ADDENDUM #1
REQUEST FOR PROPOSAL
FOR
GENERAL CONTRACTORS FOR
CONSTRUCTION OF MAINTENANCE SERVICES/COMMUNITY GARDEN MULTI-PURPOSE BUILDING

The above RFP is amended as set forth below. Offerors must acknowledge receipt of this Addendum No. 1 prior to the hour and date ("Submission Date") specified in the RFP or as amended, by signing this form below. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF THE PROPOSAL PRIOR TO THE SUBMISSION DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR PROPOSAL. If by virtue of this Addendum you desire to modify an already submitted proposal, such modification may be made in accordance with the RFP, provided the modification is received prior to the Submission Date.

This Addendum No. 1 is being issued to answer written questions received prior to the Contractor Question Deadline and provide clarifications & modifications to the Contract Documents which are presented in the RFP:

Contractor Questions:

1. Question: Are there any noise restrictions required by the project?
   
   **Answer:** The project needs to meet the City of Denver noise ordinances and construction start and stop times. Also, the project needs to be considerate of its location relative to the adjacent Elementary School and the surrounding residential lots. The Elementary School starting bell is at 8:10 A.M. and the closing bell is at 3:00 P.M.

2. Question: Can construction work occur on Saturdays?
   
   **Answer:** If needed, yes.

3. Question: Where are the RFP documents located?
   
   **Answer:** The RFP documents are located on the District’s website at: [www.gvrmobdistrict.com](http://www.gvrmobdistrict.com). Once on the home page, click the “Community” link and the RFP information will be located near the top of the page under the heading “Request for Proposal”. Also, you can request a link to the RFP document by emailing the District Manager (Micaela Duffy) at mduffy@gvrmobdistrict.com.

4. Question: Does the Contractor need to include the cost of the water tap in their Proposal?
   
   **Answer:** No. The District will pay for this separately.
5. Question: Have traffic control plans been provided?

Answer: No. The contractor will need to prepare the necessary traffic control plans, etc. that may be required by Denver for permits (i.e. right of way permits) required to be obtained for the construction of the improvements.

6. Question: Is there a source of construction water onsite?

Answer: The contractor is responsible for providing their own construction water. There is an existing fire hydrant along the project’s frontage with N. Argonne St. The contractor will need to obtain a temporary fire hydrant meter from Denver Water to use this fire hydrant.

7. Question: There appear to be no plans for the irrigation design. Whose responsibility is the design and construction of the irrigation system?

Answer: Please provide the design and construction of the irrigation design to meet the landscape plan layout and requirements. A revised Exhibit B – Pricing Form has been provided with this Addendum which includes a defined list of allowances. The irrigation design and construction have been included under Allowance Items 2 and 3, respectively.

8. Question: Whose responsibility is it to remove the 3 rail fence along the western sides of the garden plots?

Answer: The District will remove the 3 rail fence.

9. Question: Please provide specific model / mfg information, or custom design details, on the interior and exterior hollow metal and/or wood doors. These doors appear to have recessed panel inserts or a panel pattern embossment. There can be great cost variation between these types of doors.

Answer: The Basis of Design was to match the Garage Door Panel Embossment. Similar Pattern can be 6-Panel Embossed Metal Doors 3070 by TRUDOOR or approved equal. Please see attached cut sheet.

10. Question: Are tests required for soil compaction, concrete cylinders, or any other special testing? Earthwork & Concrete sections are not included in the Specifications. If testing is required, who is responsible for the costs and engaging the testing agency?

Answer: Tests are required for soil compaction, concrete cylinders, etc.

Refer to Additional Specification attached: Section 014550- Testing Laboratory Services. See Additional Specifications attached for Concrete: 031000- Concrete Formwork / 032000- Concrete Reinforcing / 032600- Concrete Accessories & 033000- Cast-In-Place Concrete. Also, refer to Additional Specification for Earthwork: 0312000- Earth Moving.
Regarding testing responsibilities, per Section 13.5 of the General Conditions (located in Exhibit J of the RFP), the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals.

11. Question: It appears your staff has some knowledge of the underground utilities located in the landscape area between the site and the street – running parallel to the street. Can someone identify what exists there so we can properly estimate the hand excavation labor necessary for new utility lines crossing this area?

Answer: District staff has limited knowledge of underground utilities within the landscape area between the site and street. Please refer to the ALTA survey and civil plans sheet(s), both provided in Exhibit A of the RFP, to better identify known public utilities within the area. It is the contractor’s responsibility to obtain utility locates for all public and private utility infrastructure prior to construction.

12. Question: What is the budget?

Answer: The District will consider the cost to complete the Work as part of its determination of the Proposal that provides the best value to the District.

Clarification & Modification Items:

1. Pricing Form – The Pricing Form located in Exhibit D shall be replaced with the Pricing Form which has been attached and made part of this Addendum #1. The attached Pricing Form includes specific Allowance Items for which the District has requested prices. Please include any additional Allowance items to the list (this may require providing an additional sheet to describe and include pricing information). Please complete and submit the Pricing Form attached to this Addendum #1 in lieu of the Pricing Form included in the RFP.

2. Topsoil – The District is planning to keep excess topsoil generated from this project. The topsoil shall be stockpiled on the Community Garden property, east of the proposed Maintenance Services/Community Garden Multi-Purpose Building and north of the existing garden plots. Please do not include haul off costs for excess topsoil in your Proposal.
3. Revisions to Power Plan (Sheet E1.0):

   A. Keyed Note #4 on Sheet E1.0 shall be revised to read:

      4) PROVIDE NEMA 6-50R RECEPTACLE FOR FUTURE EQUIPMENT. COORDINATE POWER REQUIREMENTS WITH OWNER. CONNECT USING (2 # 6, 1 # 10 G) 1”C.

   B. Keyed Note #5 on Sheet E1.0 shall be revised to read:

      5) PROVIDE NEMA 6-30R RECEPTACLE FOR FUTURE EQUIPMENT. COORDINATE POWER REQUIREMENTS WITH OWNER. CONNECT USING (2 # 10, 1 # 10 G) 3/4”C.

GVR METROPOLITAN DISTRICT

By: /s/ Micaela Duffy
    Micaela Duffy, District Manager

Acknowledgement to Addendum #1

This Addendum No. 1 Acknowledgement to the above RFP shall be attached to the Proposal Form and become a part of the proposal that is submitted. Except as provided herein, all terms and conditions of the RFP remain unchanged and in full force and effect.

Firm Name: _____________________________________________________________

By: ________________________________________________________________

Address: _________________________________________________________________

Date: ______________ ______________________________________________________

Phone: ___________________________________________________________________
6-Panel Embossed Hollow Metal Door

The 6-panel design is perfect for applications that require a more traditional looking door, without sacrificing the durability of a standard commercial metal security door. Our heavy duty 6-panel steel door is an ideal solution for condominium, apartment, hotel and motel entry doors and high-end residential buildings.

- Ideal for Interior and Exterior Applications
- Insulated Polystyrene Core (Energy Efficient)
- Fire-Rated up to 3 Hours
- Available in 3'0" Widths Only, Heights up to 8'0"

Starting at $225

Configure and Get Price

Specifications

- Heavy Duty: 18 Gauge Cold Rolled Steel
- Only Available with "Steelecraft or DKS" Hardware Prep Locations
- Full Body Polystyrene Core
- Non-Handed Design
- Seamless Filled Edges
- 12-Gauge Closer Reinforcement
- 7-Gauge Hinge Reinforcement Standard / Heavy Duty
- 16-Gauge Flush Top Cap – Galvanized
- 16-Gauge Inverted Bottom Cap – Galvanized
- ADA 10 inch Minimum Bottom Rail
- Prime Painted Gray: Two Part Epoxy Factory Applied, Baked On - No Color Finish Options Available
- Standard Lock Preparations Include 161, 161 DL, Fed B6 Edge, Panic Bar Reinforced
- WHF / ITS up to 3 Hour, Positive Pressure and "S" Smoke Included
- STC Rated 28
- R value .524
Door Construction
1700 Series

1700 Series 6-Panel Door, Sound Rated, 18-Gauge, STC 28
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SECTION 014550 - TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
   1. Cooperate with the Owner's selected testing agency and all others responsible for testing and inspecting the Work.
   2. Provide such other testing and inspecting as are specified to be furnished by the Contractor in this Section and/or elsewhere in the Contract Documents.

B. Related Sections
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions of these Specifications.
   2. Requirements for testing may be described in various Sections of these Specifications.
   3. Where no testing requirements are described, but the Owner decides that testing is required, the Owner may require such testing to be performed under current pertinent standards for testing. Payment for such testing will be made as described in this Section.

C. Work not included:
   1. The Owner will select a prequalified independent testing laboratory.
   2. Payment for initial services of the testing laboratory as further described in Article 2.1 of this Section.
   3. Owner anticipates performing testing/inspection services for, but not limited to, the following portions of the work:
      a. Earthwork
      b. Asphalt
      c. Concrete
      d. Aggregate base

1.2 SUBMITTALS

A. Promptly process and distribute required copies of test reports and related instruments to assure necessary retesting and replacement of materials with the least possible delay in progress of the work.

1.3 QUALITY ASSURANCE

A. The testing laboratory will be qualified to the Owner's approval in accordance with ASTM E329.

B. Testing, when required, will be in accordance with all pertinent codes and regulations, and with selected standards of the American Society for Testing and Materials.
1. The Owner will pay for initial testing services requested by the Owner.

2. When initial tests indicate non-compliance with the Contract Documents, the costs of initial tests associated with the non-compliance will be deducted by the Owner from the Contract Sum.

3. When initial tests indicate non-compliance with the Contract Documents, subsequent retesting occasioned by the non-compliance shall be performed by the same testing agency, and costs thereof will be deducted by the Owner from the Contract Sum.

B. Code Compliance Testing

1. Inspections and tests required by codes and ordinances, or by a plan approval authority, shall be the responsibility of, and shall be paid by the Contractor, unless otherwise provided in the Contract Documents.

C. Contractor's Convenience Testing

1. Inspecting and testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Representatives of the testing laboratory shall have access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.

3.2 PREPARATION

A. All specimens and samples for testing, unless otherwise provided in the Contract Documents, shall be taken by the testing personnel. All sampling equipment and personnel will be provided by the testing laboratory. All deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

3.3 FIELD QUALITY CONTROL

A. Provide and maintain an effective Contractor Quality Control (CQC) program and perform sufficient quality control inspections and tests of all items of work, including those of subcontractors, and material fabricators to ensure the compliance with Contract Documents. Furnish appropriate facilities, instruments, and testing devices required for performance of the quality control function. Controls must be adequate to cover construction operations and be keyed to the construction sequence.

3.4 SCHEDULES

A. By advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and to issue each of its findings.

B. Provide all required time within the construction schedule.

C. When changes of construction schedule are necessary during construction, coordinate all such changes with the testing laboratory as required.

D. When the testing laboratory is ready to test according to the established schedule, but is prevented from testing or taking specimens due to incompleteness of the Work, all extra charges for testing attributable to the delay may be back-charged to the Contractor and shall not be borne by the Owner.
SECTION 031000 – CONCRETE FORMWORK

PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes
   1. Formwork for cast-in-place concrete.
   2. Form accessories.
B. Related Sections
   1. Section 033000 - Cast-In-Place Concrete

1.2 REFERENCES
A. ACI 301: Specifications for Structural Concrete for Buildings
B. ACI 347: Recommended Practice for Concrete Formwork
C. PS 1: Construction and Industrial Plywood

PART 2 - PRODUCTS

2.1 MATERIALS
A. Form Materials
   1. Plywood:
      a. Douglas Fir species; select sheathing-tight face grade; sound, undamaged sheets with straight edges.
      b. "B-B Medium Density Overlayed Concrete Form", Class I as defined by PS-1.
      c. Use new plywood for the project for exposed surfaces. Do not reuse plywood more than four times. Do not use patched forms or plywood previously used on another job for exposed concrete.
   3. Tubular Column: Round, of spirally wound, seamless, laminated fiber type; surface treated with release agent.
B. Formwork Accessories
   1. Form Ties: Snap-off metal of fixed length; cone type; 1-1/2 inch break back dimension; free of defects that will leave holes no larger than 1 inch diameter in concrete surface, with waterproofing washer.
   2. Fillets for Chamfered Corners: Wood strips or rigid plastic, 45 degrees, 3/4 inch wing size; maximum possible lengths.
   3. Dovetail Anchor Slots: Galvanized steel at brick and concrete block and stainless steel at stone work; 24 gage; foam filled; release tape sealed slots; bent tab anchors; securable to concrete formwork.
4. Flashing Reglets: Galvanized steel; 24 gage; longest possible lengths; release tape sealed slots; with alignment splines for joints; securable to concrete formwork.

5. Form Liners: Fabricated from fiberglass, elastomeric material, or urethane.

PART 3 - EXECUTION

3.1 ERECTION INSTALLATION APPLICATION

A. Construct formwork to maintain tolerances in accordance with ACI 301.

B. Chamfer Strips (ACI 301 4.2.4): Install 45-degree chamfer strips at exposed outside corners, beams, joists and columns.

C. Forms shall be substantial, designed to resist the pressure to which they will be subjected, free from surface defects and sufficiently tight to prevent leakage of mortar with as few and as inconspicuous joints as possible. Earth forms may be used where approved by Owner. Form for joints and reveals as shown on drawings. Chamfers shall have 3/4” maximum sides.

D. Provide openings in concrete to accommodate work of other trades. Accurately place and securely support items built into forms. All trades affected shall be notified at least 24 hours before any pouring so that those trades may insure that proper blocking, sleeves, pockets, etc. are in their proper place.

E. Forms for Exposed Concrete:

1. Drill forms to suit ties used and to prevent leakage of concrete mortar around tie holes. Do not splinter forms by driving ties through improperly prepared holes.

2. Do not use metal cover plates for patching holes or defects in forms.

3. Use extra studs, walers and bracing to prevent bowing of forms between studs and to avoid bowed appearance in concrete. Do not use narrow strips of form material, which will produce bow.

4. Assemble forms so they may be readily removed without damage to exposed concrete surfaces.

5. Form molding shapes, recesses and projections with smooth-finish materials, and install in forms with sealed joints to prevent displacement.

F. Clean and adjust forms prior to concrete placement. Apply form release agents or wet forms, as required. Retighten forms during and after concrete placement, if required, to eliminate mortar leaks.

G. The Owner shall be notified at least 48 hours before filling of any forms. No concrete shall be placed until Owner has given approval.

H. Installation of Embedded Items

1. Set and build into the work anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete.

2. Use setting diagrams, templates and instructions provided by others for locating and setting.
I. Forms and shoring shall not be removed until concrete attains strength to support its own weight and loads imposed thereon.

J. Approval by The Owner shall be obtained prior to early removal of forms and shoring. Exercise care in the removal of all forms to insure against surface and corner damage.

END OF SECTION
SECTION 032000 - CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes
   1. Reinforcing steel bars, welded steel wire fabric, fabricated steel bar or rod mats for cast-in-place concrete.
   2. Support chairs, bolsters, bar supports, and spacers for supporting reinforcement.
B. Related Sections
   1. Section 031000 - Concrete Formwork
   2. Section 033000 - Cast-in-Place Concrete

1.2 REFERENCES
A. ACI 301 - Specifications for Structural Concrete for Buildings
B. ACI 318 - Building Code Requirements for Structural Concrete
C. ASTM A82 - Steel Wire, Plain, for Concrete Reinforcement
D. ASTM A185 - Welded Wire Reinforcement, Plain, for Concrete
E. ASTM A615 - Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
F. ASTM A706 - Low-Alloy Steel Deformed Bars for Concrete Reinforcement
G. CRSI - Manual of Standard Practice

1.3 SUBMITTALS
A. Submit shop drawings of reinforcing steel in accordance with ACI 301. Copies of the contract drawings shall not be marked and submitted as shop drawings.

1.4 QUALITY ASSURANCE
A. Perform concrete reinforcement work in accordance with CRSI Manual of Standard Practice.
B. Conform to ACI 301.

PART 2 - PRODUCTS

2.1 MATERIALS
A. Reinforcing Bars
   1. ASTM A615 plus S1, Grade 60, deformed.
   2. Ties, stirrups, and field bent bars may be ASTM A615, Grade 40.
B. Welded Wire Fabric
   1. Conform to ASTM A185.
   2. Adjacent sheets of wire mesh shall be lapped at least 6" and securely wired.
3. Welded wire fabric shall be set on wire chairs or "hooked" during placement of concrete to maintain 3/4" cover.

C. Accessories
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete.

PART 3 - EXECUTION

3.1 ERECTION INSTALLATION APPLICATION
   A. Reinforcement
      1. Position, support and secure reinforcements against displacement. Locate and support with metal chairs, runners, bolsters, spacers and hangers, as required.
      2. Install welded wire fabric in as long lengths as practicable, lapping at least one mesh.
      3. Welding of bar reinforcement will not be permitted.
   B. Detailing, fabrication, and placement of reinforcing steel shall be in accordance with ACI 315, Standard Practice for Detailing Reinforced Concrete Structure.
   C. Except as noted on the Drawings, concrete protection for reinforcement shall be in accordance with ACI 318 and as follows:
      1. Concrete not exposed to earth or weather = slabs.

3.2 FIELD QUALITY CONTROL
   A. Metal reinforcing, at the time concrete is placed, shall be free from rust, scale, or other coatings, which will destroy or reduce the bond.

END OF SECTION
SECTION 032600 – CONCRETE ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes
   1. Structural steel connection plates, washers, bolts, nuts, shims, anchor bolts, and templates.
   2. Base plates, cap plates, and shear stud connectors.
   3. All other work normally related to the above or specified under this section.
B. Related Sections
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Condition, and Sections in Division 1 of these Specifications.
   2. Section 014550 - Testing Laboratory Services

1.2 SUBMITTALS
A. Comply with pertinent provisions of Section 013300.
B. Product data:
   1. Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
      a. Sufficient technical data to demonstrate compliance with the specified requirements.
      b. Complete Shop Drawings showing all members.

1.3 QUALITY ASSURANCE
A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
B. In addition to complying with pertinent codes and regulations, comply with:
   1. AISC "Specification for Design, Fabrication, and Erection of Structural Steel for Buildings"
   2. AISC "Code of Standard Practice"
   3. AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts."

1.4 DELIVERY, STORAGE AND PROTECTION
A. Comply with pertinent provisions of Section 016000
B. Delivery and Storage
   1. Deliver materials to the job site properly marked to identify the location for which they are intended.
   2. Use markings corresponding to markings shown on the approved shop drawings.
   3. Store in a manner to maintain identification and prevent damage, off the ground, using pallets or other supports, and to permit easy access for inspection.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Machine Bolts:
   1. Comply with ASTM A307, grade A, and ANSI B18.2, with square and/or hexagonal heads as selected by the Contractor.

B. High strength bolts:
   1. Comply with ASTM A325, type F or N as indicated on Structural drawings.
   2. All bolts shall conform to the "Specifications for Structural Joints using ASTM A325 or A490 bolts" in the AISC manual for steel construction.
   3. Bolts shall be tension control (knock off) type or approved equal, to facilitate visual verification of proper installation.

C. Arc welding electrodes:
   1. Comply with AWS Requirements.

D. Primer:
   1. Use "1099 Tnemec Primer" or
   2. "Rustoleum number 5769 Primer."

E. Other Material:
   1. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Owner.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.
   1. Correct conditions detrimental to timely and proper completion of Work.
   2. Do not proceed until unsatisfactory conditions are corrected.

3.2 ERECTION INSTALLATION APPLICATION

A. Anchor bolts
   1. Install anchor bolts and other connectors required for securing adjacent work.
   2. Provide templates and other devices as needed for presetting bolts and other anchors to accurate locations.

B. Setting bases and bearing plates
   2. Clean the bottom surface of base and bearing plates.
   3. Set loose and attached base plates and bearing plate for structural members in wedges or other adjusting devices.
4. Tighten anchor bolts after supported members have been positioned and plumbed.
5. Do not remove wedges or shims but, if protruding, cut off flush with edge of the base or bearing plate prior to packing with grout.
6. Pack grout solidly between bearing surfaces and bases or plates to assure that no voids remain.
7. Finish exposed surfaces, protect installed materials, and allow to cure in strict compliance as approved by the Owner.

C. Field assembly
   1. Set structural members accurately to the lines and elevations indicated.
   2. Align and adjust the members forming part of a complete frame or structure before fastening permanently.
   3. Clean the bearing surfaces and other surfaces that will be in permanent contact before assembly.
   4. Adjust as required to compensate for discrepancies in elevation and alignment.
   5. Level and plumb individual members of the structure within specified AISC tolerances.
   6. Establish required leveling and plumbing measurements on the mean operating temperature of the structure, making allowances for the difference between temperature at time of erection and the mean temperature at which the structure will be when completed and in service.
   7. Comply with AISC specification for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to welds.
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SECTION 033000 – CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY
   A. Section Includes
      2. Concrete installation methods.
      3. Concrete finishing standards.
   B. Related Sections
      1. Section 032000 - Concrete Reinforcing
      2. Section 032600 - Concrete Accessories

1.2 REFERENCES
   A. American Concrete Institute - ACI
   B. American Society for Testing and Materials - ASTM
   C. Concrete Reinforcing Steel Institute - CRSI
   D. National Fire Protection Association - NFPA

1.3 DEFINITIONS

1.4 SYSTEM DESCRIPTION

1.5 SUBMITTALS
   A. Submit concrete mix designs a minimum of 15 days prior to first concrete placement.
   B. Submit complete concrete mix designs which shall include the following:
      1. Mix identification.
      2. Intended use.
      3. Mix proportions, including admixtures.
      4. Manufacturer’s data and certifications for mix materials.
      5. Wet and dry unit weight.
      6. Entrained air content.
      7. Design slump.
      8. Required average strength qualification data per ACI 301 3.9.1 and 3.9.2.
      9. Average strength qualification data (trial mix data or field test data per ACI 301 3.9.3).
     10. Field test data shall include copies of the Concrete Testing Agency’s report.
   C. Do not begin concrete production until mixes have been reviewed and are acceptable to Owner.
D. Mix designs may be adjusted when material characteristics, job conditions, weather, test results or other circumstances warrant. Do not use revised concrete mixes until submitted to and accepted by Architect and Structural Engineer.

E. Submit manufacturer’s specifications with installation instructions for proprietary materials including reinforcement and forming accessories, admixtures, joint materials, hardeners, curing materials, and others as requested by Owner.

1.6 QUALITY ASSURANCE

A. Owner will retain a testing agency under a separate contract in accordance with Section 014550, Testing Laboratory Services. The independent testing agency, including any branch office used, referred to in this Section and Chapter 16 of ACI 301 shall meet the requirements of ASTM E329 and shall have been inspected within the past 3 years by the Cement and Concrete Reference Laboratory of the National Institute for Standards and Testing (NIST) and shall have corrected any deficiencies noted. Testing laboratory will perform materials evaluation, testing and evaluation of concrete mixes. Perform sampling and testing during placement as follows:

1. Sampling: ASTM C172
2. Slump: ASTM C143, one test for each load at point of discharge.
3. Air Content: ASTM C231, one for each set of compressive strength specimens.
4. Compressive Strength: ASTM C399, one set for each 50 cu. yds. Or fraction thereof of each class of concrete; 2 specimens tested at 7 days, 1 specimen tested at 28 days. If second specimen meets specified 28-day strength, test the third specimen. If second specimen does not meet 28-day strength, test the third specimen at 45 days.
5. When the total quantity of a given class of concrete is less than 50 cu. yds., the strength tests may be waived by the Owner if field experience indicates evidence of satisfactory strength. Not less than one test will be made of each type of building components.
6. Measure and record air temperature.
7. Required references to be kept in the project field office shall include the following:
   b. CRSI “Placing Reinforcing Bars”

PART 2 - PRODUCTS

2.1 MATERIALS

A. Concrete work shall meet applicable requirements of ACI 301 “Specification for Structural Concrete for Buildings”, except as modified by the supplemental requirements specified in this Section. For numbers in parenthesis, refer to ACI 301 paragraphs.

1. Portland Cement: ASTM C 150, Type II (2.2.1.3).
   a. Fly ash may be substituted for Portland Cement on a weight-by-weight basis up to a maximum of 20 percent of the total cement content of the mix.
   b. Fly ash shall meet the requirements of ASTM C 618, except loss on ignition shall not exceed 3 percent.
   c. Use of fly ash shall be indicated on the mix design submittal.
2. Aggregates: ASTM C 33, local aggregates of proven durability may be used when acceptable to Owner. Maximum aggregate size: 3/4”.

3. Water: Clean, drinkable and free of deleterious matter.

B. All formed concrete, which will be exposed to public view, shall receive light broom finish for flatwork, and rubbed finish for other exposed surfaces.

C. Membrane-Forming Curing Compound: ASTM C 309, Type I. (12.2.1.7).
   1. Begin initial curing as soon as free water has disappeared from exposed surfaces. Where possible, keep continuously moist for not less than 72 hours. Continue curing by use of moisture-retaining cover or membrane-forming curing compound. Provide protections as required to prevent damage to exposed concrete surfaces.
   2. Cure all appropriate slab areas by a method compatible with the adhesives normally used for adhesive applied floor finishes.

D. Liquid chemical floor sealer, densifier, hardener:
   1. "Seal Hard" as manufactured by L&M Construction Chemicals, Inc. Omaha, Nebraska; (402) 453-6600.
   2. Or approved equal.
   3. Apply in accordance with manufacturers instructions.

E. The recommendations of ACI 305 "hot weather concreting" is made a part of this specification.

F. Proportion mixes to obtain compressive strengths indicated on the Drawings. Where compressive strength is not indicated, assume a minimum of 4000 psi, 28 day strength. All concrete shall have a minimum cement content of 5 1/2 sacks per yard.

G. Concrete shall be air-entrained. Air entraining admixture:
   1. ASTM C 260, shall provide not less than 2% nor more than 4% entrained air for concrete.

H. Air entraining or water reducing admixtures or both will be permitted.
   2. Only use admixtures, which have been tested and accepted by Owner.
   3. Admixtures shall be submitted for approval before submitting the mix designs and shall not be used without written approval from Owner.
   4. Admixtures shall not be used for covered floors where they are not recommended by the floor covering or floor adhesive manufacturer.

I. All admixtures shall be compatible.

J. Calcium chloride shall not be used. Chloride ions in admixtures shall not exceed 0.1% by weight of cement content.

K. Proportioning of concrete shall be in accordance with Section 3.99 of ACI 301. Proportioning by Section 3.10 of ACI 301 will not be accepted.

L. Bonding agent shall be 100% solids, moisture insensitive epoxy equal to:
   1. Sikadur Hi-Mood by Sika Chemical Corp.
2. FX-762 Hydro-Ester by Fox Industries, Inc.
3. Euco-Epoxi 460 MV by Euclid Chemical Company.

M. Expansion joint material shall be self-expanding cork and shall meet the requirements of ASTM D1752.

N. Isolation joint material shall be the thickness shown and shall meet requirements of ASTM D1751.

O. Reinforcing Support
   1. For support of reinforcing at surfaces to be exposed, plastic protected bar supports or concrete block shall be provided. Concrete masonry block, concrete masonry brick, or clay brick will not be acceptable.

P. Joint Sealant
   1. Joint sealant, where called for, shall be one of the following:
      a. Sikaflex sealant by Sika Chemical Corp.
      b. Vertiseal by W.R. Grace & Co.
      c. Euco Polysulfide Sealant by Euclid Chemical Company.

**PART 3 - EXECUTION**

3.1 PREPARATION

A. Refer to applicable Sections of ACI 301 and ACI 304, “Recommended Practice for Measuring, Mining, Transporting and Placing Concrete”, except as modified by the supplemental requirements specified in this Section. For numbers in parenthesis, refer to ACI 301 paragraphs.

   1. (8.2) Aluminum pipes, chutes, or other aluminum devices shall not be used to convey concrete.

   2. Notify Owner 48 hours prior to any concrete pour.

   3. Record and submit to NREL, date, time, quantity, location and site weather conditions for all concrete pours.

3.2 ERECTION INSTALLATION APPLICATION

A. Concrete Placement

   1. Comply with ACI 304 placing concrete in a continuous operation within planned joints or sections.

   2. Do not begin placement until work of other trades affecting concrete is completed.

   3. Place concrete within 45 minutes after mixing water has been added.

   4. Consolidate placed concrete using mechanical vibrating equipment with hand rodding and tamping, so that concrete is worked around reinforcement and other embedded items and into all parts of the form.

   5. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement and curing.
      a. In cold weather comply with ACI 306.
b. In hot weather comply with ACI 305.

B. Loading and use of all new concrete work shall be in accordance with standards set forth by the ACI.

END OF SECTION
PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Additional information concerning earth moving may be found on the civil drawings, in the project geotechnical report and agency having jurisdiction construction standards. In case of conflict between the drawings, jurisdictional criteria and the information specified herein, the more stringent requirements shall govern.

C. Additional information concerning earth moving may be found in the geotechnical investigation report by Ground Engineering Consultants, Inc. dated September 5, 2008. All requirements of this report shall be followed. The information shown in this report is for information and it shall be the contractor's responsibility to field verify conditions indicated.

1.02 SUMMARY

A. This Section includes the following:

1. Preparing and grading subgrades for slabs-on-grade, walks, pavements, lawns and grasses, and exterior plants.
2. Excavating and backfilling for buildings and structures including overexcavation of existing unsatisfactory on-site soil materials and replacement with structural fill.
3. Drainage course for slabs-on-grade.
4. Subbase and base course for asphalt or concrete paving.

B. Related Sections include the following:

1. Section 0145500- Testing Laboratory Services, for the owner's selected testing agency.

C. Permits and Fees: Obtain and pay for all permits and fees required for the work of this section, including erosion and sediment control and water quality permits required by the agency having jurisdiction and the Colorado Department of Public Health and Environment, Water Quality Control Division.

1.03 DEFINITIONS

A. Backfill: Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including
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1. Haulage Course: Course placed over the excavated subgrade in a trench before laying pipe.

2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Course placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.

D. Drainage Course: Course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

E. Excavation: Removal of all material of whatever character required for the work encountered above subgrade elevations and to lines and dimensions indicated, including boulders. See Section 3.4 for definition of unclassified and classified excavation.

F. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed or approved by Owners Representative and the testing and inspections agency to correct unsatisfactory conditions. Authorized additional excavation and replacement material will be paid for according to Contract Provisions for changes in the Work.

G. Bulk Excavation: Excavation more than 10 feet (3 m) in width and more than 30 feet (9 m) in length.

H. Fill: Fill is all material placed to raise the grade of the site or to backfill excavation, upon which the Geotechnical Engineer has made sufficient tests and observations to enable him to issue a written statement that, in his opinion, the fill has been placed and compacted in accordance with the requirements of these specifications.

I. Structural Fill: Select granular material for use below floor slabs and to 5'-0" beyond building lines. On-site material may be used if approved by the Geotechnical Engineer.

J. Underslab Gravel: Imported Class 6 road base per Colorado Department of Transportation Standard Specifications for Road and Bridge Construction (2005) or material approved by Geotechnical Engineer.

K. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

L. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

M. Subgrade: Surface or elevation remaining after completing excavation, or top surface
SECTION 312000 - EARTH MOVING

of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

N. Utilities: Include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.04 SUBMITTALS

A. Material Test Reports: Provided by Contractor from a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D 698 for each on-site or borrow soil material proposed for fill and backfill.

B. Preexcavation Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.05 QUALITY ASSURANCE

A. Comply with applicable codes, ordinances, regulations, references and standards in effect at bid date:

1. International Building Code (IBC) per jurisdiction criteria.
3. State and local codes.

B. In case of conflict between the above codes, regulations, references and standards and these specifications, the more stringent requirements shall govern.

C. Testing Agency: The Contractor will employ a qualified independent Geotechnical testing agency. Contractor shall furnish testing agency access to work, facilities and incidental labor required for testing. Notify the testing and inspection agency not less than 48 hours in advance of all work requiring testing.

D. Geotechnical Engineer: All materials and operations under this section of the specifications shall be executed under the supervision of a Geotechnical Engineer who will place qualified personnel on the site during earth moving operations as necessary.

The Geotechnical Engineer shall approve all foundation excavations and give written approval of the completed foundations to the Owner's Representative at the following times:
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1. When excavations are first open.
2. Just prior to placing of concrete, shall test and control the fill compaction, approve the materials and method of placing and compacting and give written approval to the Owner's Representative that all bearing surfaces and fill requirements have been inspected.
3. The Contractor shall be responsible to notify the Geotechnical Engineer when tests are to be made.

E. For approval of imported or on-site fill material, notify the Geotechnical Engineer at least four (4) working days in advance of intention to import material, designate the proposed borrow area and permit the Geotechnical Engineer to sample as necessary from the borrow area for the purpose of making acceptance tests to prove the quality of the material. The Geotechnical Engineer report on the acceptability shall be final and binding.

F. Reference Standards:


G. Preconstruction Conference: Conduct conference at Project site as directed by Owner's Representative prior to start of construction. Contractor to comply with requirements, which may also be included in Division 1 Section "Project Management and Coordination."

1.06 PROJECT CONDITIONS

A. Existing Utilities: Locations, sizes and depths or invert elevations of existing utilities as shown on the drawings are based on information provided by others, and believed to be correct, but may not be absolutely so. Such information is therefore presented only as approximations, and should be verified prior to construction. Protect from damage any sewer, water, gas, electric, phone or other pipe lines or conduits uncovered during the work until they have been examined by the Owner's Representative. If such lines are found to be abandoned and not in use, remove affected sections without extra cost. If such lines are found to be in use, carefully protect and carry on work around them. If Owner' Representative deems it advisable to move such lines, Owner will pay cost of moving. Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Owner's Representative and then only after arranging to provide temporary utility services according to requirements indicated.

1. Contact utility-locator service for area where project is located before excavating.
2. Notify Owner's Representative not less than two (2) days in advance of proposed utility interruptions.
3. Do not proceed with utility interruptions without Owner's Representative's written permission.

B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.
SECTION 312000 - EARTH MOVING

C. Remove all existing fill deemed by Geotechnical Engineer to be unsatisfactorily placed.

D. Existing Contours and Elevations: Contours and spot elevations of existing ground elevations at the site, and approximate elevations of finish grade cuts, fills, and excavations for the Work are shown on Drawings. Contours and elevations for existing ground lines are based on information provided by others, and are believed to be correct, but may not be absolutely so. Existing contours and elevations should therefore be considered approximate, and should be verified at the site prior to construction.

E. Verification of Existing Conditions: Visit the site prior to submission of bids. Verify existing conditions, elevations, and contours. In the event of discrepancies between existing conditions and those indicated on the Contract Documents or survey, contact the Owner’s Representative for clarification.

F. Existing Benchmarks: Carefully preserve and maintain existing benchmarks, monuments, property line pins, and other reference points. If disturbed or destroyed, restore or replace by a Professional Land Surveyor at no additional cost to Owner.

G. Frost Protection: When freezing temperatures may be expected, do not excavate to the full depth indicated unless the footing or slabs are to be poured immediately after the excavation has been completed. If placing of concrete is delayed, protect the bottoms of excavations from frost until concrete is placed.

1.07 WARRANTY

Settlement in backfill, fill or in structures built over backfill or fill, which may occur within the specified project warranty period, shall be corrected at no cost to the Owner. Any structures damaged by settlement shall be restored to their original condition by the Contractor, at no cost to the Owner.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Shall meet approval of Geotechnical Engineer and shall be free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. Clean, on-site, natural soils, or imported materials, as approved by the Geotechnical Engineer.

C. Unsatisfactory Soils: Soil Classification Groups GP, SP, CH, MH, OL, CH, MH, OH, and PT according to ASTM D 2487 or a combination of these groups, as identified by the Geotechnical Engineer.
SECTION 312000 - EARTH MOVING

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Backfill and Fill: Approved by Geotechnical Engineer.

E. Structural Fill: Approved by Geotechnical Engineer.

F. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1 ½-inch (37.5-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve. Recycled asphalt/concrete meeting CDOT requirements can be used as a base course.

G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

H. Sand: ASTM C 33; fine aggregate, natural, or manufactured sand.

I. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.02 GEOTEXTILES

A. Subsurface Drainage and Separation Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288. Utilize Mirafi 140N or as recommended by Geotechnical Engineer.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Preparation of subgrade for earth moving operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 31 Section "Site Clearing."

C. Protect and maintain erosion and sedimentation controls, which are specified in Division 31 Section "Temporary Erosion and Sediment Control," during earth moving operations. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil bearing water runoff or airborne dust to adjacent properties and rights-of-way.
SECTION 312000 - EARTH MOVING

D. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

E. Cold Weather Work: Prevent frost from entering bearing stratus upon which construction will take place or in areas where fill will be placed in that season.

3.02 DEWATERING

A. Prevent surface water and subsurface ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
   1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
   2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.
   3. Obtain and comply with all provisions of the Colorado Department of Public Health and Environment, Water Quality Control Division, Construction Dewatering Permit.

C. Protection of Persons and Property:
   1. Provide all necessary measures to protect workmen and passersby. Barricade open excavations occurring as part of the Work, as required by municipal or other authorities having jurisdiction.
   2. Protect adjacent streets, roadways, and properties throughout the entire operation. Protect newly graded areas from destruction by weather or runoff. Protect structures, utilities, sidewalks, pavements, and other improvements from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

3.03 EXPLOSIVES

A. Explosives: Do not use explosives.

3.04 EXCAVATION, GENERAL

A. Unclassified Excavation: All excavation (other than rock excavation) is considered as unclassified and is defined as removal of all material encountered, regardless of soil type. Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include soil materials, and obstructions. Unclassified excavation is considered normal excavation and no extra costs will be allowed.
SECTION 312000 - EARTH MOVING

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

2. Remove material of every nature or description encountered in obtaining required lines and grades. Excavate and/or place and compact fill to provide for building pad elevation(s) required by drawings.

3. Excavate wide enough at foundations and retaining walls to permit erection and removal of forms, application of dampproofing or waterproofing.

4. Pitch grading around excavations to prevent water from running into excavated areas.

5. Pre-rip hardpan and soft bedrock with single-tooth ripper or other suitable equipment to facilitate excavation with conventional earth-moving equipment.

6. Bearing soils disturbed by excavating equipment must be recompacted to 95 percent of maximum Standard Proctor Density (ASTM D698) prior to placing concrete.

7. Exposed areas which will receive fill once properly cleaned, shall be scarified to a minimum depth of 12”, conditioned to near optimum moisture content, and compacted.

B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth excavation and rock excavation. Do not excavate rock until it has been classified and cross sectioned by Owner’s Representative.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.

   a. Intermittent drilling; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

C. Stability:

1. Slope sides of excavations in compliance with OSHA requirements and local codes or ordinances. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.

2. Continuously monitor cut slopes for distress. Take all necessary precautions to safeguard workers, structures, and utilities.

3. Provide all necessary shoring, sheeting, or bracing of sides of excavations required to prevent caving, erosion, and gullying. Provide underpinning of existing structures or other improvements adjacent to excavations which are subject to damage.

D. Unanticipated Conditions: Notify the Owner’s Representative immediately upon finding evidence of previous structures or filled materials which penetrate below designated excavation levels, groundwater or water-bearing strata, or other conditions which are not shown or which cannot be reasonably assumed from existing surveys and geotechnical reports. Secure the Owner’s Representative instruction before proceeding with further work in such areas.
SECTION 312000 - EARTH MOVING

E. Rock Excavation: Includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction. Rock excavation in unconfined areas is defined as removal and disposal of material which in the Geotechnical Engineer’s opinion, cannot be excavated without continuous and systematic drilling and blasting, or continuous use of a suitable ripper or other special equipment.

1. Unanticipated Rock Excavation: Rock excavation that is not indicated on existing surveys or which cannot be reasonably assumed from geotechnical studies of the site and which could not have been anticipated without extensive investigations. Unanticipated rock excavation shall be subject to change order procedures or previously agreed upon unit prices.

3.05 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.10-foot. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Pile Foundations: Stop excavations 6 to 12 inches (150 to 300 mm) above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.
4. Excavation Below Slab on Grade, or Walks and Pavement: Overexcavate clays and claystone within the proposed footprint of the building slab-on-grade to a minimum depth as recommended in Geotech Report and replace with on-site or imported materials as approved by Geotechnical Engineer.

B. Existing man-made fill shall be removed under structures as required by the Geotechnical Engineer.

3.06 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

B. Scarify subgrade soils beneath exterior slabs, sidewalks and pavements to a minimum depth of 12-inches, moisture condition and recompact as specified.
SECTION 312000 - EARTH MOVING

C. Existing man-made fill shall be removed under walks and pavements as required by the Geotechnical Engineer.

3.07 EXCAVATION FOR UTILITY TRENCHES

A. Refer to Division 31 Section “Trenching and Backfilling,” for excavating and backfilling of utilities.

3.08 SUBGRADE INSPECTION

A. Notify Geotechnical Engineer when excavations have reached required subgrade.

B. If Owner’s Representative and Geotechnical Consultant determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof-roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Remove and replace soft areas. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction. Limit vehicle speed to 3 mph (5 km/h).
2. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Owner’s Representative, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

E. Reconstruc subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Owner’s Representative, without additional compensation.

3.09 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Geotechnical Engineer. If approved by Geotechnical Engineer, structural fill placed at 100 percent ASTM D698, 2 percent below to 1 percent above optimum moisture may be used.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Owner’s Representative.
SECTION 312000 - EARTH MOVING

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials in approved locations without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

   1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

   1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
   2. Surveying locations of underground utilities for Record Documents.
   3. Testing and inspecting underground utilities.
   4. Removing concrete formwork.
   5. Removing trash and debris.
   6. Removing temporary shoring and bracing, and sheeting.
   7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
   8. Acceptance of subgrade by Geotechnical Engineer.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

A. Refer to Division 31 Section “Trenching and Backfilling,” for excavating and backfilling of utilities.

3.13 SOIL FILL

A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.

   1. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
   2. In areas of fill, scarify natural soil following removal of unsatisfactory material, to a depth of 12”.

B. Place and compact fill material in layers to required elevations per the geotechnical report and as follows:

   1. Under grass and planted areas, use satisfactory soil material.
   2. Under walks and pavements, use satisfactory soil material.
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3. Under steps and ramps, use engineered fill or structural fill as approved by Geotechnical Engineer.
4. Under building slabs, use engineered fill or reconditioned on-site soils or imported fills of native soils as approved by Geotechnical Engineer.
5. Under footings and foundations, use engineered fill or reconditioned on-site soils or imported fills of native soils as approved by Geotechnical Engineer.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.14 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to optimum or to 3 percent over optimum moisture content for clay soils, or within 2 percent of optimum moisture content for granular soils. Refer to geotechnical study for additional recommendations.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content beyond the tolerances described above and is too wet to compact to specified dry unit weight.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

1. Under exterior flatwork, slabs, steps, and pavements, scarify and recompact top 8 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Underfootings and interior floor slabs, excavate to approved natural soils, in fill condition, compact to 95 percent.
3. Under lawn or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 90 percent.
4. Compact foundation wall backfill to 95 percent.
5. Compact scarified subgrade soils to 95 percent.
6. Compact retaining wall backfill to 95 percent.

3.16 GRADING
SECTION 312000 - EARTH MOVING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 0.10 feet.
2. Walks: Plus or minus 0.10 feet.
3. Pavements: Plus or minus 0.10 feet.
4. Grading inside Building Lines: Finish subgrade to a tolerance of ¼-inch (13 mm) when tested with a 10-foot (3-m) straightedge.

3.17 BASE COURSES

A. Place base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place base course under pavements and walks as follows:

1. Install separation geotextile, if requested by Geotechnical Engineer, on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place base course material over subbase course under hot-mix asphalt pavement.
3. Shape base course to required crown elevations and cross-slope grades.
4. Place base course 6 inches (150 mm) or less in compacted thickness in a single layer.
5. Place base course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
6. Compact base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

C. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders, at least 12 inches (300 mm) wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.18 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent geotechnical engineering
SECTION 312000 - EARTH MOVING

testing agency to perform field quality-control testing.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Owner's Representative.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Perform field moisture tests in accordance with ASTM D3017. Tests will be performed at the following locations and frequencies at a minimum:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 2000 sq. ft. (186 sq. m) or less of paved area or building slab, but in no case fewer than 3 tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least 1 test for each 100 feet (30 m) or less of wall length, but no fewer than 2 tests.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.19 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Owner’s Representative; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finishedsurfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.20 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Transport surplus satisfactory soil to designated storage areas on Owner’s property.
SECTION 312000 - EARTH MOVING

Stockpile or spread soil as directed by Owner’s Representative.

1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner’s property.

END OF SECTION 312000
A. **Guaranteed Maximum Price (GMP):**  
(for all work included in the Construction Documents and specifications attached)

<table>
<thead>
<tr>
<th>Construction Divisions</th>
<th>Total:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division 01 (General Conditions)</td>
<td>$ ____________</td>
</tr>
<tr>
<td>Division 02 (Site Construction)</td>
<td>$ ____________</td>
</tr>
<tr>
<td>Division 03 (Concrete)</td>
<td>$ ____________</td>
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<tr>
<td>Division 04 (Masonry)</td>
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<tr>
<td>Division 05 (Metals)</td>
<td>$ ____________</td>
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<tr>
<td>Division 06 (Wood and Plastics)</td>
<td>$ ____________</td>
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<tr>
<td>Division 07 (Thermal and Moisture Protection)</td>
<td>$ ____________</td>
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<tr>
<td>Division 08 (Doors and Windows)</td>
<td>$ ____________</td>
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<tr>
<td>Division 09 (Finishes)</td>
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<tr>
<td>Division 10 (Specialties)</td>
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<tr>
<td>Division 11 (Equipment)</td>
<td>$ ____________</td>
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<tr>
<td>Division 12 (Furnishings)</td>
<td>$ ____________</td>
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<tr>
<td>Division 13 (Special Construction)</td>
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<tr>
<td>Division 14 (Conveying Systems)</td>
<td>$ ____________</td>
</tr>
<tr>
<td>Division 15 (Mechanical)</td>
<td>$ ____________</td>
</tr>
<tr>
<td>Division 16 (Electrical)</td>
<td>$ ____________</td>
</tr>
</tbody>
</table>

(If in case of discrepancy, written amount shall govern)

B. **Alternate Pricing Included in GMP** (provide additional sheets if needed):

1. Alternate #1 - $ ____________

C. **Allowance Pricing Included in GMP** (provide additional sheets if needed):

1. Replace exist curb cut in accordance with Denver criteria at end of project. $ ____________
2. Prepare irrigation system design. $ ____________
3. Construct irrigation system per design provided under Allowance Item 2. $ ____________
4. Provide price per cubic yard to remove (haul) topsoil from project site. $ ____________
5. Provide price per cubic yard for additional overexcavation. Price shall include cost for overexcavation, material reconditioning & placement meeting compaction and moisture requirements. $ ____________
6. Provide price per cubic yard to import and place structural fill to meet compaction and moisture requirements. $ ____________
7. Allowance #7 - $ ____________
D. Contractor Owner Equipment Rental Pricing Included in GMP:

1. Rental Item #1 - $ 
2. Rental Item #2 - $ 
3. Rental Item #3 - $ 
4. Rental Item #4 - $ 

E. General Conditions: Cost per month.

(In case of discrepancy, written amount shall govern) - Include a separate sheet detailing the general conditions itemized costs per month. Total on sheet should agree with this total.

F. Miscellaneous Costs Included in GMP:

1. Insurance (describe & itemize below) $ 
   A. 
   B. 
   C. 

2. Performance, Payment & Warranty Bond $ 

3. Taxes (describe & itemize below) $ 
   A. 
   B. 
   C. 

4. Permit Fees (describe & itemize below) $ 
   A. 
   B. 
   C. 

5. Testing & Inspection Fees (describe & itemize below) $ 
   A. 
   B. 
   C. 

6. Contingency (%) $ 

7. Other (describe & itemize & itemize below) $ 
   A. 
   B. 
   C. 

G. Contractor’s Fee (Overhead & Profit Fee) Percentage: perform scope of work for a fixed markup fee percentage of PERCENT (%) 

H. Change Order Markup Fee Percentage: For any potential change orders to the contract, I/we agree to perform change order scope of work for a fixed markup fee percentage of PERCENT (%) (amount shall not exceed Contractor Fee percentage) 

(Authorized Representative, print name) __________________________ Signature __________________________