, dimensions of individual components, and finishes for chain link fences and gates.

1) Fence, gate posts, rails, and fittings.

2) Chain link fabric.

3) Gates and hardware.

2. Samples:

a. Chain Link Fabric: Approximately 6 inches square.

b. Posts, Rails, Braces, Wire, and Ties: Approximately 6 inches long.

c. Fittings: 1 each.

B. Informational Submittals:

1. Manufacturer's recommended installation instructions.

2. Evidence of Supplier and installer qualifications.

1.05 QUALITY ASSURANCE

A. Design, supply of components and installation shall be product of individual company with record of installations meeting requirements specified.

B. Preinstallation Conference: Conduct conference at project Site with fence and gate installer to verify layout.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Site in undamaged condition. Store materials off the ground to provide protection against oxidation caused by ground contact.

1.07 SCHEDULING AND SEQUENCING

A. Coordinate utility clearance at each property through the local one-call system (Gopher State One Call) prior to performing work. Notify applicable utilities prior to commencing work.

B. Complete necessary Site preparation before installing chain link fence and gates.

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- C. Interruption of Existing Utility Service: Notify owner of utility 72 hours prior to interruption of utility services. Do not proceed with interruption of utility service without written permission from utility owner.

1.08 SPECIAL GUARANTEE

- A. Provide manufacturer's extended guarantee or warranty, with Owner named as beneficiary, in writing, as special guarantee.
  - 1. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 2. Deflection of fence fabric beyond limits.

**PART 2 PRODUCTS**

2.01 CHAIN LINK FENCE FABRIC

- A. Galvanized fabric conforming to ASTM A392, Type II, Class 2, 2.0 ounces per square foot, galvanized after weaving.
- B. Aluminum-coated fabric conforming to ASTM A491, Type I, 0.4 ounce per square foot may be proposed as a substitute for galvanized fabric.
- C. Height: 72 inches, unless otherwise shown.
- D. Core Wire Gauge: No. 9.
- E. Pattern: 2-inch diamond-mesh.
- F. Diamond Count: Manufacturer's standard and consistent for fabric furnished of same height.
- G. Loops of Knuckled Selvages: Closed or nearly closed with space not exceeding diameter of wire.
- H. Wires of Twisted Selvages:
  - 1. Twisted in a closed helix three full turns.
  - 2. Cut at an angle to provide sharp barbs that extend minimum 1/4 inch beyond twist.

2.02 POSTS

A. General:

1. Strength and Stiffness Requirements: ASTM F1043, light industrial fence, except as modified in this section.
2. Round Steel Pipe, Schedule 40: ASTM F1083.
3. Roll-Formed Steel Shapes: Roll-formed from ASTM A1011/A1011M, Grade 45, High-Strength Low-Alloy steel.
4. Lengths: Manufacturer's standard with allowance for minimum embedment below finished grade of 34 inches.
5. Protective Coatings:
  - a. Zinc Coating: ASTM F1043, Type A external and internal coating.

B. Line Posts:

1. Round Steel Pipe:
  - a. Outside Diameter: 2.375 inches.
  - b. Weight: 2.96 pounds per foot.

C. End, Corner, Angle, and Pull Posts:

1. Round Steel Pipe:
  - a. Outside Diameter: 2.875 inches.
  - b. Weight: 4.69 pounds per foot.

D. Posts for Removable Fence Panels: As specified for end, corner, angle, and pull posts.

E. Posts for Swing Gates 8 Feet High and Under:

1. ASTM F900.
2. Round Steel Pipe:
  - a. Outside Diameter: 2.875 inches.
  - b. Weight: 4.64 pounds per foot.

2.03 TOP AND BRACE RAILS

A. Galvanized Round Steel Pipe:

1. ASTM F1083.
2. Outside Diameter: 1.66 inches.
3. Weight: 2.27 pounds per foot.

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- B. Protective Coatings: As specified for posts.
- C. Strength and Stiffness Requirements: ASTM F1043, top rail, light industrial fence.

2.04 FENCE FITTINGS

- A. General: In conformance with ASTM F626, except as modified by this article.
- B. Post and Line Caps: Designed to accommodate passage of top rail through cap, where top rail required.
- C. Tension and Brace Bands: No exceptions to ASTM F626.
- D. Tension Bars:
  - 1. One-piece.
  - 2. Length not less than 2 inches shorter than full height of chain link fabric.
  - 3. Provide one bar for each gate and end post, and two for each corner and pull post.
- E. Truss Rod Assembly: 3/8-inch diameter, steel, hot-dip galvanized after threading rod and turnbuckle or other means of adjustment.
- F. Tie Wires, Clips, and Fasteners: According to ASTM F626.

2.05 GATES

- A. General:
  - 1. Gate Operation: Opened and closed easily by one person.
  - 2. Metal Pipe and Tubing: Galvanized steel. Comply with ASTM F1043 and ASTM F1083 for materials and protective coatings.
  - 3. Frames and Bracing: Fabricate members from round galvanized steel tubing with outside dimension and weight according to ASTM F900.
  - 4. Gate leaves more than 8-feet wide shall have intermediate tubular members and diagonal truss rods to provide rigid construction, free from sag or twist.
  - 5. Gate Fabric Height: Same as for adjacent fence height.
  - 6. Welded Steel Joints: Paint with zinc-based paint.
  - 7. Chain Link Fabric: Attached securely to gate frame at intervals not exceeding 15 inches.

8. Latches: Arranged for padlocking so padlock will be accessible from both sides of gate.
- B. Swing Gates: Comply with ASTM F900 for single or double swing gate types.
1. Leaf Width: As shown.
  2. Hinges: Offset type, malleable iron.
    - a. Furnished with large bearing surfaces for clamping in position.
    - b. Designed to swing either 180 degrees outward, 180 degrees inward, or 90 degrees in or out, as shown, and not twist or turn under action of gate.
  3. Latches: Plunger bar arranged to engage stop, except single gates of openings less than 10 feet wide may each have forked latch.
  4. Gate Stops: Mushroom type or flush plate with anchors, suitable for setting in concrete.
  5. Locking Device and Padlock Eyes: Integral part of latch, requiring one padlock for locking both leaves of double gate.
  6. Hold-Open Keepers: Designed to automatically engage gate leaf and hold it in open position until manually released.

## 2.06 CONCRETE

- A. Materials: ASTM C387, packaged, dry, combined ingredients with Type I cement.
- B. Mixing: In a clean metal container, mix package of dry materials by hand or machine. Following manufacturer's instructions, add clean water in sufficient quantity to produce a slump of 2 inches to 3 inches.

## **PART 3 EXECUTION**

### 3.01 GENERAL

- A. Install chain link fences and gates in accordance with ASTM F567, except as modified in this section, and in accordance with fence manufacturer's recommendations, as approved by Engineer. Erect fencing in straight lines between angle points.
- B. Provide necessary hardware for a complete fence and gate installation.
- C. Any damage to galvanized surfaces, including welding, shall be repaired with paint containing zinc dust in accordance with ASTM A780.

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- D. Drainage Crossings: Where the chain-link fence must cross drainage ditches or swales, the main fence shall be carried across a ditch or swale with additional fence added below.
1. Frames and Bracing: The fence added below shall be fabricated with galvanized round steel pipe conforming to the requirements for top and brace rails.
  2. The construction of the frame shall be welded or assembled with corner fittings. The frame shall be rigid and to the extent necessary to maintain a 2-inch clearance between bottom of the frame and finish grade. If necessary to maintain rigidity, attach to the frame a series of 3/8-inch diameter galvanized steel pipe stakes that are embedded a minimum of 2 feet to the sides and bottom of the ditch.
  3. Attach chain link fabric securely to frame at intervals not exceeding 12 inches.

3.02 PREPARATION

- A. Clear area on either side of fence to the extent specified in Section 31 10 00, Site Clearing. Eliminate ground surface irregularities along fence line to the extent necessary to maintain a 2-inch clearance between bottom of fabric and finish grade.
- B. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.03 POST SETTING

- A. Drill or hand-excavate holes for posts to diameters and spacing indicated, in firm, undisturbed soil. Driven posts are not acceptable. Postholes shall be clear of loose materials. Waste materials from postholes shall be removed from Site or regraded into slopes on Site.
- B. Posthole Depth:
1. Minimum 3 feet below finished grade.
  2. 2 inches deeper than post embedment depth below finish grade.
- C. Set posts with minimum embedment below finished grade of 34 inches and with top rail at proper height above finished grade. Verify posts are set plumb, aligned, and at correct height and spacing. Brace posts, as necessary, to maintain correct position and plumbness until concrete sets.

- D. Backfill postholes with concrete to 2 inches above finished grade. Vibrate or tamp concrete for consolidation. Protect above ground portion of posts from concrete splatter.
- E. Before concrete sets, crown and finish top of concrete to readily shed water.
- F. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more.
- G. Line Posts: Space line posts uniformly at 10 feet on centers between terminal end, corner, and gate posts.

#### 3.04 POST BRACING

- A. Install according to ASTM F567, maintaining plumb position, and alignment of fencing. Install braces at gate, end, pull, and corner posts diagonally to adjacent line posts to ensure stability. Install braces on both sides of corner and pull posts.
  - 1. Locate horizontal braces at mid-height of fabric or higher, on fences with top rail, and 2/3-fabric height on fences without top rail. Install so posts are plumb when diagonal truss rod assembly is under proper tension.

#### 3.05 TOP RAILS

- A. Install according to ASTM F567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps and terminating into rail end attached to posts or posts caps fabricated to receive rail at terminal posts. Install top rail sleeves with springs at 105 feet maximum spacing to permit expansion in rail.

#### 3.06 TENSION WIRE

- A. Install according to ASTM F567 and ASTM F1916, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with tie wires at a maximum spacing of 24 inches on center.
- B. Install tension wire within 6 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.

#### 3.07 CHAIN LINK FABRIC

- A. Do not install fabric until concrete has cured minimum 7 days.

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- B. Apply fabric to outside of enclosing framework. Pull fabric taut to provide a smooth and uniform appearance free from sag, without permanently distorting fabric diamond or reducing fabric height. Tie fabric to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
- C. Splicing shall be accomplished according to ASTM F1916 by weaving a single picket into the ends of the rolls to be joined.
- D. Leave 2 inches between finish grade or surface and bottom selvage, unless otherwise indicated.
- E. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches on center.
- F. Tie Wires: Fasten ties to wrap a full 360 degrees around rail or post and a minimum of one complete diamond of fabric. Twist ends of tie wire three full twists, and cut off protruding ends to preclude untwisting by hand.
  - 1. Maximum Spacing: Tie fabric to line posts at 12 inches on center and to brace and top rails at 24 inches on center.

3.08 GATES

- A. Install gates according to manufacturer's written instructions, level, plumb and secure for full opening without interference. Attach fabric and hardware to gate using tamper-resistant or concealed means. Adjust hardware for smooth operation and lubricate where necessary so gates operate satisfactorily from open or closed position.
- B. Set gate stops in concrete to engage center drop rod or plunger bar.

3.09 FIELD QUALITY CONTROL

- A. Post and Fabric Testing: Test fabric tension and line post rigidity according to ASTM F1916.
- B. Gate Tests:
  - 1. Prior to acceptance of installed gates, demonstrate proper operation of gates under each possible open and close condition specified.
  - 2. Adjust gate to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range.

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3. Confirm that latches and locks engage accurately and securely without forcing and binding.

3.10 CLEANUP

- A. Remove excess fencing materials and other debris from Site.

**END OF SECTION**

**SECTION 32 91 13  
TOPSOIL PREPARATION**

**PART 1 GENERAL**

1.01 GENERAL

- A. This Work includes transportation and installation of topsoil and soil amendments to the project site.
- B. No water sources are located in project site. The Subcontractor may not use water from the residential property.
- C. Items specified within this section to be completed by the Earthwork Subcontractor.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
  - 1. Minnesota Department of Transportation Standard Specifications for Construction, 2005 Version or current.
  - 2. American Society for Testing and Materials (ASTM) D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)) (Standard Proctor).

1.03 SUBMITTALS

- A. Action Submittals:
  - 1. Earthwork Subcontractor shall identify borrow source(s) for sampling and approval by Contractor. Samples collected by the Contractor will be analyzed for the following:
    - a. Chemical analyses of source materials.
    - b. Nutrient analyses of source materials.
    - c. Gradation analyses of source materials.
  - 2. Earthwork Subcontractor compaction test results.
- B. Informational Submittals:
  - 1. Certified Topsoil Analysis Reports (Laboratory):
    - a. Nutrient and textural/gradation results.
    - b. Indicate quantity of lime, soil amendments, and quantity and analysis of fertilizer, as necessary.

2. Compost certification.

#### 1.04 QUALITY ASSURANCE

##### A. Notify Contractor when:

1. Whenever subgrade is ready for backfilling or when backfilling operations are resumed after a period of inactivity.
2. Soft or loose subgrade materials are encountered.
3. Topsoil material appears to be deviating from Specifications.

- ##### B. Subcontractor shall perform 1 compaction test in place per lift per excavation area. Contractor will perform compaction testing for quality assurance on a random basis in a manner to minimize interruption to backfill and compaction operations.

#### 1.05 SEQUENCING AND SCHEDULING

- ##### A. Rough grade areas to receive topsoil and seed. Perform Work specified in Section 31 23 23, Fill and Backfill, prior to performing Work specified under this section.
- ##### B. Complete Work specified in this Section within 7 days of the onset of excavation at a property.

### **PART 2 PRODUCTS**

#### 2.01 TOPSOIL

- ##### A. Topsoil shall be natural, friable, sandy, fertile soil of loamy character, containing organic matter, free from objects larger than 1-1/2 inches maximum dimension, and free of subsoil, roots, grass, other foreign matter, hazardous or toxic substances, and deleterious material that may be harmful to plant growth or may hinder grading, planting, or maintenance.
- ##### B. Material furnished shall meet requirements of MnDOT classification for topsoil designated as "A Topsoil Borrow" or "B Select Topsoil Borrow" as defined by the Soil Science Society of America. The material shall meet the requirements provided by the MnDOT standard specifications and defined as follows:
1. Topsoil Borrow: Topsoil for general use as a turf growing medium shall meet the requirements of Table 3877-1 as specified in MnDOT Standard Specification 3877 - Topsoil Borrow and as described below:

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TABLE 3877-1  
Topsoil Borrow Requirements

	Minimum	Maximum
Material Passing 2.00 mm (#10) Sieve	85%	--
Clay	5%	30%
Silt	10%	70%
Sand & Gravel	10%	70%
Organic Matter	3%	20%
pH	6.1	7.8

2. **Select Topsoil Borrow:** Select topsoil for use as a plant growing medium in designated areas, such as gardens and landscape beds, shall meet the requirements of Table 3877-2 as specified in MnDOT Standard Specification 3877 Topsoil Borrow and as described below:

TABLE 3877-2  
Select Topsoil Borrow Requirements

	Minimum	Maximum
Material Passing 2.00 mm (#10) Sieve	90%	--
Clay	5%	30%
Silt	10%	70%
Sand & Gravel	20%	70%
Organic Matter	3%	20%
pH	6.1	7.5
Extractible Phosphorous	30 kg per hectare (26.8 pounds/acre)	--
Exchangeable Potassium	150 kg per hectare (133.8 pounds/acre)	--
Soluble Salts	--	0.15 siemens per meter (1.5 mmho/cm)

C. SOURCE QUALITY CONTROL – by Contractor

1. **Soil Analysis/Testing:** The current standard testing procedure of the University of Minnesota, Soil Science Department, Soils Testing Laboratory shall be used for determining pH, percent of organic matter, extractible phosphorous, exchangeable potassium, and soluble salts. Performed by county or state soil testing service or approved certified

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independent testing laboratory to verify topsoil characteristics defined above.

2. The Contractor will collect samples for target compound list (TCL) organics and target analyte list (TAL) metals when identifying borrow source(s) to be used for topsoil. The Contractor will also collect one TCL organics and TAL metals sample per 1,000 yd<sup>3</sup> of topsoil. The topsoil will meet the Minnesota Pollution Control Agency (MPCA) Tier I Residential Soil Reference Values (SRV) to be certified as "clean".

2.02 COMPOST

- A. Compost material may be used as a soil amendment for landscape planting or turf establishment purposes as requested by the Property Owner and at the direction of the Contractor.
- B. The compost shall be considered mature and usable when 60 percent decomposition has been achieved as determined by an ignition-loss analysis and any one additional test method including the Solvita test of 5 or above. This shall mean that the compost product has no offensive smell, no identifiable organic materials, and will not reheat more than 11 °C (20 °F) degrees above ambient temperature.
- C. Compost shall be registered for sale with the State of Minnesota.
- D. Grade 1 compost for use in turf establishment shall be a nutrient rich type derived from the decomposition of animal derived material with a texture similar to a highly organic soil and meeting the specification standards for Grade 1 compost under MnDOT Standard Specification 3890 Compost. Compost vendors must furnish certification with the results of testing that their compost has been chemically and biologically tested and found to meet the standards.
- E. SOURCE QUALITY CONTROL - By Contractor: The Contractor will collect samples for target compound list (TCL) organics and target analyte list (TAL) metals when identifying compost vendors to be used as a soil amendment for landscape planting or turf establishment purposes. The Contractor will also collect one TCL organic and TAL metals sample per 1000 yd<sup>3</sup> of compost. The compost will meet the Minnesota Pollution Control Agency (MPCA) Tier I Residential Soil Reference Values (SRV) to be considered "clean".

**PART 3 EXECUTION**

3.01 TOPSOIL PLACEMENT

- A. Do not place topsoil when subsoil or topsoil is frozen, excessively wet, or otherwise detrimental to the Work.
- B. Based on recommendations of the soil testing report, the Earthwork Subcontractor shall mix lime and soil amendments with topsoil before placement or spread on topsoil surface and mix thoroughly into entire depth of topsoil before placing seed.
- C. Topsoil will be placed in each excavated area to surrounding grade. Depth of top soil shall be a minimum of 6 inches under seed areas.
- D. Select Topsoil shall be placed in garden areas to a depth of 18 inches below final grade.
- E. Topsoil shall not be placed on sub-soil with standing water or unstable subgrade conditions. Topsoil shall be placed in a manner that does not disturb or damage surrounding structures or utilities. Topsoil will be compacted to between 80 and 85 percent maximum dry density as determined by ASTM D698 (Standard Proctor) in no greater than 6-inch lifts.
- F. Uniformly distribute topsoil to + 0.1 foot of final grades. Fine grade topsoil eliminating rough or low areas and maintaining levels, profiles, and contours of subgrade.
- G. Remove stones exceeding 1-1/2 inches, roots, sticks, debris, and foreign matter during and after topsoil placement.
- H. Remove surplus borrow soil and topsoil from property.

3.02 AMENDMENT WITH COMPOST

- A. The topsoil will be amended with compost only when requested by the Property Owner and as directed by Contractor.
- B. One (1) part compost shall be mixed with three (3) parts topsoil and uniformly mixed prior to compaction and final grading. The amended topsoil shall be uniformly distributed to + 0.1 foot of final grades.

**END OF SECTION**



**SECTION 32 92 00**  
**TURF AND GRASSES**

**PART 1 GENERAL**

1.01 GENERAL

- A. Landscape Subcontractor will be required to provide water for establishment of vegetation and may not use water from residential properties.
- B. Items specified within this section to be completed by the Landscaping Subcontractor.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
  - 1. Minnesota Department of Transportation Standard Specifications for Construction, 2005 Version or current.
  - 2. Mn/DOT Seeding Manual, 2007 Edition. Office of Environmental Services Erosion Control, Engineering Unit.

1.03 DEFINITIONS

- A. Watering Period: Begin watering immediately after each property is seeded and continue for a period of six weeks during which the seeded area will be watered by the Landscape Subcontractor.
- B. Satisfactory Stand: A 70 percent stand of grass that has been growing in place in a live, healthy condition.

1.04 SUBMITTALS

- A. Informational Submittals: Product labels/data sheets.
- B. Action Submittals:
  - 1. Certification for each lot of seed; include source and seed mix.
  - 2. Certification of sod; include source and harvest date of sod, and sod seed mix.
  - 3. Description of required maintenance activities and activity frequency.
  - 4. Watering plan and schedule, identifying labor, equipment and materials to be used.

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5. Standard and organic fertilizer products proposed for use.
6. Erosion control blanket.

1.05 DELIVERY, STORAGE, AND PROTECTION

A. Seed:

1. Furnish in standard containers with seed name, lot number, net weight, percentages of purity, germination, and hard seed and maximum weed seed content, clearly marked for each container of seed.
2. Keep dry during storage.

B. Sod:

1. Do not harvest if sod is excessively dry or wet to the extent survival may be adversely affected.
2. Harvest and deliver sod only after laying bed is prepared for sodding.
3. Roll or stack to prevent yellowing.
4. Deliver and lay within 24 hours of harvesting.

1.06 WEATHER RESTRICTIONS

- A. Perform Work under favorable weather and soil moisture conditions as determined by accepted local practice.
- B. Seed and/or sod shall not be placed when the ground is frozen.

1.07 SEQUENCING AND SCHEDULING

- A. Complete Work specified in Section 32 93 00, Trees, Shrubs, and Perennials and prepare topsoil as specified in Section 32 91 13, Topsoil Preparation, before starting Work of this section.
- B. Complete Work under this section within 4 day following completion of topsoil preparation.
- C. Notify Contractor at least 3 days in advance of start of planting activity.
- D. Planting Season: Per manufacturer's recommendation.

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1.08 MAINTENANCE SERVICE

- A. Subcontractor: Perform maintenance operations during maintenance period to include:
1. Watering: Keep surface moist.
  2. Washouts: Repair by filling with topsoil, fertilizing, seeding, and mulching.
  3. Mulch: Replace wherever and whenever washed or blown away.
  4. Reseed unsatisfactory areas or portions thereof at the end of the maintenance period or next planting season (if end of maintenance period is out of planting season) if a satisfactory stand has not been produced.
  5. Replant entire area if satisfactory stand does not develop one year later.
- B. Inspect, repair, and replace as necessary all erosion control measures during the time period from completion of construction to completion of the watering period. Remove erosion control measures at the end of the watering period.

**PART 2 PRODUCTS**

2.01 SEED

- A. The seed mixture to be furnished and used shall be Mixture 270, as specified for Residential Turf in the MnDOT Standard Specification 3876 - Seed, and as provided below:

<u>MIXTURE: 270</u>			
Common Name	Bulk Rate		% of Mix Component
	kg/ac	lb/ac	
Blue Grass, Kentucky – Elite	33.6	30	25.0
Blue Grass, Kentucky – Improved	33.6	30	25.0
Blue Grass, Kentucky – Low Maintenance	33.6	30	25.0
Red fescue, creeping	10.8	9.6	8.0
Rye-grass, perennial	22.8	20.4	17.0
<b>GRAND TOTALS:</b>	<b>134.4</b>	<b>120</b>	<b>100.0</b>

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- B. The seed shall meet acceptable varieties, purity and germination requirements as specified for the plant species in the mixture in MnDOT Standard Specification 3876 – Seed.
- C. Alternate seed mixes may be considered for use if requested by the property owner or recommended by the Landscape Contractor due to growing season. The Contractor shall review alternate seed mixes for acceptability and approve as appropriate.
- D. All seed shall conform to the latest seed law of the State, including those governing labeling and weed seed tolerances. Tolerances for Germination and Purity, as determined by the Department of Agriculture, shall only apply to seed that has been previously tested and approved by the Department of Agriculture as a seed lot. Test for germination and viability shall have been made within 9 months of the date of installation.
- E. All bags of seed shall be labeled with the mixture number and the vendor from which it was obtained. All Seed not planted within 9 months after it has been tested for germination shall be sampled and retested before use, at no cost to the Contractor. Seed testing shall be in accordance with the methods on file with the Mn/DOT Erosion Control unit.

2.02 WATER

- A. Any water used to moisten surface soils or in hydroseeding operation shall be from a potable source or a source approved by the Contractor.
- B. The Subcontractor may not use water from the residence.

2.03 HYDROMULCH

- A. Wood Cellulose Fiber Mulch:
  - 1. In accordance with MnDOT Standard Specification 3884 - Hydraulic Soil Stabilizer, hydromulch shall be Type 5–Hydromulch or Type 6–Hydromulch Blend as approved by the Contractor.
  - 2. Specially processed wood fiber containing no growth or germination inhibiting factors.
  - 3. Dyed a suitable color to facilitate inspection of material placement.
  - 4. Manufactured such that after addition and agitation in slurry tanks with water, the material fibers will become uniformly suspended to form a homogeneous slurry.
  - 5. When hydraulically sprayed on the ground, material will allow absorption and percolation of moisture.

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2.04 SOD

- A. Certified, species native to that area. At least two-thirds of the grasses, as determined by initial seeding proportions, shall be of improved and elite type Kentucky bluegrass varieties as defined in 3876.2C.
- B. Lawn sod shall have a lush appearance, be dense, have a uniform texture, and bright in color throughout. The sod shall not contain grass with blade widths of 5 mm (0.2 inch) or greater. The sod shall be weed-free and shall contain no more than 5 mm (0.2 inch) of thatch over the base soil. The sod shall consist of a blend of 4 or 5 fine leafed turf grasses.
- C. Strongly rooted pads, capable of supporting own weight and retaining size and shape when suspended vertically from a firm grasp on upper 10 percent of pad.
  - 1. Grass Height: Normal.
  - 2. Strip Size: Suppliers Standard.
  - 3. Soil Thickness: Uniform; 1 inch plus or minus 1/4 inch at time of cutting.
  - 4. Age: Not less than 10 months or more than 30 months.
  - 5. Condition: Healthy, green, moist; free of diseases, nematode and insects, and of undesirable grassy and broadleaf weeds. Yellow sod, or broken pads, or torn and uneven ends will not be accepted.

2.05 EROSION CONTROL BLANKET

- A. Apply in areas with a greater than 1V:3H slope.
- B. Category 2 Erosion Control Blanket in accordance with MnDOT Standard Specification 3885 - Erosion Control Blankets, and as described below:
  - 1. Straw 1S (netting on one side).
  - 2. Meet the criteria specified in MnDOT Standard Specification Table 3885-2.
  - 3. For Category 2 blankets, the netting shall contain sufficient UV stabilization for breakdown to occur within a normal growing season.

2.06 FERTILIZER

- A. Meeting requirements from Certified Topsoil Analysis Report identified in Section 32 91 13, Topsoil Preparation.
- B. Provide recommendation for standard and organic fertilizer.

**PART 3 EXECUTION**

**3.01 PREPARATION**

- A. Grade areas to smooth, even surface with loose, uniformly fine texture.
  - 1. Roll and rake, remove ridges, fill depressions to meet finish grades.
  - 2. The soil should be prepared by loosening topsoil to a minimum depth of 3 inches.
  - 3. Limit such Work to areas to be planted within immediate future.
  - 4. Remove debris, and stones larger than 1-1/2-inch diameter, and other objects that may interfere with planting and maintenance operations.
- B. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface to dry off before seeding. Do not create muddy soil.
- C. Restore prepared areas to specified condition if eroded or otherwise disturbed after preparation and before planting.
- D. Landscaping Subcontractor shall remove silt fence, if present, during hydroseeding and hydromulching activities.
- E. Watering:
  - 1. Seed Watering: Per manufacturer's recommendations.
  - 2. Supplemental Watering: During periods of inadequate rainfall, supplemental watering may be required after the initial and additional waterings and prior to acceptance of the Work. Supplemental watering shall also be performed when directed by Contractor. Water shall be applied at the rate specified by Contractor within 24 hours of notice.

**3.02 FERTILIZER**

- A. Fertilizer shall be applied to seeded areas during the maintenance period when required or as directed by Contractor.
- B. Apply in accordance with manufacturer's instructions.

**3.03 SEEDING**

- A. Start within 2 days of topsoil preparation completion.
- B. The seed shall be sown in accordance with MnDOT Standard Specification 2575 – Controlling Erosion and Establishing Vegetation, unless otherwise specified.

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- C. Seed shall be sown on a prepared surface by hydroseeding prior to applying mulch. The use of hand operated mechanical spreaders will be permitted only on areas that are inaccessible to, or too small for, the specified equipment unless otherwise directed by the Contractor.
- D. Application Rate: 120 lb/ac for Mixture 270 or in accordance with MnDOT standard specification 2575.
- E. A tracer shall be added to the water in the hydroseeder tank to visually inspect the uniformity of the seed application.
- F. The seed or seed/fertilizer mixture shall be emptied within 1 hour after the seed is added to the tank.
- G. Apply on moist, prepared soil, only after free surface water has drained away.
- H. Prevent drift and displacement of mixture into other areas.
- I. The seeding should be performed between April 1 and September 20 as specified for the seed mix in accordance with MnDOT Standard Specification 2575 – Controlling Erosion and Establishing Vegetation. When the dates in the season of planting prohibit seeding of the specified seed mixture, the Subcontractor may propose an alternative seed mixture or methods for approval by the Contractor.

3.04 HYDROMULCH

- A. Hydromulch shall be applied in accordance with MnDOT Standard Specification 2575 – Controlling Erosion and Establishing Vegetation.
  - 1. The water to bale ratio shall be in accordance with the manufacturer's recommendations.
  - 2. Using the color of the material as a metering agent, the slurry shall be uniformly sprayed on the prepared seedbed.

3.05 SODDING

- A. Sod shall only be used when directed by the Contractor.
- B. Do not plant dormant sod, or when ground is frozen.
- C. Lay sod to form solid mass with tightly fitted joints; butt ends and sides, do not overlap.
  - 1. Stagger strips to offset joints in adjacent courses.

2. Work from boards to avoid damage to subgrade or sod.
  3. Tamp or roll lightly to ensure contact with subgrade; work sifted soil into minor cracks between pieces of sod, remove excess to avoid smothering adjacent grass.
  4. Complete sod surface true to finished grade, even, and firm.
- D. Fasten sod on slopes to prevent slippage with wooden pins 6 inches long driven through sod into subgrade, until flush with top of sod. Install at sufficiently close intervals to securely hold sod.
- E. Water sod with fine spray immediately after planting. During first week, water daily or more frequently to maintain moist soil to depth of 4-inches.
- F. Apply top dress fertilizer at recommended rate.

3.06 EROSION CONTROL BLANKET

- A. Apply to areas with greater than a 1V:3H slope.
- B. Install in accordance with MnDOT Standard Specification 2575 – Controlling Erosion and Establishing Vegetation.
- C. Place the blankets on the specified areas within 24 hours after sowing of the seed on that area.
- D. The Landscape Subcontractor shall roll out or lay the blankets parallel to the direction of water flow, with the netting on top.
- E. The blankets shall be spread evenly without stretching, and so the fibers are in direct contact with the soil over the entire area.
- F. Adjacent strip edges shall overlap each other at least 102 mm (4 inches). Strip ends shall overlap each other at least 178 mm (7 inches).
- G. If necessary, cut mat to size with scissors or shears.
- H. A minimum of 1 staple per square meter shall be inserted flush with the ground surface to anchored to the soil surface.
- I. For steep slopes and ditches, bury leading edge at top of slope in a 6-inch by 6-inch trench to prevent water from getting under the mat.
- J. Immediately after installation, gently water area thoroughly, wetting both top mat and the underlying soil.

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- K. Stakes will degrade naturally as grass becomes established.

3.07 FIELD QUALITY CONTROL

- A. Six (6) weeks after seeding is complete and on written notice from Landscape Subcontractor, Contractor will, within 15 days of receipt, determine if a satisfactory stand of grass has been established. At the direction of Contractor, any defective or unacceptable seed shall be removed, replaced and watered by the Landscape Subcontractor at the Landscape Subcontractor's expense.

**END OF SECTION**



**SECTION 32 93 00**  
**TREES, SHRUBS, AND PERENNIALS**

**PART 1 GENERAL**

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. American Association of Nurserymen (AAN): Z60.1, Nursery Stock.
2. Hortus Third, Liberty Hyde Bailey, Hortorium, 1976.
3. Federal Housing Administration (FHA), Section 1103-103.

1.02 DEFINITIONS

A. Measurement:

1. In size grading Balled and Burlapped (B & B), caliper takes precedence over height.
2. Measure trunk caliper 6 inches above the ground level (up to and including 1-inch caliper size).
3. Measure size of container-grown stock by height and width of plant.
4. Measure herbaceous perennials pot size, not top growth.

1.03 SUBMITTALS

A. Action Submittals:

1. SMRSCS Pre-Selected Plant materials source list: Landscaping Contractor shall develop and submit a list of trees, shrubs and perennials that are readily available at local nurseries and appropriate for the region with the recommended available sizes.
2. Product data on manufactured products specified.

B. Informational Submittals:

1. Maintenance Data: Instructions for storage, planting, fertilizing, care, and maintenance of each type of plant for 1-year period in climate and location of the Project.
2. Guarantee.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Cover plants during shipment with a tarpaulin or other suitable covering to minimize drying or ship in box van.
- B. B & B Plants: Wrap each ball firmly with burlap and securely bind with twine, cord, or wire for shipment and handling. Drum-lace balls with a diameter of 30 inches or more.
- C. As specified herein for transplanting.

1.05 GUARANTEE

- A. Provide nursery guarantee or warranty, with Property Owner named as beneficiary, in writing, as guarantee. Guarantee shall provide for replacement with new plants those found defective or to be dead or not in a vigorous, thriving condition during a period of 1 year after the date of Substantial Completion for each property.
- B. Replace defective plants with new plants free of dead or dying branches and branch tips, and bearing foliage of a normal density, size, and color. Closely match new plants to adjacent specimens of the same species and meet requirements of this Specification.
- C. Plant replacement plants that die during a season unfavorable for planting during the first month of the next favorable season.
- D. Plants damaged or lost due to vandalism or acts of neglect by others are not subject to this special guarantee.
- E. A Letter of Credit will be provided by the Subcontractor in the amount of 3 percent of the contract amount to remain in affect from the date of Substantial Completion through the end of the 1-year warranty period.

1.06 MAINTENANCE

- A. Commence to maintain plant life immediately after planting and maintain for the period specified for “seed watering” in Section 32 92 00, Turf and Grasses.
- B. In accordance with accepted Submittal on care and maintenance of plants and as follows:
  - 1. Maintain by watering, pruning, cultivating, and weeding as required for healthy growth.

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2. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical position as required.
3. Maintenance and fertilizer requirements as specified in Informational Submittal.
4. Restore or replace damaged wrappings. Spray as required to keep trees and shrubs free of insects and disease.
5. Maintenance includes temporary protection fences, barriers, and signs as required for protection.
6. Coordinate watering to provide deep root watering to newly installed trees.

1.07 SCHEDULING AND SEQUENCING

- A. Planting Season: Per manufacturer's recommendation.
- B. Plant trees, shrubs, and perennials after final grades are established and before seeding of lawns or grasses.

**PART 2 PRODUCTS**

2.01 PLANT MATERIALS

- A. Provide size, genus, species, and variety of trees, shrubs, and perennials to comply with applicable requirements of AAN Z60.1 to develop the SMRSCS Site Pre-selected Species (Supplement 1) that are readily available at local nurseries.
- B. Nomenclature (Names of Plants): In accordance with "Hortus Third".
- C. Quality and Size:
  1. Nursery-grown, habit of growth normal for species.
  2. Sound, healthy, vigorous, and free from insects, diseases, and injuries.
  3. Equal to or exceeding measurements specified in plant list. Measure plants before pruning with branches in normal position.
  4. Perform necessary pruning at time of planting.
  5. Sizes: Dimensional relationship requirements of AAN Z60.1 for kind and type of plants required.
  6. B & B Plants: Firm, intact ball of earth encompassing enough of the fibrous and feeding root system to enable full plant recovery.
    - a. Ball Size: AAN Z60.1.

7. Container-Grown Plants: Self-established root systems, sufficient to hold earth together after removal from container, without being root bound.
    - a. Stock: Grown in delivery containers for at least 6 months but not over 2 years.
  8. Label one tree and shrub of each variety with securely attached waterproof tag bearing legible designation of botanical and common name.
- D. Replacement Trees, Shrubs, and Perennials: Same species and quantity as specified for plant being replaced except:
1. Species that are at risk due to current or anticipated diseases or infestations in the foreseeable future (i.e., Dutch Elm disease or Emerald Ash tree borer).
  2. Existing trees larger than 4-inch caliper may be replaced with 2-inch caliper trees.
  3. Exotic species not readily available at local nurseries will be managed on property-specific basis with the property owner.

## 2.02 ANTIDESICCANT

- A. Provide transpiration retarding material to be used where any plant material is moved during the growing season.
- B. Products (or approved equivalent):
  1. Foliguard<sup>®</sup>.
  2. Wiltpruf<sup>®</sup>.

## 2.03 STAKING, AND WRAPPING MATERIALS

- A. Wood Stake: 2 inches by 2 inches by 8 feet.
- B. Guy Wires: Galvanized, 12-gauge, ductile steel.
- C. Hose: Two-ply, reinforced rubber garden hose, not less than 1/2-inch diameter, new or used.
- D. Tree Ties: No. 4 chain lock tree ties as manufactured by Green Brothers, Ltd.
- E. Wrapping Material: Heavy crepe paper.
  1. Burlap: Of first quality, minimum 8 ounces in weight, not less than 6 inches nor more than 10 inches in width.

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2.04 MULCH

- A. Recycled hardwood (chipped or shredded), free from noxious weed seed and foreign material harmful to plant growth.
- B. Depth: 3 inches.

2.05 PEAT MOSS

- A. Composition: Natural residue formed by decomposition of reeds, sedges, or mosses in a freshwater environment, free from lumps, roots, and stones.
  - 1. Organic Matter: Not less than 90 percent on a dry weight basis.
- B. Moisture Content: Maximum 65 percent by weight at time of delivery.

2.06 HERBICIDE

- A. Selective, pre-emergent, surface-applied at manufacturer's recommended rate.
- B. Manufacturers and Products (or approved equivalent):
  - 1. Eli Lilly and Co.; Surflan.
  - 2. Thompson-Hayward Chemical Co.; Casoron.

2.07 PLANTING SOIL MIX

- A. Proportion by Weight: 3/4 approved Select Topsoil with 1/4 approved organic matter (peat moss).

2.08 FERTILIZER

- A. Commercial, complete, of neutral character; in granular, packet, or pellet form, 35 to 80 percent of nitrogen slow release.
  - 1. Minimum: 10 percent available nitrogen, 3 percent to 5 percent phosphoric acid, and 3 percent to 5 percent soluble potash.
- B. Organic fertilizer when requested by property owner and as directed by the Contractor.

2.09 SOURCE QUALITY CONTROL (BY CONTRACTOR)

- A. Topsoil Analysis/Testing: As specified in Section 32 91 13, Topsoil Preparation.

**PART 3 EXECUTION**

**3.01 LOCATION OF PLANTS**

- A. Locate new planting in same location as removed plant or otherwise directed by Contractor.
- B. Locate no planting, except ground cover, closer than 18 inches to pavements, pedestrian pathways, and 36 inches to structures unless replacing plant that was previously located there.
- C. Request Contractor observe locations and adjust as necessary before planting begins.
- D. Planting of trees and shrubs shall be as specified herein and shown on Standard Details:
  - 1. 3293-612, Small Tree Planting.
  - 2. 3293-614, Tree Planting on Slope.
  - 3. 3293-630, Shrub Planting from Container.
- E. Ground Cover Beds:
  - 1. Mix amendments and fertilizer with top soil prior to placing or apply on surface of top soil and mix thoroughly before planting.
  - 2. Scarify top soil to a depth of 4 to 6 inches.
  - 3. Establish finish grading of soil. Rake areas to smooth and create uniform texture and fill depressions.
  - 4. Moisten.

**3.02 PREPARATION**

- A. Planting Soil: Delay mixing of amendments and fertilizer if planting will not follow preparation of planting soil within 2 days. For pit and trench type backfill, mix planting soil prior to backfilling and stockpile at Site.
- B. Trees, Shrubs, and Perennials:
  - 1. Pits, Beds, and Trenches: Excavate with vertical and scarified sides.
  - 2. B & B Trees and Shrubs: Make excavations at least twice as wide as root ball.
  - 3. Container-Grown Stock: Excavate as specified for B & B stock, adjust for size of container width and depth.

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4. Bare-Root Trees: Excavate pits to a width to just accommodate roots fully extended and depth to allow uppermost roots to be just below original grade.
5. Fill excavations with water and allow to percolate out prior to planting.

3.03 PLANTING

- A. Plant trees before planting surrounding smaller plants. Adjust plants with most desirable side facing toward the prominent view (sidewalk, building, street).
- B. B & B Plants: Place in pit by lifting and carrying by its ball (do not lift by branches or trunk). Lower into pit. Set straight and in pit center with tip of rootball 1 to 2 inches above adjacent finish grade.
- C. Bare-Root Plants: Spread roots and set stock on cushion of planting soil mixture. Set straight in the pit center so that roots, when fully extended, will not touch walls of the planting pit and the uppermost root is just below finish grade. Cover roots of bare-root plants to the crown.
- D. Container-Grown Plants: Remove containers, slash edges of rootballs from top to bottom at least 1-inch deep. Plant as for B & B plants.
- E. Ground Covers: Dig planting holes with one of the following: hand trowel, shovel, bulb planter, or hoe. Split biodegradable pots or remove nonbiodegradable pots. Root systems of all potted plants shall be split or crumbled. Plant so roots are surrounded by soil. Set potted plants so pot top is even with existing grade.
- F. Transplants: The Property Owner may have removed existing plants prior to excavation and removal by the Earthwork Subcontractor. At the direction of the Contractor, the Landscaping Subcontractor shall prepare planting holes appropriate for the transplants.

3.04 BACKFILLING

- A. Backfill with planting soil mix as specified in Article 2.07.
- B. B & B Plants:
  1. Partially backfill pit to support plant. Remove burlap and binding from sides and tops of B & B plants, do not pull burlap from under balls.
  2. When excavation is approximately 2/3 full, water thoroughly before placing remainder of backfill to eliminate air pockets even if it is raining. Finish backfilling pit sides.

3. Never cover top of rootball with soil. Form a saucer above existing grade, completely around the outer rim of the plant pit.

C. Bare-Root Plants:

1. Plumb before backfilling and maintain plumb while working backfill around roots and placing layers above roots.
2. Set original soil line of plant 1 inch to 2 inches above adjacent finish landscape grades. Spread out roots without tangling or turning up to surface. Cut injured roots cleanly; do not break.
3. Carefully work backfill around roots by hand; puddle with water until backfill layers are completely saturated.

3.05 STAKING, AND WRAPPING

- A. Support trees immediately after planting to maintain plumb position.
- B. Staking: Support deciduous trees 2 inches in caliper or less with stakes spaced equally about each tree.
- C. Wrapping: Spirally wrap trunks of deciduous trees from ground line to height of second branches, promptly after planting. Wrap neatly and snug. Hold material in place with raffia cord at top and bottom.

3.06 FERTILIZER

- A. Add as top dressing depending on soil test report, plant size and manufacturer's recommendation.

3.07 MULCHING

- A. Cover planting beds and area of saucer around each plant with 3-inch thick layer of selected mulch within 2 days after planting. Saturate planting area with water.

3.08 WEED CONTROL

- A. Maintain a weed-free condition within planting areas during maintenance period. Apply pre-emergent selective herbicide to mulched beds at manufacturer's recommended rate of application.

3.09 SUPPLEMENT

- A. The supplement listed below, following "End of Section," is a part of this Specification:

SOUTH MINNEAPOLIS RESIDENTIAL SOIL CONTAMINATION SITE  
USEPA-REGION 5

1. Template: Trees, Shrubs and Perennial Listing.

**END OF SECTION**

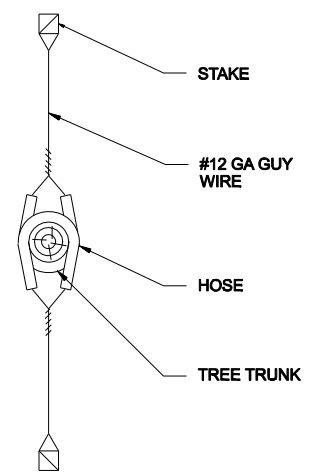
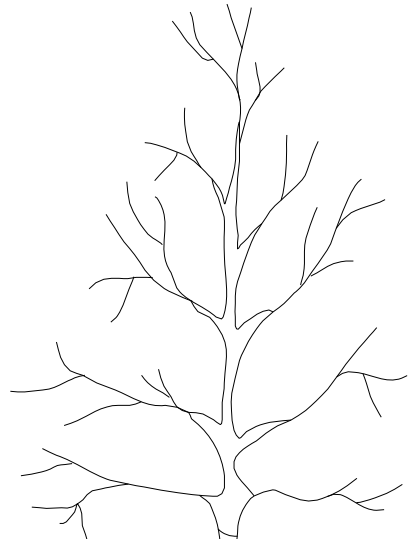


SOUTH MINNEAPOLIS RESIDENTIAL SOIL CONTAMINATION SITE  
USEPA-REGION 5

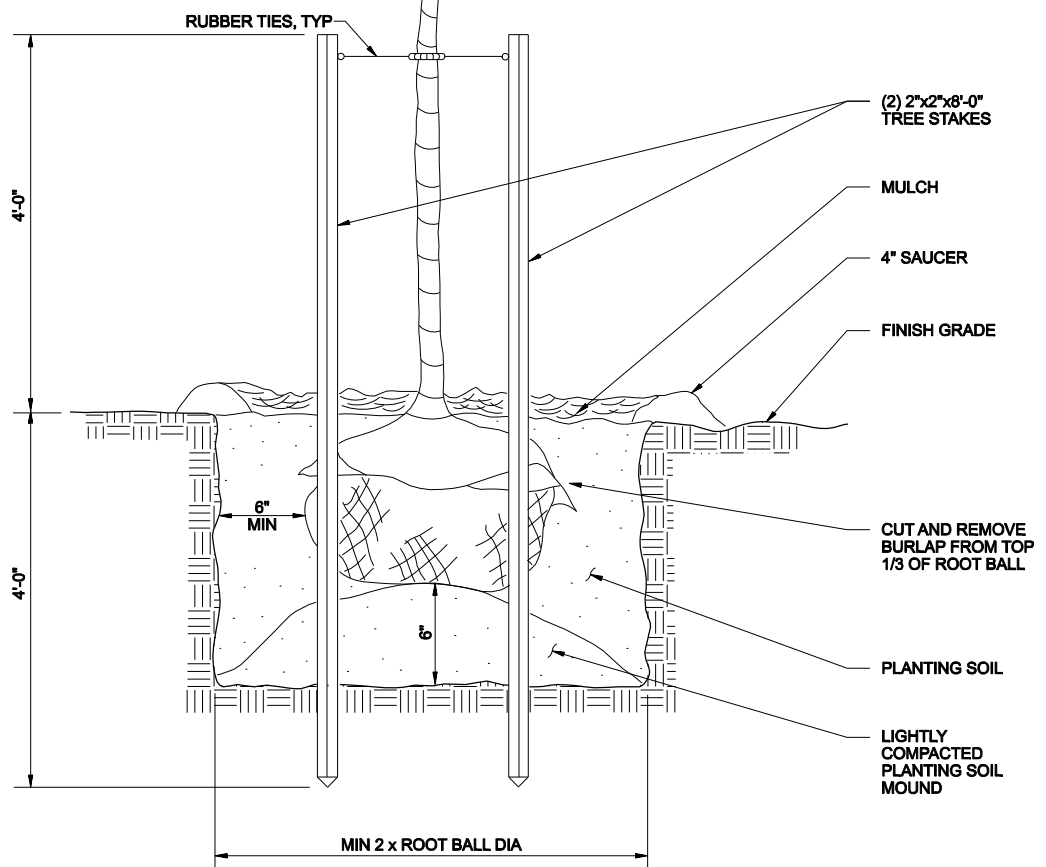
<b>Tree Listing</b>				
<b>Quantity</b>	<b>Size</b>	<b>Genus</b>	<b>Species</b>	<b>Variety</b>
<i>example</i>	<i>2-inch DBH</i>	<i>Birch</i>	<i>River Birch</i>	<i>Betula Nigra</i>
<b>Shrub Listing</b>				
<i>example</i>	<i>3-gallon pot</i>	<i>Viburnum</i>	<i>Viburnum Arrowwood</i>	<i>Viburnum dentatum</i>
<b>Perennial Listing</b>				
<i>example</i>	<i>4-inch pot</i>	<i>Hosta</i>	<i>H. Royal Standard</i>	<i>Royal Standard</i>

*Note: Landscaping Subcontractor shall develop listing of trees, shrubs, and perennials in the above format (or comparable) with plants that are appropriate for the region and readily available at local nurseries.*





**PLAN**



**NOTE:**

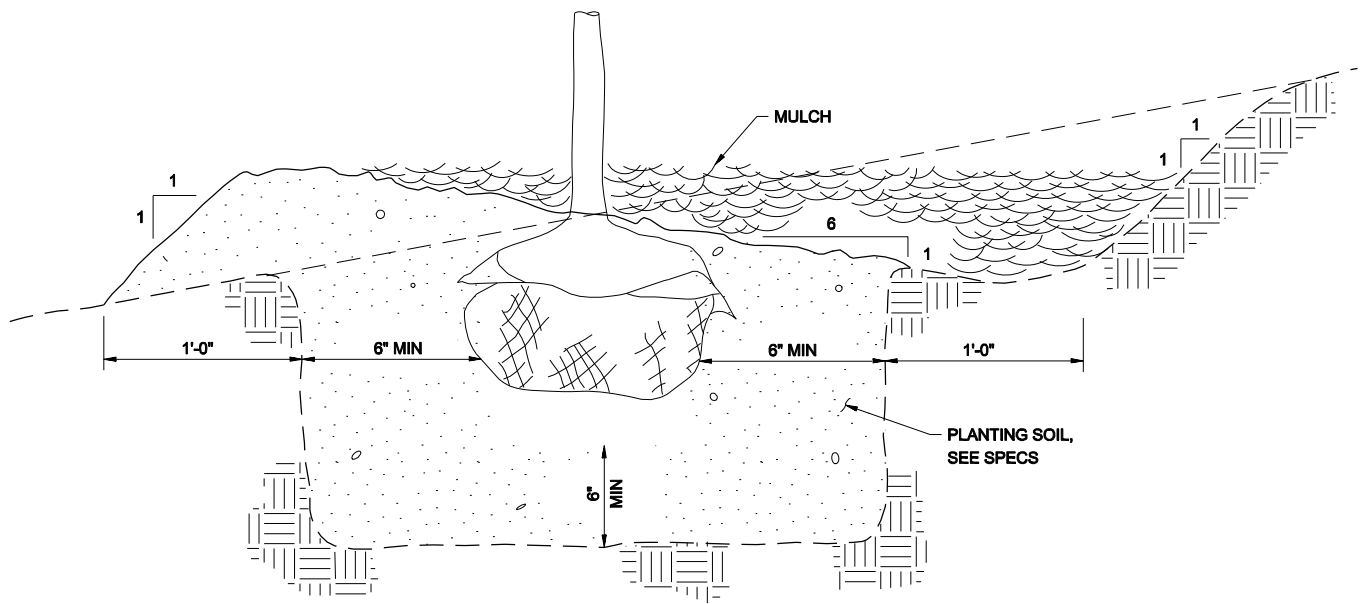
TREE SHALL BEAR SAME RELATION TO FINISH GRADE AS IT BORE TO PREVIOUS GRADE.

DETAIL 3293-612  
**SMALL TREE PLANTING**

PROPERTY IMPROVEMENTS  
 SOUTH MINNEAPOLIS RESIDENTIAL SOIL CONTAMINATION SITE







DETAIL 3293-614

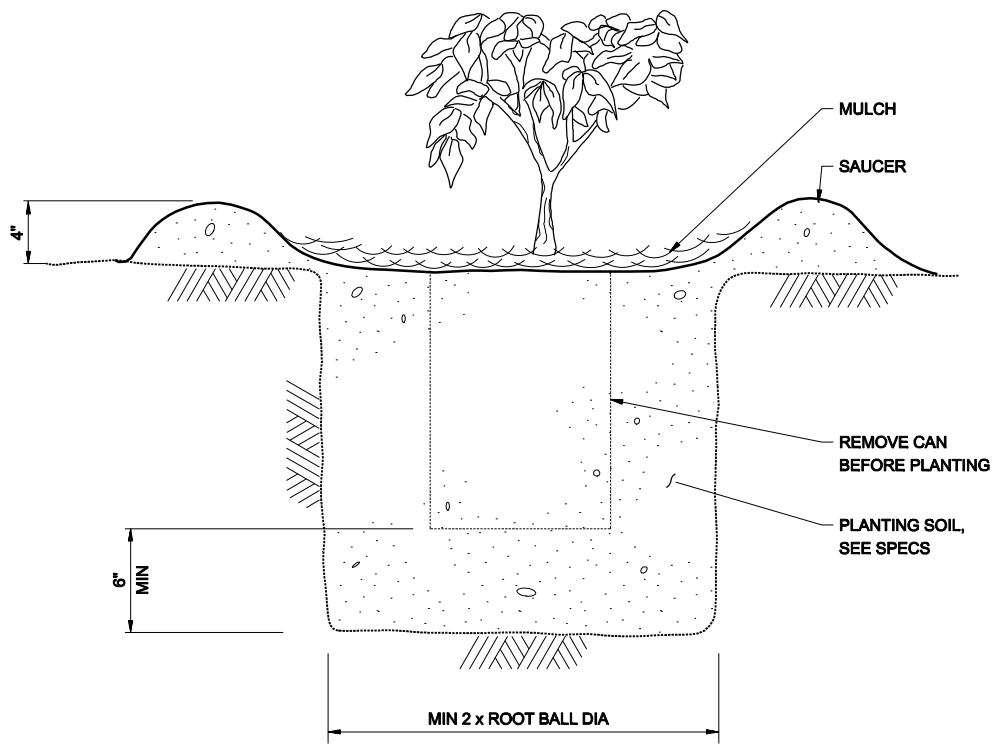
**TREE PLANTING ON SLOPE**

PROPERTY IMPROVEMENTS

SOUTH MINNEAPOLIS RESIDENTIAL SOIL CONTAMINATION SITE

**CH2MHILL**





DETAIL 3293-630  
**SHRUB PLANTING FROM CONTAINER**

PROPERTY IMPROVEMENTS  
 SOUTH MINNEAPOLIS RESIDENTIAL SOIL CONTAMINATION SITE

**CH2MHILL**













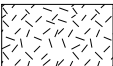
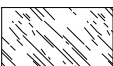



**Drawings**

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**LEGEND:**

	ROADWAY OR ALLEY
	DRIVEWAY, SIDEWALK, CONCRETE SLAB, STEPS, PATIO, ETC.
	PROPERTY LINE
	BACK YARD, SIDE YARD, FRONT YARD DIVIDING LINE
	CHAIN LINK FENCE
	WOOD FENCE
	WROUGHT IRON FENCE
	RETAINING WALL
	BUILDING (MAJOR AND MINOR)
 N1E09-09F-SS 6.7 mg/kg	SOIL SAMPLE LOCATION WITH SAMPLE IDENTIFICATION NUMBER AND CONCENTRATION AMOUNT
	TREE (ALL TYPES AND SIZES)
	AREA OF EXCAVATION (> 25 mg/kg)
	MULCHED AREAS
	GARDEN AREAS
	NORTH ARROW

**GENERAL NOTES:**

1. AREAS OF EXCAVATION ARE SHOWN WITH 1-FOOT OFFSET FROM BUILDINGS, SIDEWALKS AND PROPERTY BOUNDARIES.
  2. INDIVIDUAL PROPERTY SKETCHES ARE BASED ON THE INTERPRETATION OF INFORMATION FROM THE FOLLOWING SOURCES:
    - HENNEPIN COUNTY PARCEL BOUNDARIES (OBTAINED JUNE 2008)
    - CITY OF MINNEAPOLIS PLANIMETRIC LINES AND POINTS (OBTAINED JUNE 2008)
    - CITY OF MINNEAPOLIS AERIAL PHOTOGRAPHY (APRIL 2007)
    - HENNEPIN COUNTY WEB-BASED AERIAL PHOTOGRAPHY (APRIL 2006)
    - OTHER WEB-BASED AERIAL AND STREET VIEW PHOTOGRAPHY AS APPROPRIATE
    - FIELD NOTES AND SKETCHES AS AVAILABLE (2006 - NOT TO SCALE)
- FEATURES THAT ARE NOT READILY APPARENT FROM AERIAL PHOTOGRAPHY OR CHANGED AS A RESULT OF CONSTRUCTION OR OTHER ACTIVITIES AT THE PROPERTY MAY NOT BE REFLECTED IN THE SKETCHES. ACTUAL CONDITIONS AND EXTENTS OF EXCAVATION WILL BE VERIFIED DURING PRECONSTRUCTION MEETINGS AT THE INDIVIDUAL PROPERTIES.



Property sketches are included on the attached CD.