



Electrical Services Sub-metering Project - Oregon Convention Center

RFB 12-2055

Metro Property and Project Management Office

600 NE Grand Ave.
Portland, OR 97232
503-797-1700

Project Manager

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Notice is hereby given that bids for RFB 12-2055 for the **Electrical Services Sub-metering Project - Oregon Convention Center** shall be received by Metro, 600 NE Grand Avenue, Portland OR 97232 until **2:00 p.m. on March 15, 2012**. It is the sole responsibility of the bidder to ensure that Metro receives the Bid by the specified date and time. All late Bids shall be rejected. Bidders shall review all instructions and contract terms and condition.

Electrical Services Sub-metering Project - OCC

Request for Bid (RFB 12-2055)

The Property and Project Management Office of Metro, a metropolitan service district organized under the laws of the State of Oregon and the Metro Charter, located at 600 NE Grand Avenue, Portland, OR 97232-2736, is hereby requesting sealed bids for the **Electrical Services Sub-metering Project – Oregon Convention Center**. Bids are due (postmarks and faxes are not accepted for formal bids) no later than the date and time indicated on the RFB cover page, at Metro, 600 NE Grand Avenue, Portland, OR 97232. All bids must be submitted in sealed envelopes that clearly identify the item(s) as stated in the RFB. First Tier Subcontractor and Good Faith Effort forms are required from all bidders within two (2) hours of the bid closing time or the bid will be considered non-responsive.

Bidding documents, (including plans and specifications depicting the work) may be viewed at the Metro website, www.oregonmetro.gov under “Doing Business”. Bidding documents are available from ARC Oregon at 1431 NW 17th Avenue Portland, OR, by calling (503) 227-3424, or by email to pdx.planwell@e-arc.com. This project is available online at PlanWell. To order, view or download documents from the ARC Oregon online planroom, go to <http://www.e-arc.com/locations/overview/arc-oregon>. Under “Customer Service”, select the 4th option “Public Projects” Select the project from the list and click on the project number. Bidders that receive documents, either as hard copies or as an instant download, will be added to the planholders list and receive notification of any addenda issued. For assistance, contact ARC Oregon Bid Services department at (503) 227-3424 or email pdx.planwell@e-arc.com. A plan set is also available for review at the Oregon Association of Minority Entrepreneurs, 4134 N. Vancouver Ave., Portland, OR 97217, 503-249-7744 or www.oame.org.

All bids must conform to the RFB format and be complete including the use of any required forms. Metro may accept or reject any or all bids, in whole or in part, or waive irregularities not affecting substantial rights if such action is deemed in the public interest.

Metro and its contractors will not discriminate against any person(s), employee or applicant for employment based on race, creed, color, national origin, sex, sexual orientation, age, religion, physical handicap, political affiliation or marital status. Metro fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. For more information, or to obtain a Title VI Complaint Form, see www.oregonmetro.gov.

Metro extends equal opportunity to all persons and specifically encourages minority, women-owned, and emerging small businesses to access and participate in this and all Metro projects, programs and services.

This project will be subject to prevailing wage requirements as established by the Oregon Bureau of Labor and Industries (BOLI). By submitting a bid, all bidders certify that they will pay and comply with minimum prevailing wage requirements of ORS 279C.800-279C.870. If project is subject to both ORS 279C.800-279C.870 and the Davis Bacon Act (40 U.S.C 276a), bidders certify that they will pay the higher of the applicable state or federal rate.

For all construction projects over \$25,000, all bidders must be appropriately licensed with the Construction Contractors Board or the State Landscape Contractors Board. (ORS 279C.365 (1)(k)). In addition, for this public work subject to ORS 279C.800 to 279C.870, Contractor and every subcontractor shall have a public works bond required by 2005 Oregon Laws Chapter 360 filed with the Construction Contractors Board before starting work on the project, unless exempt under Section 2 of 2005 Oregon Laws Chapter 360.

Metro Code provisions 2.04.100 and 200 require all Bidders to follow and document a specific good faith outreach effort to State certified Minority, Women and Emerging Small Businesses. Certification of good faith compliance and a declaration of any actual utilization pursuant to both programs are required within two (2) hours of Bid closing.

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INVITATION TO BID

Metro is requesting bids for the Electrical Services Sub-metering Project – Oregon Convention Center. Sealed bids must be enclosed in a sealed envelope and mailed or delivered to Metro, 600 NE Grand Avenue, Portland, Oregon 97232-2736, to attention: Julie Hoffman, RFB 12-2055, no later than the date and time indicated on the RFB cover page. Bids will be publicly opened and read at that time in Room 375.

Description of Work

Metro is soliciting bids for General Contracting Services for an electrical systems improvement project at the Oregon Convention Center (OCC), located at 777 NE MLK Jr. Blvd, Portland, OR 97232. OCC will be adding a 50+ point electrical metering system to specific loads throughout the entire facility that will interface with the existing mechanical controls system. Included are electrical and mechanical loads for kitchen, concessions, meeting halls, ballrooms, pre-function spaces and lobbies. The metering system is a bidder designed system conforming to the specifications and plans included as part of ATTACHMENT A and ATTACHMENT B respectively. The basis of design is a new E-Mon metering system interfaced with an existing Alerton control and monitoring system.

The OCC will be utilizing the metering system to track electrical demand for kitchen and concession loads in order to generate revenue reports for those specific areas. The OCC will also utilize the metering system to track energy consumption in specific categories such as mechanical systems, meeting halls, ballrooms, pre-function spaces, and grand lobbies. Reports will be generated using this information to examine trends in energy consumption for specific events and milestones.

The scope of the project is located in various electrical, mechanical, audio-visual, concessions, and storage spaces within the original and expansion portions of OCC. Contractor is to install all metering equipment, wiring, raceway systems, hangers/supports, identification of systems, new mechanical control panels, interface with existing mechanical control and monitoring system, and programming of the existing mechanical control and monitoring software. Contractor is responsible for cleanliness of work areas and should plan to pick up debris created during construction. OCC is a member of the Facility Permit Program with the City of Portland. OCC will be providing electrical and trade permits as necessary, with coordination from contractor. If any special inspections are required OCC shall provide them.

Contractor is responsible for cover up and protection of existing equipment/building materials to remain. Contractor is to maintain a worksite free of hazardous work conditions and construction debris. Contractor shall not interfere with scheduled events or prohibit any tenants or clients from accessing other spaces in the building. Loud noise can be an issue in the facility; therefore any work that may be louder than a hand drill or similar will need to be coordinated with OCC, so as to not disturb events/clients. Dust control is the responsibility of the Contractor. Although work is expected to be in areas without impact on events, work will need to be done around building schedule. Schedule will need to be coordinated with OCC project manager Contractor shall work with OCC provided schedule. This project may require Contractor to work "off hours" in order to complete the project in a timely manner as agreed upon with the OCC.

OCC reserves the right to reduce or increase the scope of work depending on the available budget and subsequent bid prices. Reduction, or increase in the scope of work are subject to agreement between OCC and Contractor prior to or following the start of work. Contractor is responsible for field measuring OCC designated areas for exact square footage areas for exact square footage area to be calculated in bid.

Material submittals are required before materials are ordered and must be approved by OCC.

Contractor is to provide three (3) sets of As-Built drawings upon project completion.

. Tentative contract dates are April 2012 through June 30, 2012.

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Qualifications

Contractor must have five (5) or more years of successful experience in the area(s) of Electrical Metering. Qualifications and references shall be supplied with bid. Metro reserves the right to evaluate, approve or reject firms on the basis of their review.

Pre-bid Conference

A voluntary pre-bid site walk through will be held at the Oregon Convention Center located at 777 NE MLK Blvd, Portland, OR 97232 on Tuesday, February 28, 2012 at 2:30 p.m. Interested proposers are encouraged to attend the conference in order to gain information about the RFP requirements. As a courtesy, please contact Renee Pace at 503-797-1911 or renee.pace@oregonmetro.gov to RSVP.

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INSTRUCTIONS TO BIDDERS

BID

Metro is soliciting Bids for the Electrical Services Sub-metering Project – Oregon Convention Center. Bids must be enclosed in a sealed envelope and mailed or delivered to, Metro, 600 NE Grand, Portland, Oregon 97232-2736, Attention: Julie Hoffman, RFB 12-2055.

All bids must be received no later than the date and time indicated on the RFB cover page, and will be publicly opened and read at that time. First Tier Subcontractor and Good Faith Effort forms are due from all bidders within two (2) hours of the bid closing time or the bid will be considered non-responsive. A bid may not be submitted by facsimile (FAX) transmittal or electronically by email.

The outside of the envelope shall plainly identify the subject of the Bid, the opening date, and the Bid number.

All bids must be clearly and distinctly typed or written with ink or indelible pencil. All blank spaces must be completed. No erasures are permitted. Mistakes must be crossed out and corrections typewritten or written in ink adjacent thereto, and initialed in ink by the party signing the Bid, or their authorized representative.

Written amounts shall be shown in both words and figures. Words shall govern in cases of discrepancy between the amounts stated in words and the amounts stated in figures.

All bids must be on the form furnished by Metro or they may be rejected by Metro. Where plans and specifications are attached to the bid, the Bidder must return them with the bid response.

COST OF BID

This Request for Bid does not commit Metro to pay any costs incurred by any Bidder in the submission of a bid, or in making necessary studies or designs for the preparation thereof, or for procuring or contracting for the items to be furnished under the invitation to bid.

ERRORS/OMISSIONS

Any Bid may be deemed non-responsive by the Procurement Officer if it is: Not on the Bid forms provided; contains errors or omissions, erasures, alterations, or additions of any kind; proposes prices which are unsolicited or obviously unbalanced; or not in complete conformance with any and all conditions of the bidding documents.

ADDENDA TO PLANS OR SPECIFICATIONS

Requests for additional information or interpretation of the contract documents shall be delivered to the Julie Hoffman, julie.hoffman@oregonmetro.gov, in writing at least five (5) business days prior to the Bid opening date and time. If, in the opinion of Metro, additional information or interpretation is needed by the Bidders, an addendum will be issued to all known specification holders. The provisions of any written addenda issued by the Procurement Officer at least seventy two (72) hours prior to the Bid opening date and time shall be binding upon the Bidders, and failure of a Bidder to obtain such addenda shall not excuse compliance therewith by the successful bidder.

MODIFICATION OF BID

An offer to modify the bid that is received from the successful Bidder after award of contract that makes the terms of the Bid more favorable or advantageous to Metro will be considered, and may thereafter be accepted. To be effective, every modification must be made in writing over the signature of the Bidder.

WITHDRAWAL OF BIDS

A Bidder may withdraw its bid in person, or by written or telegraphic request, which are received prior to the scheduled closing time for filing Bids. A bid may not be withdrawn by facsimile (FAX). Negligence on the part of the Bidder in preparing his bid confers no right to withdraw the bid after the scheduled closing time for filing Bids.

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LATE BID

Bids received after the scheduled closing time for filing Bids will be returned to the Bidder unopened, unless such closing time is extended by Metro in writing.

EXECUTION

Each Bid shall give the Bidder's full business address and bear its legal signature.

Bids by partnerships must list the full name of all partners and be signed by a partner or agent authorized to execute the contract on behalf of the partnership and identified by printed name and title.

Bids by corporations must bear the legal name of the corporation, the name of the state of incorporation, and the signature of the officer or agent authorized to legally bind the corporation.

Upon request by Metro, satisfactory evidence of the authority of the partner or officer shall be furnished.

If an agent who is not an officer of the corporation or a member of the partnership signs the Bid, a notarized Power of Attorney must be on file with Metro prior to the opening of Bids or be submitted with the Bid. Without such notice of authority, the Bid shall be considered improperly executed, defective and therefore non-responsive.

A Bid submitted by a joint venture must include a certified copy of the terms and conditions of the agreement creating the joint venture.

EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE OF WORK

It is understood that the Bidder, before submitting a Bid, has made a careful examination of the plans, specifications, and contract; that it has fully informed itself as to the quality and quantity of materials and the character of the work required; and that it has made a careful examination of the location and condition of the work and the sources of supply for materials.

COMPLIANCE

Each Bidder shall inform itself of, and the Bidder awarded a contract shall comply with, federal, state, and local laws, statutes, and ordinances relative to the execution of the work. This requirement includes, but is not limited to, nondiscrimination in the employment of labor, protection of public and employee safety and health, environmental protection, waste reduction and recycling, the protection of natural resources, fire protection, burning and non-burning requirements, permits, fees and similar subjects.

ELIGIBILITY

Prior to submitting a Bid, all Bidders (and subcontractors of bidders) on public works/construction projects are required to be appropriately registered with the State of Oregon Construction Contractors Board pursuant to ORS 701.035.

EQUAL EMPLOYMENT AND NONDISCRIMINATION

Metro and its contractors will not discriminate against any person(s), employee or applicant for employment based on race, color, religion, sex, national origin, age, marital status, familial status, gender identity, sexual orientation, disability for which a reasonable accommodation can be made, or any other status protected by law. Metro fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. For more information, or to obtain a Title VI Complaint Form, see www.oregonmetro.gov.

PERMITS AND LICENSES

OCC is part of the Facility Permit Program and will secure and pay for building permits and special inspections, with coordination from Contractor.

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CONFLICT OF INTEREST

A Bidder filing a bid thereby certifies that no officer, agent, or employee of Metro or Metro has a pecuniary interest in this Bid or has participated in contract negotiations on behalf of Metro; that the bid is made in good faith without fraud, collusion, or connection of any kind with any other Bidder for the same call for Bids; the Bidder is competing solely in its own behalf without connection with, or obligation to, any undisclosed person or firm.

IMMATERIAL VARIANCES

Metro reserves the right to determine whether equipment or materials that comply substantially in quality and performance with the specifications are acceptable to Metro, and whether any variance listed by the Bidder in a bid is material or immaterial.

LATEST MODEL

Parts and materials must be new, of latest model, of current date, and meet specifications. This provision excludes all surplus, remanufactured, and used products, unless such material is proposed in lieu of items specified.

"OR APPROVED EQUAL" CLAUSE

In order to establish a basis of quality, certain processes, types of machinery and equipment, or kinds of materials may be specified, either by description of process or by designating a manufacturer by name and referring to his brand or product designation, or by specifying a kind of material. It is not the intent of these specifications to exclude other processes, equipment, or materials of equal value, utility or merit.

Whenever a process is designated or a manufacturer's name, brand, or product is described, it shall be understood that the words, "or approved equal" follow such name, designation, or description, whether in fact they do so or not.

If a Bidder proposes to furnish an item, process or material which it claims to be of equal utility to the one designated, then:

1. Bidder shall submit as part of their Bid, a written statement describing it together with supporting data and details sufficient to permit Metro to evaluate the same. If the product contains chemical properties, the relevant Material Safety Data Sheets (MSDS) shall be included to document all health and physical hazards, chemical ingredients, exposure limits, personal protective equipment for handling and use, and emergency procedures in response to unanticipated spills or environmental release.
2. Metro may require demonstration, additional tests, and additional data, all to be supplied at the expense of the Bidder.
3. Metro shall in its sole discretion determine if an item submitted as an alternate or approved equal is "equal" or "equivalent".

RECYCLABLE PRODUCTS

Vendors shall use recyclable products to the maximum extent economically feasible in the performance of the work set forth in this contract document.

RECYCLED PRODUCTS AS BID ITEMS

Oregon Law (ORS 279A.125) requires Metro and all public agencies to give preference to materials and supplies manufactured from recycled materials.

All Bidders are therefore required to specify the exact or minimum percentage of recycled paper and fiber type in all paper products or recycled content in all other products offered, plus both the post-consumer and secondary waste content of the products offered.

Only Bids submitted with such information shall receive preference consideration and post Bid declaration or discovery shall not be allowed.

TERMS

A Bid may be rejected if it requires payment in less than thirty (30) calendar days after an approved invoice date or if it requires payment, in whole or in part, less than fifteen (15) days after invoice approval prior to delivery.

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PRICES

All prices submitted shall be firm during the contract period. If unit prices are requested, they should be provided for each unit on which there is a Bid. In case of mistake in extension of price, unit prices shall govern. All prices shall be Freight on Board (F.O.B.) the destination designated by Metro.

WARRANTY/GUARANTY

Each Bid for the furnishing of materials and equipment shall provide an explanation of both the Bidder's and manufacturer's warranties on materials and workmanship.

Every Bid shall indicate any warranty costs to Metro, including but not limited to, all parts, labor, and shipping costs required for compliance with any specific requirement(s) contained in the special conditions.

Each Bidder on a public works/construction project shall provide at minimum a one-year guaranty on all materials and workmanship.

SERVICE

Each Bidder shall furnish detailed information on any service facilities, locations, and procedures as well as information on any maintenance agreements or contracts available to Metro.

BID SECURITY

All bids must be accompanied by bid security in the form of a cashier's check, certified check, irrevocable letter of credit, or a bid bond issued by a surety authorized to conduct such business in Oregon. Security shall be in the amount of five percent (5%) of the total bid price. The bid security shall serve as a guarantee that the bidder will not withdraw the bid for a period of sixty (60) days after bid opening, and if awarded the contract, will execute the Metro contract and furnish all required bonds and insurance within the time frame specified.

The Attorney-in-Fact who executes any bond on behalf of the surety must attach a notarized copy of his or her Power of Attorney as evidence of authority to bind the surety on the date of bond execution.

Bid securities will be held until the Contract has been fully executed, after which all Bid securities, other than those which have been forfeited, will be returned to the respective Bidders whose Bid they accompanied.

RESIDENT/NON-RESIDENT BIDDER

Oregon law requires Metro, in determining the lowest responsive Bidder, to add a percent increase on the Bid of a non-resident Bidder equal to the percent, if any, of the preference given to that Bidder in the state in which that Bidder resides. Therefore, each Bidder must indicate whether it is a resident or non-resident Bidder. A resident Bidder is a Bidder that has paid unemployment taxes or income taxes in the state of Oregon during the last twelve (12) months immediately preceding submission of this Bid, has a business address in Oregon, and has stated in its Bid that it is a "resident Bidder."

EXPERIENCE AND ABILITY TO PERFORM THE WORK

Upon request, Bidders must present all necessary information indicating that the Bidder has met the standards of responsibility set forth in ORS 279B.110. Metro will make the final determination as to whether or not the Bidder is qualified to perform the work.

The Contractor and/or First Tier sub-contractor shall provide a list of three (3) different project references with their Bid submission. These references will be contacted regarding the quality of workmanship and service that the Bidder or sub-contractors have provided on projects of comparable size and scope. The Bidder shall submit this information using the Contractor Qualification Statement.

BASIS OF AWARD

The award shall be made to the responsible Bidder submitting the lowest responsive bid submitting the lowest total BASE BID. Metro reserves the right to consider any and all alternates offered by the selected Bidder.

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Any determination of bidder's responsibility or responsiveness is subject to review and determination by the Office of the Metro Attorney as to legal sufficiency. Metro reserves the right to accept or reject any and all bids in whole or in part and to waive any irregularities in the best interest of Metro. Only those bidders that, in the sole opinion of Metro, meet the minimum experience requirements shall be considered to be responsible bidders.

In the event all Bids exceed the engineer's estimate, Metro reserves the right to negotiate with the selected low Bidder in an effort to meet the project budget.

NOTICE OF AWARD

Within twenty (20) calendar days after the opening of Bids, Metro will accept one of the Bids, or combination of Bids, or reject all Bids in accordance with the Basis of Award. The acceptance of the Bid will be by written Notice of Award, mailed or delivered to the office designated in the Bid. The Notice of Award shall not entitle the party to whom it is delivered to any rights whatsoever.

APPEAL OF CONTRACT AWARD

Aggrieved bidders who wish to appeal the award of this contract must do so in writing within seven (7) days of issuance of the notice of intent to award by Metro. Appeals must be submitted to Metro Procurement Officer, 600 NE Grand Avenue, Portland, OR 97232 and must state the specific deviation of rule or statute in the contract award. Metro will issue a written response to the appeal in a timely manner.

CONTRACT

Within seven (7) business days of receipt of the contract from Metro, the Successful Bidder shall sign and deliver the Contract to Metro, along with all required insurance certificates and bonds listed below.

BONDS

Upon contract award, Contractor shall provide the following on Metro's standard bond forms:

- A Performance Bond in an amount equal to 100 percent of the contract price.
- A Labor and Materials bond in an amount equal to 100 percent of the contract price.

INSURANCE AND WORKERS COMPENSATION

Contractor shall purchase and maintain at the Contractor's expense, the following types of insurance, covering the Contractor, its employees, and agents:

1. The most recently approved ISO (Insurance Services Office) Commercial General Liability policy, or its equivalent, written on an occurrence basis, with limits not less than \$1,000,000 per occurrence and \$1,000,000 aggregate. The policy will include coverage for bodily injury, property damage, personal injury, contractual liability, premises and products/completed operations. Contractor's coverage will be primary as respects Metro;
2. Automobile insurance with coverage for bodily injury and property damage and with limits not less than minimum of \$1,000,000 per occurrence;
3. Workers' Compensation insurance meeting Oregon statutory requirements including Employer's Liability with limits not less than \$500,000 per accident or disease; and
4. If required, Professional Liability Insurance, with limits of not less than \$1,000,000 per occurrence, covering personal injury and property damage arising from errors, omissions or malpractice.

Metro, its elected officials, departments, employees, and agents shall be named as ADDITIONAL INSUREDS on Commercial General Liability and Automobile policies.

Contractor shall provide to Metro 30 days notice of any material change or policy cancellation.

Contractor shall provide Metro with a Certificate of Insurance complying with this article upon return of the Contractor signed agreement to Metro. Certificate of Insurance shall identify the Metro contract number.

Contractor, and all subsequent subcontractors and suppliers performing work pursuant to this contract shall provide Workers' Compensation benefits as required by and in accordance with all applicable state and federal laws.

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COMMENCEMENT OF WORK

Prior to starting work on a contract or sub-contract for a public works project, a contractor or sub-contractor shall file a public works bond with the Construction Contractors Board. Bond shall be from a corporate surety authorized to do business in the state of Oregon and be in the amount of \$30,000 and shall comply with all other requirements of ORS 279C.800 to 279C.870. Contractor shall provide written documentation of bond number(s) of bond(s) for contractor and all sub contractor(s) to Metro Project Manager with original bid or prior to starting project work.

Contractor shall only commence work on this project upon receipt of a Notice to Proceed issued by Metro.

FOREIGN CONTRACTOR

A Contractor that is not domiciled in or registered to do business in the State of Oregon shall, upon execution of a contract in excess of \$10,000, promptly report the total contract price, terms of payment, length of contract and all other required information to the Oregon Department of Revenue. Compliance shall be documented and Metro shall be fully satisfied as to complete compliance prior to release of final payment.

NOTICE OF ASSIGNMENT

Metro will not recognize any assignment or transfer of any interest in this contract without the prior written consent of the Procurement Officer and the Metro Attorney.

HAZARD COMMUNICATION

The Contractor shall be required to strictly adhere to, coordinate with Metro and document full compliance with the policies and procedures of the Oregon Occupational Health and Safety Code, OAR Chapter 437, Division 155, Hazard Communication.

Therefore, the Contractor and all subcontractors and suppliers within his or her control shall notify Metro and all parties to the agreement as to:

- > Hazardous materials to which they may be exposed on site;
- > Employee measures to lessen the possibility of exposure;
- > All contractor measures to reduce the risk;
- > Procedures to follow if exposed.

The Contractor shall provide Metro with all Material Safety Data Sheets (MSDS) prior to delivery or introduction of the material on site. For further information or clarification, contact the Metro Risk Management Division at 503-797-1622.

PATENTS

The Contractor agrees to protect, to defend (if Metro requests) and save the agency harmless against any demand for payment for wrongful or unauthorized use of any patented material, process, article, or device that may enter into manufacture, construction, or forms a part of the work covered by this contract.

INVOICES, PAY APPLICATIONS

Invoices/pay applications shall be prepared and submitted to Project Manager unless otherwise specified. Invoices shall contain the following information: Metro contract number, item numbers, description of supplies or services, sizes, quantities, unit prices and extended totals. Payment shall be made by Metro on a Net 30 day basis upon approval of Contractor invoice.

LAW OF STATE OF OREGON

This contract is entered into within the state of Oregon, and the law of said State, whether substantive or procedural, shall apply and be followed with respect to this contract.

PREVAILING WAGE

The contractor, and all subcontractors and suppliers, shall be required to comply with ORS 279C.800 through 279C.870 and ensure that all workers are paid not less than, and in accordance with, the Oregon Bureau of Labor and Industries (BOLI) "Prevailing Wage Rates for Public Contract Works Contracts in Oregon - Effective January 1, 2012", pursuant to

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the administrative rules established by the Commissioner of Labor and Industries. **This project is covered by the appropriate Bureau of Labor and Industries (BOLI) prevailing wage rates as above**, available at <http://www.boli.state.or.us> or by calling the State of Oregon Bureau of Labor and Industries at 971-673-0839. If the project is subject to Davis-Bacon Act (40U.S.C. 276A), Contractor and all sub-contractors shall pay at least the higher rate of applicable state or federal prevailing wages. Contractor and every subcontractor shall have a public works bond required by 2005 Oregon Laws Chapter 360 filed with the Construction Contractors Board before starting work on the project, unless exempt under Section 2 of 2005 Oregon Laws Chapter 360.

Bureau of Labor and Industries
Wage and Hour Division, Prevailing Wage Unit
800 NE Oregon Street, #32
Portland, OR 97232
www.boli.state.or.us

CERTIFIED PAYROLL

The Contractor and all sub-contractors, in compliance with ORS 279C.845, shall file certified payroll statements with Metro Project Manager to be due once per month by the fifth business day of the following month. Metro shall retain 25% of any amount earned by Contractor if certified payrolls are not submitted as required. Contractor shall retain 25% of sub-contractor earnings if sub-contractor certified payrolls are not submitted as required. Upon receipt of appropriate certified payrolls, Metro and Contractor shall release any amounts so retained within fourteen (14) days.

MINORITY, WOMEN AND EMERGING SMALL BUSINESS PROGRAM

In the event that any subcontracts are to be utilized in the performance of this agreement, the Bidder's attention is directed to Metro Code Section 2.04.100, which encourages the use of minority, women and emerging small businesses (MWESB) sub-contractors to the maximum extent practical. Copies of these MWESB requirements are available from Metro Procurement Services, 600 NE Grand Avenue, Portland, OR 97232 or by calling 503-797-1648.

FIRST OPPORTUNITY TARGET AREA (FOTA) PROGRAM

In the event that any subcontracts are to be utilized in the performance of this agreement, the Bidder's attention is directed to MERC's First Opportunity Area (FOTA) Program which is intended to provide maximum employment for economically disadvantages residents living in the target area, for contracts and employment, in accordance with House Bill 3075, passed by the Oregon Legislature in 1989. Additional information regarding the FOTA Program is available from Metro Procurement Services, 600 NE Grand Avenue, Portland, OR 97232 or by calling 503-797-1648

NOTICE TO ALL BIDDERS

The attached agreement included herein reflects preliminary, draft contract language and selected, proposed contract terms for this procurement. Bidders should be aware that such language terms and provisions are for illustrative purposes only and that Metro reserves the right, following submission and ranking of all bids submitted in response to this procurement, to amend, modify or negotiate over any and all such contract language, terms and provisions before making a final determination regarding the issuance of the Notice of Intent to Award the agreement rising from this procurement. By submitting a bid in response to this procurement, bidders acknowledge that they are aware of and do not object to any later, potential amendment and modification of such preliminary, draft language and terms. In addition, by responding to this procurement, bidders acknowledge that they are aware of their ability to offer alternatives to any of the preliminary, draft contract language and proposed contract terms set forth herein.

Electrical Services Sub-metering Project - OCC

Request for Bid (RFB 12-2055)

APPENDIX A

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

CONTENTS

Note: The following documents (1-16) **must be returned** as part of the bid response or the bid will be considered non-responsive.

	Bid Response Packet Contents	Due By Bid Due Date and Time	Due Within Two Hours of Bid Closing	Due Within Seven Days of Award Notification
1	Bidder's Checklist	✓		
2	Bid Form	✓		
3	Schedule of Bid Prices	✓		
4	Schedule of Values	✓		
5	Signature Page	✓		
6	Addenda Acknowledgement /Surety	✓		
7	Bid Bond	✓		
8	Resident/Non-Resident Bidder Status	✓		
9	Non-Collusion Affidavit	✓		
10	Contractor Qualification Statement	✓		
11	Certificate of Compliance for Recycling	✓		
12	Drug Certification Form	✓		
13	First-Tier Subcontractor Disclosure Form		✓	
14	Good Faith/ MBE/WBE/ESB/FOTA Program Form		✓	
15	Labor & Material Payment Bond			✓
16	Performance Bond			✓

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

BIDDERS'S CHECKLIST

 FIRM _____
 NAME _____
 MAILING ADDRESS _____
 PHONE _____ FAX _____ E-MAIL _____

BIDDER REPRESENTS/CERTIFIES/ACKNOWLEDGES AS PART OF THIS OFFER THAT:

(Contractor shall check or complete all applicable boxes)
(BID WILL BE CONSIDERED NON-RESPONSIVE WITHOUT THE FOLLOWING DOCUMENTS*)

1. **BID FORMS AND ATTACHED SIGNATURE SHEET***
2. **SCHEDULE OF BID PRICES** *Located in Bid Forms*
3. **SCHEDULE OF VALUES** *Instructions located in Bid Forms*
4. **ADDENDA ACKNOWLEDGEMENT & SURETY** *Located in Bid Forms*
5. **BID BOND***: Bidder has complied with MERC's requirements for bid surety and guarantees that this Bid is irrevocable for the period specified herein. *Form Located in Bid Forms*
6. **CONFLICT OF INTEREST**: Bidder hereby certifies that no officer, agent, or employee of MERC has participated on behalf of MERC in preparation of this Bid, that the Bid is made in good faith without fraud, collusion, or connection of any kind with any other Bidder for the same work, and the Bidder is competing solely in its own behalf without connection or obligation to any undisclosed person or firm. _____ *(initial)*
7. **RESIDENT/NON-RESIDENT***: *Form located in Bid Forms* Undersigned Bidder states that it is a resident or non-resident of the State of Oregon. State in which Bidder resides _____
8. **NON-COLLUSION AFFIDAVIT*** *Located in Bid Forms*
9. **TYPE OF BUSINESS ORGANIZATION**: Prosper operates as an individual, a corporation, incorporated under the laws of the state of _____, a non-profit organization, a partnership. (If partnership, attach names of the partners)
10. **OREGON LICENSE**: If a corporation, it is, or is not, licensed with Oregon Corporation Commission
11. **REGISTRATION NO**: _____ with Construction Contractors Board.
12. **CONTRACTOR QUALIFICATION STATEMENT*** *Located in Bid Forms*
13. **OREGON RECYCLING CERTIFICATE OF COMPLIANCE*** *Located in Bid Forms*
14. **CERTIFICATE OF EMPLOYEE DRUG TESTING PROGRAM*** *Located in Bid Forms*
15. **DOING BUSINESS AS**: Provide any assumed names utilized. _____
16. **BIDDERS CHECKLIST*** *(This Document)*

TO BE SUBMITTED IN SEPARATE ENVELOPE BY BID DUE DATE AND TIME OF 4:00 P.M.

1. **FIRST TIER SUBCONTRACTOR DISCLOSURE FORM*** *Form Located in Bid Forms*
2. **MBE/WBE/ESB/FOTA PROGRAM FORMS*** *Form located in Bid Forms*

PRIOR TO AWARD:

- Financial records and other information in accordance with ORS 279C at the option of MERC's Project Manager
- Performance Bond**: Cost of the Bond shall be included in the Bid.
- Labor and Materials Bond**: Cost of the Bond shall be included in the Bid
 Bond amounts shall each equal 100% of contract total, or as stated in RFB.

 NAME AND TITLE OF PERSON AUTHORIZED TO
 CONTRACT/SIGN OFFER (TYPE OR PRINT)

SIGNATURE OF AUTHORIZED PERSON

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

BID FORMS

NOTE TO BIDDER: Bidders must provide all of the information requested in this Bid. Bidder should type or use ink for completing this Bid.

To: Metro Procurement Office, 600 N.E. Grand Avenue, Portland, OR 97232

Bidder: _____

Address: _____

Bidder's Contact: _____ Telephone: _____ Date: _____

BIDDER'S DECLARATION AND UNDERSTANDING

The undersigned, hereinafter called the Bidder, declares that the only persons or parties interested in this Bid are those named herein, that this Bid is, in all respects, fair and without fraud, that it is made without collusion with any official of Metro, and that the Bid is made without any connection or collusion with any person submitting another Bid on this Contract.

The Bidder further declares that it has carefully examined the Contract Documents for the completion of the Work, has personally inspected the Site, has satisfied itself as to the Work involved, and that this Bid is made in accordance with the provisions and under the terms of the Contract Documents, which are hereby made a part of this Bid.

Any printed matter on any letter or paper enclosed herewith which is not part of the Bidding Documents or which was not requested by Metro is not to be considered a part of this Bid, and the undersigned agrees that such printed matter shall be entirely disregarded and, notwithstanding such printed matter, that the Bid is a bid to do the Work and furnish the labor and materials and all other things required by the Contract Documents strictly within the time and in accordance with such Specifications. This Bid is irrevocable for sixty- (60) days following the date of the opening of Bids.

BID SECURITY

Bid security in the form of a certified check, cashier's check, irrevocable letter of credit or bid bond as further described in the Instructions for Bidders and in the amount of five percent (5%) of the total bid price is enclosed herewith and is subject to all the conditions stated in the Instructions for Bidders.

CONTRACT EXECUTION, BONDS AND INSURANCE

The Bidder agrees that if this Bid is accepted, it will, within seven (7) days after award of the Contract by the Metro Council, sign the Construction Agreement in the form annexed hereto, and will at that time deliver to Metro the Performance Bond and the Labor and Materials Payment Bond required herein and in the form annexed hereto, along with all certificates of insurance and certified copies of insurance policies specified and required in these Contract Documents, and will, to the extent of its Bid, furnish all machinery, tools, apparatus, and other means of operation and construction and do the Work and furnish all the materials necessary to complete all Work as specified or indicated in the Contract Documents

COMMENCEMENT OF WORK AND CONTRACT COMPLETION TIME

The time frame for the award and execution of this Contract shall be as described in the Instructions for Bidders and other Contract Documents. The Successful Bidder further agrees to commence the Work within five (5) days of issuance of the Notice to Proceed and to diligently prosecute the Work to its final completion in accordance with the Contract Documents.

ADJUSTED PAYMENTS

In the event the Bidder is awarded the Contract and fails to complete the Work in compliance with the time required by the Contract Documents, adjusted payments shall be paid to Metro as described in the General Conditions.

SALES AND USE TAXES

The Bidder agrees that all applicable federal, state and local sales and use taxes are included in the stated bid prices for the Work.

LUMP SUM AND UNIT PRICE WORK

The Bidder further proposes to accept as full payment for the Work proposed herein the amounts computed under the provisions of the Contract Documents and based on the listed lump sum and unit price amounts. The amounts shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.

PREVAILING WAGES FOR PUBLIC WORK

Bidder hereby certifies that the provisions of ORS 279C.800 - 279C.870, regarding prevailing wages, shall be complied with on this project.

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

SCHEDULE OF BID PRICES

The Bidder, whose legal signature binding the Bidder to the bid process indicated on these pages is found on the signature page, hereby bids as follows:

Item	Description	Total Amount
1	All Food and Beverage Areas	\$
2	Central Plant	\$
3	Exhibit Hall C	\$
Construction Cost Base Bid Price		
		\$
Total Base Bid Price (in words)		
		DOLLARS

Note: Pricing to include labor & materials, and any related shipping costs.

Note: If any of the items listed on the Bid Schedule contain recycled product (see Certificate of Compliance for Recycling), the bidder shall specify the amounts of such product in an attachment to the Bid Form. If no attachment is included, the amount of recycled product in the items listed will be considered to be zero for the purpose of this bid. Metro reserves the right to reject any or all bids.

Print Name of Company _____

Print Name of Bidder _____

Signature _____

Title _____

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

BID ALTERNATES	
Alternate #1 - C Meeting Rooms and Lobby	\$
Price for Add Alternate #1 (in words)	
DOLLARS	
Alternate #2 - Pre-Function C	\$
Price for Add Alternate #2 (in words)	
DOLLARS	
Alternate #3 – Oregon Ballroom	\$
Price for Add Alternate #3 (in words)	
DOLLARS	
Alternate #4 – Portland Ballroom	\$
Price for Add Alternate #3 (in words)	
DOLLARS	

Note: The Allowance for Incidental Unforeseen Items will be paid for only upon a pricing agreement for the extra work prior to beginning the Work. The work may be on a time and material basis or lump sum pricing submitted by Contractor and agreed upon by Metro’s Project Manager.

Print Name of Company _____

Print Name of Bidder _____

Signature _____

Title _____



600 NE Grand Ave.
Portland, OR 97232-2736
503-797-1700

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

SIGNATURE PAGE

The name of the Bidder submitting this Bid is _____ doing business at

Street	City	State	Zip
--------	------	-------	-----

which is the full business address to which all communications concerned with this Bid and with the Contract shall be sent.

The names of the principal officers of the corporation submitting this Bid, or of all of the partners, if the Bidder is a partnership or joint venture, or of all persons interested in this Bid as individuals are as follows:

If Individual

IN WITNESS hereto the undersigned has set his/her hand this ____ day of 20__

Signature of Bidder _____

Printed Name of Bidder _____

Title _____

If Partnership or Joint Venture

IN WITNESS hereto the undersigned has set his/her hand this ____ day of 20__.

Name of Partnership or Joint Venture

By: _____

Printed Name of Person Signing

Title: _____

If Corporation

IN WITNESS WHEREOF the undersigned corporation has caused this instrument to be executed and its seal affixed by its duly authorized officers this ____ day of 20__.

Name of Corporation

State of Incorporation

By: _____

Printed Name of Person Signing

Title: _____

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

SCHEDULE OF VALUES

BIDDER: _____

INSTRUCTIONS:

In addition to Lump Sum Pricing above, Bidder MUST also submit a Schedule of Values; to be submitted in Bidders own format and on their *own Form*.

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

ADDENDA

The Bidder is presumed to have read and hereby acknowledges receipt and acceptance of Addenda Numbers:

(Insert No. and Date of Each Addendum Received)

SURETY

If the Bidder is awarded a Contract on this Bid, the surety or sureties who provide(s) the Performance Bond and Labor and Materials Payment Bond will be:

SURETY

ADDRESS

1. _____	_____

2. _____	_____

Print Name of Company _____

Print Name of Bidder _____

Signature _____

Title _____



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Public Improvement Bid Response (RFB 12-2055)

BID BOND

(NOTE: BIDDERS MUST USE THIS FORM, NOT A SURETY COMPANY FORM)

Bond Number: _____

Bond Amount: _____

KNOW ALL MEN BY THESE PRESENTS:

We the undersigned, _____, as PRINCIPAL, and _____, a corporation organized and existing under and by virtue of the laws of the state of _____ and duly authorized to do surety business in the state of Oregon and name on the current list of approved surety companies acceptable on federal bonds and conforming with the underwriting limitations as published in the he Federal Register by the audit staff of the Bureau of Accounts and the U.S. Treasury Department and is of the appropriate class for the bond amount as determined by Best's Rating System, as SURETY, hereby hold and firmly bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, unto the MERC, as OBLIGEE, in the sum of \$_____ in lawful money of the United States of America, for the payment of which sum, well and truly to be made as agreed and liquidated damages.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT whereas the PRINCIPAL has submitted to the MERC a certain bid for work required for the "Electrical Services Sub-metering Project - OCC", which work is specifically described in the accompanying Bid;

NOW, THEREFORE, if MERC does not award a contract to the PRINCIPAL within the time specified in the Instructions to Bidders for the work described in said Bid, or in the alternate, if said bid shall be accepted and the PRINCIPAL, within the time and in the manner described under the Contract Documents, enters into a written contract in accordance with the BID, files the two bonds, one guaranteeing faithful performance of the work to be done and the other guaranteeing payment for labor and materials as required by the law, and files the required certified copies of insurance policies and certificates of insurance, then the obligation shall be null and void; otherwise, the same shall remain in full force and effect.

THE SURETY, for value received, hereby stipulates and agrees that the obligation of said SURETY and this bond shall be in no way impaired or affected by any extension of the time within which MERC may accept such Bid; and said SURETY does hereby waive notice of any such extension.

If more than one SURETY is on this bond, each surety hereby agrees that it is jointly and severally liable for all obligation on this bond.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 2012.

SURETY

PRINCIPAL

BY: _____

BY: _____

TITLE: _____

TITLE: _____



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Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

RESIDENT/NON-RESIDENT BIDDER STATUS

Oregon law requires that Metro, in determining the lowest responsive Bidder, must add a percent increase on the Bid of a non-resident Bidder equal to the percent, if any, of the preference given to that Bidder in the state in which that Bidder resides.

Consequently, each Bidder must indicate whether it is a resident or non-resident Bidder. A resident Bidder is a Bidder that has paid unemployment taxes or income taxes in the state of Oregon during the twelve (12) calendar months immediately preceding submission of this Bid, has a business address in Oregon, and has stated in its Bid that the Bidder is a "resident Bidder." A "non-resident Bidder" is a Bidder who is not a resident Bidder (ORS 279A.120).

The undersigned Bidder states that it is: (check one)

1. _____ A resident Bidder

2. _____ A non-resident Bidder

Indicate state in which Bidder resides: _____

Print Name of Company _____

Print Name of Bidder _____

Signature _____

Title _____



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Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

NON-COLLUSION AFFIDAVIT

STATE OF _____ County of _____

I state that I am _____ (Title) of _____ (Name of Bidder) and that I am authorized to make this Affidavit on behalf of the Bidder. I am the person authorized by the Bidder and responsible for the price(s) and the amount of this Bid.

I state that: (1) the price(s) and amount of this Bid have been arrived at independently and without consultation, communication or agreement with any other contractor, Bidder or potential Bidder, except as disclosed in the attached appendix.

(2) Neither the price(s) nor the amount of this Bid, and neither the approximate price(s) nor approximate amount of this Bid, have been disclosed to any other person who is a Bidder or potential Bidder, and they will not be disclosed before bid opening.

(3) No attempt has been made or will be made to induce any person to refrain from bidding on this contract, or to submit a Bid higher than this Bid, or to submit any intentionally high or non-competitive bid or other form of complementary Bid.

(4) This Bid is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any person to submit a complementary or other noncompetitive Bid.

(5) _____ (Name of Bidder), its affiliates, subsidiaries, officers, directors and employees (as applicable) are not currently under investigation by any governmental agency and have not in the last four years been convicted of or found liable for any act prohibited by state or federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as listed and described in the attached appendix.

I state that I and _____ (Name of Bidder) understand and acknowledge that the above representations are material and important, and will be relied on by Metro/MERC in awarding the Contract for which this Bid is submitted. Any misstatement in this Affidavit will be treated as fraudulent concealment from Metro/MERC of the true facts relating to the submission of Bids for this Contract.

Signature of Affiant

Printed Name of Affiant

Sworn to and subscribed before me this _____ day of _____ 2012.

Notary Public for _____

My Commission Expires: ___ / ___ / ___

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

CONTRACTOR QUALIFICATION STATEMENT

NOTE: The prime contractor or first tier sub-contractor proposed to conduct the following work must complete this Contractor Qualification Statement: (list type of work applicable)

The undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading:

Contractor Name _____

Address _____

Telephone _____ Fax _____ E-Mail _____

ORGANIZATION _____

How many years has your organization been in business as a Contractor? _____

Under what former names has your organization operated? _____

LICENSING AND BONDING

Oregon CCB# _____ Public Works Bond # _____

Other licenses _____

EXPERIENCE

List the type of work your organization normally performs with its own forces and the number of full time employees to be assigned to the project? _____

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

CONTRACTOR QUALIFICATION STATEMENT continued

Does your firm own or able to obtain the necessary equipment for this job? Please indicate equipment available to conduct the work. _____

CLAIMS AND SUITS

Has your organization ever failed to complete any work awarded to it? _____

Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or officers? _____

Has your organization filed any lawsuits or requested arbitration with regard to construction contracts within the last five years? Provide information _____

Have any officers or employees been convicted of any crimes relative to a project such as this? _____

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

CONTRACTOR QUALIFICATION STATEMENT continued

REFERENCES

List the major construction projects your organization has **in progress**

Project Name	Owner	Architect/Engineer	Amount	% Complete	Completion Date	Contact Person	Phone #

List the major public park and/or trail construction projects your organization has **completed in last 5 years**

Project Name	Owner	Architect/Engineer	Amount	% Complete	Completion Date	Contact Person	Phone #

List 3 subs Metro/MERC can contact for a reference.

Name	Specialty	Contact Name	Phone #

List 3 suppliers Metro/MERC can contact for a reference.

Name	Specialty	Contact Name	Phone #



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Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

CONTRACTOR QUALIFICATION STATEMENT continued

Bank Reference

Name: _____

Address: _____

Contact Name: _____ Phone number: _____

Bidder signature

This information provided is true and complete.

Print Name of Company _____

Print Name of Bidder _____

Signature _____

Title _____

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

CERTIFICATE OF COMPLIANCE FOR RECYCLING

I, the undersigned duly authorized representative of the Bidder, hereby certify that the products offered in this bid contain the following minimum percentages:

- (A) _____ Percentage of post-consumer waste as defined in
ORS 279A.010(s) (formerly ORS 279.545(1))
- (B) _____ Percentage of secondary waste materials as defined in
ORS 279A.010 (hh) (formerly ORS 279.545(6))

It is the bidder's responsibility to provide additional signed copies of this Certification of Compliance for each item which contains a different percentage of recycled materials than listed above.

DEFINITIONS:

ORS 279A.010(s): "'Post Consumer Waste' means a finished materials that would normally be disposed of as solid waste, having completed its life cycle as a consumer item. 'Post-consumer waste' does not include manufacturing waste."

ORS 279A.010(hh): "'Secondary Waste Materials' is defined as fragments of products or finished products of a manufacturing process which has converted a virgin resource into a commodity of real economic value, and includes post-consumer waste, but does not include excess virgin resources of the manufacturing process. For paper, 'secondary waste materials' does not include fibrous waste generated during the manufacturing process such as fibers recovered from waste water or trimmings of paper machine rolls, mill broke, wood slabs, chips, sawdust or other wood residue from a manufacturing process."

I, the undersigned duly authorized representative of the bidder, understand that the bid must be signed in ink by the bidder or an authorized representative of the bidder and that any alterations or erasures must be initialed in ink by the person signing the bid. Further, I acknowledge that I have read and understand all bid instructions, specifications, terms and conditions (including the attachments indicated above and agree, on behalf of myself and the bidder to be bound by them.

I, the undersigned duly authorized representative of the bidder certify that the information provided in this bid is true and accurate. Further, I understand and acknowledge that providing incorrect or incomplete information may be cause for bid rejection or contract termination.

Signature: _____

Title: _____

Company: _____

Telephone: _____



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Public Improvement Bid Response (RFB 12-2055)

- a) 5% of the total Contract Price, but at least \$15,000 of the Bid Price,
- b) \$350,000 regardless of the percentage of the total Bid Price.

Failure to submit this form in a separate envelope by the disclosure deadline will result in a bid submitted becoming non-responsive, and such bid shall not be considered for award.

Form Submitted by (Name of Bidder) _____

Name of Company _____

Contact Name _____ Phone # _____

First Tier Subcontractor Disclosure Form – Page2

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

GOOD FAITH PROGRAM

The Metro Council is committed to doing business with minority, woman-owned firms and emerging small businesses (MBE/WBE/ESB). The Council recognizes that supporting these firms will result in a stronger economy and increased competition.

To this end, Metro has established these procedures to maximize utilization of MBEs, WBE's and ESBs for Metro projects. The following steps are required to help Metro monitor the usage of these firms.

Good Faith Efforts Steps:

1. Identify areas in which Bidder intends to use sub-contractors.
2. Attend the Pre-Bid meeting if held. Meet any MBE/WBE/ESB firms at the Pre-Bid meeting.
3. Contact several (or all) certified MBE/WBE/ESB firms listed (with the State of Oregon) to perform the work needed. (Metro Procurement Services can provide Bidder with a list of firms upon request 503-797-1648.)
4. Negotiate with interested, available and capable MBE/WBE/ESB firms who submit competitive bids.
5. Report to Metro all sub-contractors contacted. Please include their response and price quoted.
6. List all sub-contractors that Bidder intend to use on this project.

Please note a selected MBE/WBE/ESB firm must be used unless Metro authorizes a substitution after contract award.

The following MBE/WBE/ESB Program forms are to be completed and returned as part of your Bid submission. Please contact Procurement Services at 503 797-1648 if additional information is required.

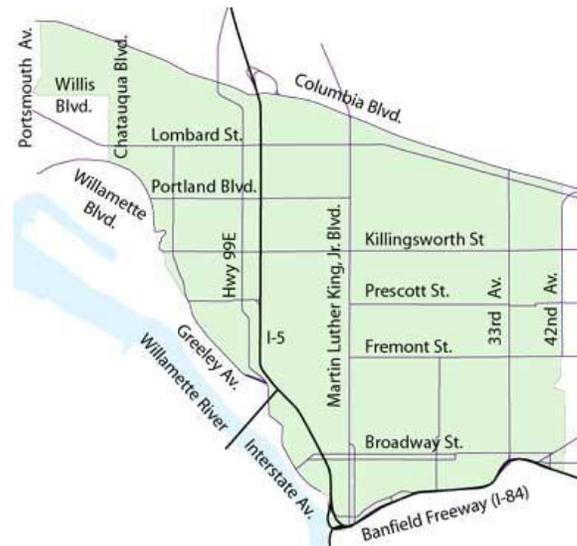
FOTA

MERC's First Opportunity Area (FOTA) program is intended to provide maximum employment for economically disadvantages residents living in the target area, for contracts and employment, in accordance with House Bill 3075, passed by the Oregon Legislature in 1989,

Accordingly MERC aspires to utilize 10% (by dollar value) of subcontractors within the First Opportunity Target Area (FOTA) on this project. First Opportunity recruitments are openings for target area Applicants for vacant positions. In addition to standard recruiting techniques, good faith outreach efforts will be made through target area jobs training and economic development agencies to identify recruit and refer such applicants. First Opportunity applicants will be given consideration for employment after the internal recruitment process has concluded

First Opportunity Target Area

North boundary: Columbia Boulevard
 East boundary: 42nd Avenue
 South boundary: Banfield Freeway (I-84)
 West boundary: Chatauqua Avenue to Willamette Boulevard;
 follow the Willamette River and Greeley Avenue
 by Fremont Bridge; west on Fremont Bridge to
 Albina Community and Northwest target area
 but continue south along Willamette River
 to I-5 and I-84 boundaries but continue south
 along Willamette River to I-5 and I-84.



Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

MBE/WBE/ESB PROGRAM FORM

THIS IS A REQUIRED FORM TO BE SUBMITTED WITHIN TWO HOURS OF BID CLOSING

Bidder/Proposer _____

Address _____

Phone _____ Fax _____ Email _____

Bid Closing Date and Time: AS INDICATED ON THE RFB COVER PAGE.

YOU MUST SUBMIT THIS FORM WITHIN TWO (2) HOURS OF THE ABOVE CLOSING DATE

Step 1. Identify areas in which you intend to use sub-contractors.

Step 2. Attend the Pre-Bid meeting if held. Meet any MBE/WBE/ESB firms at the Pre-Bid meeting.

Name of person who attended pre-bid _____

Steps 3. List all firms contacted for sub-contracting work. (use more sheets if necessary)

Sub-contract for _____

MBE, WBE, ESB, Other	Certification #	Name of Firm	Date Contacted	Mode of Communication	Amount of Bid	Comments

Sub contract for _____

MBE, WBE, ESB, Other	Certification #	Name of Firm	Date Contacted	Mode of Communication	Amount of Bid	Comments

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

MBE/WBE/ESB PROGRAM FORM CONTINUED

Sub contract for _____

MBE, WBE, ESB, Other	Certification #	Name of Firm	Date Contacted	Mode of Communication	Amount of Bid	Comments

Step 4: List all sub-contractors used for this project.

BIDDER INTENDS TO SUBCONTRACT WITH THE FOLLOWING:

MBE, WBE, ESB, Other	Certification #	Name of Firm, Address, Phone	CCB#*	Nature of Work	Dollar Value of Participation

*Please include Construction Contractors Board (CCB) Number

Total Bid Amount _____

Authorized Signature _____ Date _____

Print Name of Bidder _____

Print Name of Company _____

Electrical Services Sub-metering Project - OCC

Public Improvement Bid Response (RFB 12-2055)

LABOR AND MATERIAL PAYMENTS BOND

(NOTE: CONTRACTOR MUST USE THIS FORM, NOT A SURETY COMPANY FORM)
KNOW ALL MEN BY THESE PRESENT:

We the Undersigned _____ as PRINCIPAL and _____
a corporation organized and existing under and by virtue of the laws of the state of _____ and duly
authorized to do surety business in the state of Oregon and named on the current list of approved surety companies
acceptable on federal bonds and conforming with the underwriting limitations as published in the Federal Register by the
audit staff of the Bureau of Accounts and the U.S. Treasury Department and which carries an "A" rating and is of the
appropriate class for the bond amount as determined by Best's Rating System, as SURETY, hereby hold and firmly bind
ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, unto METRO, as OBLIGEE,
in the sum of _____ Dollars (\$ _____) in
lawful money of the United States of America, for the payment of that sum for the use and benefit of claimants as defined
below.

The condition of this obligation is such that whereas the PRINCIPAL entered into a contract with METRO
dated _____, 2012, which contract is hereunto annexed and made a part hereof, for accomplishment of
the project described as follows: "Electrical Services Sub-metering Project - OCC".

NOW THEREFORE, if the PRINCIPAL shall promptly make payments to all persons, firms, subcontractors, corporations
and/or others furnishing materials for or performing labor in the prosecution of the Work provided for in the aforesaid
_____, and any authorized extension or modification thereof, including all amounts
due for materials, equipment, mechanical repairs, transportation, tools and services consumed or used in connection
with the performance of such Work, and for all labor performed in connection with such Work whether by subcontractor
or otherwise, and all other requirements imposed by law, then this obligation shall become null and void; otherwise this
obligation shall remain in full force and effect, subject, however, to the following conditions:

1. A claimant is as specified in ORS 279C.600.
2. The above-named PRINCIPAL and SURETY hereby jointly and severally agree with the OBLIGEE and its
assigns that every claimant as above-specified, who has not been paid in full, may sue on this bond for the use
of such claimant, prosecute the suit to final judgment in accordance with ORS 279C.610 for such sum or sums
as may be justly due claimant, and have execution thereon. The OBLIGEE shall not be liable for the payment
of any judgment, costs, expenses or attorneys' fees of any such suit.



600 NE Grand Ave.
Portland, OR 97232-2736
503-797-1700

Electrical Services Sub-metering Project - OCC

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PROVIDED, FURTHER, that SURETY for the value received, hereby stipulates and agrees that all changes, extensions of time, alterations to the terms of the _____ or to Work to be performed thereunder or the Specifications accompanying the same shall be within the scope of the SURETY's undertaking on this bond, and SURETY does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the _____ or to the Work or to the Specifications. Any such change, extension of time, alteration or addition to the terms of the contract or to the Work or to the Specifications shall automatically increase the obligation of the SURETY hereunder in a like amount, provided that the total of such increases shall not exceed twenty-five percent (25%) of the original amount of the obligation without the consent of the SURETY.

This obligation shall continue to bind the PRINCIPAL and SURETY, notwithstanding successive payments made hereunder, until the full amount of the obligation is exhausted, or if the full amount of the obligation is not exhausted and no claim is pending resolution, until such time as no further claims can be made pursuant to law with regard to the above-described project, by any claimant specified in ORS 279C.600.

If more than one SURETY is on this bond, each SURETY hereby agrees that it is jointly and severally liable for all obligations of this bond.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this ____ day of _____, 2012

SURETY

By: _____

Title: _____

Street Address

City, State ZIP

Phone Number

CONTRACTOR

By: _____

Title: _____

Street Address

City, State ZIP

Phone Number



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PERFORMANCE BOND

(NOTE: CONTRACTORS MUST USE THIS FORM, NOT A SURETY COMPANY FORM)

KNOW BY ALL MEN BY THESE PRESENT:

We the undersigned _____ as PRINCIPAL (hereinafter called CONTRACTOR), and _____ a corporation organized and existing under and by virtue of the laws of the state of _____ duly authorized to do surety business in the state of Oregon and named on the current list of approved surety companies acceptable on federal bonds and conforming with the underwriting limitations as published in the Federal Register by the audit staff of the Bureau of Accounts and the U.S. Treasury Department and is of the appropriate class for the bond amount as determined by Best's Rating System, as SURETY, hereby hold and firmly bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, to pay to METRO as OBLIGEE (hereinafter called METRO), the amount of _____ Dollars (\$ _____) in lawful money of the United States of America.

WHEREAS, the CONTRACTOR entered into a contract with METRO dated _____, 2012, which Contract is hereunto annexed and made a part hereof, for accomplishment of the project described as follows: "Electrical Services Sub-metering Project - OCC".

NOW, THEREFORE, the condition of this obligation is such that if the CONTRACTOR shall promptly, truly and faithfully perform all the undertakings, covenants, terms, conditions, and agreements of the aforesaid _____, METRO having performed its obligations thereunder, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Whenever CONTRACTOR shall be declared by METRO to be in default under the Contract Documents for the project described herein, the SURETY may promptly remedy the default, or shall promptly complete the _____ in accordance with the Contract Documents and the project Specifications. SURETY, for value received, further stipulates and agrees that all changes, extensions of time, alterations, or additions to the terms of the Contract or Specifications for _____ are within the scope of the SURETY's undertaking on this bond, and SURETY hereby waives notice of any such change, extension of time, alteration or addition to the terms of the _____ or to the Work or to the Specifications. Any such change, extension of time, alteration or addition to the terms of the _____ or to the Work or to the Specifications shall automatically increase the obligation of the Surety hereunder in a like amount, provided that such increase shall not exceed twenty-five percent (25%) of the original amount of the obligation without the consent of the Surety.



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This obligation shall continue to bind the PRINCIPAL and SURETY, notwithstanding successive payments made hereunder, until the full amount of the obligation is exhausted.

No right of action shall accrue on this bond to or for the use of any person or corporation other than METRO or its heirs, executors, administrators, successors or assigns.

If more than one SURETY is on this bond, each SURETY hereby agrees that it is jointly and severally liable for obligations on this bond.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 2012.

SURETY

By: _____

Title: _____

Street Address

City State ZIP

Phone Number

CONTRACTOR

By: _____

Title: _____

Street Address

City State ZIP

Phone Number



Electrical Services Sub-metering Project - OCC

Request for Bid (RFB 12-2055)

SAMPLE PUBLIC CONTRACT

CONTRACT NO. _____

For Public Contracts \$50,000 & Above

THIS Contract is entered into between the Metropolitan Exposition-Recreation Commission (MERC), , whose address is 600 NE Grand Avenue, Portland, Oregon 97232-2736, and _____, whose address is _____, hereinafter referred to as the "CONTRACTOR."

THE PARTIES AGREE AS FOLLOWS:

ARTICLE I SCOPE OF WORK

CONTRACTOR shall perform the work and/or deliver to MERC the goods described in the Scope of Work attached hereto as Attachment A. All services and goods shall be of good quality and, otherwise, in accordance with the Scope of Work.

ARTICLE II TERM OF CONTRACT

The term of this Contract shall be for the period commencing _____, 20__ through and including _____, 20__, with substantial competition by _____, 20__.

ARTICLE III CONTRACT SUM AND TERMS OF PAYMENT

MERC shall compensate the CONTRACTOR for work performed and/or goods supplied as described in the Scope of Work. MERC shall not be responsible for payment of any materials, expenses or costs other than those which are specifically included in the Scope of Work. Payment shall be made by MERC on a Net 30 day basis upon approval of CONTRACTOR invoice.

ARTICLE IV LIABILITY AND INDEMNITY

CONTRACTOR is an independent contractor and assumes full responsibility for the content of its work and performance of CONTRACTOR'S labor, and assumes full responsibility for all liability for bodily injury or physical damage to person or property arising out of or related to this Contract, and shall indemnify, defend and hold harmless MERC, its agents and employees, from any and all claims, demands, damages, actions, losses, and expenses arising out of or in any way connected with its performance of this Contract. CONTRACTOR is solely responsible for paying CONTRACTOR'S subcontractors and nothing contained herein shall create or be construed to create any contractual relationship between any subcontractor(s) and MERC.

ARTICLE V TERMINATION

MERC may terminate this Contract upon giving CONTRACTOR seven (7) days written notice. In the event of termination, CONTRACTOR shall be entitled to payment for work performed to the date of termination. MERC shall not be liable for indirect, consequential damages or any other damages. Termination by MERC will not waive any claim or remedies it may have against CONTRACTOR.

ARTICLE VI INSURANCE & BONDS

CONTRACTOR shall purchase and maintain at the CONTRACTOR'S expense, the following types of insurance, covering the CONTRACTOR, its employees, and agents:

- A. The most recently approved ISO (Insurance Services Office) Commercial General Liability policy, or its equivalent, written on an occurrence basis, with limits not less than \$1,000,000 per occurrence and \$1,000,000 aggregate. The policy will include coverage for bodily injury, property damage, personal injury, contractual liability, premises and products/completed operations. CONTRACTOR'S coverage will be primary as respects MERC;



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- B. Automobile insurance with coverage for bodily injury and property damage and with limits not less than minimum of \$1,000,000 per occurrence;
- C. Workers' Compensation insurance meeting Oregon statutory requirements including Employer's Liability with limits not less than \$500,000 per accident or disease; and
- D. If required by the Scope of Work, Professional Liability Insurance, with limits of not less than \$1,000,000 per occurrence, covering personal injury and property damage arising from errors, omissions or malpractice.

MERC/METRO, its elected officials, departments, employees, and agents shall be named as ADDITIONAL INSUREDS on Commercial General Liability and Automobile policies.

CONTRACTOR shall provide to MERC 30 days notice of any material change or policy cancellation.

CONTRACTOR shall provide MERC with a Certificate of Insurance complying with this article upon return of the CONTRACTOR signed agreement to MERC. Certificate of Insurance shall identify the MERC contract number.

CONTRACTOR shall not be required to provide the liability insurance described in this Article only if an express exclusion relieving CONTRACTOR of this requirement is contained in the Scope of Work.

CONTRACTOR shall meet MERC/METRO Bonds and Bid Security requirements as follows:

1. Bid Security not exceeding 10 percent of the amount bid for the contract is required for contracts over \$100,000.
2. For public improvements, a labor and material bond and a performance bond, both in the amount equal to 100 percent of the contract price are required for contracts over \$100,000.
3. Bid security, labor and material bond and performance bond may be required even though a contract is of a class not identified above, if the General Manager determines it is in the public interest.

In addition, for public works subject to ORS 279C.800 to 279C.870, CONTRACTOR and every subcontractor shall have a public works bond required by 2005 Oregon Laws Chapter 360 filed with the Construction Contractors Board before starting work on the project, unless exempt under Section 2 of 2005 Oregon Laws Chapter 360.

ARTICLE VII PUBLIC CONTRACTS

All applicable provisions of ORS chapters 187 and 279A, 279B, and 279C and all other terms and conditions necessary to be inserted into public contracts in the State of Oregon, are hereby incorporated as if such provision were a part of this Agreement. Specifically, it is a condition of this contract that CONTRACTOR and all employers working under this Agreement are subject employers that will comply with ORS 656.017 as required by 1989 Oregon Laws, Chapter 684.

For public work subject to ORS 279C.800 to 279C.870, the CONTRACTOR shall pay prevailing wages. If such public work is subject both to ORS 279C.800 to 279C.870 and to 40 U.S.C. 276a, the CONTRACTOR and every subcontractor on such public work shall pay at least the higher prevailing wage. The CONTRACTOR and each subcontractor shall pay workers not less than the specified minimum hourly rate of wage in accordance with Section 7 of 2005 Oregon Laws Chapter 360. MERC shall pay an administrative fee as provided in ORS 279C.825(1) to the Bureau of Labor and Industries pursuant to the administrative rules established by the Commissioner of Labor and Industries. CONTRACTORS must promptly pay, as due, all persons supplying to such contractor labor or material used in this contract.

If the CONTRACTOR or first-tier subcontractor fails, neglects, or refuses to make payment to a person furnishing labor or materials in connection with the public contract for a public improvement within 30 days after receipt of payment from the public contracting agency or a contractor, the CONTRACTOR or first-tier subcontractor shall owe the person the amount due plus shall pay interest in accordance with ORS 279C.515. If the CONTRACTOR or first-tier subcontractor fails, neglects, or refuses to make payment, to a person furnishing labor or materials in connection with the public contract, the person may file a complaint with the Construction Contractors Board, unless payment is subject to a good



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faith dispute as defined in ORS 279C.580. CONTRACTOR must pay any and all contributions and amounts due to the Industrial Accident Fund from contractor or subcontractor and incurred in the performance of the contract. CONTRACTORS are required to pay the Department of Revenue all sums withheld from employees pursuant to ORS 316.167. CONTRACTOR must provide a written schedule to employees showing the number of hours per day and days per week the employee may be required to work OAR839-25-0020(2)(c), and must pay daily, weekly, weekend and holiday overtime in accordance with, and as required per ORS 279C.520. No liens or claims are permitted to be filed against MERC on account of any labor or material furnished.

For public work subject to ORS 279C.800 to 279C.870, CONTRACTOR and every subcontractor shall have a public works bond required by 2005 Oregon Laws Chapter 360 filed with the Construction Contractors Board before starting work on the project, unless exempt under Section 2 of 2005 Oregon Laws Chapter 360. CONTRACTOR must include in every subcontract a provision requiring sub-contractor to have a public works bond filed with the Construction Contractors Board prior to starting work on the project unless exempt unless exempt in accordance with ORS 279C.855(3).

For public improvement work all CONTRACTORS must demonstrate that an employee drug-testing program is in place.

ARTICLE VIII MODIFICATIONS

MERC may approve changes and modifications to the original contract, including deletions of work, order of additional materials, and additional services reasonably related to the original work scope. Contractor may propose changes in the work that Contractor believes are necessary, will result in higher quality work, improve safety, decrease the amount of the contract, or otherwise result in a better or more efficient work product. If such changes are approved by MERC, they shall be executed by written contract amendment signed by both parties. Such changes shall not relieve Contractor of any obligation or warranty under the contract. No oral statements by either party shall modify or affect the terms of the contract.

ARTICLE IX QUALITY OF GOODS AND SERVICES

Unless otherwise specified, all materials shall be new and both workmanship and materials shall be of the highest quality. All workers and subcontractors shall be skilled in their trades. CONTRACTOR guarantees all work against defects in material or workmanship for a period of one (1) year from the date of acceptance or final payment by MERC, whichever is later. All guarantees and warranties of goods furnished to CONTRACTOR or subcontractors by any manufacturer or supplier shall be deemed to run to the benefit of MERC.

ARTICLE X OWNERSHIP OF DOCUMENTS

Unless otherwise provided herein, all documents, instruments and media of any nature produced by CONTRACTOR pursuant to this agreement are Work Products and are the property of MERC, including but not limited to: drawings, specifications, reports, scientific or theoretical modeling, electronic media, computer software created or altered specifically for the purpose of completing the Scope of Work, works of art and photographs. Unless otherwise provided herein, upon MERC request, CONTRACTOR shall promptly provide MERC with an electronic version of all Work Products that have been produced or recorded in electronic media. MERC and CONTRACTOR agree that all work Products are works made for hire and Contractor hereby conveys, transfers, and grants to MERC all rights of reproduction and the copyright to all such Work Products.

- A. CONTRACTOR and subcontractors shall maintain all fiscal records relating to such contracts in accordance with generally accepted accounting principles. In addition, CONTRACTOR and subcontractors shall maintain any other records necessary to clearly document:
 - 1. The performance of the CONTRACTOR, including but not limited to the contractor's compliance with contract plans and specifications, compliance with fair contracting and employment programs, compliance with Oregon law on the payment of wages and accelerated payment provisions; and compliance with any and all requirements imposed on the CONTRACTOR or subcontractor under the terms of the contract or subcontract;

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2. Any claims arising from or relating to the performance of the CONTRACTOR or subcontractor under a public contract;
3. Any cost and pricing data relating to the contract; and
4. Payments made to all suppliers and subcontractors.

B. CONTRACTOR and subcontractors shall maintain records for the longer period of (a.) six years from the date of final completion of the contract to which the records relate or (b.) until the conclusion of any audit, controversy or litigation arising out of or related to the contract.

C. CONTRACTOR and subcontractors shall make records available to MERC, and its authorized representatives, including but not limited to the staff of any MERC department and the staff of the Metro Auditor, within the boundaries of the Metro region, at reasonable times and places regardless of whether litigation has been filed on any claims. If the records are not made available within the boundaries of Metro, the CONTRACTOR or subcontractor agrees to bear all of the costs for MERC employees, and any necessary consultants hired by MERC, including but not limited to the costs of travel, per diem sums, salary, and any other expenses that MERC incurs, in sending its employees or consultants to examine, audit, inspect, and copy those records. If the CONTRACTOR elects to have such records outside these boundaries, the costs paid by the CONTRACTOR to MERC for inspection, auditing, examining and copying those records shall not be recoverable costs in any legal proceeding.

D. CONTRACTOR and subcontractors authorize and permit MERC and its authorized representatives, including but not limited to the staff of any MERC department and the staff of the Metro Auditor, to inspect, examine, copy and audit the books and records of CONTRACTOR or subcontractor, including tax returns, financial statements, other financial documents and any documents that may be placed in escrow according to any contract requirements. MERC shall keep any such documents confidential to the extent permitted by Oregon law, subject to the provisions of section E.

E. CONTRACTOR and subcontractors agree to disclose the records requested by MERC and agree to the admission of such records as evidence in any proceeding between MERC and the CONTRACTOR or subcontractor, including, but not limited to, a court proceeding, arbitration, mediation or other alternative dispute resolution process.

F. CONTRACTOR and subcontractors agree that in the event such records disclose that MERC is owed any sum of money or establish that any portion of any claim made against MERC is not warranted, the CONTRACTOR or subcontractor shall pay all costs incurred by MERC in conducting the audit and inspection. Such costs may be withheld from any sum that is due or that becomes due from MERC.

G. Failure of the CONTRACTOR or subcontractor to keep or disclose records as required by this document or any solicitation document may result in disqualification as a bidder or proposer for future MERC contracts as provided in ORS 279B.130 and Metro Code Section 2.04.070(c), or may result in a finding that the CONTRACTOR or subcontractor is not a responsible bidder or proposer as provided in ORS 279B.110 and Metro Code Section 2.04.052.

ARTICLE XI SUBCONTRACTORS

CONTRACTOR shall contact MERC prior to negotiating any subcontracts and CONTRACTOR shall obtain approval from MERC before entering into any subcontracts for the performance of any of the services and/or supply of any of the goods covered by this Contract.

MERC reserves the right to reasonably reject any subcontractor or supplier and no increase in the CONTRACTOR'S compensation shall result thereby. All subcontracts related to this Contract shall include the terms and conditions of this agreement. CONTRACTOR shall be fully responsible for all of its subcontractors as provided in Article IV.

ARTICLE XII RIGHT TO WITHHOLD PAYMENTS

MERC shall have the right to withhold from payments due CONTRACTOR such sums as necessary, in MERC's sole opinion, to protect MERC against any loss, damage or claim which may result from CONTRACTOR'S performance or failure to perform under this agreement or the failure of CONTRACTOR to make proper payment to any suppliers or



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subcontractors. In addition for public improvement work, if a CONTRACTOR is required to file certified statements under ORS 279C.845, MERC shall retain 25 percent of any amount earned by the CONTRACTOR on the public works until the contractor has filed all required certified statements with MERC.

If a liquidated damages provision is contained in the Scope of Work and if CONTRACTOR has, in MERC's opinion, violated that provision, MERC shall have the right to withhold from payments due CONTRACTOR such sums as shall satisfy that provision. All sums withheld by MERC under this Article shall become the property of MERC and CONTRACTOR shall have no right to such sums to the extent that CONTRACTOR has breached this Contract.

ARTICLE XIII SAFETY

If services of any nature are to be performed pursuant to this agreement, CONTRACTOR shall take all necessary precautions for the safety of employees and others in the vicinity of the services being performed and shall comply with all applicable provisions of federal, state and local safety laws and building codes, including the acquisition of any required permits.

ARTICLE XIV INTEGRATION OF CONTRACT DOCUMENTS

All of the provisions of any procurement documents including, but not limited to, the Advertisement for Bids, Proposals or responses, General and Special Instructions to Bidders, Proposal, Scope of Work, and Specifications which were utilized in conjunction with the bidding of this Contract are hereby expressly incorporated by reference. Otherwise, this Contract represents the entire and integrated agreement between MERC and CONTRACTOR and supersedes all prior negotiations, representations or agreements, either written or oral. This Contract may be amended only by written instrument signed by both MERC and CONTRACTOR. The laws of the state of Oregon shall govern the construction and interpretation of this Contract.

ARTICLE XV COMPLIANCE

CONTRACTOR shall comply with federal, state, and local laws, statutes, and ordinances relative to the execution of the work. This requirement includes, but is not limited to, non-discrimination, safety and health, environmental protection, waste reduction and recycling, fire protection, permits, fees and similar subjects.

ARTICLE XVI INTERGOVERNMENTAL COOPERATIVE AGREEMENT

Pursuant to ORS 279A and the Metro public contract code, MERC/Metro participates in an Intergovernmental Cooperative Purchasing program by which other public agencies shall have the ability to purchase the goods and services under the terms and conditions of this awarded contract. Any such purchases shall be between the Contractor and the participating public agency and shall not impact the Contractor's obligation to MERC under this agreement. Any estimated purchase volumes listed herein do not include volumes for other public agencies, and MERC makes no guarantee as to their participation in any purchase. Any Contractor may decline to extend the prices and terms of this solicitation to any or all other public agencies upon execution of this contract. Unless the Contractor specifically declines to participate in the program by marking the box below, the Contractor agrees to participate in the Intergovernmental Cooperative Purchasing program. **Contractor declines to participate in the Intergovernmental Cooperative Purchasing program or is not applicable to this Contract. as indicated by the following initials _____.**

ARTICLE XVI SITUS

The situs of this Agreement is Portland, Oregon. Any litigation over this agreement shall be governed by the laws of the State of Oregon and shall be conducted in the Circuit Court of the state of Oregon for Multnomah County, or, if jurisdiction is proper, in the U.S. District Court for the District of Oregon.



Electrical Services Sub-metering Project - OCC Request for Bid (RFB 12-2055)

ARTICLE XVII ASSIGNMENT

CONTRACTOR shall not assign any rights or obligations under or arising from this Contract without prior written consent from MERC.

CONTRACTOR

METROPOLITAN EXPOSITION-RECREATION COMMISSION

Signature: _____

Signature: _____

Printed Name _____

Printed Name: _____

Date: _____

Date: _____

Company _____

Title: _____

Address: _____

Project Manager: _____

Telephone: _____

Telephone: _____

Tax I.D. or SS#: _____

CCB # _____



Electrical Services Sub-metering Project - OCC Request for Bid (RFB 12-2055)

Attachment A to Standard Public Contract

Contract No _____

1. Purpose and Goal of Work

2. Description of the Scope of Work

- Clarifications
- Exclusions
- Additional Requirements

3. Deliverables/Outcomes

4. Payment and Billing

Contractor shall perform the above work for a maximum price of not to exceed (written) _____ AND ___/100TH DOLLARS (\$_____). The maximum price includes all fees, costs and expenses of whatever nature. MERC shall not be responsible for payment of any materials, expenses or costs other than those which are specifically included in the Scope of Work Payment shall be on a unit price only for those goods or services received in a condition or manner acceptable to MERC. Each of MERC's payments to CONTRACTOR shall equal the percentage of the work CONTRACTOR accomplished during the billing period. CONTRACTOR's billing invoices will include an itemized statement of services provided, and items purchased and/or expenses incurred during the billing period, and will not be submitted more frequently than once a month. CONTRACTOR'S invoice shall and shall be sent to MERC, Attention: Accounts Payable, 600 NE Grand Ave., Portland, Oregon 97232, or to renee.pace@oregonmetro.gov. CONTRACTOR's invoice must breakout 5% retainage as allowed by ORS 701.420, and CONTRACTOR must submit Certified Payroll with invoices. MERC will pay CONTRACTOR within 30 days of receipt of an approved invoice.

5. General Conditions

All services and goods shall be of good quality and, otherwise, in accordance with the Scope of Work. CONTRACTOR agrees to provide all labor, tools, equipment, machinery, supervision, transportation, permits and every other item and service necessary to perform the work described in the contract documents. CONTRACTOR agrees to comply with each and every term, condition and provision of the contract documents.

The Contract Time shall commence upon issuance of the Notice to Proceed which is anticipated to be issued following execution of the contract. CONTRACTOR shall commence work under this Contract within no more than ten (10) calendar days after issuance of written Notice to Proceed. **CONTRACTOR shall bring the Work to substantial completion no later than _____ 20__**, or at such date as may be extended by Change Order approved by CONTRACTOR and Owner. By executing this Contract, CONTRACTOR confirms and accepts that the Contract Time so stated is a reasonable period for performance of all of the Work.

The end date of the Contract Term is intended to allow for finalization of all closeout requirements, receipt of warranties, manuals and final payment, but does not alter requirements for substantial completion of the work by the date specified. Contractor shall be liable to incur liquidated damages if not substantially complete by contract terms. *Liquidated damages shall be assessed at no less than (\$100) per day.*

CONTRACTOR shall provide all services and materials necessary to complete the work described below in a professional manner, in compliance with applicable building codes and per industry standards. All services and

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materials shall be provided by CONTRACTOR in accordance with the Scope of Work and in compliance with the Owner's schedule. Contractor may be subject to liquidated damages if work not in compliance with and Contract Agreement and any and all attachments. **All work included in this Contract is subject to Prevailing Wages.**

A facility events schedule will be provided for the duration of the work. This schedule indicates the dates and approximate shifts that are currently available and unavailable to the CONTRACTOR to perform the required work, depending on the location in the building of the scheduled event, the type of event and the Work being conducted simultaneously with the event. Due to the likely possibility of additional "bookings" or cancellations of events in the building, this schedule may be modified, which may positively or negatively impact the work schedule. In the event of a schedule change, the Owner will notify the CONTRACTOR directly following the implementation of the change so that work plans may be modified accordingly.

Contractors work will be scheduled in accordance with the building's events schedule. Building events schedule will be provided as a part of this contract along with areas open for contractor work and availability. A formal project schedule is to be provided by the Contractor in accordance with the building event schedule and coordinated with the Project Manager prior to the start of any work. Due to the nature of the Public Events Facility Industry, it will be necessary for the contractor to work closely with the Project Manager to coordinate day-to-day logistical requirements for the benefit of the Contractor and to afford Owner staff the necessary time to perform event or non-event related functions. Owner will provide Contractor access to all areas as necessary to complete the work and access to on-site parking. Contractor shall be responsible for all of Contractor's equipment, tools and materials at all times, Owner shall not be held responsible for any theft.

Contractor shall coordinate all work with MERC Project Manager and schedule his work so as to minimize any disruption to the ongoing operations of the Oregon Convention Center. Generally, Contractor will be able to conduct work activities at any time as long as those activities do not impact or impede events in progress by noise, dust or construction material blocking access routes to events or facilities. Specific utilization of the areas on a day-to-day basis will be coordinated by the Project Manager or his designee and the Contractor Representative. Contractor will be working in an occupied functioning building and could expect to perform work in some areas prior to the building opening at 8:00 AM. It may be possible for the Contractor to work on weekends if the area is available and scheduled with the owner in advance and at no additional cost to the Owner. Safety for Contractor as well as general public and staff is a major concern. Contractor is to coordinate work with Project Manager and building staff and be prepared to section off and sign work areas as appropriate.

Section 00700

General Conditions (RFB 12-2055)

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GENERAL CONDITIONS

ARTICLE 1 GENERAL PROVISIONS

1.1. Definitions. Unless otherwise defined or specified in the Contract Documents, the following terms shall have the meanings indicated:

1.1.1. Act of God -- means an earthquake, flood, typhoon, cyclone or other natural phenomenon of catastrophic proportions or intensity.

1.1.2. Addendum (Plural: Addenda) -- means a document issued by Metro during the bidding period, which modifies, interprets, supersedes or supplements the Contract Documents and becomes a part of the Contract Documents. It is the Bidder's responsibility to determine how addenda impact the Work. All Bids submitted shall include the cost of the Work included in any addenda issued prior to award.

1.1.3. Alternate Bids -- are portions of the Work for which a Bidder must submit a separate Bid amount. Alternate Bid items may or may not be awarded at Metro's discretion.

1.1.4. Engineer -- is the firm representing Metro as designers and its agents, representatives, employees and consultants or such other firm as Metro may appoint. The Engineer will have authority to act on behalf of Metro only to the extent provided in these Contract Documents.

1.1.5. "As-Builts" or Record Documents -- are those drawings made, revised or annotated by Contractor and approved by Metro during the performance of the Contract, fully illustrating how all elements of the work were actually installed and completed.

1.1.6. Authorized Representative -- is a person, corporation, partnership or other legal entity acting on behalf of another through expressly delegated authority as specified in these Contract Documents.

1.1.7. Bid -- is the written offer of a Bidder to perform the Work as defined in these Contract Documents, when made out in accordance with all of the Contract Documents and submitted on the appropriate Bid Forms.

1.1.8. Bidder -- is any individual, partnership, corporation, or joint venture, acting directly or through a duly and legally authorized representative, submitting or intending to submit a Bid for the Work as described in these Contract Documents.

1.1.9. Bidding Documents -- See "Contract Documents."

1.1.10. Bid Forms -- include the following: the Bid proposal (including Schedule of Bid Prices and Recycled Product Attachment), Surety; Minority, Women-Owned and Emerging Small Business Program Compliance Form; Resident/Non-Resident Bidder Status form; Signature Page; the Non-Collusion Affidavit; and Bid Bond.

1.1.11. City or County -- means the city or county in which the Work is located.

1.1.12. Change Order -- is a written document signed by Metro and Contractor stating their agreement upon all of the following:

1.1.12.1. a change in the Work;

1.1.12.2. the amount of the increase or decrease in the Contract Amount, if any; and

1.1.12.3. the extent of the adjustment to the Contract Time, if any.

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1.1.13. Clarification -- is a written document consisting of supplementary details, instruction or information issued by Metro after the award of Contract which clarifies, or supplements the Contract Documents and becomes a part of the Contract Documents. A Clarification may or may not affect the scope of work.

1.1.14. Completion -- See "Substantial Completion" and "Final Completion and Acceptance."

1.1.15. Construction Manager -- is the Metro representative on the construction site. The Construction Manager will be an employee of Metro, who will represent Metro to the extent of his authority as delegated by the Chief Operating Officer. For purposes of administering this contract the terms "Construction Manager" will refer to the on-site Metro representative and to any duly appointed assistants who may be designated in writing. The Architect/Engineer of Record will be called upon as required by and at the direction of Metro for technical assistance and for interpretation of the Contract Documents.

1.1.16. Construction Schedule or Schedule -- is the timeline described in Section 01310 of the Specifications.

1.1.17. Contract Amount -- is the total amount shown in the Construction Agreement as revised by Change Orders.

1.1.18. Contract Documents or Contract or Bidding Documents -- consist of the Advertisement for Bids, the Invitation to Bid, the Instructions to Bidders, the Bid Forms, the Construction Agreement, the Performance Bond, the Labor and Materials Payment Bond, the General Conditions, the Supplementary Conditions, the Specifications, the Drawings, the approved and updated Construction Schedule, and any modifications of any of the foregoing in the form of Addenda, Clarifications, Change Orders or Force Account Work.

1.1.19. Contractor -- is the party who has entered into this Contract with Metro and who is responsible for the complete performance of the Work contemplated by the Contract Documents and for the payment of all legal debts pertaining to the Work, including its officers, agents, employees and representatives.

1.1.20. Contract Time -- is the period of time, including adjustments approved by Metro, which is allowed in the Contract Documents for Contractor to substantially complete the Work.

1.1.21. Critical Path Method or CPM -- means the critical path method of scheduling as understood and interpreted by standard industry practice.

1.1.22. Days -- means calendar day including Saturdays, Sundays and legal holidays.

1.1.23. Direct Costs -- are those costs of labor (including benefits), material and equipment incurred by the person, corporation, partnership or joint venture whose employees are actually performing the task.

1.1.24. Minority Business Program -- is Metro's program to provide maximum opportunities to Minority, Women-Owned and Emerging Small Business Enterprises in contracts, which is contained in Metro Code Section 2.04.

1.1.25. Drawings -- means the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

1.1.26. Equal, Approved, Approved Equal -- is used to indicate that the material or product to be supplied or installed must be equal to or better than that named in function, performance, reliability, quality and general configuration and that the substitute must be approved by Engineer. Equality in reference to the Project design requirements shall be determined by Metro prior to installation of any material or product in the Project. Where the term "or equal" is not used and a sole product is specified, the term "or equal" is implied.

1.1.27. Final Completion and Acceptance -- means the completion by Contractor of all of the Work called for under the Contract, whether expressly or impliedly required, including but not limited to, satisfactory operation of all equipment, completion and correction of all punch list items to the satisfaction of Metro, settlement of all claims, delivery of all

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warranties and agreements to correct Work, equipment operation and maintenance manuals, as-built drawings, required approvals and acceptances by federal, state or local governments or other authorities having jurisdiction over the Work, and removal of all rubbish, tools, scaffolding and surplus materials and equipment from the Site.

1.1.28. Final Payment -- is the balance of the Contract Amount to be paid to the Contractor upon Final Completion and Acceptance of the Work.

1.1.29. Force Account Work -- is work, ordered in writing by Metro, for which Contractor must report its actual costs in accordance with Paragraph 8.4 of the General Conditions.

1.1.30. Furnish -- means, unless the context requires otherwise, supply and deliver materials, systems and equipment to the Site, ready for unpacking, assembly, installation, etc., as applicable in each instance.

1.1.31. General Contractor -- is the party who enters into the Contract with Metro. See also "Contractor".

1.1.32. Geotechnical Engineer -- The Geotechnical Engineer is an agent of the Engineer.

1.1.33. Install -- includes, unless the context requires otherwise, unload, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, connect to electrical power and/or piping, and similar operations at the Site, as applicable in each instance.

1.1.34. Lump Sum -- means all costs and expenses of whatever nature, including Overhead and Profit, associated with the Work involved.

1.1.35. Material or Materials -- shall be construed to include machinery, equipment, manufactured articles, materials of construction such as formwork, fasteners, etc., and any other classes of items to be provided in connection with the Contract, except where a more limited meaning is indicated by the context.

1.1.36. Metro -- is a metropolitan service district organized under the laws of the State of Oregon and the Metro Charter.

1.1.37. Metro Chief Operating Officer or COO -- means the Chief Operating Officer of Metro.

1.1.38. Metro Council or Council -- means the elected Council of Metro.

1.1.39. Miscellaneous Phrases -- in the Contract Documents shall be interpreted as follows:

Wherever the words "as directed," "as instructed," "as required," "as permitted," or words of like effect are used, it shall be understood that the direction, requirement, or permission of Metro is intended.

The words "sufficient," "necessary," "proper," and the like shall mean sufficient, necessary or proper in the judgment of Metro.

The words "approved," "acceptable," "satisfactory," or words of like import, shall mean approved by, or acceptable to, or satisfactory to, Metro.

1.1.40. Notice of Award -- is the document issued by Metro to the lowest responsive, responsible Bidder whose Bid complies with all the requirements prescribed by the Contract Documents. The Notice of Award shall be given pursuant to the provisions of the Instructions to Bidders. It shall not entitle the party to whom it is given to any payment under the Contract, nor shall Metro be liable to such party or to any person for any alleged damages for any action taken in reliance upon such notice.

1.1.41. Notice to Proceed -- is the written notice given Contractor to commence the prosecution of its Work as defined in the Contract Documents. The Notice to Proceed will also establish the date and time of a preconstruction conference.

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1.1.42. Other Metro Contractors -- are all individuals, corporations, partnerships, or joint ventures (except Contractor) with whom Metro has a contract to perform work on, or related to, the Project.

1.1.43. Overhead -- when applied to the cost of the work, shall include the following items, when reasonable and necessary for completion of the work:

1.1.43.1. All on-site payroll costs, taxes, insurance, fringe benefits and bonuses of same, for supervising, estimating, expediting, purchasing, drafting and clerical/secretarial services where directly incurred in the performance of the Contract.

1.1.43.2 Small tools (less than \$250 capital cost per item).

1.1.43.3 Contractor Owned Equipment.

1.1.43.4 Equipment maintenance and repairs.

1.1.43.5 Temporary construction, utilities, and safety requirements.

1.1.43.6 Transportation of materials other than direct identifiable cost of specific deliveries, or as included in price of material.

1.1.43.7 Parking fees for workers (if applicable).

1.1.43.8 Permit fees.

1.1.43.9 Cost of reproduction.

1.1.43.10 Field office costs.

Home or branch office overhead shall not be included, but shall be part of Contractor's profit and shall include, but is not limited to, the following:

1.1.43.10.1. Accounting functions of Contractor's Home and Branch Office.

1.1.43. 10.2. General expenses of Contractor's Home and Branch Office.

1.1.43. 10.3. Interest on capital.

1.1.43. 10.4. Salaries of any home and branch office estimators and administration..

1.1.44. Owner -- means Metro.

1.1.45. Plans -- means Drawings.

1.1.46. Profit -- means that portion of Contractor's Bid price that is not Direct Costs or Overhead

1.1.47. Project -- means the Work described in the Contract Documents.

1.1.48. Provide -- means furnish and install complete and in place and ready for operation and use.

1.1.49. Punch List -- is the list prepared by Metro and/or Construction Manager at the time of Substantial Completion, which reflects Contractor's incomplete, nonconforming work. Punch list items must be completed to the satisfaction of the Metro in order for the Project to reach Final Completion and Acceptance.

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1.1.50. Request for Clarification -- is a written request made by Contractor for additional information to clarify an ambiguity in the Contract Documents.

1.1.51. Retainage or Retention -- is the difference between the amount earned by Contractor on the Contract and the amount paid on the Contract by Metro.

1.1.52. Schedule of Values -- is the detailed breakdown of a lump sum contract amount as required in Section 01025 of the Specifications.

1.1.53. Separate Contract -- is a contract between Metro and a party other than Contractor for the construction or furnishing of a portion of the Project.

1.1.54. Shown, As Shown -- work shown on the Drawings which is a part of the Contract Documents.

1.1.55. Site -- is the real property upon which the Project is located.

1.1.56. Special Inspector -- is a representative of the Owner, Landscape Architect, Engineer or Geotechnical Engineer with specialized knowledge applicable to the installation of certain elements of the work.

1.1.57. Specifications -- are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services.

1.1.58. Subcontractor -- means a person, partnership, corporation or joint venture, which has a direct contract with Contractor to perform a portion of the Work at the Site.

1.1.59. Submittals -- include shop drawings, samples, manufacturer's brochures, pamphlets, catalog cuts, color charts or other descriptive data, clearly defining the article, material, equipment or device proposed by Contractor for use in the Work. "Shop drawings" are the drawings and diagrams showing details of fabrication and erection, which Contractor is required to submit to the Metro.

1.1.60. Substantial Completion -- is the stage in the progress of the Work, as determined by Metro, when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that Metro can occupy or use the Work for its intended use.

1.1.61. Supplier -- means an individual, partnership, corporation or joint venture entering into an agreement with Metro or Contractor for furnishing a portion of the Work which requires no labor at the Site, other than common carriers.

1.1.62. Unit Prices -- are the costs for specific units of work as defined in the Bid and Supplementary Conditions and include all costs, including, but not limited to, equipment, labor, materials, incidentals, Overhead and Profit, for the unit of work described.

1.1.63. Unusually Persistent Severe Weather -- Severe weather conditions exist when the average day time temperature at the Project is less than 32°F, and is accompanied by an accumulation of ice or snow. Such conditions are unusually persistent when they continue for a number of consecutive days, in excess of the annual average. Contractor shall determine the annual average number of consecutive days severe weather conditions occur for the part of the Metro region where the Project is located, based upon ten-year averages, with reference to the annual publication of Local Climatological Data for Portland Oregon, available at the Portland Weather Service Office. Contractor shall incorporate said annual average number of consecutive days severe weather conditions exist into the Project schedule.

1.1.64. Work -- means, unless the context requires otherwise, the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by Contractor to fulfill Contractor's obligations. The Work may constitute all or a portion of the Project as the context requires.

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1.2. Intent and Interpretation of Contract Documents

1.2.1. Intent -- The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. The intent of the Contract Documents is to include in the Contract price the cost of all labor and materials, water, fuel, tools, plant, scaffolding, equipment, power, light, transportation, and all other facilities, services and expense as may be necessary for the proper execution of the Work, unless otherwise indicated in these Contract Documents. In interpreting the Contract Documents, words describing materials or work which have a well-known technical or trade meaning, unless otherwise specifically defined in the Contract Documents, shall be construed in accordance with such well-known meaning recognized by Metro.

1.2.2. Divisions and Headings -- Titles and headings are for the convenience of organizing the Contract Documents and shall not be construed to limit Contractor's obligations hereunder. The General Conditions are divided into fifteen (15) Articles. The first-tier subheadings of each Article shall be referred to as Paragraphs; the second-tier sub-headings shall be referred to as Subparagraphs; and the third-tier subheadings shall be referred to as Clauses.

1.2.3. Mandatory Nature of Specifications and Drawings -- mention in the Specifications or indication on the drawings of articles, materials, operations, sequence or methods requires Contractor to furnish and install (i.e., provide) each article mentioned or indicated, of quality or according to qualifications noted, to perform each operation called for, in the sequence called for, and to provide therefore, all necessary labor, equipment and incidentals. The determination of the type of operations and methods to be utilized in the performance of the Work shall be the responsibility of Contractor unless the Contract Documents prescribe a specific type of operation, sequence or method, in which case Contractor shall comply with the prescribed operation, sequence or method. Sentences in the imperative tense or command format in these Contract Documents shall be deemed to be directed to Contractor and to require Contractor to perform the services and/or provide the materials described.

1.2.4. Precedence of Contract Documents -- all determination of the precedence of, or discrepancy in, the Contract Documents shall be made by Metro, but in general, precedence will be in accordance with the following list with the highest precedence item at the top:

1.2.4.1. Signed Construction Agreement.

1.2.4.2. Supplementary Conditions.

1.2.4.3. General Conditions, Advertisement for Bids, Instructions to Bidders, Invitation to Bid, Bid Forms, Performance Bond and Labor and Materials Payment Bond.

1.2.4.4. Specifications

1.2.4.5. Drawings.

Within each of the above documents, detailed information takes precedence over general information and words take precedence over numbers unless obviously incorrect.

Addenda, Clarifications and all Change Orders to the Contract Documents take the same order of precedence as the specific sections that they are amending.

1.2.5. Discrepancies, Errors and Omissions -- the intent of the Contract Documents is to require Contractor to perform and provide every detail and item necessary for completion of the Project. The Contract Documents are not complete in every detail, however, and Contractor shall comply with their intent and meaning, taken as a whole, and shall not avail itself of any manifest errors or omissions to the detriment of the Work. Should any error, omission, discrepancy or ambiguity appear in the Contract Documents, instructions or work done by others, Contractor shall immediately upon discovery submit a Request for clarification to Metro pursuant to Paragraph 3.2. If Contractor proceeds with any such work without receiving a Clarification, Contractor shall be responsible for all resulting damage and defects, and shall perform any work necessary to comply with Metro's Clarifications at no cost to Metro. Any work or material not indicated in the Contract

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Documents, which is manifestly necessary for full and faithful performance of the Work in accordance with the intent of the Contract Documents shall be indicated by Contractor on the shop drawings and provided by Contractor to the same extent as if both indicated and specified. Any work indicated on the drawings but not specified, or vice versa, shall be furnished in the manner specified above as though fully set forth in both. Work not particularly detailed, marked or specified shall be the same as similar parts that are detailed, marked or specified. In case of discrepancy or ambiguity, in quantity or quality, the greater quantity or better quality as determined by Metro shall be provided at no extra cost to Metro.

1.2.6. Standards to Apply Where Detailed Specifications Are Not Furnished --wherever in these Contract Documents or in any directions given by Metro pursuant to or supplementing these Contract Documents, it is provided that Contractor shall furnish materials or manufactured articles or shall do work for which no detailed Specifications are set forth, the materials or manufactured articles shall conform to the usual standards for first-class materials or articles of the kind required, with due consideration of the use to which they are to be put. Work for which no detailed Drawings or Specifications are set forth herein shall conform to the usual standards for first-class work of the kind required.

1.3. Supply of Contract Documents -- Metro shall supply Contractor, without charge, a maximum of ten (10) sets of Contract Documents. Contractor shall contact Metro for additional sets of documents for which Contractor shall be charged the cost of printing.

1.4.Use of Contract Documents -- the Contract Documents were prepared for use in the construction of this Project only. No part of the Contract Documents shall be used for any other construction or for any other purpose except with the written consent of Metro. Any unauthorized use of the Contract Documents is at the sole responsibility of the user and such unauthorized use shall be deemed an activity in the performance of the Contract for purposes of Contractor's duty to indemnify under Article 11.

1.5.Copyright -- all submittals, record documents and any other products or documents produced by Contractor pursuant to this Contract are the property of Metro and it is agreed by the parties hereto that such documents are works made for hire. Contractor does hereby convey, transfer and grant to Metro all rights of reproduction and the copyright to all such documents.

1.6.Severability Clause -- should any provision of this Contract at any time be in conflict with any law, regulation or ruling, or be legally unenforceable for any reason, then such provision shall continue in effect only to the extent that it remains valid. In the event that any provision of this Contract shall become legally unenforceable, in whole or in part, the remaining provisions of this Contract shall nevertheless remain in full force and effect.

1.7.Notice or Service -- any written notice required or allowed under the Contract shall be deemed to have been communicated to the other party and service thereof shall be deemed to have been made if such notice is delivered in person to the individual, a member of the partnership or joint venture, or an officer of the corporation for whom it was intended or if delivered at or sent by regular, registered or certified mail to the last business address of the relevant person or party known to the person or party giving the notice or to Contractor's Site office if the notice is directed to Contractor. The date or time of service for purposes of all notices required or allowed under the Contract shall be the date and/or time upon which the relevant document was mailed or delivered as above-described.

The address given in the Bid is hereby designated as the legal business address of Contractor, but such address may be changed at any time by ten (10) days prior notice in writing, delivered to Metro.

ARTICLE 2 CONTRACTOR'S ORGANIZATION

2.1. Contractor's Authorized Representatives -- prior to commencing any work under this Contract, Contractor shall submit in writing to Metro a list of Contractor's authorized representatives. Such list shall include the name and title of each representative along with the extent to which each representative is authorized to represent, bind and act for Contractor. The description of extent of representation shall include, but not be limited to, the maximum dollar value of Change Orders which the individual may authorize, whether the individual may respond to Request for Proposals and for what maximum

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dollar amount and whether the individual may submit a claim pursuant to Paragraph 3.3. Contractor shall be fully liable for the acts, omissions and decisions of such representatives to the extent stipulated in the written list submitted to Metro.

Contractor shall at all times be represented at the Site by one or more of such authorized representatives, who, cumulatively, shall have complete authority to represent, bind and act for Contractor in all matters pertaining or related to this Contract. In the event that Contractor does not comply with this paragraph and, consequently, is not fully represented at the Site at all times, Contractor shall be deemed to acquiesce in all actions taken by Metro which pertain or relate to this Contract.

2.2. Contractor's Office at the Site -- prior to commencement of work at the site, Contractor shall establish a field office at the site acceptable to the Construction Manager. This office shall be located in a job trailer or temporary building. This office shall be the headquarters of Contractor's representatives authorized to receive notices, instructions, drawings or other communications from the Construction Manager on behalf of Metro and to act on Change Orders or other actions. Such notices, instructions, drawings or other communications given to such a representative or delivered to Contractor's site office in his/her absence shall be deemed to have been given to Contractor.

2.2.1 Use of the Site by Contractor -- Contractor shall have complete and exclusive use of the premises for execution of the work within the boundaries shown on the drawings. The contractor's use of the premises is limited only by the Owner's right to perform work or to retain other contractors on portions of the project. All construction activities, storage, staging and work shall be confined to the limits of Work, as per the drawings. Under no circumstances shall portions of the site beyond the limits of work shall be disturbed. The contractor shall appropriately fence and maintain barriers to confine limits of work to those areas indicated on the drawings. All driveways and entrances to the site shall remain clear and available to the Owner and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule delivery of materials to minimize space and time requirements for storage of materials and equipment on site. Keep roadway pavement clean, free of mud, rocks, debris associated with materials and vehicles. Coordinate use of the premises under the direction of the Owner. Assume all responsibility for the protection and safe keeping of the site, structures and products stored on the site included in this contract. At no cost to the owner, move any stored products which interfere with operations of the Owner or construction activities. Obtain and pay for the use of additional storage or work areas needed for operations.

2.2.2 Construction Staking -- Contractor shall provide all necessary construction staking as to lines and grades shown on the Drawings. Contractor shall protect and preserve all control points in their original position or be responsible for providing new control points established from Engineer's original control points.

2.2.3 Construction Staging Area -- Coordinate use of the site with Metro prior to utilization of the area. Providing site security, barriers, and other temporary protection is the responsibility of the Contractor. Limit all construction activities within the work limits shown on the Drawings. All areas disturbed in any way or during construction and not covered by roads, parking, or structures shall be rehabilitated to their pre-construction condition.

2.3. Key Personnel -- Contractor shall submit, in writing, to Metro a list of the names, addresses, and telephone numbers of its key personnel who are to be contacted in case of emergencies on the job during non-working hours, including Saturdays, Sundays and holidays and all other key personnel as may be required.

2.4. Contractor's Employees -- Contractor shall enforce strict discipline and good order among Contractor's employees and other persons carrying out the Work. Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

Whenever Metro shall notify Contractor that any employee on the Work is, in the judgment of Metro, incompetent, unfaithful, disorderly or refuses to carry out the provisions of the Contract, such employee shall be discharged or transferred from the Work.

Contractor shall give Metro, at its request at any time, full and correct information as to the number of workers employed in connection with each subdivision of the Work, the classification and rate of pay of each worker, the cost to Contractor of

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each class of materials, tools and appliances used by it in the Work, and the amount of each class of materials used in each subdivision of the Work.

2.5. Contractor to Supply Sufficient Material and Workers -- Contractor shall at all times keep on the premises sufficient material and employ sufficient supervision and workers to prosecute the Work at the rate necessary to substantially complete the Work herein required within the time specified in the Contract and in accordance with the Construction Schedule. Contractor shall coordinate the Work of its Subcontractors so that information required by one will be provided by others involved in time for incorporation in the Work in proper sequence and without delay of any materials, devices or provisions for future work.

2.6. Construction Plant, Equipment and Methods --The construction plant and equipment provided by Contractor, and Contractor's methods and organization for handling the Work shall be such as will secure a good quality of work and rate of progress which will ensure the completion of the Work within the time specified, in accordance with the Construction Schedule, and without violating city, local, state or federal environmental regulation during construction.

Contractor shall give Metro full information in advance as to Contractor's plans for carrying on any part of the Work. If at any time before the commencement or during the progress of the Work, any part of Contractor's plant or equipment, or any of Contractor's methods of executing the Work, appears to Metro to be inadequate to ensure the required quality, environmental protection or rate of progress of the Work, Metro may order Contractor to increase or improve its facilities or methods, and Contractor shall promptly comply with such orders. Neither compliance with such orders nor failure of Metro to issue such orders shall relieve Contractor from obligation or liability to secure the quality of work and the rate of progress required by the Contract. Contractor shall be responsible for overload of any part or parts of structures beyond their safe calculated carrying capacities, and for release of pollutants into surrounding waters resulting from Contractor's activities on the Site.

Contractor shall provide temporary utilities pursuant to the Specifications and shall be responsible for the safety and adequacy of its plant, equipment and methods.

2.7. Contractor's Temporary Structures -- Contractor shall obtain all necessary permits for and shall erect and maintain at its own expense, and remove upon completion of the Work or as ordered by Metro temporary structures, sheds, barriers, walks, hoisting equipment, scaffolds, etc., as are necessary for the Work pursuant to these Contract Documents.

Contractor's temporary structures, equipment, stored materials, stored equipment, etc., shall be located so as not to interfere with the prosecution of the Work. If not so located, they shall be moved by Contractor, as directed by Metro, at no cost to Metro. Contractor's temporary structures, equipment or materials that obstruct progress of any portion of the work shall be removed or relocated by Contractor at Contractor's expense.

ARTICLE 3 ADMINISTRATION OF THE CONTRACT

3.1. Authority and Relationships of Metro and Engineer -- the following provisions shall govern the authority of the various officers, agents, representatives, consultants and employees of Metro, and Engineer. Except as specifically provided in this section, no individual acting or purporting to act as an officer, agent, representative, consultant or employee of Metro or Engineer shall have any authority to make representations, statements or decisions of whatever nature binding Metro or Engineer regarding any aspect of this Contract. Except as specifically provided in this Article, Contractor shall have no right to, and shall not rely on any such representation, statement or decision. Any reference to action by Metro in this Contract requires the written approval of the Metro Chief Operating Officer or a person who is designated in writing by the Metro Chief Operating Officer as having authority to act for Metro but only to the extent that such authority is expressly delegated in writing.

3.1.1. Authority of Metro -- except as otherwise provided herein, Metro shall determine the amount, quality, acceptability, fitness, and progress of the Work covered by the Contract. Metro and Engineer will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the work, and they will not be responsible for Contractor's failure to carry out the Work in accordance with the Contract Documents. Metro and Engineer will not be responsible for or have control over the acts or

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omissions of Contractor, Subcontractors, or any of their agents or employees, or any other persons performing any of the Work. Nothing contained in this Contract is intended nor shall be construed to create any third-party beneficiary relationship between Metro and Contractor's subcontracting agents or employees.

It shall be the duty of Contractor to comply with all procedures established and/or implemented by Metro as stated above. In the event any such procedures are at variance with other provisions of these Documents, such procedures shall prevail.

Metro may call for meetings of Contractor, Contractor's Subcontractors and Suppliers as Metro deems necessary for the proper supervision and inspection of the Work. Such meetings shall be held at the Site on regular working days during regular working hours, unless otherwise directed by Metro. Attendance shall be mandatory for all parties notified to attend.

Contractor shall immediately comply with any and all orders and instructions given in accordance with the terms of this Contract by Metro.

Contractor has no right to, and shall not, rely on representations of whatever nature made by any individual, whether or not employed by or purporting to represent Metro or Engineer, unless such individual has been specifically and expressly delegated authority to make such representations pursuant to these Contract Documents. Likewise Contractor has no right, and shall not rely on any representations of authorized changes in the contract of whatever size or nature unless such change is in writing and signed by Metro.

Nothing contained in this Paragraph shall obligate Metro or Engineer to supervise Contractor's work under this Contract and Contractor shall remain fully responsible for the complete and proper supervision of all of the Work.

3.2. Request for Information -- should it appear that the Work to be done or any of the matters relative to the Contract Documents are not sufficiently detailed or explained in the Contract Documents, or should there be any questions which may arise as to the meaning or intent of the Contract Documents, Contractor shall immediately submit to Metro a written Request for Information (RFI) which shall fully describe the information sought. All correspondence shall be directed to the Construction Manager. Subcontractors shall direct correspondence through the Contractor to the Construction Manager. At a minimum the RFI shall contain: 1) project title, 2) identify the nature and location of each clarification/verification, 3) date, 4) response by, RFI number, 5) subject, 6) initiator of the question, 7) indication of the costs, 8) contract drawings reference, 9) contract specification section and paragraph, 10) descriptive text and space for a reply. Each RFI shall be numbered sequentially beginning with #001 and a separate RFI shall be submitted for each item. Verbal discussions/clarifications for minor items can be addressed with the Engineer by phone and the contractor shall follow-up with a confirming RFI.

It is Contractor's responsibility to request information under this Paragraph in sufficient time for review by the Engineer and Metro so that the orderly progress and prosecution of the Work is not delayed.

The Engineer, in consultation with Metro, shall interpret the meaning and intent of the Contract Documents and shall issue, within ten (7) working days of receiving an RFI from Contractor, a written Clarification describing such meaning and intent. Additionally, the Engineer, after consulting with Metro, may at any time issue written RFI as deemed necessary to carry out the Work included in the Contract Documents. Notwithstanding any dispute or disagreement which Contractor may have concerning any such RFI, Contractor shall perform the Work as prescribed and in accordance with all such RFI.

If notified by Metro that an RFI is forthcoming, any related work done before the receipt of the RFI shall be coordinated with Metro so as to minimize the effect of the RFI on work in progress. Any related work not coordinated with Metro done before receipt of the RFI shall be at Contractor's risk and at no cost to Metro if that work does not conform to the Clarification.

If Contractor proceeds with work which is not sufficiently detailed or explained in the Contract Documents without requesting and obtaining an RFI pursuant to this Paragraph, Contractor shall do so at its own risk and shall, at no cost to Metro, perform any additional work which may be required by Metro to bring the work into conformance with the intent of the Contract Documents.

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3.3. Contractor's Claims

3.3.1. Generally -- No claims of any sort whatsoever by Contractor shall be considered or allowed under this Contract except as specifically provided and prescribed under this Paragraph. Failure to make a claim as specifically prescribed by this Paragraph or failure to perform disputed work, if any, as directed by Metro shall bar Contractor from any recovery of any sort or extension of time resulting from the facts surrounding the claim. Contractor's full and complete compliance with this Paragraph shall be a condition precedent to any right of Contractor to further prosecute any claim against Metro arising out of or related to Work described in the Contract Documents. Every decision and action of Metro shall be considered final unless Contractor makes a claim concerning such decision or action pursuant to this Paragraph.

3.3.2. Types of Claims -- Contractor claims are limited to the following:

3.3.2.1 Claims based upon Excusable Delays as described in Subparagraph 3.3.3

3.3.2.2. Claims based upon differing Site conditions as described in Subparagraph 3.3.4;

3.3.2.3. Claims based upon Clarifications or Change Orders issued by Metro or any other decision, action or failure to act by Metro as described in subparagraph 3.3.5.

As a condition precedent to any such claim, Contractor shall comply with all applicable procedural and substantive requirements of this Contract.

3.3.3 Claims For Excusable Delays

3.3.3.1. Definition of Excusable Delay A Delay is "Excusable" if such act, event or condition has a materially adverse effect on the ability of Contractor to perform its obligations under this Contract as scheduled, and/or materially increases the cost to Contractor to perform such obligations as scheduled and if such act, event or condition and its effect:

- (a) Are beyond the reasonable control of Contractor (or any third party for whom Contractor is directly responsible); and
- (b) Do not arise out of (a) strikes, labor disputes or other labor difficulties involving Contractor or its Subcontractors or Suppliers or entities providing transportation to Contractor or its Subcontractors or Suppliers, (b) labor shortages, or (c) changing economic conditions; and
- (c) Could not have been reasonably anticipated by Contractor.

3.3.3.2 Types of Excusable Delay Claims. Excusable Delays are either Compensable or Non-compensable. Claims for Non-compensable Excusable Delays are limited to claims for extension of Contract Time. Contractor may claim both an increase in the Contract Amount and an extension of the Contract Time for Compensable Excusable Delays.

3.3.3.3 Non-Compensable Excusable Delay Claims. Delays resulting from the following acts, events and conditions are Non-Compensable Excusable Delays:

- (a) An Act of God.
- (b) Unusually Severe Weather. No claim for extension of the Contract Time will be considered for Unusually Severe Weather unless Contractor submits documentation satisfactory to Metro establishing that the weather at the Project satisfied the definition of Unusually Severe Weather set forth herein.
- (c) Acts of a public enemy, war (whether or not declared) or governmental intervention resulting there from, blockage, embargo, insurrection, riot or civil disturbance.

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- (d) The failure to issue or renew, or the suspension, termination, interruption or denial of, any permit, license, consent, authorization or approval essential to the Work, if such act or event is not the result of the willful or negligent action or inaction of Contractor, or of any third party for whom Contractor is directly responsible, and if Contractor is taking, has taken or will cause to be taken, all reasonable actions in good faith to contest such action (it being understood that the contesting in good faith of any such action shall not constitute or be construed as a willful or negligent act of Contractor).
- (e) The failure of any appropriate federal, state, municipal, county or other public agency or authority or private utility having operational jurisdiction over the Work or Site to provide and maintain utilities, services, water and sewer lines and power transmission lines to the Site, which are required for and essential to the Work.
- (f) Epidemics or quarantines.
- (g) Material, equipment or fuel shortages or freight embargoes.
- (h) Priorities or privileges established for the manufacture, assembly or allotment of material by order, decree, or otherwise of the U. S. or by any department, bureau, commission, committee, agent or administrator of any legally constituted public authority.

3.3.3.4 Compensable Excusable Delay Claims. Delays resulting from the following acts, events and conditions are Compensable Excusable Delays:

- (a) Changes in the work ordered by Metro if they require additional time to complete the work and adversely impact the Critical Path.
- (b) The prevention by Metro of Contractor from commencing or prosecuting the Work.

3.3.3.5 Inexcusable Delays. Delays resulting from the following acts, events and conditions shall not result in Excusable Delays:

- (a) Any delay which could have been avoided by the exercise of care, prudence, foresight and diligence on the part of Contractor.
- (b) Any delay in the prosecution of parts of the Work, which may in itself be unavoidable but which does not necessarily prevent or delay the prosecution of other parts of the Work, nor the Substantial Completion of the Work of this Contract within the time specified.
- (c) Any reasonable delay resulting from the time required by Metro for review of Submittals or Shop Drawings submitted by Contractor and for the making of surveys, measurements and inspections.
- (d) any delay arising from an interruption in the prosecution of the Work on account of the reasonable interference from Other Metro Contractors which does not necessarily prevent the Substantial Completion of the Work of this Contract within the time specified.
- (e) any delay resulting in any manner from labor disputes, strikes or difficulties or any delay resulting in any manner from any labor-related event, act or condition whether or not Contractor has any control over such event, act or condition.
- (f) any delays in delivery of equipment or material purchased by Contractor or its Subcontractors or Suppliers (including Metro-selected equipment) if timely ordering would have made the equipment available. Contractor shall be fully responsible for the timely ordering, scheduling, expediting, delivery, and installation of all equipment and materials.

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3.3.3.6. Excusable Delay Claims Procedure -- Contractor shall, within twenty-four (24) hours of the start of the occurrence or Contractor's first knowledge of the occurrence which is the basis of the claim for Excusable Delay, whichever is earlier, notify Metro in writing of such delay. The written notice by Contractor shall indicate the cause of the delay and shall estimate the possible time extension requested. Within ten (10) days after the cause of the delay has been remedied, Contractor shall give written notice to the Construction Manager of any actual time extension and, if the Excusable Delay is a Compensable Excusable Delay, any increase in the Contract Amount requested as a result of the aforementioned occurrence in accordance with this Contract. If Contractor believes that a single circumstance or set of facts gives rise to both a claim for an extension to the Contract Time and an increase in the Contract Amount, Contractor must state both such allegations in one written claim or waive the unstated allegation;

Within twenty-one (21) days after Contractor submits to the Construction Manager such a written notice for an extension of Contract Time and/or increase in the Contract Amount, the Construction Manager will issue the decision on each request. If Contractor is dissatisfied with such decision, Contractor may preserve its claim as provided and prescribed by Subparagraph 3.3.6.

3.3.4. Claims for Differing Site Conditions -- Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Construction Manager of (i) subsurface or latent physical conditions at the Site which differ materially from those indicated in this Contract, or (ii) unknown physical conditions at the Site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

The Construction Manager shall investigate the Site conditions promptly after receiving the notice. If the conditions do materially so differ as to cause an increase or decrease in Contractor's cost of, or the time required for performing any part of the Work under this Contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made and a Change Order issued.

If Contractor is dissatisfied with the decision of the Construction Manager under this Subparagraph, Contractor may preserve its claim as provided and prescribed by Subparagraph 3.3.6.

3.3.5. Other Contractor Claims -- Contractor claims based upon Clarifications or Change Orders issued by Metro or any other decision, action or failure to act by Metro shall be made according to this Subparagraph. Contractor shall, within twenty-four (24) hours following discovery of the facts, which give rise to its claim, notify the Construction Manager in writing of its intent to make the claim. Within ten (10) days following discovery of the facts, which give rise to its claim and prior to commencing the work or conforming to the Clarification on which the claim is based, if any, Contractor shall submit its formal written claim to the Construction Manager. Contractor's formal claim shall include a description of:

3.3.5.1. The factual occurrences upon which Contractor bases the claim including the decision, action or failure to act by Metro or its authorized representatives that allegedly give rise to the claim;

3.3.5.2. How Metro's decision, action or failure to act has affected Contractor's performance or otherwise affected Contractor;

3.3.5.3. Whether the claim is for an extension in the Contract Time or increase in the Contract Amount or both and the specific extension or increase requested;

3.3.5.4. The provisions of the Contract upon which the claim is based.

Submission of written notice of intent to make a claim and formal claim as specified above shall be mandatory and failure to comply shall be a conclusive waiver to any claim by Contractor. Oral notice or statement will not be sufficient nor will notice or statement after commencing the work in question.

After the written notification is submitted by Contractor (if the claim is not resolved or withdrawn in writing) and only upon written direction by the Construction Manager, Contractor shall proceed without delay to perform the work pursuant to the direction of the Construction Manager. While the work on an unresolved claim is being performed, Contractor shall keep

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track of costs and maintain records in the manner set forth in the section on Force Account Work, at no cost to Metro. Such notice by Contractor and the fact that Contractor is keeping track of costs and maintaining records shall not in any way be construed as proving the validity of the claim nor the costs thereof.

Provided the claim or claims have been submitted in accordance with the requirements of this Article, the Construction Manager will consider and investigate the claim or claims of Contractor. Within twenty-one (21) days of receipt of the above-described written notification of claim the Construction Manager will advise Contractor of the Construction Manager's decision to accept or reject the claim or claims, in full or in part. If Contractor is dissatisfied with the decision of the Construction Manager under this Subparagraph, Contractor may preserve its claim as provided and prescribed by Subparagraph 3.3.6.

3.3.6. Preservation of Claims -- Within thirty (30) days after a rejection of claim, in whole or in part, by Metro under Subparagraphs 3.3.3, 3.3.4 or 3.3.5, Contractor may preserve its claim by submitting a fully documented claim package to Contracts Manager of Finance and Administrative Services Department, Metro. That package shall include substantiating documentation with an itemized breakdown of Contractor and Contractor's Subcontractor's costs on a daily basis which shall include, but not be limited to, labor, material, equipment, supplies, services, Overhead and Profit. All documentation that Contractor believes is relevant to the claim shall be provided in the claim package including without limitation, payroll records, purchase orders, quotations, invoices, estimates, correspondence, profit and loss statements, daily logs, ledgers and journals. Failure to submit the claim package in full compliance with this requirement, and/or maintain cost records as herein required, will constitute a waiver of the claim.

If Contractor elects to pursue any claims by filing a lawsuit against Metro, it must commence such lawsuit within six (6) months after the date of Substantial Completion. Failure to commence a lawsuit within this time limitation shall constitute a waiver of all such claims by Contractor.

3.4. Metro's Right to Adjust Payments

3.4.1. Adjusted Payments for Delay -- Time is of the essence in this Contract. Metro and Contractor understand and agree that Metro will be damaged if Contractor fails to substantially complete the Work within the Contract Time, and that Metro will be vulnerable to further damages if Metro is obligated to continue paying Contractor for work performed after the Contract Time has expired. It is therefore agreed that after the Contract Time, Metro may adjust its payments to Contractor by any combination of the following: (1) making no further payments to Contractor until the Work is substantially complete, (2) paying the Subcontractor costs incurred by Contractor without any overhead, profit or fee of any kind going to Contractor, and/or (3) by collection of liquidated damages as designated in Section 00800, Supplementary Conditions of this document.

Permitting Contractor to continue and finish the work or any part thereof after the Contract Time has expired shall in no way operate as a waiver on the part of Metro of any of its rights under this subparagraph or the balance of the Contract Documents.

3.4.2. Adjusted Payments Not a Bar to Metro's Right to Other Damages -- Payment of adjusted payments shall not release Contractor from obligations in respect to the complete performance of the Work, nor shall the payment of such adjusted payments constitute a waiver of Metro's right to collect any additional adjusted payments which it may sustain by failure of Contractor to fully perform the Work, it being the intent of the parties that the aforesaid adjusted payments be full and complete payment only for failure of Contractor to complete the Work on time. Metro expressly reserves the right to make claims for any and all other damages which Metro may incur due to Contractor's failure to perform in strict accordance with this Contract.

3.5. Mediation -- Both parties shall, in good faith, attempt to negotiate resolutions to all disputes arising out of this Contract. It is agreed, subject to the conditions and limitations of this paragraph, that any controversy or claim arising out of or relating to this Contract, which remains unresolved after such negotiations, shall submit to mediation prior to the commencement of litigation. The mediator shall be an individual mutually acceptable to both parties. Should the parties lack specific recommendations for a mediator, the parties shall look to the local circuit court or the Oregon Dispute Resolution Commission. Each party shall pay its own costs for the time and effort involved in mediation. The cost of the

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mediator shall be split equally between the two parties. Both parties agree to exercise their best effort in good faith to resolve all disputes in mediation. Participation in mediation is a mandatory requirement on both the Owner and Contractor. The schedule and time allowed for mediation shall be mutually acceptable. The mediation process is nonbinding.

Contractor agrees to consolidation of any mediation between Metro and Contractor with any other mediation involving, arising from, or relating to this Contract.

All disputes not resolved by mediation shall be decided exclusively by a court of competent jurisdiction in Multnomah County, under the laws of the state of Oregon.

In no event shall submission of a dispute arising out of this Contract, by either party, relieve Contractor of its obligation to fully perform the requirements of the Contract as directed by Metro, pending resolution of the dispute pursuant to the procedures set forth in this Article. In the event Contractor, in Metro's opinion, fails to fully perform the requirements of the Contract pending resolution of a dispute, Metro shall be entitled to exercise its rights to impose adjusted payments pursuant to Subparagraph 3.4.1, and/or terminate the Contract pursuant to Article 15 of this Contract.

ARTICLE 4 SUBCONTRACTING AND ASSIGNMENT OF THE CONTRACT

4.1. Contractor's Responsibility for the Work -- Contractor shall perform or cause to be performed all labor, services and work of whatever nature and shall provide or cause to be provided all materials, equipment, tools and other facilities of whatever nature necessary to complete the Work and shall otherwise cause the Work to be completed in accordance with the Contract Documents.

Contractor shall take and assume all risk for all work and material involved in the Project until the entire Project has been finally accepted by Metro.

Contractor shall supervise and direct the Work, using Contractor's best skill and attention. Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters.

4.2. Subcontracting -- Contractor shall arrange and delegate its work in conformance with trade practices and union regulations, if applicable, but shall remain responsible to Metro for performance of all work required or implied by the Contract Documents. Contractor shall also be responsible for coordinating the efforts of its Subcontractors and Suppliers.

4.2.1. Objection to Subcontractors or Suppliers -- Metro reserves the right to make reasonable objection to any of Contractor's Subcontractors or Suppliers if Metro discovers any data or information at any time during the performance of the Contract which gives Metro a basis for such reasonable objection.

Metro will notify Contractor in writing if Metro has any reasonable objection to any of Contractor's Subcontractors or Suppliers. Contractor shall not subcontract with any Subcontractor or Supplier to which Metro has made a reasonable objection. In the event of Metro's reasonable objection to any Subcontractor or Supplier, Contractor shall propose another entity to which Metro has no reasonable objection. The Contract Amount shall not be increased by any difference in cost occasioned by such substitution, nor shall the Contract Time be extended.

4.2.2. Substitution, Change or Addition of Subcontractors or Suppliers -- At any time that Contractor intends to substitute, change or add a Subcontractor or Supplier during the performance of the Contract, Contractor shall give Metro prior written notice of such intention. Contractor shall not substitute, change or add any such Subcontractor or Supplier if Metro gives Contractor reasonable objection in writing within ten (10) days after Metro receives such notice.

When any Subcontractor fails to prosecute a portion of the Work in a satisfactory manner, Metro may so notify Contractor. If the Subcontractor fails to cure the unsatisfactory work promptly, Contractor shall remove such Subcontractor

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immediately upon written request of Metro and Contractor shall request approval from Metro of a new Subcontractor to perform this section of the Work at no increase in the Contract Amount, and with no change in the Contract Time.

4.2.3. Metro Not Obligated to Detect Unsatisfactory Work -- Nothing contained in this Contract shall obligate Metro or place on Metro an affirmative duty to detect or discover unsatisfactory work or materials of Contractor's Subcontractors or Suppliers. Failure of Metro to detect or discover such unsatisfactory work or materials shall not relieve Contractor of any of its obligations under this Contract.

4.2.4. No Contractual Relationships Between Metro and Contractor's Subcontractors and Suppliers -- Nothing contained in this Contract is intended nor shall be construed to create any contractual or third-party beneficiary relationship between Metro and any of Contractor's Subcontractors, Suppliers or agents, save and except in relation to the Labor and Materials Payment Bond.

4.2.5. Contractor's Agreements with Subcontractors -- Contractor shall provide in all subcontract and supply agreements that the Subcontractor or Supplier will be bound by the terms and conditions of this Contract to the extent that they relate to the Subcontractor's or Supplier's work. Where appropriate, Contractor shall require each Subcontractor to enter into similar agreements with sub-tier Subcontractors and Suppliers. Contractor shall make available to each proposed Subcontractor and Supplier, prior to the execution of the subcontract or supply agreement, copies of the Contract Documents, which apply to the work and materials to be provided by the Subcontractor or Supplier. Subcontractors and Suppliers shall similarly make copies of applicable portions of such documents available to their respective proposed sub-tier Subcontractors and Suppliers.

All Subcontractor's and Supplier's agreements shall also provide that they are assignable to Metro at Metro's option, in the event that Metro terminates the Contract. Contractor will provide to Metro, a copy of all subcontracts and supply contracts for permanent materials.

Nothing contained in this Subparagraph shall be construed as creating a direct or indirect contractual relationship between Metro and any of Contractor's Subcontractors or Suppliers. No such Subcontractor or Supplier shall have, or shall claim to have, any third-party beneficiary rights or status in relations to this Contract, save and except in relation to the Labor and Materials Payment Bond provided by Contractor.

4.3. Assignment -- Contractor shall constantly give its personal attention to the faithful prosecution of the Work. Contractor shall keep the Work under its personal control and shall not assign any or all of Contractor's rights, by power of attorney or otherwise, nor delegate any of its duties except with the prior written approval of the Metro Council.

ARTICLE 5 TIME OF COMPLETION AND SCHEDULE FOR THE WORK

5.1. Prosecution of Work Generally -- Contractor shall commence the Work within five (5) days after issuance of written Notice to Proceed from Metro and will diligently prosecute the Work to its Final Completion and Acceptance. The start of Work shall include attendance at preconstruction conferences, preparation and submittal of shop drawings, equipment lists, Schedule of Values, CPM construction schedules, requests for substitutions and other similar activities, as described by these Contract Documents.

5.2. Time of Completion -- Contractor shall bring the Work to Substantial Completion within the Contract Time as set forth in the Construction Agreement.

The time limits stated in these Contract Documents are of the essence of this Contract. By executing the Construction Agreement, Contractor confirms that the Contract Time is a reasonable period for performing all of the Work.

Failure of Contractor to substantially complete the Work within the Contract Time and according to the provisions of these Contract Documents shall subject Contractor to damages pursuant to the applicable sections of these Contract Documents.

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5.3. Extensions of Time -- Extensions of the Contract Time shall be made pursuant to the procedure and according to the provisions and requirements contained in Articles 3 and 8 of these Contract Documents.

5.4. Project Scheduling -- Contractor shall submit to Metro a detailed Construction Schedule for completion of the work pursuant the Specifications. The Construction Schedule shall, when approved and as updated and approved by Metro, become a part of the Contract Documents.

5.5. Use of Completed Parts of the Work Before Acceptance -- Whenever, in the opinion of Metro, the Work or any part thereof is in a condition suitable for use and it is in the best interest of Metro to require such use, Metro may take possession of, connect to, open for public use, or use the Work or a part thereof. When so used, maintenance and repair due to ordinary wear and tear or vandalism will be made at Metro's expense and Metro will defend liability claims, which may result from such use by Metro. The use by Metro of the Work or part thereof as contemplated in this Paragraph shall in no case be construed as constituting acceptance of the Work or any part thereof. Such use shall neither relieve Contractor of any of its responsibilities under the Contract Documents, nor act as a waiver by Metro of any of the conditions thereof.

ARTICLE 6 COORDINATION WITH OTHER METRO CONTRACTORS

6.1. Other Metro Contractors Generally -- Metro reserves the right to award other contracts in connection with the work. Contractor shall afford all such Other Metro Contractors reasonable opportunity for storage of their materials and execution of their Work, shall provide that the execution of Contractor's Work properly connects and coordinates with work of all Other Metro Contractors, and shall cooperate with Other Metro Contractors to the end of facilitating the Work in such a manner as Metro may direct. Connection between the work of the Contractor and other Metro Contractors will be the responsibility of the party, which is last in time to construct, unless otherwise directed in the Contract Documents.

6.2. Duty to Inspect Other Metro Contractors' Work -- Where Contractor's Work is associated with that of Other Metro Contractors, or is to interface in any way with such Other Metro Contractor's work, Contractor shall examine, inspect and measure the adjacent or in-place work of such Other Metro Contractors. If Contractor determines that any defect or condition of such adjacent or in-place work will impede or increase the cost of Contractor's performance or otherwise prevent the proper execution of Contractor's Work, Contractor shall immediately, and before performing any work affected by the Other Metro Contractors' work, submit a Request for Information to Metro pursuant to Paragraph 3.2. If Contractor proceeds without examining or inspecting the work and submitting a Request for Clarification, Contractor shall be held to have accepted the Other Metro Contractors' work or material and the existing conditions, and shall be responsible for any defects in Contractor's Work resulting there from and shall not be relieved of any obligation or any warranty under this Contract because of any such condition or imperfection. This provision shall be included in any and all of Contractor's subcontracts for Work to be performed.

The foregoing does not apply to latent defects. Contractor shall report latent defects in any Other Metro Contractors' work at any time such defects become known or Contractor should have known, and Metro shall promptly thereafter take such steps as may be appropriate. If Contractor in the exercise of reasonable care should have known of such defects but did not report them, such defects shall not be considered latent.

6.3. Duty to Maintain Schedule -- It shall be the responsibility of Contractor to maintain its schedule so as not to delay the progress of the Project or the work of Other Metro Contractors. Contractor is required to cooperate in every way possible with Other Metro Contractors. Except as otherwise specifically provided in this Contract, no additional compensation will be paid for such cooperation. If Contractor delays the progress of the Project or the progress of Other Metro Contractors, it shall be the responsibility of Contractor to take all of the steps necessary to bring the affected work into compliance with any affected schedules and to indemnify Metro from all liability for such delays pursuant to Article 11.

Metro shall be under no duty to monitor or detect any delays of Contractor or any Other Metro Contractor on the Project or any lack of coordination on the Project. Consequently, the failure of Metro to so monitor or detect shall not be construed as relieving Contractor of its duties to fully perform all of its obligations under the Contract.

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6.4.Failure to Maintain Schedule -- If, in the opinion of Metro, Contractor falls behind the Construction Schedule or delays the progress of Other Metro Contractors and is not entitled to an extension of time pursuant to the Contract Documents, Contractor shall perform all steps which are necessary, in the opinion of Metro, to bring Contractor's Work into compliance with the Construction Schedule or to remedy any delay to the progress of Other Metro Contractors. Contractor shall submit operation plans to Metro, which plans shall fully demonstrate the manner of intended compliance with this Paragraph. The steps referred to above shall include, but not be limited to:

6.4.1. Increase manpower in such quantities and crafts as will substantially eliminate the backlog of work.

6.4.2. Increase, when permitted, the number of working hours per shift, shifts per working day, working days per week, or the amount of equipment or any combination of the foregoing, sufficient to eliminate the backlog of work.

6.4.3. ...Reschedule activities to achieve maximum practical concurrence of accomplishment of activities.

6.4.4. Expedite delivery of materials and equipment such as use of airfreight.

If Metro directs Contractor to take measures described in this Paragraph, or if Contractor takes such measures without direction from Metro, Contractor shall bear all costs of complying. Metro shall, however, reimburse Contractor for reasonable costs of complying if such directive to accelerate from Metro was issued to overcome delay caused by the acts or omissions of Metro or persons acting for Metro, provided Contractor has complied with all applicable provisions of Articles 3 and 8 of this Contract.

Failure to maintain the construction schedule or to take action to regain the schedule or to furnish a schedule as outlined in the specifications may result in withholding of all or part of the monthly progress payments.

6.5.Failure to Coordinate Work -- If Contractor fails to coordinate its work with the work of Other Metro Contractors as directed by Metro, Metro may, upon written notice to Contractor:

6.5.1. Withhold any payment otherwise due hereunder until Contractor complies with Metro's directions.

6.5.2. Direct others to perform portions of the affected Work and charge the cost of such Work against the Contract Amount or deduct the cost from sums held in Retainage.

6.5.3. Terminate any or all portions of the Work for Contractor's failure to perform in accordance with the Contract.

6.6.Other Metro Contractors' Failure to Coordinate -- If Contractor determines that any Other Metro Contractor on this Project is failing to coordinate its work with the Work of Contractor, Contractor shall immediately and before performing any affected Work submit a Request for Clarification to Metro pursuant to Paragraph 3.2.

6.7.Conflicts Among Contractors -- Any difference or conflict that may arise between Contractor and Other Metro Contractors in regard to their work shall be adjusted as determined by Metro. If directed by Metro, Contractor shall suspend any part of the Work specified or shall carry on the same in such manner as may be prescribed by Metro when such suspension or prosecution is necessary to facilitate the work of Other Metro Contractors.

6.8.Coordination Drawings -- Contractor shall prepare coordination drawings as determined necessary by Metro, to satisfactorily coordinate and interface its Work with the work of all Other Metro Contractors, thereby avoiding conflicts, which may arise.

6.8.1 Owner Responsibilities for FOIC Items -- Owner furnished products/items are indicated on the drawings as FOIC (Furnished by Owner, Installed by Contractor). Owner's responsibilities include: 1) arrange for and deliver necessary shop drawings, product data, and samples to the contractor, 2) Arrange and pay for Product delivery to the site, 3) Deliver supplier's bill of materials to Contractor, 4) Inspect deliveries jointly with the Contractor, record shortages, damaged or defective items, 5) Submit claims for transportation damage, 6) Arrange for replacement of damaged, defective or missing

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items, 7) Arrange for manufacturer's warranties, bonds, service and inspections as required and 8) Owner is responsible for scheduling all FOIC items in accordance with Contractor's Construction Schedule.

6.8.2 Contractor Responsibilities for FOIC Items – The following outlines the responsibilities of the Contractor for FOIC items: 1) Designate a delivery date for each item in the Construction Schedule, 2) Review shop drawings, product data and samples, 3) Immediately notify the Construction Manager of any discrepancies or problems anticipated in the use of this product, 4) Review and unload products at the site, 5) Promptly inspect products jointly with Owner, record shortages, damaged or defective items, 6) Handle products at the site, including uncrating, and storage, 7) Protect products from exposure to elements and damage, 8) Assemble, install, connect, adjust and finish product as stipulated in the respective Section of Specifications and 9) Repair or replace items damaged by Contractor.

6.9. Conferences -- At any time during the progress of the Work, Metro shall have authority to require Contractor to attend any conference of any or all of Contractors engaged in the Project or related projects.

6.9.1. Project Meetings – The Construction Manager will schedule and chair meetings and conferences at the Project site unless otherwise indicated. Inform participants and others involved, and individuals whose presence is required of the date and time of each meeting. Construction Manager shall prepare an agenda, distribute to all attendees, and prepare minutes that reflect significant discussions and agreements achieved. Meeting minutes shall be distributed to everyone concerned including the owner within three days of the meeting.

6.9.2. Pre-construction Conference – A pre-construction conference before starting construction, at a time convenient to Metro but no later than 5 days after execution of the Agreement. The conference will be held at the project site on another convenient location. The purpose of the meeting is to review responsibilities and personnel assignments. Attendees: Authorized representatives of the Metro, Contractor and its superintendent, major subcontractors, suppliers and other concerned parties shall attend the conference. All participants shall be familiar with the project and authorized to conclude matters relating to the work. The agenda shall include the following items: tentative construction schedule, phasing, critical work sequencing and long-lead items, designation of key personnel and their duties, procedures for processing field decisions and change orders, procedures for requests for interpretations (RFI's), procedures for testing and inspecting, procedures for processing applications for payment, distribution of contract documents, submittal procedures, preparation of record documents, use of premises, work restrictions, owner's occupancy requirements, responsibilities for temporary facilities and site protection, construction waste management and recycling, parking availability, office, work and storage areas, equipment deliveries and priorities, first aid, security, progress cleaning, working hours.

6.9.3. Pre-installation Conferences – Conduct a pre-installation conference at the Project site before each construction activity that requires coordination with other construction and includes installation of FOIC items. Contractor is responsible for conducting these meetings and shall occur on the same date as progress meetings if possible. Attendees shall include the installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination with other materials or installations. Agenda items will include: contract documents, options, related RFI's, related change orders, purchases, deliveries, submittals, review of mock-ups, possible conflicts, compatibility problems, time schedules, weather limitations, manufacturer's written recommendations, warranty requirements, compatibility of materials, acceptability of materials, temporary facilities and controls, space and access limitations, regulations of authorities having jurisdiction, testing and inspecting, installation procedures, coordination with other work, required performance results, protection of adjacent work, protection of the sites and its elements. Metro shall record significant conference discussions, agreements and disagreements including corrective action measures and action.

ARTICLE 7 CONTROL AND QUALITY OF WORK AND MATERIAL

1.1. Quality Control

7.1.1. Generally -- Contractor has the primary responsibility for quality control. Contractor will provide continuous superintendence and inspection to insure that the work is completed in accordance with the plans and specifications, Additionally, during the performance of the Work, Metro, or any other persons deemed necessary by any of them acting within the scope of the duties entrusted to them, including representatives of federal, state, and local agencies having jurisdiction over the Work, may at any time, and for any purpose, enter upon the Site, the shops where any part of such

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Work may be in preparation, or the factories or sites where any materials for use in the Work are being or are to be manufactured or derived. Contractor shall provide proper and safe facilities therefore, and shall make arrangements with manufacturers or other suppliers to facilitate inspection of their processes and products to such extent as Metro's interest may require.

No claims for extension of the Contract Time or increase in the Contract Amount shall be allowed for any access allowed to Metro under this Paragraph.

7.1.2. Quality Control Plan -- Contractor shall prepare and submit to the Construction Manager within thirty (30) days following Notice to Proceed a Quality Control Plan, which describes Contractor's, procedures for implementing the Quality Control Program. The Plan shall include, but not be limited to, the Quality Control Organization, inspection procedures, tests anticipated, materials control, contingency plans related to fire protection and remediation of contaminated releases or other environmental improvement, and reports. Metro reserves the right to accept or reject or modify the Quality Control Plan. Contractor will submit an interim Quality Control Plan prior to the start of work to cover the first thirty days (30) of construction.

7.1.3. Quality Control Manager -- Prior to initiation of construction, Contractor shall designate in writing a Quality Control Manager who shall be responsible for coordinating Contractor's Quality Control Program. The individual so designated shall be the interface with the Construction Manager on matters relating to submittals, inspection, scheduling, unacceptable work product and corrective actions. Metro reserves the right to accept or reject the Quality Control Manager designated by Contractor.

7.2. Inspection -- Contractor has the primary responsibility for providing inspection and testing, except as otherwise set forth in the specifications. Metro and its agents will also inspect at their discretion or as outlined in the specifications.

7.2.1. Generally -- Contractor shall at all times commencing with the issuance of the Notice to Proceed until Final Completion and Acceptance of the Work, permit Metro, or any other persons deemed necessary by any of them acting within the scope of the duties entrusted to them, including representatives of federal, state, and local agencies having jurisdiction over the Work, to visit and monitor the progress of the Work for conformance of the Work with the Contract Documents.

7.2.2. Special Inspections -- Contractor shall at all times, commencing with the issuance of the Notice to Proceed until Final Completion and Acceptance of the Work, permit Metro, or any other persons deemed necessary by any of them acting within the scope of the duties entrusted to them, including representatives of federal, state, and local agencies having jurisdiction over the Work, to visit and inspect the Work, the materials and the manufacture and preparation of such materials, and subject the Work and materials to inspection and testing to determine if the Work conforms to the requirements of the Contract Documents. Contractor shall maintain proper facilities and safe access for all such inspections. Where the Contract requires work to be inspected or tested, it shall not be covered up until inspected, tested and approved by Metro. Contractor shall be solely responsible for notifying Construction Manager at least two (2) working days prior to performing such work, so that necessary arrangements for inspection and testing can be made. Should any work be covered without such inspection or test and approval, it shall be uncovered and repaired at Contractor's expense.

7.2.3. Notice to Metro for Certain Work Days -- Whenever Contractor intends to perform work on Saturday, Sunday or any legal holiday, it shall give written notice to Metro of such intention at least two (2) working days prior to performing such work, or such other period as may be specified by Metro, so that Metro may make the necessary arrangement for testing and inspection.

7.2.4. Correction of Defective Work Before Acceptance -- Any defective work or work which otherwise fails to conform to the Contract Documents, which is discovered before Final Completion and Acceptance of the Work, shall be corrected immediately by Contractor, and any unsatisfactory materials shall be rejected and replaced with satisfactory materials, notwithstanding that they may have been overlooked by the authorized inspector. The inspection of the Work by Metro, or any other agency shall not relieve Contractor of any of its obligations to perform fully all of the terms and provisions of the Contract Documents.

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7.2.5. Acceptance Not Implied by Failure to Object -- Failure or neglect on the part of Metro or any of its authorized representatives to condemn or reject defective, improper or inferior work or materials shall not be construed to imply a final acceptance of such work or materials and shall not be construed as relieving Contractor of its duties to perform fully all requirements of the Contract Documents.

7.3. Unsatisfactory Materials and Workmanship

7.3.1. Generally -- Material, work or workmanship which, in the opinion of the Construction Manager, does not conform to the Contract Documents, or is not equal to the samples submitted to and approved by the Construction Manager, or is in any way unsatisfactory or unsuited to the purpose for which it is intended, will be rejected. Contractor shall bear the cost of correcting or removing as deemed necessary by Metro, all non-conforming materials, work or workmanship. Contractor shall make a close inspection of all materials as delivered, and shall promptly replace all defective materials with conforming materials without waiting for their rejection by Metro.

7.3.2. Removal of Rejected or Non-Conforming Work or Material -- All rejected material or work, and all defective or non-conforming work or material, shall be removed from the Site without delay. If Contractor fails to do so within forty-eight (48) hours after having been so directed by Metro, the rejected material may be removed by Metro and the cost of removal charged against Contractor and deducted from Retainage held by Metro or offset against payments due Contractor, at Metro's option.

If in the judgment of Metro it is undesirable or impracticable to replace any defective or non-conforming work or materials, the compensation to be paid to Contractor shall be reduced by Change Order or Force Account, as applicable, by such amount as, in the judgment of Metro, shall be equitable.

7.4. General Warranty of Contractor -- Contractor warrants to Metro that materials and equipment provided under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects and contaminants not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by Metro, Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

The warranty made by Contractor under this Paragraph shall be in addition to any other specific warranties and certifications required elsewhere in these Contract Documents.

7.5. Correction of Work by Contractor -- Contractor shall be responsible for and shall promptly correct or replace any defective Work, whether due to faulty or contaminated materials or errors in workmanship, or Work failing to conform to the requirements of the Contract Documents which may be discovered or which may develop within one (1) year after the date of Substantial Completion or within such longer period as is specified below or otherwise in these Contract Documents.

In the case of equipment manufactured by others and supplied and/or installed by Contractor, the one (1) year period shall commence upon the date of first beneficial operation of such equipment by Metro. In the case of Work which is corrected or replaced by Contractor, the one (1) year period shall commence again on the date of acceptance by Metro of such corrected or replaced Work. Testing shall not be construed to mean acceptance.

If Metro does not require correction or replacement of defective Work or Work failing to conform to the Contract Documents, Contractor, if required by Metro, shall repay to Metro such portion of the Contract Amount as is equitable under the circumstances, as determined by Metro.

Contractor's responsibilities under this Paragraph shall not extend to correction or replacement of defects, which are attributable to mistreatment by Metro, or to normal wear and tear.

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7.6. Warranty and Correction Agreements by Subcontractors

7.6.1. Generally -- In addition to any requirements for written warranties required by the Specifications, Contractor shall require all of its Subcontractors and Suppliers of any tier to make the same warranty to Metro as Contractor makes under Paragraph 7.4. Contractor shall also require all of its Subcontractors and Suppliers of any tier to agree to correct or replace defective Work or Work not conforming to the Contract Documents, and to take full responsibility for defective materials, in the same manner as Contractor agrees to correct or replace such Work under Paragraph 7.5.

7.6.2. Form of Submissions -- Contractor shall require all of its Subcontractors and Suppliers of any tier to sign documents evidencing the promises made pursuant to Subparagraph 7.6.1 above and shall submit such documents to Metro with its request for Final Payment. Such documents shall be signed by both Contractor and the applicable Subcontractor or Supplier and shall be in the following form:

"We the undersigned hereby warrant that the _____

(described work performed and/or materials provided)

which we have provided for INSERT PROJECT NAME has been done in accordance with the Contract Documents and that the work as provided will fulfill the requirements of the warranty included in Article 7 of the Contract Documents.

"We agree to correct or remove and replace any or all of our work, together with any other adjacent work which may be displaced or affected by so doing, that may be defective in its workmanship or materials or which may fail to conform to the requirements of the Contract Documents within a period of one (1) year following the applicable date described in Paragraph 7.5 without any expense whatsoever to Metro, normal wear and tear and mistreatment excepted.

"In the event of our failure to comply with the above-mentioned conditions within twenty (20) calendar days after Metro notifies Contractor in writing, we collectively and separately do hereby authorize Metro to proceed to have said defects repaired and corrected at our expense and we will honor and pay the costs and to dispose of nonconforming materials and charges therefore upon demand."

7.7. Remedies Not Restrictive -- The remedies provided for in this Article shall not be restrictive of but shall be cumulative and in addition to all other remedies of Metro in respect to latent defects, frauds or failure to perform all work as required by the Contract Documents.

7.8. Proof of Compliance with Contract Provisions -- For Metro to determine whether Contractor has complied or is complying with the requirements of the Contract which are not readily enforceable by inspection and test of the Work, Contractor shall, upon request, promptly submit to Metro such properly authenticated documents as may be necessary to demonstrate compliance with the Contract or other satisfactory proof of its compliance with such requirements.

7.9. Patents, Copyrights, Trademarks -- All fees or costs of claims for any patented invention, article or arrangement or any copyrights or trademarks that may be used upon or in any manner connected with the performance of the Work or any part thereof, shall be included in the Bid for doing the Work. Contractor shall save, keep, hold harmless, and fully indemnify Metro from all damages, claims for damage, lawsuits, costs, expenses or liabilities of whatever nature in law or equity, including attorney's fees and court costs, which may at any time arise or be set up for any infringement of the patent rights, copyrights or trademarks of any person or persons in consequence of the use by Metro of articles to be supplied under the Contract and of which Contractor is not the patentee or assignee or has not the lawful right to sell the same. This is in addition to all other hold harmless and indemnification clauses in these Contract Documents.

7.10. Anti-Trust Claims -- By entering into this Contract, Contractor, for consideration paid to Contractor under the Contract, does irrevocably assign to Metro any claim for relief or cause of action which Contractor now has or which may accrue to Contractor in the future, including, at Metro's option, the right to control any such litigation on such claim for relief or cause of action, by reason of any violation of 15 USC Section 1-15, ORS 646.725 or ORS 646.730, in connection

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with any goods or services that are used, in whole or in part, for the purpose of carrying out Contractor's obligations under this Contract.

Contractor shall require all Subcontractors and Suppliers to irrevocably assign to Metro, as a third party beneficiary any right, title or interest that has accrued or may accrue to the Subcontractors or Suppliers by reason of any violation of 15 USC Section 1-15, ORS 646.725 or ORS 646.730, including, at Metro's option, the rights to control any litigation arising hereunder, in connection with any goods or services provided to the Subcontractors or Suppliers by any person, in whole or in part, for the purpose of carrying out the Subcontractors' or Suppliers' obligations as agreed to by Contractor in pursuance of the completion of the Contract.

In connection with Contractor's, Subcontractors' or Suppliers' assignment, it is an express obligation of Contractor, Subcontractor or Supplier that it will take no action which will in any way diminish the value of the rights conveyed or assigned hereunder to Metro. It is an express obligation of Contractor, Subcontractor or Supplier to advise the Office of Metro Attorney:

7.10.1. In advance, of its intention to commence any action on its own behalf regarding such claims for relief or causes of action;

7.10.2. Immediately, upon becoming aware of the fact that an action has been commenced on its own behalf by some other person or persons, of the impendency of such action; and

7.10.3. The date on which it notified the obligor(s) of any such claims for relief or causes of action of the fact of its assignment to Metro.

Furthermore, it is understood and agreed that in the event that any payment under any such claim is made to Contractor, Subcontractor or Supplier, it shall promptly pay over to Metro its proportionate share thereof, if any, assigned to Metro hereunder.

ARTICLE 8 CHANGES IN THE WORK

8.1. Change Orders Generally -- Metro may order changes in the Work herein required, including deletions of work, and may order additional materials and work in connection with the performance of the Work.

If such changes in the Work increase or decrease the cost of any part of the Work or change the time necessary to complete the Work, the Contract Amount shall be increased or decreased by such amount and the Contract Time changed as Contractor and Metro may agree upon as reasonable in a written Change Order. Contractor shall promptly comply with such Change Orders and carry them out in accordance with the Contract Documents.

No order for any alteration, modification or additional work which shall increase or decrease the Contract Amount or change the Contract Time shall become part of the Contract unless the resulting Change Order shall have been agreed upon in writing and the Change Order signed by Contractor and Metro, unless the work is Force Account work. Metro may, at its discretion, also require the signature of Contractor's surety on the Change Order. Prior to the approval of such Change Order, Metro shall have approved any design modifications entailed thereby.

Owner anticipates generating not more than one change order per month.

8.2. Procedure for Determining Impact of Change Orders on Contract Amount

8.2.1. Price before Proceeding -- If Metro intends to order changes in the Work, it may request a proposal by Contractor for the proposed added or deleted work before directing Contractor to commence work. Within fourteen (14) days after issuance of such request by Metro, Contractor shall furnish three copies of a complete breakdown of costs of both credits and additions directly attributable to the change in the Work proposed, itemizing materials, labor, taxes, affect on Contract Time, if any, and Overhead and Profit on a form approved by Metro and in accordance with the limitations described in the following Paragraph. Subcontract work shall be so indicated and written proposals from Subcontractors or Suppliers shall

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be included with similar breakdowns provided. Following submission of its cost breakdown, Contractor shall meet with Metro to discuss all aspects of scope, costs, scheduling and construction methods.

8.2.2. Proceed While Pricing -- If Metro finds it necessary to make changes in the Work in an expeditious manner, it may direct Contractor to proceed with the change while preparing a proposal for the added or deleted Work. In such an instance, Metro may assign an estimated value to the change, which Contractor shall not exceed without further authorization by Metro. Within fourteen (14) days after issuance of such by Metro, Contractor shall furnish three copies of a complete breakdown of costs of both credits and additions directly attributable to the change in the Work proposed, itemizing materials, labor, taxes, affect on Contract Time, if any, and Overhead and Profit on a form approved by Metro and in accordance with the limitations described in the following Paragraph. Subcontract work shall be so included with similar breakdowns provided. Following submission of its cost breakdown, Contractor shall meet with Metro to discuss all aspects of scope, costs, scheduling and construction methods.

8.2.3. Unit Prices -- If the proposed additional or deleted work is the subject of Unit Prices stated in the Contract Documents or subsequently agreed upon, such Unit Prices shall be binding upon Contractor in calculating the increase or decrease in the Contract Amount attributable to the proposed additional or deleted work.

A unit price schedule is as follows:
Unit Price No. 1 – XXXXXXXXXXXXXXXX.
Description: XXXXXXXXXXXXXXXX
Unit of Measurement: XXXXXXXXXXXX

8.3. Limitations when Change Orders Impact Contract Amount-- The following limitations shall apply in the calculation of the costs of changes in the Work:

8.3.1. Overhead and Profit -- Contractor will be permitted a reasonable allowance for Profit and Overhead on its increased Direct Cost resulting from any changes in the Work ordered by Metro. Likewise, Profit and Overhead will be deducted for any portion of the Work, which is deleted. In the case of a change involving both credits and extras, Overhead and Profit shall be applied to the net extra after subtraction of credits.

Overhead and Profit for the entity performing the work with its own crews shall not exceed twenty percent (20%) of the Direct Cost of the changed work.

Overhead and Profit for Contractor or Subcontractor who has had the work performed by a lower tier Subcontractor shall not exceed five percent (5%) of the Direct Cost of the changed work.

If the Work is performed by a second-tier or inferior Subcontractor, the total Overhead and Profit for all tiers shall in no event exceed thirty percent (30%) of the Direct Cost of the changed work. Distribution of this Overhead and Profit among the tiers is the responsibility of Contractor.

8.3.2. Taxes and Insurance -- Federal, state, regional, county and local taxes, including, but not limited to, income taxes, excise taxes, sales and use taxes and payroll taxes and insurance shall be shown separately and will be allowed on extras and shall be credited on credits. No Overhead and Profit will be allowed on taxes and insurance.

8.3.3. Bond Premiums -- The actual rate of bond premium as paid on the additional Direct Cost plus the cost of taxes defined in 8.3.2 will be allowed. No Overhead and Profit will be allowed on such premiums.

8.3.4. Equipment Costs -- The allowance for equipment costs (both rental as well as Contractor-owned equipment) shall be limited to those rates in the Rental Rate Bluebook published by Dataquest Incorporated, 1290 Ridder Park Drive, San Jose, California 95131-2398, (800) 227-8444.

8.4. Force Account Work -- If Contractor does not respond to Metro's Request for Proposal with a cost breakdown within the fourteen (14) day period as required above, or if Metro determines that Contractor's breakdown of costs is unreasonable in consideration of the work proposed to be added or deleted, or if Metro determines that the proposed work

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must be commenced promptly to avoid delay to the Project, Metro may issue an order for Force Account work and Contractor shall promptly perform or delete the work described in such order. Change, if any, in the Contract Amount due to such Force Account work shall be the sum total of the following items:

8.4.1. Actual labor cost, including premium on compensation insurance and charge for social security taxes, and other taxes pertaining to labor.

8.4.2. The proportionate cost of premiums of public liability property damage and other insurance applicable to the extra work involved and required by these Contract Documents.

8.4.3. Actual cost of material, including applicable taxes pertaining to materials.

8.4.4. Actual cost of plant and equipment rental, at rates to be agreed upon in writing before the work is begun or at rates per Subparagraph 8.3.4 above. No charge for the cost of repairs to plant or equipment will be allowed. Equipment items having a capital cost of under \$250.00 are considered small tools and classified as Overhead.

8.4.5. Overhead and Profit as provided and limited in Paragraph 8.3.

8.4.6. The proportionate actual costs of premiums for bonds required by these Contract Documents.

Whenever any Force Account work is in progress, Contractor shall furnish each working day to Metro a detailed written report signed by Contractor and Metro's representative of the amount and cost of all of the items listed in (1) through (6) above, and no claim for compensation for such extra work will be allowed unless such report shall have been made. Metro reserves the right to provide such materials as it may deem expedient and no compensation, overhead or profit will be allowed to Contractor for such materials.

8.5. Oral Modifications -- No oral statement of any person whomsoever shall in any manner or degree modify or otherwise affect the terms of this Contract.

8.6. Contractor Proposals for Changes in Work

8.6.1. Generally -- At any time during the performance of the Work, Contractor may propose to Metro changes in work which Contractor believes will result in higher quality work, improve safety, shorten the Contract Time, decrease the Contract Amount, or otherwise result in better or more efficient work.

8.6.2. Purpose -- Metro encourages Contractor to submit Value Engineering Change Proposals (VECPs) in order to avail Metro of potential cost savings that may result. Contractor and Metro will share any savings, computed in accordance with instructions herein. Contractor is encouraged to submit VECPs whenever he identifies an area which can be improved, using the format described herein.

8.6.3. Application -- This clause applies to a contractor developed and documented VECP which: (1) requires a change to this Agreement to implement the VECP; and (2) reduces the Contract Price without impairing essential functions or characteristics of the Work, provided it is not based solely on a change in specified quantities.

8.6.4. Documentation -- At a minimum, the following information shall be submitted by Contractor with each VECP: (1) description of the existing requirements of the Contract Documents which are involved in the proposed change; (2) description of the proposed change; (3) discussion of differences between existing requirements and the proposed change, together with advantages and disadvantages of each changed item; (4) itemization of the requirements which must be changed if the VECP is accepted (e.g., Drawing numbers and Specifications); (5) justification for changes in function or characteristics of each such affected item and effect of the change on the performance of the end item; (6) effect of proposed change on life-cycle costs, including operation and maintenance, replacement costs, and life expectancy; (7) date or time by which a Change Order adopting the VECP must be issued in order to obtain the maximum cost reduction, noting any effect on Contract Time or delivery schedule; and (8) cost estimate for existing contract requirements correlated to his lump sum breakdown and proposed changed requirements. Costs of development and

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implementation by Contractor shall be identified. Estimated Metro costs (e.g., cost of testing and redesign) shall also be identified.

8.6.5. Submission -- Proposals will be processed expeditiously; however, Metro will not be liable for any delay in acting upon any proposal submitted pursuant to this clause. Contractor shall have the right to withdraw, in whole or in part, any VECP at any time prior to acceptance by Metro.

8.6.6. Acceptance -- Metro may accept, in whole or in part, by Change Order, any VECP submitted pursuant to this clause. Until a Change Order is issued, Contractor shall remain obligated to perform in accordance with this Agreement. The decision as to acceptance or rejection of any VECP will be at the sole discretion of Metro and will be final and not subject to review by mediation or otherwise.

8.6.7. Sharing -- If a VECP submitted by Contractor pursuant to this clause is accepted, Contractor shall proceed with the change and the Contract Price will be adjusted in accordance with the following provisions:

Definitions

8.6.7.1. Estimated Gross Savings to Contractor (GS): The difference between cost of performing the Work according to the existing requirement and the cost if performed according to the proposed change. In each instance, Contractor's profit shall not be considered part of the cost.

8.6.7.2. Contractor Costs (CC): Reasonable costs incurred by Contractor in preparing the VECP and making the change such as cancellation or restocking charges where required.

8.6.7.3. Estimated Net Savings to Contractor (NS): Gross savings (GS) less Contractor costs (CC).

8.6.7.4. Metro's Costs (OC): Reasonable costs incurred by Metro for evaluating and implementing the VECP, such as testing and redesign, where required.

Calculations

8.6.7.5. The Contract Price shall be reduced by an amount equal to 50 percent of (NS) plus 50 percent of (OC), expressed by the formula:

$$\text{Reduction} = 0.5 (\text{NS}) + 0.5 (\text{OC}).$$

8.6.7.6. Contractor's profit will not be reduced by application of the VECP.

8.6.8. Subcontracts -- Contractor shall include appropriate value engineering incentive provisions in all subcontracts of \$25,000 or greater. He may include such provisions in any Agreement. Subcontracts shall contain a provision that any benefits accruing to Contractor as a result of an accepted VECP initiated by a Subcontractor shall be shared by Contractor and Subcontractor. To compute any adjustment in the Contract Price under Paragraph 6.45 above, Contractor's costs of preparation and charge for a VECP shall include any preparation and change costs. Examples are cancellation or restocking charges when required.

8.6.9. Disclosure Restrictions -- Contractor may restrict Metro's right to use any sheet of a VECP or of the supporting data submitted pursuant to this clause, in accordance with the terms of the following legend if it is marked on such sheet:

Legend

To the extent allowed by law, data furnished pursuant to the value engineering incentive clause of the Agreement shall not be: (1) disclosed to any outside person or agency, (2) duplicated, or (3) used. Metro may disclose, duplicate, or use furnished data to evaluate a VECP submitted under said clause. This restriction does not limit Metro's right to use information that has been obtained, or is otherwise available, from Contractor or from another source without limitations.

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If such a VECP is accepted, Metro shall have the right to duplicate, use, and disclose any data reasonably necessary to the full utilization of such VECP as accepted, in any manner and for any purpose whatsoever, and have others so do.

8.7. Impact of Authorized Changes in the Contract -- Changes in the Work made pursuant to this Article and extensions of the Contract Time allowed by Metro due to such changes shall not in any way release any warranty or promises given by Contractor pursuant to the provisions of the Contract Documents, nor shall such changes in the Work relieve or release the sureties of bonds executed pursuant to said provisions. The sureties, in executing such bonds, shall be deemed to have expressly agreed to any such change in the Work and to any extension of Contract Time made by reason thereof.

ARTICLE 9 PAYMENTS AND COMPLETION

9.1. Scope of Payment -- Payment to Contractor of the Contract Amount for performing all Work required under the Contract, as adjusted for any Change Orders approved as hereinbefore specified, shall be full compensation for furnishing all labor, materials, equipment and tools necessary to the Work, and for performing and completing, in accordance with these Contract Documents, all Work required under the Contract, and for all expenses incurred by Contractor for any purpose in connection with the performance and completion of said Work.

Whenever it is specified herein that Contractor is to do work or provide materials of any class for which no price is fixed in the Contract, it shall be understood that Contractor is to do such work or provide such materials without extra charge or allowance or direct payment of any sort, and that the cost of doing such work or providing such materials is included in its Bid.

9.2. Schedule of Values

9.2.1. Generally -- Within fifteen (15) days after the Notice to Proceed, Contractor shall submit a detailed breakdown of its lump sum bid items. The format and detail of the breakdown shall be as directed by Metro and in accordance with Section 01025 of the Specifications to facilitate and clarify future progress payments to Contractor. This breakdown shall be referred to as the Schedule of Values.

9.2.2. Review of Schedule of Values -- Metro will review the Schedule of Values to ascertain that the dollar amounts of the Schedule of Values are in fact fair cost allocations for the work item listed. Upon concurrence by Metro, a formal approval of this Schedule of Values will be issued. Metro shall be the sole judge of fair cost allocations. Contractor's monthly progress payment requests shall reflect the cost figures included in the approved Schedule of Values and shall be based upon completed work items or percentages of work items completed prior to the end of the payment period as more fully described below.

9.3. Progress Payment Procedure

9.3.1. Generally -- Subject to the approval of Metro, disbursements shall be made by Metro of progress payments upon written request of Contractor and pursuant to the Contract Documents as specified in Section 01025 of the Specifications.

Before the end of each calendar month, Contractor shall file with the Construction Manager in duplicate on a form approved by Metro, a proposed payment estimate for the period commencing on the 26th day of the previous month through midnight on the 25th day of the calendar month in question. Metro and the Construction Manger shall review Contractor's estimate and shall determine the value of Contractor's work based upon the Schedule of Values and incorporated labor and materials for the payment period. Contractor shall not be paid for any work, which is, in Metro's opinion, defective or improper or for work needed to correct Contractor's defective or improper work. Contractor shall be paid 95 percent (95%) of the determined value of work accomplished less any offset or withholding of sums by Metro allowed under the Contract Documents within thirty (30) days after receipt by Metro of Contractor's payment estimate. Metro will routinely withhold five percent (5%) as Retainage.

No inaccuracy or error in any monthly progress payment estimates shall operate to release Contractor or its surety from damages arising from such work or from the enforcement of each and every provision of the Contract Documents, and Metro shall have the right subsequently to correct any error made in any estimate for progress payments.

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9.3.2. Retainage -- If, in Metro's opinion, work on the Project is progressing satisfactorily, Metro may eliminate additional Retainage on any remaining monthly progress payments after 50 percent (50%) of the Work under the Contract is, in Metro's opinion, completed. Elimination of additional Retainage under this Subparagraph shall be allowed by Metro only upon written application by Contractor, which application shall include written approval of Contractor's surety.

If after Metro allows such an elimination of additional Retainage, Metro determines that progress of the Work is not satisfactory or that Contractor has breached any provision of the Contract, Metro may again retain and continue to retain, in addition to that Retainage already being held by Metro, five percent (5%) of any future progress payments made to Contractor.

When Metro determines that the Work is 97-½ percent (97-½%) complete, Metro may, at its discretion and without application by Contractor reduce the retained amount to 100 percent (100%) of the value of the Work remaining to be done.

All funds retained by Metro under this section shall be retained in a fund by Metro and paid in accordance with ORS 279C.570.

Contractor may elect to deposit bonds or securities of the type described below with Metro or in any bank or trust company to be held in lieu of the cash retainage described above and for the benefit of Metro. In such event, Metro shall reduce the Retainage in an amount equal the value of the bonds and securities and shall pay the amount of the reduction to Contractor in accordance with ORS.279C.570. Interest on such bonds or securities shall accrue to Contractor.

Bonds and securities deposited or acquired as described above shall be of a character approved by the Director of Oregon's Department of General Services including, but not limited to:

- 9.3.2.1 Bills, certificates, notes or bonds of the United States.
- 9.3.2.2 Other obligations of the United States or its agencies.
- 9.3.2.3 Obligations of any corporation wholly owned by the federal government.
- 9.3.2.4 Indebtedness of the Federal National Mortgage Association.

Contractor may elect to require Metro to deposit the accumulated Retainage in an interest bearing account in a bank, savings bank, trust company or savings association for the benefit of Metro. Interest on such an account shall accrue to Contractor.

If Metro incurs additional costs as a result of Contractor's exercise of any of the above-described options, Metro may recover such costs from Contractor by reduction of the Final Payment. Metro shall inform Contractor of all such accrued costs.

9.3.3. Payment for Material Stored Off Site -- Payment for material stored off of the Site will not be allowed unless the payment for such material benefits Metro in terms of lead time, scarcity, schedule, etc. Metro has sole discretion as to what materials will be paid for in advance of delivery to or installation on Site. Proof of off-site material purchases (invoice or checks) and appropriate insurance coverage will be required for payment. Title to all equipment and materials shall pass to Metro upon payment therefore or incorporation in the Work, whichever shall first occur, and Contractor shall prepare and execute all documents necessary to effect and perfect such transfer of title. Contractor must provide to Metro written consent from Contractor's surety approving the advanced payment for materials stored off-site.

The maximum prepayment allowed by Metro shall be 75 percent of the actual fair market value of the item being considered. Metro shall be the sole judge of fair market value. Contractor shall protect stored materials from damage, and damaged or otherwise unacceptable materials, even though paid for, shall not be incorporated into the Work.

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9.3.4. Other Conditions Precedent to Payment -- It is a condition precedent to Contractor's rights to any payments under the Contract that all bills for labor and materials, including labor and materials supplied by or to Contractor, shall have been paid in full and, if requested by Metro, Contractor shall submit receipted invoices and/or lien waivers, as evidence of payment in full of all such accounts. As a further condition precedent to Contractor's right to any payments under this Contract, if requested by Metro, Contractor shall submit a claims release before any payment, and a final claims release stating Contractor has been paid in full prior to the Final Payment.

Payments to Contractor shall be conditioned upon Contractor complying with all provisions of this Contract regarding scheduling and progress reports submissions and upon Contractor furnishing all other information and data necessary to ascertain actual progress. Metro's determination that Contractor has failed or refused to furnish the required information, data, schedules or other reports shall constitute a basis for withholding all payments until the required information, data, revised schedules and diagrams, if necessary, and other reports are furnished.

9.3.5. Payment Does Not Imply Acceptance of Work -- The granting of any progress payment, or the receipt thereof by Contractor, shall not constitute acceptance of the Work or any portion thereof, and shall in no way lessen the liability of Contractor to replace unsatisfactory work or material, though the unsatisfactory character of such work or material may or may not have been apparent or detected at the time such payment was made

9.3.6. Offset of Sums Due Metro from Contractor -- In addition to any retention rights allowed Metro under this Contract, it is mutually understood and agreed that Metro may, upon prior written notice to Contractor, offset from any payment otherwise due Contractor, as much as may be necessary to protect and compensate Metro from any costs or expenses it may incur due to any breach of the Contract by Contractor, including applicable liquidated damages. Any sums so offset shall become the property of Metro.

9.3.7. Time of the Essence -- Time is of the essence for the performance of the Work under this Contract.

9.4. Substantial Completion -- When Contractor considers the Work to be substantially complete, Contractor shall submit to Metro a written notice that the Work is substantially complete and a punch list of items to be completed or corrected. Within a reasonable time after receipt of such notice, Metro will review the Work, including a physical inspection, to determine the status of completion. Should Metro determine that the Work is not substantially complete:

9.4.1. Construction Manager will promptly notify Contractor in writing, giving the reasons therefore.

9.4.2. Contractor shall remedy the deficiencies in the Work, and thereafter send a second written notice of Substantial Completion to Metro.

The above-described procedure shall be followed until the Work is, in the opinion of Metro, substantially complete. At that point:

9.4.2.1. Metro will prepare a Certification of Substantial Completion on AIA Document G704, accompanied by the approved punch list of items to be completed or corrected.

9.4.2.2. Metro shall submit the Certificate of Substantial Completion to Contractor for signature. Contractor shall complete the items on the approved punch list.

9.5. Final Completion and Acceptance -- When Contractor considers the Work to be finally complete, Contractor shall submit written certification to Metro that:

9.5.1. Contract Documents have been reviewed.

9.5.2. Work has been inspected for compliance with Contract Documents.

9.5.3. Work has been completed in accordance with Contract Documents to include submission of record documents.

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9.5.4. Equipment systems have been tested in presence of Metro and are operational.

9.5.5. Work is ready for final inspection.

Metro will promptly review the Work and include a physical inspection to verify the status of completion and shall inform Metro of the conclusions. Metro shall, within fifteen (15) days after receipt of Contractor's certification, either accept the Work or notify Contractor of the work yet to be performed on the Contract as outlined below.

Should Metro consider that the work is incomplete or defective:

9.5.5.1. Construction Manager will promptly notify Contractor in writing, listing the incomplete or defective work.

9.5.5.2. Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to Metro that the Work is complete.

9.5.5.3. Metro will review and re-inspect the Work.

The above-described procedure shall be followed until the Work is, in the opinion of Metro, finally complete. Contractor shall immediately thereafter prepare and submit Closeout Submittals as described below.

9.6. Closeout Submittals -- Contractor shall submit the following items, as applicable, with its request for Final Payment:

9.6.1. Evidence of Compliance with Requirements of Governing Authorities.

9.6.2. Project record documents in accordance with the Specifications.

9.6.3. Operation and maintenance data in accordance with the Specifications.

9.6.4. Warranties in accordance with requirements of various Specification sections and these General Conditions.

9.6.5. Extra stock and maintenance materials. Contractor shall submit receipts, signed by Metro, for the various specific items.

9.6.6. Evidence of payment and release of claims in accordance with the following section.

9.6.7. Consent of surety to Final Payment.

9.6.8. Certificates of insurance for products and completed operations in accordance with Article 11 of these General Conditions.

9.6.9. If Contractor is a non-resident bidder as that term is defined in Subparagraph 14.3.6, complete documentation of Contractor's compliance with ORS 279A.120

9.7. Releases -- Contractor and each assignee under any assignment in effect at the time of Final Payment shall execute and deliver, at the time of application for Final Payment, as a condition precedent to Final Payment, a release in form and substance satisfactory to Metro, discharging and releasing Metro of and from all liabilities, obligations and claims arising under this Contract.

In addition to the above-described release, Contractor shall:

9.7.1. Submit to Metro an affidavit certifying that Contractor has paid all federal, state and local taxes including excise, use, sales, and employee withholding taxes.

9.7.2. Deliver to Metro written releases of all rights to file claims against Metro or to file claims on any bonds

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in connection with the Contract, signed by each Subcontractor and Supplier who performed labor or furnished materials in connection with the work.

9.7.3. Deliver to Metro Contractor's written undertaking, with sureties acceptable to Metro:

9.7.3.1. To promptly pay and obtain a release of claims on any bonds which may in the future affect the premises; and

9.7.3.2. To defend, indemnify and save Metro harmless from any liability or expense because of any claim on any bond or any other claim related to the Contract or the Work.

9.8. Final Payment -- Upon application of Contractor and Contractor's completion of and compliance with all of the provisions of the above Paragraphs and settle of all claims arising from the agreement including claims that Metro may have against Contractor, Metro shall pay Contractor the balance of the Contract Amount subject to the availability of monies in the Construction Fund as described in Paragraph 9.1 and less any previous payments, offsets and withholdings allowed Metro under this Contract and Retainage which has been returned to Contractor.

Acceptance of Final Payment by Contractor shall constitute a waiver of all claims of whatever nature which Contractor may have or allege to have against Metro arising out of or related to Work described in the Contract Documents.

9.9. No Waiver of Rights -- Neither the final review by Metro, nor any order or certificate for the payment of money, nor any payment for, nor acceptance of the whole or any part of the Work by Metro, nor any extension of time, nor any position taken by Metro shall operate as a waiver of any provision of this Contract or of any power herein reserved by Metro or any right to damage herein provided; nor shall any waiver of any breach of this Contract be held to be a waiver of any other or subsequent breach. All of Metro's remedies provided in this Contract shall be taken and construed as cumulative; that is, in addition to each and every other remedy herein provided; and Metro shall have any and all equitable and legal remedies, which it would in any case have.

ARTICLE 10 SAFETY AND PROTECTION OF THE WORK

10.1. Safety Requirements

10.1.1. Safety Generally -- Contractor shall be solely and completely responsible for the safety of the Work and the Site, including, but not limited to, the safety of all persons and property involved in the Work at the Site at any time until Final Completion and Acceptance of the Work.

All Work shall be performed in full accordance with all applicable safety codes, laws, ordinances and requirements including, but not limited to, the Safety and Health Regulations for Construction, promulgated by the Secretary of Labor under Section 107 of the Contract Work Hours and Safety Standards Act as set forth in Title 29 of the Code of Federal Regulations, federal and state OSHA, Metro's insurance standards, and all other applicable safety codes. Where any of these are in conflict, the more stringent requirement shall be followed. Contractor's failure to thoroughly familiarize itself with the aforementioned safety provisions shall not relieve it from any requirements in the Contract Documents to comply with such safety provisions or from any penalties for failure to so comply.

Contractor shall inspect the Work and the Site daily and immediately correct any unsafe conditions. All job personnel shall be knowledgeable of and comply with the above safety requirements.

Contractor shall take all precautions to prevent the possibility of fire resulting from contract operations. Contractor shall provide properly maintained emergency fire extinguishing equipment of a readily available type and quantity as necessary to meet potential fire hazards.

10.1.2 Health and Safety Program -- Contractor shall develop, publish and implement the overall Health and Safety Program for the Project. Refer to Section 01500 of the Technical Specifications. This Program shall conform to all applicable codes. Contractor shall submit the written Health and Safety Program to Metro for review and comment within fourteen (14) days after the receipt of the written Notice To Proceed. The Program, as approved by Metro, shall

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subsequently be distributed to and implemented by Contractor's personnel as well as its Subcontractors and Suppliers. Contractor shall fully implement and comply with the approved Safety Program.

10.1.3. Health and Safety Officer -- Prior to initiation of construction, Contractor shall designate in writing a Site Health and Safety Officer who shall be responsible for coordinating Contractor's Health and Safety Program. The individual so designated shall be the interface with the Construction Manager on matters relating to safety, and Contractors compliance with the approved Safety Program. Metro reserves the right to accept or reject the Health and Safety Officer designated by Contractor.

10.2. First Aid -- Contractor shall maintain on the Site during work operations, a member of its work force who is qualified in administering first aid to its personnel and shall have available in its job office the first aid equipment as required to meet all applicable safety codes. The names and credentials of qualified personnel will be submitted to the Construction Manager.

Contractor shall require or provide adequate clothing and protective gear for all personnel working on the job site. This includes but is not limited to hard hats; substantial boots or shoes, shirts with sleeves at all times; eye and ear protection, gloves, face masks, welding hoods, safety belts as required for the type of work being done.

10.3. Protection of Work, Persons and Property Against Damages -- Contractor shall protect the Work from damage due to construction operations, the action of the elements, including erosion due to normal and extraordinary weather conditions, the carelessness of other contractors, vandalism, or any other cause whatever until Final Completion and Acceptance of the Work.

Contractor shall protect all public and private property insofar as it may be endangered by operations of Contractor including adjoining lands, air and waterways, and shall be fully responsible for taking proper precautions for the prevention of accidents to persons and/or damage to such property at, on or near the Site.

All federal, state and local safety and environmental protection laws, rules and orders including fire codes, applicable to the Work to be done under the Contract, shall be obeyed, complied with and enforced by Contractor.

Contractor shall provide and maintain such guards, fences, barriers, signs, regulatory and warning lights, and other traffic control and safety devices adjacent to and on the Site as may be necessary to prevent accidents to the public and damage to property. Contractor shall also provide, place and maintain such lights as may be necessary for illuminating the said signs, guards, fences, barriers and other traffic and safety control devices.

Upon Final Completion and Acceptance of the Work, Contractor shall remove all temporary signs, lights, barriers, etc., from the Site.

ARTICLE 11 INDEMNIFICATION AND INSURANCE

11.1. Indemnification -- Contractor agrees that for purposes of the Oregon Tort Claims Act (ORS 30.260 through 30.300), neither Contractor, its officers, agents and employees nor any Subcontractor or Supplier of Contractor of any tier, or its officers, agents or employees, are agents of Metro. Contractor for itself and its officers, agents, employees and its Subcontractors and Suppliers of any tier and their officers, agents and employees will make no claim whatsoever against Metro for indemnification pursuant to ORS 30.260 to 30.300 and Contractor agrees to hold Metro harmless and indemnify Metro from any such claims.

Contractor shall assume all responsibility for the Work and shall bear all losses and damages directly or indirectly resulting to Contractor, Metro, their officers, agents and employees, or to others on account of the character or performance of the Work, or accidents, unless such cause is due to the sole negligence of Metro.

Contractor shall assume the defense, if requested, indemnify and hold harmless Metro from all claims, liability, loss, damage, consequential or otherwise, and injury of every kind, nature and description, directly or indirectly resulting from activities in the performance of the Contract, the ownership, maintenance or use of motor vehicles in connection

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therewith, or the acts, omissions, operations, or conduct of Contractor or any Subcontractor or Supplier under the Contract or in any way arising out of the Contract, irrespective of whether fault is the basis of the liability or claim.

Any specific duty or liability imposed or assumed by Contractor, as may be otherwise set forth in the Contract Documents, shall not be construed as a limitation or restriction of the general liability or duty imposed upon Contractor by this Paragraph.

Such liabilities and losses from which Contractor shall indemnify and hold harmless the above-described indemnities shall include, but not be limited to:

11.1.1. Special activities by Metro to verify and/or expedite delivery of materials and those losses incurred by Metro as a result of any delays to Other Metro Contractors resulting from acts of Contractor or its failure to act.

11.1.2. Acceleration payments to Other Metro Contractors on the project or related projects resulting from Contractor falling behind the Construction Schedule for causes not entitling it to an extension of time under any provisions of the Contract Documents which cause other Metro Contractors to fall behind the Construction Schedule and who must then accelerate the performance of the work, as directed by Metro, in order to maintain progress.

11.1.3. Violations of the ordinances or regulations of Metro, any federal, state, county or city laws or order of any properly constituted authority in any manner affecting this Contract, in addition to any laws or regulations which might affect this Contract.

11.1.4. Any and all suits, actions, damages or claims of every name and description to which the above indemnified may be subjected or put by reason of injury to persons or property arising out of, in connection with, or incident to the execution of the work or resulting from acts or omissions on the part of Contractor, its Subcontractors, officers, employees or agents and all attorney's fees and court costs incident thereto.

11.2. Insurance

11.2.1. Public Liability and Property Damage Insurance

Contractor shall purchase and maintain, at the Contractor's expense, the following types of insurance covering the Contractor, its employees and agents.

A. Broad form comprehensive general liability insurance covering bodily injury, property damage, and personal injury with automatic coverage for premises/completed operations and product liability. The policy must be endorsed with contractual liability coverage.

B. Automobile bodily injury and property damage liability insurance.

Insurance coverage shall be on an occurrence basis with an annual aggregate limit of \$1,000,000.

Metro, its elected officials, departments, employees and agents shall be named as an ADDITIONAL INSURED. Notice of any material change or policy cancellation shall be provided to Metro thirty (30) days prior to the change.

C. Subcontractor's Insurance – Contractor shall require that all of its Subcontractors and Suppliers of any tier provide insurance coverage and conditions identical to Contractor's insurance coverage, except that the policy limits of all Subcontractors' insurance coverage shall be at least \$1,000,000 combined single limit for each occurrence and in the aggregate.

11.2.2. Workers' Compensation and Employer's Liability Insurance

The Contractor, its subcontractors, and all employers working under this contract are subject employers under the Oregon Workers' Compensation Law and shall comply with ORS 656.017, which requires them to provide workers' compensation coverage for all their subject workers. The Contractor shall provide Metro with certification of workers' compensation insurance including employer's liability of \$1,000,000.

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11.2.3. Forms of Policies and Other Insurance Requirements -- In addition to filing any other insurance certificates specified elsewhere in these Contract Documents, Contractor shall, within seven (7) days following Notice of Award of Contract, provide Metro two (2) certified copies of the policies of all insurance herein required to be obtained by Contractor except that Worker's Compensation Insurance may be evidenced by a Certificate of Insurance. At Metro's request, Contractor shall immediately deliver to Metro the receipts for payment of premiums on any or all such policies.

All policies of insurance and Certificates of Insurance shall be satisfactory to Metro. Approval of the insurance by Metro shall not relieve or decrease the extent to which Contractor or Contractor's Subcontractors and Suppliers of any tier may be held responsible for payment of any and all damages resulting from performance of the Work.

Each such policy or Certificate of Insurance shall bear an endorsement precluding its cancellation, expiration or any reduction in its coverage without giving to Metro at least sixty (60) days prior written notice. Contractor shall file with Metro two (2) certified copies of the required new or renewed policy or two (2) Certificates of Insurance for each such policy, as applicable, before the effective date of such cancellation, change or expiration.

If Contractor neglects to obtain or maintain in force any such insurance or to deliver such policy or policies, certificates and receipts to Metro, then Metro may, at its option, obtain and maintain such insurance. Contractor hereby appoints Metro its true and lawful attorney, to do all things necessary to obtain and maintain such insurance. All monies expended by Metro for such insurance shall be charged to Contractor and Metro may offset its costs in obtaining and/or maintaining such policies from sums due or to become due Contractor under the Contract or otherwise collect such sums from Contractor. Failure of Metro to obtain or maintain such insurance shall in no way relieve Contractor of any of its responsibilities under this Contract.

Contractor's failure to maintain any item of the required insurance shall be sufficient cause for termination or suspension of this Contract.

All insurance required shall be obtained through a company or companies having a policyholders surplus of at least ten (10) times the amount or limit of liability afforded by such insurance company on policies issued for this Contract. Such company shall be duly and legally licensed to transact business in the state of Oregon and shall be acceptable to Metro. Said insurance shall be primary over any insurance or self-insurance of Metro.

11.3. Builder's All Risk Insurance

11.3.1. Contractor, for the life of this Contract, shall effect and maintain Builders All Risk Insurance and fire insurance with extended coverage and malicious mischief coverage upon the structures on which the work of this Contract is to be done to 100 percent (100%) of the insurable value thereof, protecting: 1) Owner's interest; 2) Contractor's interest; and 3) the subcontractor's interests in the work. Contractor's interest and the subcontractor's interests, as used herein, means their property interests and the property interests of others for which they are responsible in the Project, in all materials and supplies entering into or used or destined for use therein, and in all expendable items of equipment which are used in or are incidental to but which do not become a part of the finished Project, located at the job site at the time of loss or damage. Such insurance shall not exclude coverage for landslides, collapse, explosion or loss due to the result of faulty workmanship.

11.3.2. Contractor and all subcontractors shall be responsible for any loss or damage to their machinery and apparatus and nonexpendable items of their equipment.

11.3.3. Contractor shall provide adequate fire protection equipment and safeguards to protect the Owner and Contractor's interests in accordance with the Owner's insurance carrier's requirements.

11.4. Labor and Materials and Performance Bonds

11.4.1 Contractor shall provide continuous coverage of a separate Performance Bond and a Labor and Materials Bond for the duration of the Contract. The Bonds shall be in the forms provided in these Contract Documents.

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11.4.2 As an alternative to providing either or both of the bonds specified in this section 11.03, Contractor may provide a Letter or Letters of Credit, issued by a sound financial institution satisfactory to Metro. Such Letter or Letters of Credit shall be in a form acceptable to Metro. The Letter or Letters of Credit shall be in an amount equivalent to the bonds required under this section.

ARTICLE 12 MINORITY BUSINESS PROGRAM

Contractor shall comply with all pertinent provisions of Metro's Minority Business Program which are contained in Metro Code 2.04 and which are by this reference expressly incorporated herein and made a part of this Contract.

Contractor shall not replace a minority, women-owned or emerging small business enterprise Subcontractor with another Subcontractor, either before Contract award or during Contract performance, without prior written approval of Metro. In replacing a minority, women-owned or emerging small business Subcontractor, Contractor shall replace such minority, women-owned or emerging small business Subcontractor with another certified minority, women-owned or emerging small business Subcontractor or make good faith efforts to do so. Failure to do so shall constitute Contractor's default of this Contract, and Metro, at its option, may terminate this Contract under the procedures set out in Article 15.

Metro reserves the right, at all times during the period of this Contract, to monitor Contractor's compliance with the terms of the Minority Business Program and enforce the program if Contractor should fail to so comply. Contractor shall be bound by any and all representations made concerning its compliance with the program prior to Contract award and any and all representations made by Contractor concerning the replacement of a minority or women-owned business Subcontractor during the performance of this Contract.

ARTICLE 13 EQUAL EMPLOYMENT OPPORTUNITY AFFIRMATIVE ACTION REQUIREMENT

Contractor shall be certified as Equal Employment Opportunity Affirmative Action Employers by the City of Portland, Oregon, for the entire term of the Contract. Contractor's Subcontractors and Suppliers shall be certified prior to commencement of any of their Work on the Project and shall remain certified for the entire duration of the Contract.

ARTICLE 14 MISCELLANEOUS STATUTORY RESPONSIBILITIES OF CONTRACTOR

14.1. Generally -- Contractor shall keep itself fully informed of and shall fully comply with all federal, state, regional and local laws, rules, regulations, ordinances and orders pertaining in any manner, to this Contract and those rules, regulations and orders of any agency or authority having jurisdiction over the work or those persons employed or engaged therein. Contractor shall pay all taxes, including federal, state, regional, county, city or taxes of any other governmental entity applicable to the work performed or materials provided under this Contract.

14.2. Environmental Laws -- Contractor shall fully comply with all federal, state and local laws, ordinances and regulations dealing with the prevention of environmental pollution and the preservation of natural resources and all amendments thereto. Contractor shall also fully comply with all rules, regulations and ordinances enacted or to be enacted by any federal, state or local agency dealing with the prevention of environmental pollution and the preservation of natural resources that affect the performance of the Contract. Such statutes, rules, regulations and ordinances shall include, but are not limited to those in 7 USCA Sections 136 to 136Y, 15 USCA Sections 2601 to 2629, 33 USCA Sections 1251 to 1376, 33 USCA Sections 1401 to 1445, 42 USCA Sections 300f to 300j-11, 42 USCA Sections 4321 to 4370a, 42 USCA Sections 4901 to 4918, 42 USCA Sections 6901 to 6991i, 42 USCA Sections 7401 to 7642, 42 USCA Sections 9601 to 9675, 29 USCA Sections 651 et seq., Oregon Administrative Rules Chapter 61, and Title 18 of the City of Portland Code.

Such agencies shall include, but not be limited to, the following:

FEDERAL AGENCIES

Agriculture, Department of Forest Service
Soil Conservation Service
Defense, Department of

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Army Corps of Engineers
Energy, Department of
Environmental Protection Agency
Health and Human Services, Department of
Interior, Department of
Fish and Wildlife Service
Heritage Conservation and Recreation Service
Bureau of Land Management
Bureau of Indian Affairs
Water and Power Resource Service
Office of Surface Mining
Labor, Department of
Occupational Safety and Health Administration
Mine Safety and Health Administration
Transportation, Department of
Coast Guard
Federal Highway Administration

STATE AGENCIES

Agriculture, Department of
Energy, Department of
Environmental Quality, Department of
Fish and Wildlife, Department of
Forestry, Department of
Geology and Mineral Industries, Department of
Human Resources, Department of
Land Conservation and Development, Department of
Soil and Water Conservation Commission
State Engineer
State Land Board and Division of State Lands
Water Resources Board, Department of
Bureau of Labor and Industries

14.3. Other Provisions of Oregon Law

14.3.1. Generally -- The provisions set out in Oregon Revised Statutes Chapters 187 and 279A, 279 B and 279C, as amended or superseded, including the latest additions and revisions, are incorporated by reference as part of these Contract Documents. Such sections include, but are not necessarily limited to, ORS 187.010, 187.020 279A.120 279C.505, 279C.515, 279C.520, 279C.525, 279C.530, 279C.540, 279C.800, 279C.840, 279.352 279C.830, 279C.845, 279C.850, 279C.855, 279C.815, 279C.860, 279C.870, and 279C.550 through 279C.570. Contractor shall fully comply with all applicable provisions of these statutes. The specific requirements of certain of these sections are set out below.

14.3.2. Payment to Subcontractors and Laborers -- Pursuant to ORS 279C.505, Contractor shall make payment promptly, as due, to all persons supplying such Contractor labor or material for the projection of the Work provided in this Contract. Contractor shall pay all contributions or amounts due the Industrial Accident Fund (IAF) from such Contractor, Subcontractor or Supplier incurred in the performance of the Contract. Contractor shall not permit any lien or claim to be filed or prosecuted against Metro, the State, County, school district, municipality, municipal corporation, or subdivision thereof, on account of any labor or material furnished. Contractor shall pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

14.3.3. Failure to Make Payment for Labor or Services -- Pursuant to ORS 279C.515, if Contractor fails, neglects, or refuses to make prompt payment of any claim for labor or services furnished to Contractor or a Subcontractor by any person in connection with this Contract as such claim becomes due, Metro may pay such claim to the person furnishing the labor or services and charge the amount of the payment against funds due or to become due Contractor by reason of

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such Contract. Metro's payment of such a claim in the manner authorized by ORS 279C.515 shall not relieve Contractor or Contractor's surety from obligation with respect to any unpaid claims.

14.3.4. Hours of Work -- Except as provided in ORS 279C.540 no person shall be employed for more than ten (10) hours in any one day, or forty (40) hours in any one week, except in cases of necessity, emergency, or where the public policy absolutely requires it, and in such cases the laborer shall be paid at least time and a half pay for all overtime in excess of ten (10) hours a day and for work performed on Saturday and on any legal holiday specified in ORS 279C.540 Contractor shall furthermore comply with any applicable provisions of ORS , 279C.520 279C.540, and 279C.545

14.3.5. Payment for Medical Care -- Pursuant to ORS 279C.530 , Contractor shall promptly, as due, make payment to any person, co-partnership, association or corporation, furnishing medical, surgical and hospital care or other needed care and attention, incident to sickness or injury, to the employees of Contractor, of all sums which Contractor agrees to pay for such services and all monies and sums which Contractor collected or deducted from the wages of employees pursuant to any law, contract or agreement for the purpose of providing or paying such service.

14.3.6. Requirements for Non-resident bidder-- Pursuant to ORS279A.120, any "non-resident bidder awarded a public contract with a price exceeding \$10,000, shall promptly report to the Department of Revenue, on forms to be provided by the Oregon Department of Revenue, the total contract price, terms of payment, length of contract and such other information as may be required before Final Payment can be received on the public contract. Final Payment shall not be made until this provisions has been complied with.

For purposes of this paragraph, a "foreign contractor" is one who is not domiciled in or registered to do business in the state of Oregon.

14.3.7. Prevailing Wage -- Except as limited by Oregon Revised Statutes, Contractor shall pay his/her workers and require his/her Subcontractors to pay its workers the prevailing rate of wage as required in ORS 279C.840 , and shall comply with all other requirements contained therein. The Appendix to this Contract contains a schedule of the existing prevailing rate of wage which may be paid to workers in each trade or occupation required to perform the Work, either by Contractor or its Subcontractors or any other person doing or contracting to do the whole or any part of the Work contemplated by this Contract, and such workers shall be paid not less than such specified minimum hourly rate of wage. The specifications for each subcontract shall include a copy of the prevailing wage schedule applicable to this project, and each subcontract shall include a clause regarding conformance to the schedule. In order to insure compliance of prevailing wage requirements, under Chapter 279C, Metro will require that all certified payrolls be submitted by contractor and subcontractor on a schedule to be determined by Metro. If project is subject to Davis-Bacon Act (40 U.S.C. 276a) contractor and all subcontractors shall pay higher of state or federal prevailing wages.

14.3.8. Sanitary Facilities -- Contractor shall be responsible for all costs that may be incurred in complying with ORS 654.150 and the rules adopted pursuant thereto including, but not limited to, securing exemption or partial exemption from the requirements of ORS 654.150, (sanitary facilities at construction projects; standards, exemptions).

14.3.9. Royalty Payments -- Contractor shall promptly pay when due, all royalties owed to the State of Oregon or other governmental entity under ORS Chapter 274 or other provision of law.

14.4. Work to Comply with Codes -- All Work shall be in full compliance with any and all codes specified in the Contract Documents and all federal, state and local laws, ordinances, rules, regulations and orders and all amendments to such codes, laws, ordinances, rules, regulations and orders. If Contractor observes or discovers that any portion or portions of the Contract Documents are at variance with any such requirements, Contractor shall promptly submit a written Request for Clarification to Metro pursuant to Paragraph 3.2, which shall fully describe the variance. If Contractor performs Work contrary to codes, laws, ordinances, rules, regulations or orders without submitting such Request to Metro, Contractor shall assume full responsibility for such Work and shall bear all costs attributable thereto.

Persons authorized by Metro or any governmental body having jurisdiction over the Project may at any time enter upon any part of the work to ascertain whether Contractor is complying with such laws, ordinances, regulations or orders.

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14.5. No Additional Compensation Allowed for Compliance with Laws -- The Contract Amount includes full compensation for compliance with all applicable laws, rule, regulations, ordinances and orders and all amendments thereto and Contractor shall not make claim for nor be allowed any additional compensation for such compliance.

ARTICLE 15 TERMINATION OR SUSPENSION OF THE WORK

15.1. For Default of Contractor -- If Contractor should be adjudged bankrupt, or if Contractor should make a general assignment for the benefit of its creditors, or if a receiver should be appointed on account of insolvency, or if Contractor should refuse to or fail to supply enough properly skilled workers or proper materials for the efficient prosecution of the Work, disregard laws, ordinances or the instructions of Metro, or otherwise be in violation of any provision of the Contract, Metro may, without prejudice to any other right or remedy and after giving Contractor and Contractor's surety on the Performance Bond prior written notice, terminate the Contract or any portion of the Contract, which termination shall be effective ten (10) days after service of such notice. Such notice shall contain the reasons for the termination and shall state that unless, within ten (10) calendar days of service of the termination notice on Contractor, Contractor or its surety on the Performance Bond shall have cured or shall have made, in Metro's opinion, appropriate arrangements for prompt cure of all of the cause(s) for termination cited in the notice of termination, the Contract shall terminate.

Upon termination, Metro may take possession of the premises and of all materials, tools and appliances thereon as well as all other materials whether on the premises or not, for which Contractor has received partial payment, and finish the Work or the portion terminated by whatever method it may deem expedient.

In the event action as above indicated is taken by Metro, Contractor, or Contractor's surety, shall provide Metro with immediate and peaceful possession of all of the materials, tools and appliances located on the premises as well as all other materials whether on the premises or not, for which Contractor has received any progress payment. Upon termination, in the event that the surety does not complete the Contract, at the election of Metro, Contractor shall assign any and all subcontracts and material contracts to Metro or Metro's designee. Further, Contractor shall not be entitled to receive any further payment until the Work is completed. On completion of the Work, determination shall be made by Metro of the total amount Contractor would have been entitled to receive for the Work, under the terms of the Contract, had Contractor completed the Work. If the difference between said total amount and the sum of all amounts previously paid to Contractor, which difference will hereinafter be called the "unpaid balance," exceeds the expense incurred by Metro in completing the Work, including expense for additional managerial and administrative service, and all other costs, damages and expenses incurred by Metro due to Contractor's failure to complete the Contract, such excess will be paid to Contractor, with the consent of the surety. If, instead, the described expenses incurred by Metro exceed the unpaid balance, the amount of the excess shall be paid to Metro by Contractor or his/her surety. If only a portion of the Contract is terminated, this paragraph shall be deemed to apply to that portion of the Work only.

In addition to the above-mentioned right, Metro shall have the right, at its option, to suspend all or part of Contractor's performance under the Contract should any of the events occur which give Metro the right to terminate the Contract as above-described. In such event Metro shall give Contractor and Contractor's surety prior written notice of such suspension and Contractor shall stop or cause to stop all such work under the Contract immediately on receipt of such notice and shall not commence such work under the Contract again unless and until Contractor shall receive written notice from Metro to proceed. Metro shall not be responsible or liable to Contractor or others for any costs or expenses of whatever nature related to Contractor's failure to stop work as directed by Metro.

After receipt of a notice of termination or suspension, and except as otherwise directed by Metro, Contractor shall as regards those portions of the Contract terminated or suspended:

15.1.1. Stop work under the Contract on the date and to the extent specified in the notice of termination or suspension.

15.1.2. Place no further orders or subcontracts, or suspend the same, as applicable, for materials, services or facilities except as necessary to complete the portion of the work under the Contract, which is not terminated or suspended.

15.1.3. Terminate or suspend, as applicable, all orders and subcontracts to the extent that they relate to the performance of such work terminated or suspended.

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Metro may, at its discretion, avail itself of any or all of the above rights or remedies and its invoking of any one of the above rights or remedies will not prejudice or preclude Metro from subsequently invoking any other right or remedy set forth above or elsewhere in the Contract.

None of the foregoing provisions shall be construed to require Metro to complete the Work, nor to waive or in any way limit or modify the provisions of the Contract relating to the fixed and liquidated damages suffered by Metro on account of failure to complete the Project within the time prescribed.

15.2 Termination in the Public Interest -- It is hereby agreed that Metro has the right to terminate the Contract in whole or in part when Metro considers it to be in the public interest.

In the event the Contract is terminated as being in the public interest, Contractor shall be entitled to a reasonable amount of compensation for preparatory work and for all reasonable costs and expenses arising out of the termination, excluding lost profits.

In the event of termination under this Paragraph, the amount to be paid to Contractor shall be determined on the basis of the Schedule of Values in the case of any fully completed separate item or portion of the Work for which there is a separate or unit contract price and in respect to any other work under the Contract, Contractor will be paid a percent of the Contract price equal to the percentage of the work completed.

*** END OF SECTION ***

Electrical Services Sub-metering Project - OCC
Request for Bid (RFB 12-2055)

600 NE Grand Ave.
Portland, OR 97232-2736
503-797-1700

ATTACHMENT A

Division 26 Specifications Electrical (RFB 12-2055)

SPECIFICATIONS INDEX

DIVISION 26 – ELECTRICAL

260126	ACCEPTANCE TESTING OF ELECTRICAL SYSTEMS
260500	COMMON WORK RESULTS FOR ELECTRICAL
260610	EXISTING SYSTEMS
260523	CONTROL-VOLTAGE ELECTRICAL POWER CABLES
260526	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
260529	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
260533	RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS
260553	IDENTIFICATION FOR ELECTRICAL SYSTEMS
260913	ELECTRICAL POWER MONITORING

SECTION 260126 ACCEPTANCE TESTING OF ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 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. Section 260128 - Thermography.

1.2 SUMMARY

- A. Testing company shall be an independent company, separate from the contractor, sub contractors, suppliers and others involved with the project.

1.3 EQUIPMENT AND DEVICE TESTS

- A. Perform all equipment and device testing after installation and prior to substantial completion or owner occupancy, allowing enough time for corrective action of all deficiencies.
- B. Review manufacturer's installation instruction and confirm that equipment is installed in accordance with manufacturer's instructions.
- C. Prior to performing tests confirm that the equipment is clean and free of construction debris and dust.
- D. Phase Relationship Tests: Check connections to all new and existing equipment for proper phase relationship. During such check, disconnect all devices which could be damaged by the application of voltage or reversed phase sequence.
- E. Test the open/close or energize/de-energize operation of each switch, circuit breaker, contactor and other item of electrical control with the systems fully energized and operating. Each shall be tested three times. Test report shall include a list of equipment tested and the signed initials of the electricians performing the test on a device by device basis.
- F. Test new electrical equipment and existing electrical equipment that has been revised as a part of this contract.
- G. Inspect and test entire electrical systems provided by this contract to verify equipment and controls are correctly operating. Power system tests shall be performed 4 to 8 weeks after substantial completion, and at such time that the maximum possible load is connected (usually highest available occupancy at mid day.)

1.4 SUBMITTALS

A. General

- 1. Provide submittal information in accordance with Division 1 - General Requirements, Section 260500 - Common Work Results For Electrical and requirements described in this section.

B. Test Report

Division 26 Specifications

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1. The contractor shall maintain a written record of all tests and shall assemble and certify a final test report indicating all equipment tested and the results found for each. Any system, material, or workmanship which is found to have abnormal operation, shall be specifically identified.

1.5 QUALITY ASSURANCE

1. The contractor shall submit proof of company qualifications and personnel qualifications. Include resumes of recent experience (within the last three years) for the firm, engineers and technicians that will be assigned to the project. Include references with current phone numbers in the resume. The testing company shall have been regularly engaged in the testing of electrical materials, devices, installations, and systems for a minimum of five years.
2. Test Equipment: The contractor shall have a calibration program, and test instruments used shall be calibrated in accordance with NETA ATS. Provide a complete list of test equipment utilized in all of the testing. Include manufacturer, model number, current calibration date, next calibration date and age of equipment.
3. Testing, inspection, calibration and adjustments shall be performed by an engineering technician, certified by NETA or the National Institute in Engineering Technologies with a minimum of five years experience testing, calibrating electrical distribution and generation equipment, systems, and devices.

1.6 CLOSEOUT

1. Operational and Maintenance Manuals
 - a. All approved submittal information
 - b. Full test report in the O&M Manual
 - c. Completed form for each item of equipment tested
2. One electronic version of the test report on CD and in the latest version of Microsoft Word.
3. Schedule of recommended testing frequency for all equipment tested under this contract
4. Testing company test stamps or stickers on all tested equipment. Indicate testing company name, testing date and expiration date.

PART 2 - PRODUCTS

2.1 TESTING COMPANY

- A. Retain the services of an independent testing company that is qualified to test electrical equipment, and is a state approved testing company.
- B. Testing company shall prepare test reports on the systems they test.
- C. Testing company shall be an independent company, separate from the contractor, sub contractors, suppliers and others involved with the project.
- D. Test, inspect, calibrate, adjust electrical distribution system and generation equipment as listed in paragraph 3.1 – Acceptance Tests and Inspections. Provide written certification on company letterhead that the entire electrical installation complies with contract documents, code and proper system operation. Perform acceptance tests in accordance with manufacturer's recommendations, NFPA 70B and International Electrical Testing Association (NETA) testing specifications NETA ATS-2009.

Division 26 Specifications

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2.2 TEST EQUIPMENT

- A. The testing firm shall provide all apparatus and material required for testing. The testing firm shall use installation tools and test equipment which are designed for the specific task and shall use this equipment per the manufacturer's instructions. All test equipment shall have current calibration certification by a third party calibration laboratory, and shall have a signed and dated calibration sticker affixed to the device. Calibration shall be traceable to the National Bureau of Standards and be less than 6 months since last calibration. Defective test equipment and installation tools shall not be used. Installation tools such as torque wrenches shall be calibration certified.

PART 3 - EXECUTION

3.1 ACCEPTANCE TESTS AND INSPECTIONS

- A. Testing companies shall perform acceptance tests and inspections. Test methods, procedures, and test values shall be performed and evaluated in accordance with NETA ATS, the manufacturer's recommendations, and as required by each applicable specification section. Equipment shall be placed in service only after completion of required tests and evaluation of the test results has been completed. The following testing shall be performed:

1. Section 26 09 13 Electrical Power Monitoring

3.2 PROJECT DOCUMENTS

- A. Deliver applicable project documents to testing company two weeks prior to testing. As a minimum include:
1. Division 26 Specification
 2. Electrical Floor Plans showing equipment to be tested.
 3. Electrical One Line Diagrams
 4. Submittals of Manufacturers Data and Shop Drawings including engineers review letter of all systems to be tested.
 5. Coordination Study and device settings for all adjustable devices

3.3 SCHEDULE

- A. Perform all testing after installation and before energizing. All primary systems shall pass tests prior to placing in service. Notify Owner's Representative 10 working days prior to performance of any test.

3.4 TEST REPORTS

- A. The testing firm shall prepare test reports including description of project, description of equipment tested, description of test, test results, conclusions and recommendations, retesting results and list of test equipment used and calibration date.
- B. One copy of each test report shall be delivered directly to the electrical engineer and Owner within 7 calendar days of the test.
- C. Insert a copy of each test report in the operation and maintenance manuals.

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3.5 RETESTING

- A. Any fault in material or in any part of the installation revealed by these tests shall be investigated, replaced or repaired by the Contractor and the same test repeated at Contractor's expense until no fault appears.

3.6 LABELS

- A. Upon completion of the tests, a label shall be attached to all serviced devices. These labels shall indicate date serviced and the testing company.

3.7 OBSERVATIONS BY ENGINEER

- A. Contractor shall remove and replace covers of electrical equipment, open manholes and remove/replace ceiling tiles to permit engineer to observe equipment and wiring provided. Furnish ladder and flashlight.

3.8 TROUBLESHOOTING

- A. If a system or device provided under this contract does not operate per manufacturers specifications contractor shall provide qualified men with tools and test equipment to find and repair problem at contractor's expense.

3.9 SYSTEM ACCEPTANCE

- A. Final acceptance of the system is contingent upon satisfactory completion of acceptance tests and inspections. A representative from the testing company shall be present when equipment tested by the company is initially energized and placed in service.

End of Section

Division 26 Specifications Electrical (RFB 12-2055)

SECTION 260500 COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section includes general electrical requirements for all Division 26 work and is supplemental and in addition to the requirements of Division 1.
- B. It is the intention of this Division of the Specifications and the Contract Drawings to describe and provide for the furnishing, installing, testing and placing in satisfactory and fully operational condition all equipment, materials, devices and necessary appurtenances to provide a complete electrical system. Provide all materials, appliances and apparatus not specifically mentioned herein or shown on the drawings, but which are necessary to make a complete, fully operational installation of all electrical systems shown on the contract drawings or described herein. Connect equipment and devices furnished and installed under other Divisions of this specification (or the Owner) under this Division.
- C. Workmanship shall be of the best quality and competent and experienced electricians shall be employed and shall be under the supervision of a competent and experienced foreman.
- D. The drawings and specifications are complimentary and what is called for (or shown) in either is required to be provided as if called for in both. Where conflicting information occurs within the drawings and specifications or between the drawings and specifications, the more expensive alternative shall be used as a basis for bidding and construction.
- E. See Division 01 for sequence of work.

1.3 ALTERNATES

- A. The documents are noted to have the Contractor provide alternate bid pricing for specific portions of the project. The Contractor shall provide individual unit pricing for the items specified. The alternate bid shall include:
 - 1. Unit pricing for each metering point designated on Sheet E0.01. Pricing shall capture the following:
 - a. Metering equipment; including all labor and material.
 - b. Interface with existing Alerton monitoring and control system; including all labor and material.
 - c. Programming of existing Alerton monitoring and control system; including all labor and material.

1.4 WORK IN OTHER DIVISIONS

- A. See all other specifications for other work which includes but is not limited to:

- Communications
- Cutting and Patching
- Firestopping
- Equipment Wiring
- Painting, Refinishing and Finishes

Division 26 Specifications

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1.5 CODES, PERMITS, INSPECTION FEES

- A. The following codes and standards are referenced in the Division 26 specifications. Perform all work and provide materials and equipment in accordance with the latest referenced codes and standards of the following organizations:
1. American National Standards Institute (ANSI)
 2. National Electrical Manufacturer's Association (NEMA)
 3. National Fire Protection Association (NFPA)
 4. Underwriter's Laboratories (UL)
- B. Install the electrical systems based on the following:
- | | |
|---------|---|
| NFPA 70 | National Electrical Code as adopted and amended by the Local Jurisdiction. |
| IBC | International Building Code as adopted and amended by the Local Jurisdiction. |
- C. The referenced codes establish a minimum level of requirements. Where provision of the various codes conflict with each other, the more stringent provision shall govern. If any conflict occurs between referenced codes and this specification, the codes are to govern. Compliance with code requirements shall not be construed as relieving the Contractor from complying with any requirements of the drawings or specifications which may be in excess of requirements of the governing codes and rules and not contrary to same.
- D. Obtain from the Owner all licenses, permits and inspections required by laws, ordinances and rules governing work specified herein. Arrange for inspection of work by the inspectors and give the inspectors all necessary assistance in their work of inspection.

1.6 COORDINATION

- A. Coordinate work with that of the other Contractors and/or other trades doing work on the project. Examine all drawings and specifications of other trades for construction details and coordination. Make every reasonable effort to provide timely notice of work affecting other trades to prevent conflicts or interference as to space requirements, dimensions, openings, block-outs, sleeving or other matters which will cause delays or necessitate work-around methods.
- B. Obtain submittals and shop drawings of all equipment with electrical connections furnished under other divisions of the specification and by the Owner. Provide all wiring in accordance with specific equipment requirements. Immediately advise the Owner's Representative of any changes which may affect the contract price.
- C. Special attention is called to the following items. Coordinate all conflicts prior to installation:
1. Location of grilles, pipes, sprinkler heads, ducts and other mechanical equipment so that all electrical outlets, lighting fixtures and other electrical outlets and equipment are clear from and in proper relation to these items.
 2. Location of cabinets, counters and doors so that metering equipment and raceway systems are clear from and in proper relation to these items.
 3. Recessing and concealing electrical materials in CMU walls, concrete construction and precast construction.
 4. At each switchboard, panelboard and motor control center location the Contractor shall monitor the work of all trades to assure that the space and clearance requirements of code are met.

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5. Review specifications for other Divisions of the work to determine where other Divisions are requiring electrical connections. Verify electrical provisions shown on contract drawings by examining shop drawing submittals of other Divisions prior to submission to the owner. Do not proceed with ordering of supporting electrical equipment, such as circuit breakers, until electrical characteristics are verified. Proceed with rough only after verification of shop drawings.
- D. Digital format copies of bid drawings will be furnished to the successful bidder. Augment bid documents with additional information to ensure coordination between trades. Provide digital format electrical systems drawings showing all ceiling devices, fixtures, raceways and cable tray locations and routing to mechanical contractor to be used for coordination drawings provided by mechanical contractor. Include dimensions and elevations of devices, fixtures, and raceways.
- E. Furnish, install and place in satisfactory condition all raceways, boxes, conductors and connections and all other materials required for the electrical systems shown or noted in the contract documents to be complete, fully operational and fully tested upon completion of the project. Raceways, boxes and ground connections are shown diagrammatically only and indicate the general character and approximate location. The layout does not necessarily show the total number of raceways or boxes for the circuits required, nor are the locations of indicated runs intended to show the actual routing of the raceways.
- Where routings of major raceways and telecommunication pathways are indicated on plan sheets, the routing information supplements the information on diagrams. If no routing information is shown, route the systems in a manner that will coordinate with new and existing infrastructure and the work of other trades.
- F. Provide inserts or sleeves for outlet boxes, conductors, cables and/or raceways as required. Coordinate the installation thereof with other trades.
- G. The Contractor will not be paid for relocation of work, cuttings, patching and finishing required for work requiring reinstallation due to lack of coordination prior to installation.

1.7 WARRANTY

- A. Refer to General Conditions of the Contract.

1.8 CORRECTION OF WORK

- A. Within one year after the date of Substantial Completion of the work, the Contractor shall correct any work found to be not in conformance with the Contract Documents promptly after written notice from the owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. This obligation shall survive acceptance of the work under this Contract and termination of the Contract. The Owner shall give such notice promptly after discovery of the condition.

1.9 ITEMIZED SCHEDULE OF COSTS

- A. Complete the Schedule of Values included at the end of this section. This schedule shall be adhered to for the electrical contractor to facilitate analysis and approval of the monthly progress billings. Refer to the Supplementary Conditions of General Contract and Division 1 - General Requirements for details, and conform thereto. Provide a copy directly to Sparling.

1.10 MATERIAL AND LABOR ALLOWANCE

- A. Provide a material and installation allowance for additions or modifications directed by the Owner. As the work progresses it may become necessary to modify or add to portions of the electrical systems. Examples may be additional receptacles, creation of a small office space in an unfinished part of the building, resolving a hidden condition, or adding some work as part of a response to a contractor's request for information.

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- B. The electrical material and installation allowance shall appear as a line item on the Schedule of Values. This allowance is independent of any other allowance or requirement for work listed elsewhere in this contract. This material and labor allowance is independent of and in addition to any requirements for similar work identified on the drawings.
- C. The allowance will not be used for electrical work in areas that have received their final Owner's Representative final finish, unless the electrical work will not affect the finish. The units under this allowance shall include all direct and indirect, as well as supportive costs of work from other trades.
- D. If the additions or modifications are needed for items that are not specifically listed, an "equivalent value" will be negotiated for items that are on the list, or at the Owner's discretion, a change order will be issued. If after substantial completion of the work there are remaining quantities of items which are unused the Owner may direct that the material portion of the items be turned over to the Owner, or negotiate a credit to the contract.
- E. The contractor shall create an Excel software based spreadsheet for tracking the usage of materials in this allowance. For each item identify the mechanism used to detract materials from the allowance (RFI #, etc.) the quantity of the allowance used, and the quantity remaining. Usage shall be as directed by the Owner, or as negotiated.
- F. Provide Material and Labor Allowance for the following items:
1. Raceway: EMT behind concealed spaces but without the concealing element in place, or EMT in open spaces, or EMT surface mounted, complete with field bends, couplings, and pull boxes. Installed 10 feet above the floor, with pull boxes on 25-foot centers, and offsets around existing systems at 15-foot intervals. Quantities as follows:
 - 3/4" [1000] Feet
 - 1" [1000] Feet
 - 1-1/4" [250] Feet
 2. Wire installed in raceway, with an average of 5 wires per raceway, with a pull length and termination at 25-foot intervals:
 - #12 [4000] Feet
 - CAT6 [1000] Feet
 - STP [1000] Feet
 3. Outlet box, coverplate, single gang: Quantity 25.
 4. New metering equipment:
 - Emon meter Quantity [5]
 - 25-200A CT Quantity [5]
 - 400A CT Quantity [5]
 - 800-1600A CT Quantity [5]
 - 3200A CT Quantity [3]

1.11 SUBMITTALS AND SHOP DRAWINGS

- A. Submittals and Shop Drawings: Schedule so as not to delay construction schedule and no later than 60 days after award of contract, submit common brochure(s) with index and divider tabs by specification section, containing all required catalog cuts. Allow two weeks for review for each submittal and resubmittal. Incomplete submittals and shop drawings which do not comply with these requirements will be returned for correction, revision and resubmittal. See General Conditions for format, quantity, etc.

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- B. Submit in a three ring binder with hardboard covers. Submittals shall show:
1. Indicate listing by UL or other approved testing agency.
 2. Highlight with yellow or blue marker adequate information to demonstrate materials being submitted fully comply with contract documents.
 3. Review and check all material prior to submittal and stamp "Reviewed and Approved".
- C. Shop drawings shall show:
1. Ratings of items and systems.
 2. How the components of an item or system are assembled, interconnected, function together and how they will be installed on the project.
 3. System layout floor plans with complete device layout, point-to-point wiring connection between all components of the system, wire sizes and color coding.
 4. Coordinate with other division shop drawings and submittals. Identify interface points and indicate method of connection.
 5. Electrical rooms: Submit 1/2" = 1'0" detail plans and wall elevations of each room showing actual size of equipment in place. Identify coordinating elements such as structural beams or mechanical systems. Submittals shall show coordination among all suppliers of equipment, including power components, fire alarm, racks, nurse call, public address, security, etc. Submit room layouts at same time as material submittals, and prior to installation of any equipment.
- D. The Contractor agrees:
1. Submittals and shop drawings processed by the Owner's Representative are not change orders.
 2. The purpose of submittals and shop drawings by the Contractor is to demonstrate to the Engineer that the Contractor understands the design concept.
 3. Submittals demonstrate equipment and material Contractor intends to furnish and install and indicate detailing fabrication and installation methods Contractor intends to use.
 4. To accept all responsibility for assuring that all materials furnished under this Division of the specifications meet, in full, all requirements of the contract documents.
 5. To pay for Engineers review cost of submittal review beyond one resubmittal.
- E. The Engineer's review is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Corrections or comments made during this review do not relieve contractor from compliance with the requirements of the drawings and specifications. Contractor is responsible for: Dimensions which shall be confirmed and correlated at the job site; fabrication process and techniques of construction; coordination of his work with that of all other trades; performing his work in a safe and satisfactory manner.
- F. Submittals and shop drawings are required per the submittals schedule at the end of this Section.

1.12 PROJECT CLOSE-OUT

- A. Coordinate with close-out provisions in Division 01 - General Requirements.
- B. Request For Final Punchlist
1. To request a final electrical punch list, forward a letter to Sparling, Inc. stating; "The electrical work on this project is complete, all punch list items to date are complete, items a. - n. in the Punchlist Procure

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paragraph in Section 260500 - Common Work Results For Electrical are complete and the project is ready for final punch list observation."

2. Project Punchlist Procedure: Perform the following procedures for project closeout of electrical portions of work.
 - a. Perform testing, tests and documentation per Section 260126 - Maintenance Testing of Electrical Systems.
 - b. Provide engraved nameplates on electrical equipment.
 - c. Refinish electrical equipment finishes which are damaged.
 - d. Color code junction boxes per Section 260533 - Raceways and Boxes For Electrical Systems.
 - e. Obtain final electrical permit inspection. Include copies in O & M manual.
 - f. Provide written warranty in O & M per the General Conditions of the Contract.
 - g. Furnish Record Drawings per this section. Obtain signature on Job Completion Form.
 - h. Furnish O & M Manuals per this section. Obtain signature on Job Completion Form.
 - i. Give instruction periods to owner's personnel per this section. Obtain signature on Job Completion Form.
 - j. To request final acceptance of project, fill out Job Completion Form in this section and forward to Sparling. Note: If inspectors have not signed form, a copy of signed-off permits will suffice.
 - k. Include with Job Completion Form, a copy of the final punch list with the word "DONE", and the date and Contractor's initials after each item on the list.

1.13 ELECTRICAL EQUIPMENT OPERATION AND MAINTENANCE (O&M) MANUALS

- A. Provide O&M manuals required in Division 01 - General Requirements plus one manual for Sparling for all equipment furnished under Division 26 - Electrical of the specifications. Submit a preliminary copy, complete except for the bound cover, 60 days prior to completion of the project for checking and review. Deliver final bound corrected copies as noted in Division 1 - General Requirements plus a copy to Sparling 20 days prior to scheduled instruction periods. Obtain a receipt for the manuals and forward a copy of the receipt to the Engineer with the Job Completion Form.
- B. The information included must be the exact equipment installed. Where sheets show the equipment installed and other equipment, the installed equipment shall be neatly and clearly identified on such sheets.
- C. These O&M manuals shall contain all the information needed to operate and maintain all systems and equipment provided in the project. Present and arrange information in a logical manner for efficient use by the Owner's operating personnel. The information provided shall include but not be limited to the following:
 1. Equipment manufacturer, make, model number, size, nameplate data, etc.
 2. Description of system configuration and operation including component identification and interrelations. A master control schematic drawings(s) may be required for this purpose.
 3. Dimensional and performance data for specific unit provided as appropriate.
 4. Manufacturer's recommended operation instructions.
 5. Manufacturer's recommended lubrication and servicing data including frequency.
 6. Complete parts list including reordering information, recommended spares and anticipated useful life (if appropriate). Parts lists shall give full ordering information assigned by the original parts manufacturer. Relabeled and/or renumbered parts information as reassigned by equipment supplier not acceptable.
 7. Shop drawings.
 8. Wiring diagrams.
 9. Signal equipment submittals shall contain step-by-step circuit description information designed to acquaint maintenance personnel with equipment operation in each mode of operation.

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10. A complete list of local (nearest) manufacturer representative and distributor contacts for each type of equipment and manufacturer. Include name, company, address, phone, fax, e-mail address, and web site.
 11. A complete list of local (nearest) manufacturer representative and distributor contacts for each type of equipment and manufacturer. Include name, company, address, phone, fax, e-mail address, and web site.
- D. Furnish complete wiring diagrams for each system for the specific system installed under the contract. "Typical" line diagrams will not be acceptable unless revised to indicate the exact field installation.
- E. Group the information contained in the manuals in an orderly arrangement by specification index. Provide a typewritten index and divider sheets between categories with identifying tabs. Bind the completed manuals with hard board covers not exceeding 5" thick. (Provide two or more volumes if required.) Signal and communication systems shall be in separate volumes. Imprint the covers with the name of the job, Owner, Owner's Representative, Electrical Engineer, Contractor and year of completion. Imprint the back edge with the name of the job, Owner and year of completion. Hard board covers and literature contained may be held together with screw post binding.

1.14 INSTRUCTION PERIODS

- A. After substantial completion of the work and 20 days after the O&M manuals have been delivered to the owner and after all tests and final inspection of the work by the Authority(s) Having Jurisdiction; demonstrate the electrical systems and instruct the Owner's designated operating and maintenance personnel in the operation and maintenance of the various electrical systems. The Contractor shall arrange scheduled instruction periods with the Owner. The Contractor's representatives shall be superintendents or foremen knowledgeable in each system and suppliers representatives when so specified. When more than one training session is specified, the second session shall be 30 to 90 days after the first as agreed to by the Owner.
- B. Include in each instruction session an overview of the system, presentation of information in maintenance manuals with appropriate references to drawings. Conduct tours of the building areas with explanations of maintenance requirements, access methods, servicing and maintenance procedures, equipment cleaning procedures and adjustment locations.
- C. Include the following scheduled instruction periods:
- | | 1st Session | 2nd Session |
|--------------------------------|-------------|-------------|
| 1. Electrical Power Monitoring | [4] hours | [4] hours |
- D. Provide one professionally produced digitally recorded or video tape of each training session in DVD format. Furnish two (2) copies to the owner.

1.15 RECORD DRAWINGS

- A. Continually record the actual electrical system(s) installation on a set of prints kept readily available at the project during construction. These prints shall be used for this purpose alone.
1. Mark record prints with red erasable pencil. Mark the set to show the actual installation where the installation varies substantially from the work as originally shown.
 2. Accurately locate with exact dimensions all underground and underslab raceways and stub-outs.
 3. Note changes of directions and locations, by dimensions and elevations, as utilities are actually installed.
 4. Include addenda items and revisions made during construction.

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5. Erase conditions not constructed or "X-out" and annotate "not constructed" to clearly convey the actual "as constructed" condition.
 6. Organize record drawings sheets in manageable sets, bind and print suitable titles, dates and other identification on the cover of each set.
- B. Transmit the record drawing set to the Owner's Representative at the completion of the work. Final payment to the contractor will not be authorized until these prints have been submitted to and accepted by the Owner's Representative.
- C. Transfer the changes marked up on the record prints into AutoCAD 2008 (or higher) at the completion of the work. Provide two (2) sets of prints, one set of fixed line reproducible drawings and one set of AutoCAD drawing files on CD Rom. Transmit drawings, CAD files and the record drawing mark-ups to the Owner's Representative. Final payment to the contractor will not be authorized until these documents have been submitted to and accepted by the Owner's Representative.

1.16 FINAL ACCEPTANCE REQUEST

- A. Submit to the Owner's Representative, with a copy to the Sparling Engineer, a Sparling Job Completion Form (form attached in this section) properly filled out prior to the time final acceptance of the electrical work is requested.

1.17 ABBREVIATIONS AND DEFINITIONS

- A. When the following abbreviations and definitions are used in relation to the work for Division 26 they shall have the following meanings:

<u>Item</u>	<u>Meaning</u>
AHJ	Authority Having Jurisdiction.
Boxes	Outlet, Junction or Pull Boxes.
Code	All applicable codes currently enforced at project location.
Compression	Compressed using a leveraged powered (hydraulic or equivalent) crimping tool.
Connection	All materials and labor required for equipment to be fully operational.
Exterior Location	Outside of or penetrating the outer surfaces of the building weather protective membrane.
Fully Operational	Tested, approved, and operating to the satisfaction of the AHJ, manufacturer and contract documents.
Furnish	Deliver to the jobsite
Install	To enter permanently into the project and make fully operational.
Kcml	Thousand circular mils (formerly MCM).
Mfr.	Manufacturer.
NEC	National Electrical Code, National Fire Protection Association, Publication #70.
NIC	Not in Contract.
Noted	Shown or specified in the contract documents.
Provide	Furnish and install.
Required	As required by code, AHJ, contract documents, or manufacturer for the particular installation to be fully operational.
Shown	As indicated on the drawings or details.
Wiring	Raceway, conductors and connections.

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PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials and equipment installed shall have been tested and listed by Underwriters Laboratories or other approved testing organization and shall be so labeled unless otherwise permitted by the Authority Having Jurisdiction (Inspector).
- B. All materials to be new, free from defects and not less than quality herein specified. Materials shall be designated to insure satisfactory operation and operational life in the environmental conditions which will prevail where they are being installed.
- C. Each type of materials furnished shall be of the same make, be standard products of manufacturers regularly engaged in production of such materials and be the manufacturer's latest standard design.
- D. All materials, equipment and systems furnished that include provisions for storing, displaying, reporting, interfacing, inputting, or functioning using date specific information shall perform properly in all respects regardless of the century. Any interface to other new or existing materials, equipment or systems shall function properly and shall be century compliant, both in regards to information sent and received.

2.2 SUBSTITUTION OF MATERIALS

A. No Substitute:

Where a specified product is indicated "no substitute", it is the intent of this specification to require new materials to be compatible with the existing installation or as specifically requested by the owner. To this end certain materials and systems no substitution will be allowed.

B. Prior to Bid Opening:

Acceptance of products other than those specified will be issued by addendum to the bid documents only after the following requirements are met and the proposed listed material is determined to meet or exceed the requirements:

1. Requests for listing to be original material, clearly indicating the product fully complies with contract documents and be neatly marked with yellow felt tip marker to clearly define and describe the product for which listing is requested.
2. Include certified laboratory test report for lighting fixtures.
3. Samples shall be submitted if requested.
4. Requests shall be received 10 days prior to bid opening.
5. Requests containing insufficient information to confirm compliance with contract documents will not be considered.

C. After Award of Contract:

Substitution of products will be considered after award of contract only under the following conditions:

1. The Contractor shall have placed orders for specified materials promptly after contract is awarded and the specified products can not be delivered to the project to meet the Owner's construction schedule.
2. The reason for the unavailability is beyond the Contractor's control, i.e., due to strikes, bankruptcy, discontinuance of manufacturer, acts of God.
3. The specified product is no longer manufactured.

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4. There is compelling economic advantage to the Owner.

- D. In all cases, should a substituted material result in requiring electrical system or building modifications; the Contractor alone shall pay all costs to provide these modifications including all costs to the Engineer and Owner's Representative for redesign, and updating of record drawings required to accommodate the required modifications.

2.3 NAMEPLATES

- A. Provide nameplates per Section 260553 - Identification for Electrical Systems.

PART 3 - EXECUTION

3.1 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft. Handle all equipment carefully to prevent damage, breakage, denting, and scoring of finishes. Do not install damaged equipment.
- B. Store products subject to damage by the elements above ground, undercover in a weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instruction.

3.2 CUTTING BUILDING CONSTRUCTION

- A. Obtain permission from the Owner's Representative and coordinate with other trades prior to cutting. Locate cuttings so they will not weaken structural components. Cut carefully and only the minimum amount necessary. Cut concrete with diamond core drills or concrete saws except where space limitations prevent the use of such tools.
- B. All construction materials damaged or cut into during the installation of this work must be repaired or replaced with materials of like kind and quality as original materials by skilled labor experienced in that particular building trade.

3.3 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire rated floor and wall assemblies to maintain fire-resistance rating of the assembly. Firestopping materials and installation requirements are specified in Section 260523 "Control-Voltage Electrical Power Cables".

3.4 PAINTING

- A. Items furnished under this Division that are scratched or marred in shipment or installation shall be refinished with touchup paint selected to match installed equipment finish.

3.5 EQUIPMENT CONNECTION

- A. For equipment furnished under this or other Divisions of the specifications, or by owner, provide complete all electrical connections necessary to serve such equipment and provide required control connections to all equipment so that the equipment is fully operational upon completion of the project. Provide disconnect switch as required by code whenever an equipment connection is shown on the drawings.
- B. Investigate existing equipment to be relocated and provide new connections as required.

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- C. Obtain rough-in requirements for equipment furnished under other divisions of this specification prior to roughing-in. Review shop drawings and submittals of other Divisions to determine requirements.

3.6 CLEAN UP

- A. Contractor shall continually remove debris, cuttings, crates, cartons, etc., created by his work. Such clean up shall be done daily and at sufficient frequency to eliminate hazard to the public, other workmen, the building or the Owner's employees. Before acceptance of the installation, Contractor shall carefully clean cabinets, panels, lighting fixtures, wiring devices, cover plates, etc., to remove dirt, cuttings, paint, plaster, mortar, concrete, etc. Blemishes to finished surfaces of apparatus shall be removed and new finish equal to the original applied.
1. Wipe surfaces of electrical equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

3.7 TESTING AND DEMONSTRATION

- A. Demonstrate that all electrical equipment operates as specified and in accordance with manufacturer's instructions. Perform tests in the presence of the Owner or Engineer. Provide all instruments, manufacturer's operating instructions and personnel required to conduct the tests. Repair or replace any electrical equipment that fails to operate as specified and or in accordance with manufacturer's requirements.

End of Section

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260510 EXISTING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 RELATED WORK

- A. Same as in Section 260500 - Common Work Results For Electrical.

1.3 EXISTING SYSTEMS MAINTAINED

- A. Prior to bidding, existing systems and systems adjacent to the work shall be investigated thoroughly. Any damage resulting from performance of work under this contract shall be repaired to assure continuing operation and integrity during and at completion of the project at no increase in contract cost.
- B. The building will continue operation during the work and it is essential that no systems operation be interrupted unless scheduled with the Owner's Representative. For bidding purposes, the Contractor shall assume all work to be done "hot". Contractor shall assume responsibility for unscheduled interruptions and expedient repair. Any damage resulting from performance of work under this contract shall be immediately repaired to assure continuing operation and integrity at no increase in contract cost.
- C. Provide new raceway support system for all existing raceways above existing or new accessible ceilings in the project area in accordance with Section 260533 - Raceways and Boxes for Electrical Systems. (Note: The original construction consists of raceways being supported by the ceiling suspension system which is unacceptable to the Electrical Inspector.)
- D. Maintain existing systems not identified for demolition. Maintaining existing systems includes relocating the systems to coordinate with work of this contract, when work of this contract cannot be done while the existing system is in its present location. Examine drawings of all disciplines to determine where work of other trades will or is likely to require relocation of existing systems. Relocation of any system shall be permanent.
- E. Exact relocation requirement of existing systems to remain to be based on detailed coordination with other trades. Contractor to provide proposed locations of relocated devices to Owner's Representative for approval prior to commencement of work.

1.4 EXISTING SYSTEMS CONCEALED

- A. The electrical drawings show portions of the existing electrical systems which are to remain, be removed or be modified as a part of the Contractor's work. Concealed features of the existing systems are derived from record drawings and the Engineer's best judgment of the configuration, but no guarantee is made as to their correctness.
- B. The Contractor shall inspect the existing installation prior to bidding and shall make his own judgment as to the work required to provide a complete installation within the intent of the contract documents.

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1.5 DEMOLITION WORK

- A. All demolition work required under this contract is not shown on the drawings.
- B. The demolition drawings show portions of the existing systems which are derived from record drawings. The contractor shall assume there is 20% more electrical systems than what is shown on the demolition drawings.
- C. The Contractor shall inspect the existing installation prior to bidding and shall make his own judgment as to the work required to provide complete demolition within the intent of the contract documents.

1.6 TEMPORARY ELECTRICAL EQUIPMENT

- A. Removing, temporary hanging by chains and reinstalling in ceilings of light fixtures, speakers, detectors, exit signs and other electrical equipment is not shown on the drawings. The Contractor shall investigate the ceiling demolition work and include this work in the bid. The sequence of work shall be (1) Remove and store fixtures, detectors and speakers along with removal of ceiling, (2) Provide temporary support for wired fixtures and devices to be reinstalled in new ceiling at approximately the same location. Use chains for lighting fixture support, (3) Clean and reinstall in the new or replaced ceilings. Provide new lamps when so noted. Provide temporary relocation of exit signs to original location when exit is reactivated.
- B. Provide temporary lighting, exit lighting, and fire notification in areas of construction that will have ongoing or intermittent public access. Temporary lighting shall comply with IES standards and other provisions of these specifications. Selected light fixtures must have battery backup to allow for egress at all times. Indicate path to nearest exit with exit signs. All temporary systems shall be removed after they are no longer in operation.

1.7 WORK OUTSIDE OF REMODEL AREAS

- A. Caution - this work is not shown on the contract documents. Provide new wiring systems in concealed ceiling spaces to switchboards, panelboards, communication and signaling and system control panels. Remove and relocate electrical equipment in the way of other trades work installed under this contract. Spaces above existing ceilings are highly congested. Route wiring around obstructions and provide pull boxes per code.
- B. Review work of other trades and disciplines for similar impacts. Remove and relocate electrical equipment in the way of work of other trades.
- C. For work outside of the project area assume that removal and replacement of ceiling tiles is required in all finished areas. Spaces above existing ceilings are highly congested. Route wiring around obstructions and provide pull boxes per code.

1.8 PREMIUM TIME

- A. Premium time shall be included in the Base Bid for electrical system(s) outages and for other work as required by the schedule, as shown on the drawings and as noted in other Divisions of the Specifications.

1.9 EXISTING STRUCTURAL CONDITIONS

- A. Existing floor slabs are post tensioned concrete slabs. Contractor shall penetrate floors by core drilling only. Extreme caution is required to avoid cutting post tensioned cables. X-ray of floor shall be performed prior to selecting location of cores and anchors for electrical equipment. Cores and anchors shall be kept 2" minimum away from the post tensioning cables.

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PART 2 - PRODUCTS

2.1 EXISTING MATERIALS

- A. All materials which are a part of the building shall remain the property of the Owner.

2.2 EXISTING MATERIALS TO BE REINSTALLED

- A. Existing materials and equipment (except interior, undamaged raceways) that are removed as a part of the work or stored in surplus shall not be reinstalled as a part of the new systems unless specifically noted or authorized in writing by the Owner's Representative. Forward a copy of the authorization to the Engineer. The requirements of the specifications (i.e., condition, installation, testing, etc.) shall apply as if the materials were new, furnished by the Contractor.

2.3 EXISTING MATERIALS NOT TO BE REINSTALLED

- A. In coordination with the Owner's Representative, these materials shall be made available for his inspection and decision as to whether the Owner will retain possession. Items selected for retention shall be turned over to the Owner. These items shall be delivered to a location on the premises selected by the Owner. Take reasonable care to avoid damage to this material. If the Contractor fails to conform to this requirement, he shall purchase and turn over to the Owner replacement material of like kind and quantity.
- B. All material not selected for retention by the Owner and debris shall be legally disposed of by the Contractor.

PART 3 - EXECUTION

3.1 EXISTING CONDITIONS

- A. Examine the structure, building, and conditions under which electrical work is to be installed for conditions detrimental to proper and timely completion of electrical work. Do not proceed with work until deficiencies or detrimental conditions have been corrected. Report deficiencies or detrimental conditions of existing electrical work which might be unsuitable to connect with or receive other work. Failure to so report shall constitute acceptance of other work as being fit and proper for the reception of electrical work.

3.2 DEMOLITION

- A. Switchboards, panelboards, signaling and communication systems, other electrical equipment free standing or surface mounted, raceway (exposed) and conductors; which are no longer in service presently or as a result of this contract shall be removed. Unused flush mounted devices, outlet and other boxes in finished areas shall be removed from wall and the remaining hole patched to match adjacent wall surfaces. Unused raceways and sleeves shall be cut flush at ceiling, floor or wall and filled with grout. Unused raceways above accessible ceilings shall be removed.
- B. Contractor shall remove all floor, wall or ceiling mounted electrical equipment in the "Demolition Area" indicated on the drawing even if the equipment/or device is not shown on the project drawings. If Contractor questions whether a particular device is to be removed notify the Owner's Representative noting type and location of device. If so directed the Contractor shall maintain the existing device in service without any change in contract price.
- C. Contractor shall divert all electrical demolition materials including, but not limited to copper and aluminum cabling, fixture ballasts and lamps, enclosures, raceways and busducts, to either a local recycling station or to the on-site recycling station as provided by the General Contractor or Owner.

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3.3 POWER OUTAGES

- A. This facility will be in operation 24 hours a day seven days a week during the construction work; therefore it is required that the Contractor fully schedule electrical system(s) outages with the Owner's Representative. Contractor shall work closely with Owners' Representative to assure the Owner fully understands the extent of each outage. Owner maintains the right to limit the extent and length of any given outage. Assume all outages to Electrical systems(s) in Owner occupied areas will require premium time and that temporary electrical work may be required to limit the duration of outages.
- B. Temporary generator(s) will be required for any work that takes the existing generator system out of service or off-line from any portion of the emergency power distribution.
- C. Submit a written request for a power outage at least one week in advance identifying the areas and systems that will be affected, time and duration of the power outage. The Contractor shall receive written authorization to proceed with the outage and shall re-notify the Owner verbally at least one hour prior to the outage and also notify the Owner when the outage is completed.
- D. **Unscheduled Outages:** In the event that the Contractor's work causes or contributes to an electrical system(s) outage (or other system fault), the Contractor is responsible for immediately correcting the problem. Included (as examples) shall be any premium time required to stay on the job site until problem is corrected and air freight for parts not locally available. If the Contractor fails to correct the problem, the Owner's cost of correcting the problem shall be deducted from the Contractor's contract amount.

3.4 EXISTING SYSTEMS MAINTAINED

- A. **General**
Re-route existing circuits that are interrupted as a result of this contract that serve devices to remain in service.
 - 1. **Power Circuits (Including removal or relocation of existing panelboards).**
 - a. Prior to demolition work trace out and identify each branch circuit and feeder circuit that serves loads in occupied areas.
 - b. Provide temporary wiring, schedule outage and reconnect loads to temporary wiring.
 - c. Provide new wiring in new location.
 - d. Schedule outage, disconnect temporary wiring, and connect loads to new wiring. Remove temporary wiring.
 - e. Outage for each circuit shall not be more than 20 minutes.
 - 2. **Signal and Communication Systems**
 - a. Prior to demolition trace out and identify device and systems being served.
 - b. Provide temporary wiring to maintain operation of system throughout facility.
 - c. Schedule outage and connect to temporary wiring and test system.
 - d. Provide new wiring on new location.
 - e. Schedule outage, disconnect temporary wiring, and reconnect to new wiring. Remove temporary wiring.
 - f. Outage for each system shall not be more than 20 minutes.

3.5 ACCESS TO PERFORM WORK

- A. Carefully remove, store or temporarily hang and re-install in undamaged condition all electrical equipment, lighting fixtures and ceiling tiles where access to perform work is required. Clean prior to re-installation. Provide new lamps when so noted.

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3.6 NEW DEVICES IN REMODEL AREAS

- A. Provide flush mounting for devices in existing walls. Fish conduit in wall. Where existing boxes are indicated to be reused, extend box as necessary and provide new devices and plates.
- B. Contractor is cautioned that the existing building contains clay tile and concrete walls. New devices may require cutting and patching, and it shall be the responsibility of the contractor to provide all cutting and patching required for the installation of the Division 26 work. Contractor shall investigate existing areas prior to bid and shall include all costs of such work in the bid.
- C. This facility has wiring embedded in raceways in concrete slabs. Provide new concealed wiring to last outlet or pull box before homerun to panel.

End of Section

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260523 CONTROL-VOLTAGE ELECTRICAL POWER CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. UTP cabling.
2. RS-232 cabling.
3. RS-485 cabling.
4. Low-voltage control cabling.
5. Control-circuit conductors.
6. Identification products.

1.3 DEFINITIONS

- A. Basket Cable Tray: A fabricated structure consisting of wire mesh bottom and side rails.
- B. Channel Cable Tray: A fabricated structure consisting of a one-piece, ventilated-bottom or solid-bottom channel section.
- C. EMI: Electromagnetic interference.
- D. IDC: Insulation displacement connector.
- E. Ladder Cable Tray: A fabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs).
- F. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control and signaling power-limited circuits.
- G. Open Cabling: Passing telecommunications cabling through open space (e.g., between the studs of a wall cavity).
- H. RCDD: Registered Communications Distribution Designer.
- I. Solid-Bottom or Non-Ventilated Cable Tray: A fabricated structure consisting of integral or separate longitudinal side rails, and a bottom without ventilation openings. J. Trough or Ventilated Cable Tray: A fabricated structure consisting of integral or separate longitudinal rails and a bottom having openings sufficient for the passage of air and using 75 percent or less of the plan area of the surface to support cables.
- K. UTP: Unshielded twisted pair.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

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1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified layout technician, installation supervisor, and field inspector.
- B. Source quality-control reports.
- C. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For wire and cable to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member Company of an NRTL.
 - 1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.
- B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Test cables upon receipt at Project site.
 - 1. Test each pair of UTP cable for open and short circuits.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install UTP and optical fiber cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 PATHWAYS

- A. Conduit and Boxes: Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems." Flexible metal conduit shall not be used.
 - 1. Outlet boxes shall be no smaller than 2 inches (50 mm) wide, 3 inches (75 mm) high, and 2-1/2 inches (64 mm) deep.

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2.2 UTP CABLE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following
1. Belden CDT Inc.; Electronics Division.
 2. Berk-Tek; a Nexans company.
 3. CommScope, Inc.
 4. Draka USA.
 5. Genesis Cable Products; Honeywell International, Inc.
 6. KRONE Incorporated.
 7. Mohawk; a division of Belden CDT.
 8. Nordex/CDT; a subsidiary of Cable Design Technologies.
 9. Superior Essex Inc.
 10. SYSTIMAX Solutions; a CommScope, Inc. brand.
 11. 3M.
 12. Tyco Electronics/AMP Netconnect; Tyco International Ltd.
- B. Description: 100-ohm, four-pair UTP, formed into 25-pair binder groups covered with a blue thermoplastic jacket.
1. Comply with ICEA S-90-661 for mechanical properties.
 2. Comply with TIA/EIA-568-B.1 for performance specifications.
 3. Comply with TIA/EIA-568-B.2, Category 6.
 4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
 - a. Communications, Plenum Rated: Type CMP, complying with NFPA 262.

2.3 UTP CABLE HARDWARE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following
1. American Technology Systems Industries, Inc
 2. Dynacom Corporation.
 3. Hubbell Premise Wiring.
 4. KRONE Incorporated.
 5. Leviton Voice & Data Division.
 6. Molex Premise Networks; a division of Molex, Inc.
 7. Nordex/CDT; a subsidiary of Cable Design Technologies.
 8. Panduit Corp.
 9. Siemon Co. (The).
 10. Tyco Electronics/AMP Netconnect; Tyco International Ltd.
- B. UTP Cable Connecting Hardware: IDC type, using modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of the same category or higher.

2.4 RS-232 CABLE

- A. Plenum-Rated Cable: NFPA 70, Type CMP.
1. Paired, two pairs, No. 22 AWG, stranded (7x30) tinned-copper conductors.
 2. Plastic insulation.
 3. Individual aluminum foil-polyester tape shielded pairs with 100 percent shield coverage.

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4. Plastic jacket.
5. Pairs are cabled on common axis with No. 24 AWG, stranded (7x32) tinned-copper drain wire.
6. Flame Resistance: Comply with NFPA 262.

2.5 RS-485 CABLE

A. Plenum-Rated Cable: NFPA 70, Type CMP.

1. Paired, two pairs, No. 22 AWG, stranded (7x30) tinned-copper conductors.
2. Fluorinated ethylene propylene insulation.
3. Unshielded.
4. Fluorinated ethylene propylene jacket.
5. Flame Resistance: NFPA 262, Flame Test.

2.6 LOW-VOLTAGE CONTROL CABLE

A. Plenum-Rated, Paired Cable: NFPA 70, Type CMP.

1. One pair, twisted, No. 18 AWG, stranded (19x30) tinned-copper conductors.
2. Fluorinated ethylene propylene insulation.
3. Unshielded.
4. Plastic jacket.
5. Flame Resistance: NFPA 262, Flame Test.

2.7 CONTROL-CIRCUIT CONDUCTORS

- A. Class 1 Control Circuits: Stranded copper, Type THHN-THWN, in raceway, complying with UL 83.
- B. Class 2 Control Circuits: Stranded copper, Type THHN-THWN, in raceway, complying with UL 83.
- C. Class 3 Remote-Control and Signal Circuits: Stranded copper, Type TW or Type TF, complying with UL 83.

2.8 IDENTIFICATION PRODUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Brady Corporation.
2. HellermannTyton.
3. Kroy LLC.
4. Panduit Corp.

B. Comply with UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

C. Comply with requirements in Division 26 Section "Identification for Electrical Systems."

2.9 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to evaluate cables.

B. Factory test UTP and optical fiber cables on reels according to TIA/EIA-568-B.1.

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- C. Factory test UTP cables according to TIA/EIA-568-B.2.
- D. Factory test multimode optical fiber cables according to TIA/EIA-526-14-A and TIA/EIA-568-B.3.
- E. Cable will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 INSTALLATION OF CONDUCTORS AND CABLES

- A. Comply with NECA 1.
- B. General Requirements for Cabling:
 - 1. Comply with TIA/EIA-568-B.1.
 - 2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
 - 3. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, and cross-connect and patch panels.
 - 4. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 - 5. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
 - 6. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
 - 7. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
 - 8. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.
- C. UTP Cable Installation:
 - 1. Comply with TIA/EIA-568-B.2.
 - 2. Install 110-style IDC termination hardware unless otherwise indicated.
 - 3. Do not untwist UTP cables more than 1/2 inch (12 mm) from the point of termination to maintain cable geometry.
- D. Installation of Control-Circuit Conductors:
 - 1. Install wiring in raceways. Comply with requirements specified in Division 26 Section "Raceway and Boxes for Electrical Systems."

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E. Separation from EMI Sources:

1. Comply with BICSI TDMM and TIA/EIA-569-A recommendations for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches (127 mm).
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches (305 mm).
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches (600 mm).
3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches (64 mm).
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches (150 mm).
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches (305 mm).
4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches (75 mm).
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches (150 mm).
5. Separation between Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches (1200 mm).
6. Separation between Cables and Fluorescent Fixtures: A minimum of 5 inches (127 mm).

3.2 REMOVAL OF CONDUCTORS AND CABLES

- A. Remove abandoned conductors and cables.

3.3 CONTROL-CIRCUIT CONDUCTORS

A. Minimum Conductor Sizes:

1. Class 1 remote-control and signal circuits, No 14 AWG.
2. Class 2 low-energy, remote-control, and signal circuits, No. 16 AWG.
3. Class 3 low-energy, remote-control, alarm, and signal circuits, No 12 AWG.

3.4 FIRESTOPPING

- A. Comply with TIA/EIA-569-A, Annex A, "Firestopping."
- B. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.5 GROUNDING

- A. For data communication wiring, comply with ANSI-J-STD-607-A and with BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.
- B. For low-voltage wiring and cabling, comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems."

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3.6 IDENTIFICATION

- A. Identify system components, wiring, and cabling according to TIA/EIA-606-A. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform tests and inspections.
- C. Tests and Inspections:
1. Visually inspect UTP and optical fiber cable jacket materials for UL or third-party certification markings. Inspect cabling terminations to confirm color-coding for pin assignments, and inspect cabling connections to confirm compliance with TIA/EIA-568-B.1.
 2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
 3. Test UTP cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not after cross connection.
 - a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
- D. Document data for each measurement. Print data for submittals in a summary report that is formatted using Table 10.1 in BICSI TDMM as a guide, or transfer the data from the instrument to the computer, save as text files, print, and submit.
- E. End-to-end cabling will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.

End of Section

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SECTION 260526

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Grounding systems and equipment.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency and testing agency's field supervisor.
- B. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

2.2 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, pressure type with at least two bolts.
 - 1. Pipe Connectors: Clamp type, sized for pipe.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

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B. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.

3.2 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Feeders and branch circuits.
2. Flexible raceway runs.

C. Signal and Communication Equipment: In addition to grounding and bonding re-quired by NFPA 70, provide a separate grounding system complying with require-ments in TIA/ATIS J-STD-607-A.

1. For telephone, alarm, voice and data, and other communication equipment, pro-vide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.

2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless oth-erwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

3.4 LABELING

A. Comply with requirements in Division 26 Section "Identification for Electrical Systems" Article for instruction signs. The label or its text shall be green.

3.5 FIELD QUALITY CONTROL

A. Grounding system will be considered defective if it does not pass tests and inspections.

B. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Owner's Representative promptly and include recommendations to reduce ground re-sistance.

3.6 SIZE OF GROUND WIRE

A. As required by National Electric Code. Where ground wire is exposed to physical damage protect with rigid non-ferrous conduit as permitted by applicable code.

3.7 GROUND CONNECTION OF PIPING

A. Metal internal piping shall be grounded, as a part of this contract.

3.8 METHOD OF CONNECTIONS

A. Make all ground connections and ground cable splices by thermal welding or copper compression set type connectors U.L. listed for grounding purposes. Grounding lugs, where provided as standard manufacturer's items on equipment furnished, may be used.

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3.9 EXPANSION FITTINGS

- A. In conduit runs requiring an expansion fitting, a bonding jumper shall be installed around the fitting to maintain continuous ground continuity.

End of Section

SECTION 260529 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Hangers and supports for electrical equipment and systems.

1.3 REFERENCES

- A. ASTM A325: American Society for Testing and Materials - Standard Specification for Structural Bolts.
- B. ASTM A603: American Society for Testing and Materials - Standard Specification for Zinc-Coated Steel Structural Wire Rope.
- C. IBC: International Building Code 2006 and adopted and amended by the Authority Having Jurisdiction.
- D. ICC: International Code Council.
- E. MFMA-3: Metal Framing Manufacturers Association's Metal Framing Standards Publication.
- F. MSS SP-58: Manufacturers Standardization Society of the Valve and Fittings Industry Standard for Pipe Hangers and Supports - Materials, Design, and Manufacture.
- G. NECA 1: National Electrical Contractors Association Standard Practices for Good Workmanship in Electrical Contracting.
- H. OSHPD: Office of Statewide Health Planning and Development.

1.4 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. RMC: Rigid metal conduit

1.5 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

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1.6 ACTION SUBMITTALS

A. Product Data: For the following:

1. Steel slotted support systems.
2. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and associated structural calculations for the following:
 - a. Steel slotted channel systems. Include Product Data for components.
 - b. Equipment supports.

1.7 QUALITY ASSURANCE

A. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Allied Tube & Conduit.
 - b. Cooper B-Line, Inc.; a division of Cooper Industries.
 - c. ERICO International Corporation.
 - d. GS Metals Corp.
 - e. Thomas & Betts Corporation.
 - f. Unistrut; Tyco International, Ltd.
 - g. Wesanco, Inc.
2. Finishes:
 - a. Plated Coatings: Zinc Plated. Fitting and accessories - zinc plated
 - b. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-3. Fitting and accessories - hot-dip galvanized or stainless steel where hot-dip galvanized is not available.
3. Channel Dimensions: Selected for applicable load criteria.

B. Raceway and Cable Supports: As described in NECA 1.

C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

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1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Hilti Inc.
 - 2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 3) MKT Fastening, LLC.
 - 4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2) Empire Tool and Manufacturing Co., Inc.
 - 3) Hilti Inc.
 - 4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 5) MKT Fastening, LLC.
3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 3 - EXECUTION

3.1 SUPPORT INSTALLATION -GENERAL

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).
- C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 1. To Wood: Fasten with lag screws or through bolts.
 2. To New Concrete: Bolt to concrete inserts or use expansion anchor fasteners.
 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 4. To Existing Concrete: Expansion anchor fasteners.

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5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete **4 inches (100 mm)** thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than **4 inches (100 mm)** thick.
6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
7. To Light Steel: Sheet metal screws.
8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.

D. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.2 HANGERS AND SUPPORTS FOR RACEWAYS

- A. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT and RMC as scheduled in NECA 1, where Table 1 lists maximum spacings less than stated in NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
- B. Suspended ceiling systems: Do not attach raceways to ceiling suspension system hangers.
- C. Raceways 3/4" (20mm) and smaller serving equipment located within ceiling cavity or mounted on or supported by the ceiling grid system may be supported by dedicated #12 ga. galvanized, soft annealed mild steel wire hangers. Two raceways maximum per hanger. Attach raceways to wires with clips manufactured for the purpose.
- D. Raceways 1" and larger: Provide lay-in pipe hangers on 1/4" (6mm) or larger all threaded rods attached to metal ceiling inserts or to structural members at not greater than spacing noted above and within 12" (300mm) of each change in direction.
- E. Multiple Raceways or Cables: When more than two raceways will use the same routing, group together on a channel trapeze support system supported by threaded rods attached to metal ceiling inserts or structural members. Size supports for multiple raceways for 25% future capacity. Trapeze shall be sized in accordance with SMACNA Guidelines with conduit weight taken to be as listed for same size pipe filled of water.
 1. Secure raceways and cables to these supports with single-bolt conduit clamps using spring friction action for retention in support channel.
- F. Raceway Support Methods: In addition to methods described in NECA 1, EMT and RMC may be supported by openings through structure members, as permitted in NFPA 70.

3.3 VERTICAL CABLE SUPPORTS

- A. Provide cable support for vertical cable runs as required by NFPA 70.

3.4 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS D1.1/D1.1M.

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Metro

600 NE Grand Ave.
Portland, OR 97232-2736
503-797-1700

3.5 COATINGS

- A. Touchup: Clean field cuts, field welds and abraded areas of PVC, Epoxy and Acrylic coated products. Re-coat exposed areas immediately after erecting hangers and supports. Follow manufacturer's instructions for repair of coated products.

- B. Hot Dip Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

End of Section

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SECTION 260533 RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Metal conduits, tubing, and fittings.
2. Metal wireways and auxiliary gutters.
3. Boxes, enclosures, and cabinets.

B. Related Sections

1. Section 260529 - Hangers and Supports for Electrical Systems
2. Section 260544 - Sleeves and Sleeve Seals for Electrical Raceways and Cabling

1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. EPDM: Ethylene-propylene-diene terpolymer rubber.
- C. FMC: Flexible metal conduit
- D. GRC: Galvanized rigid steel conduit.
- E. HDPE: High Density Polyethylene
- F. LFMC: Liquidtight flexible metal conduit.
- G. NBR: Acrylonitrile-butadiene rubber.
- H. RNC: Rigid nonmetallic conduit.
- I. RTRC: Reinforced Thermosetting Resin Conduit

1.4 REFERENCES

- A. American National Standards Institute (ANSI)
- B. National Electrical Manufacturers Association (NEMA)
- C. Underwriters Laboratories, Inc. (UL)
- D. National Fire Protection Association (NFPA)

1.5 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

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B. Shop Drawings: For the following raceway components. Include plans, elevations, sections, and attachment details, and attachments to other work.

1. Custom enclosures and cabinets.

1.6 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with work of other trades, using input from installers of items involved:

1. Structural members in paths of conduit groups with common supports.

B. Qualification Data: For professional engineer.

C. Seismic Qualification Certificates: For enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculations.
 - a. The term "withstand" means "the cabinet or enclosure will remain in place without separation of any parts when subjected to the seismic forces specified."
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

D. Qualification Data: For professional engineer and testing agency.

E. Source quality-control test reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following

1. AFC Cable Systems, Inc.
2. Alflec Inc.
3. Allied Tube & Conduit; a Tyco International Ltd. Co.
4. Anamet Electrical, Inc.; Anaconda Metal Hose.
5. Electri-Flex Company.
6. Manhattan/CDT/Cole-Flex.
7. Maverick Tube Corporation.
8. O-Z/Gedney; a brand of EGS Electrical Group.
9. Wheatland Tube Company; a division of John Maneely Company.

B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. GRC: Comply with ANSI C80.1 and UL 6.

D. EMT: Comply with ANSI C80.3 and UL 797.

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- E. FMC: Comply with UL 1; zinc-coated steel.
- F. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- G. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
 - 1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
 - 2. Fittings for EMT:
 - a. Material: Steel.
 - b. Type: Setscrew or compression. Die Cast fittings are not acceptable.
 - 3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
- H. Joint Compound for GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following
 - 1. Cooper B-Line, Inc.
 - 2. Hoffman; a Pentair company.
 - 3. Square D; a brand of Schneider Electric.
- B. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type 1 unless otherwise indicated.
- C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Screw-cover type.
- E. Finish: Manufacturer's standard enamel finish.

2.3 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following
 - 1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
 - 2. EGS/Appleton Electric.
 - 3. Erickson Electrical Equipment Company.
 - 4. Hoffman.
 - 5. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
 - 6. O-Z/Gedney; a unit of General Signal.
 - 7. RACO; a Hubbell Company.
 - 8. Robroy Industries, Inc.; Enclosure Division.
 - 9. Scott Fetzer Co.; Adalet Division.
 - 10. Spring City Electrical Manufacturing Company.
 - 11. Thomas & Betts Corporation.
 - 12. Walker Systems, Inc.; Wiremold Company (The).
 - 13. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.

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- B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- C. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

- D. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

- E. Device Box Dimensions: 4 inches square by 2-1/8 inches deep (100 mm square by 60 mm deep)

- F. Gangable boxes are prohibited.

- G. Cabinets:
 - 1. NEMA 250, Type 1, galvanized-steel box with removable interior panel and re-movable front, finished inside and out with manufacturer's standard enamel.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Key latch to match panelboards.
 - 4. Metal barriers to separate wiring of different systems and voltage.
 - 5. Accessory feet where required for freestanding equipment.
 - 6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed Conduit: GRC.
 - 2. Concealed Conduit, Aboveground: GRC.

- B. Comply with the following indoor applications: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed, Not Subject to Physical Damage: EMT.
 - 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 - 3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
 - a. Loading dock.
 - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical rooms.
 - d. Gymnasiums.
 - 4. Concealed in Ceilings and Interior Walls and Partitions: EMT .
 - 5. Damp or Wet Locations: GRC.
 - 6. Raceways for Optical Fiber or Communications Cable in Spaces Used for Envi-ronmental Air: EMT.
 - 7. Raceways for Optical Fiber or Communications Cable Risers in Vertical Shafts: EMT.
 - 8. Raceways for Concealed General Purpose Distribution of Optical Fiber or Com-munications Cable: EMT.

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9. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch (21-mm) trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 2. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10. Cast metal fittings are not acceptable
 3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.
- F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.
- G. Install surface raceways only where indicated on Drawings.

3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where re-quirements on Drawings or in this article are stricter. Comply with NECA 102 for alu-minum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Comply with requirements in Division 26 Section "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches (300 mm) of changes in direction.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- H. A. Support conduit within 12 inches (300 mm) of enclosures to which attached.
- I. Stub-ups to Above Recessed Ceilings:
1. Use EMT for raceways.
 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- J. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

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- K. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- L. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch (35mm) trade size and insulated throat metal bushings on 1-1/2-inch (41-mm) trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- M. Install raceways square to the enclosure and terminate at enclosures with locknuts. In-stall locknuts hand tight plus 1/4 turn more.
- N. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- O. Cut conduit perpendicular to the length. For conduits 2-inch (53-mm) trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- P. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- Q. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- R. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 2. Where an underground service raceway enters a building or structure.
 3. Where otherwise required by NFPA 70.
- S. Expansion-Joint Fittings:
1. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
 - a. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F (70 deg C) temperature change.
 - b. Attics: 135 deg F (75 deg C) temperature change.
 2. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F (0.06 mm per meter of length of straight run per deg C) of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F (0.0115 mm per meter of length of straight run per deg C) of temperature change for metal conduits.
 3. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
 4. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

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- T. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inch-es (1830 mm) of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
1. Use LFMC in damp or wet locations subject to severe physical damage.
 2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.
- U. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- V. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- W. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- X. Locate boxes so that cover or plate will not span different building finishes.
- Y. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- Z. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- AA. Set metal floor boxes level and flush with finished floor surface.

3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Division 26 Section "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.4 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 260523 "Control Voltage Electrical Power Cables".

3.5 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

End of Section

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260544

SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.

- B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

- C. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

D. Sleeves for Rectangular Openings:

1. Material: Galvanized sheet steel.
2. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and with no side larger than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
 - b. For sleeve cross-section rectangle perimeter 50 inches (1270 mm) or more and one or more sides larger than 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE-SEAL SYSTEMS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

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1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Advance Products & Systems, Inc.
 - b. CALPICO, Inc.
 - c. Metraflex Company (The).
 - d. Pipeline Seal and Insulator, Inc.
 - e. Proco Products, Inc.
2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Carbon steel.
4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

- A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Presealed Systems.

2.4 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

- A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.
- B. Comply with NEMA VE 2 for cable tray and cable penetrations.

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- C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
 - a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."
 - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
 3. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.
 4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
 5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level. Install sleeves during erection of floors.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
 2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.
- B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

End of Section

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SECTION 260553

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Equipment identification nameplates.
 - 2. Identification for conductors
 - 3. Identification for raceways.
 - 4. Miscellaneous identification products.

1.3 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. ANSI A13.1 "Scheme for Identification of Piping Systems"
- B. Occupational Safety and Health Administration (OSHA). 29 CFR - Labor Chapter XVII Part 1910-145 "Occupational and Safety Health Standards" 1992.

1.4 SUBMITTALS

- A. Make submittals in accordance with Section 260500 - Common Work Results for Electrical.
- B. Product Data: For each electrical identification product provided.
- C. Identification Schedule: Submit a complete nameplate schedule to indicate nameplate size, lettering size and color.

1.5 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- B. Note that equipment names and room numbers shown on the Contract Drawings may not be final names and numbers. Confirm all final naming prior to label manufacture.
- C. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- D. Coordinate installation of identifying devices with location of access panels and doors.
- E. Install identifying devices before installing acoustical ceilings and similar concealment.

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PART 2 - PRODUCTS

2.1 EQUIPMENT NAMEPLATES

A. Materials:

1. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Overlay shall provide a weatherproof and UV-resistant seal for label.

B. Dimension

1. Nameplate minimum of 1 3/4" high by 5" wide.
2. Lettering height for panel or equipment identifier @ 1/4".
3. Lettering height for remaining lines @ 1/8" high with 1/8" spacing between lines.
4. Normal System: White letters on black background.
5. Emergency System: White letters on orange red background.
6. Comply with ANSI 13.1.

C. Meters

1. Provide phenolic nameplate for each device with the following information:

Line 1: Load metered

Line 2: Panelboard and circuit number from which device is fed

Line 3: Fuse size or breaker size as applicable

2.2 CONDUCTOR, CABLE AND AC AND MC CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each conductor and cable size.
- B. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.

2.3 RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1, for minimum lettering size and for minimum length of color field for each raceway size.
- B. Color for Raceway Carrying Circuits at 600 V or Less:
 1. Black Letters on an orange field
- C. Color for Raceway Carrying Communications Circuits:
 1. Blue Letters on an Orange field
 2. Legend: "Communications" with 3-inch- (75-mm-) high letters on 20-inch (500-mm) centers.
- D. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

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2.4 CABLE TIES

- A. Plenum-Rated Cable Ties: Self extinguishing, UV stabilized, one piece, self locking.
 - 1. Minimum Width: 3/16 inch (5 mm).
 - 2. Tensile Strength at 73 deg F (23 deg C), According to ASTM D 638: 7000 psi (48.2 MPa).
 - 3. UL 94 Flame Rating: 94V-0.
 - 4. Temperature Range: Minus 50 to plus 284 deg F (Minus 46 to plus 140 deg C).
 - 5. Color: Black.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
 - 1. Outdoors: UV-stabilized nylon.
 - 2. In Spaces Handling Environmental Air: Plenum rated.

3.2 EQUIPMENT IDENTIFICATION:

- A. On each unit of equipment, install unique designation nameplate that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual.
- B. In addition to equipment listed in Part 2 provide nameplates for:
 - 1. Access doors for concealed electrical devices
 - 2. Electrical cabinets, enclosures and terminal cabinets
 - 3. Monitoring panels and equipment
- C. Confirm all final naming prior to label manufacture.
- D. Labeling Instructions:
 - 1. Indoor Equipment: Adhesive film label with clear protective overlay.
 - 2. Outdoor Equipment: Engraved, laminated acrylic or melamine label with screw fasteners
 - 3. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.

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4. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

3.3 CIRCUIT CONDUCTOR IDENTIFICATION

A. Power-Circuit Conductor Identification, 600 V or Less:

1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder and branch-circuit conductors.
 - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
 - b. Colors for 208/120-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - 4) Neutral: White
 - 5) Equipment Ground: Green
 - 6) Isolated Ground: Green with yellow tracer
 - c. Colors for 480/277-V Circuits:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - 4) Neutral: Gray
 - 5) Equipment Ground: Green
 - 6) Isolated Ground: Green with yellow tracer
 - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of **6 inches (150 mm)** from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
2. Conductors to Be Extended in the Future: Attach self adhesive label to conductors and list source.

B. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.

3.4 RACEWAY IDENTIFICATION

- #### A. System Identification Color-Coding Bands for Raceways: Each color-coding band shall completely encircle raceway. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at **50-foot (15-m)** maximum intervals in straight runs, and at **25-foot (7.6-m)** maximum intervals in congested areas.

B. Junction Box Color Coding

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Metro

600 NE Grand Ave.
Portland, OR 97232-2736
503-797-1700

1. Color Code all junction and pull boxes installed in accessible ceiling spaces and exposed in unfinished areas using spray paint on the box and entire cover in the following manner:

System	Color
480 Volt Power	Brown
120/208 volt	Unpainted
Emergency Power	Orange
Metering and Communications	Blue

2. Use black felt tip marker following painting to indicate the circuit numbers in 1" (25mm) high letters contained within.

3.5 WORKING CLEARANCE IDENTIFICATION

- A. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated.
- B. Do not install at flush-mounted panelboards and similar equipment in finished spaces.

End of Section

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SECTION 260913 ELECTRICAL POWER MONITORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. The Contractor shall provide a design-build electrical power monitoring system based on the documents provided using E-Mon metering equipment linked to the existing Alerton monitoring and control system for data compilation. All metering points are shown on the drawings and shall be linked to the existing Alerton system for a complete and operational metering system.
- B. The metering system will be used for both tenant submetering and energy tracking for various categories as outlined on the drawings and in the specifications. All metering equipment shall be revenue class.
- C. The existing Alerton monitoring and control system shall be expanded as required in order for the metering system to interface seamlessly. Refer to the drawings for further requirements.
- D. Specific loads are noted to be programmed using existing Variable Frequency Drive (VFD) data information. Contractor to program the monitoring and control system using amperage data with an equation to output kilo-watts (kW) and kilo-watt-hours (kWh).
- E. The existing Alerton monitoring and control system shall be used to capture, record, store, trend, and produce all necessary reports for billing, demand metering, trend logging, and energy modeling. The Alerton monitoring and control system is presently maintained (including programming) by the following company and all requirements of this project shall be coordinated with the company prior to submission of bids:
 - Environmental Controls Company
 - Attn: Mike Kucharski
 - 15860 SW Upper Boones Ferry Road
 - Lake Oswego, OR 97035-4066
 - (503) 330-5569
- F. Section includes the following for monitoring of electrical power system:
 - 1. PC-based workstation(s) and software.
 - 2. Communication network and interface modules for RS-232 and IEEE 802.3 data transmission protocols

1.3 DEFINITIONS

- A. Ethernet: Local area network based on IEEE 802.3 standards.
- B. Firmware: Software (programs or data) that has been written onto read-only memory (ROM). Firmware is a combination of software and hardware. Storage media with ROMs that have data or programs recorded on them are firmware.
- C. HTML: Hypertext markup language.
- D. I/O: Input/output.

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- E. KY Pulse: A term used by the metering industry to describe a method of measuring consumption of electricity that is based on a relay changing status in response to the rotation of the disk in the meter.
- F. LAN: Local area network; sometimes plural as "LANs."
- G. LCD: Liquid crystal display.
- H. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or remote-control, signaling and power-limited circuits.
- I. Modbus TCP/IP: An open protocol for exchange of process data.
- J. Monitoring: Acquisition, processing, communication, and display of equipment status data, metered electrical parameter values, power quality evaluation data, event and alarm signals, tabulated reports, and event logs.
- K. PC: Personal computer; sometimes plural as "PCs."
- L. rms: Root-mean-square value of alternating voltage, which is the square root of the mean value of the square of the voltage values during a complete cycle.
- M. RS-232: A TIA standard for asynchronous serial data communications between terminal devices.
- N. RS-485: A TIA standard for multipoint communications using two twisted-pairs.
- O. TCP/IP: Transport control protocol/Internet protocol incorporated into Microsoft Windows.
- P. THD: Total harmonic distortion.
- Q. UPS: Uninterruptible power supply; used both in singular and plural context.
- R. WAN: Wide area network.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Attach copies of approved Product Data submittals for products that describe power monitoring features to illustrate coordination among related equipment and power monitoring.
- B. Shop Drawings: For power monitoring equipment. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Outline Drawings: Indicate arrangement of components and clearance and access requirements.
 - 2. Block Diagram: Show interconnections between components specified in this Section and devices furnished with power distribution system components. Indicate data communication paths and identify networks, data buses, data gateways, concentrators, and other devices to be used. Describe characteristics of network and other data communication lines.
 - 3. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 4. Wiring Diagrams: For power, signal, and control wiring. Coordinate nomenclature and presentation with a block diagram.

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C. Software and Firmware Operational Documentation:

1. Self-study guide describing the process for setting equipment's network address; setting Owner's options; procedures to ensure data access from any PC on the network, using a standard Web browser; and recommended firewall setup.
2. Software operating and upgrade manuals.
3. Software Backup: On a magnetic media or compact disc, complete with Owner-selected options.
4. Device address list and the set point of each device and operator option, as set in applications software.
5. Graphic file and printout of graphic screens and related icons, with legend.

D. Qualification Data: For qualified installer and manufacturer.

E. Field quality-control reports.

F. Operation and Maintenance Data: For power monitoring units, to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

1. Operating and applications software documentation for Alerton system.
2. Software licenses for Alerton system.
3. Software service agreement for Alerton system.
4. Hard copies of manufacturer's specification sheets, operating specifications, design guides, user's guides for software and hardware, and PDF files on CD-ROM of the hard-copy submittal.

G. Other Informational Submittals:

1. Manufacturer's system installation and setup guides, with data forms to plan and record options and setup decisions.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Manufacturer Qualifications: A firm experienced in manufacturing power monitoring equipment similar to that indicated for this Project and with a record of successful in-service performance.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.6 COORDINATION

A. Coordinate features of distribution equipment and power monitoring components to form an integrated interconnection of compatible components.

1. Match components and interconnections for optimum performance of specified functions.

B. Coordinate Work of this Section with those in Sections specifying distribution components that are monitored or controlled by power monitoring equipment.

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1.7 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Meters: Furnish at least one of each type.
 - 2. Current Transformers: Furnish at least three of each type.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide manufacturer's name; product name or designation.
 - 1. E-Mon (Metering Equipment)
 - 2. Alerton (Existing Power Monitoring System)

2.2 FUNCTIONAL DESCRIPTION

- A. Instrumentation and Recording Devices: Monitor and record load profiles and chart energy consumption patterns.
 - 1. Calculate and Record the Following:
 - a. Load factor.
 - b. Peak demand periods.
 - 2. Measure and Record Metering Data for the Following:
 - a. Electricity.
- B. Software: Calculate allocation of utility costs.
 - 1. Automatically Import Energy Usage Records to Allocate Energy Costs for the Following (also see drawing E0.01 for categories):
 - a. Kitchen
 - b. Concessions
 - c. Mechanical
 - d. C Hall
 - e. C Meetings Rooms/Lobby
 - f. C Prefunction
 - g. Oregon Ballroom/Lobby
 - h. Portland Ballroom/Lobby
- C. System: Report equipment status.

2.3 SYSTEM REQUIREMENTS

- A. Monitoring System: The Owner will provide the PC-based workstation fitted with the Alerton Control Systems software for the power monitoring system. The Contractor shall provide the software requirements as stated elsewhere in the documents that will capture all data received from the metering equipment.
- B. Addressable Devices: All transmitters and receivers shall communicate unique device identification and status reports to monitoring clients.

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- C. BAS Interface: Provide factory-installed hardware and software to enable the BAS to monitor, display, and record data for use in processing reports.
1. Hardwired Monitoring Points: Electrical power demand (kilowatts), electrical power consumption (kilowatt-hours).
 2. BACnet MSTP communication interface with the BAS shall enable the BAS operator to remotely monitor meter information from a BAS operator workstation. Control features and monitoring points displayed locally at metering panel shall be available through the BAS. Connect to the BAS through MSTP cable to the nearest Alerton control panel, unless otherwise noted. Refer elsewhere in the documents where BAS MSTP is available.
 3. The metering system may also communicate with a direct connection to the BAS Ethernet LAN if available in the nearby telecommunications room. Refer elsewhere in the documents where the BAS LAN is available. BAS LAN switching equipment shall be provided by the Owner.

2.4 APPLICATIONS SOFTWARE

A. Basic Requirements:

1. Fully compatible with and based on the approved operating system.
2. Password-protected operator login and access; three levels, minimum.
3. Password-protected setup functions.
4. Context-sensitive online help.
5. Capability of creating, deleting, and copying files; and automatically maintaining a directory of all files, including size and location of each sequential and random-ordered record.
6. Capability for importing custom icons into graphic views to represent alarms and I/O devices.
7. Automatic and encrypted backups for database and history; automatically stored at central control PC and encrypted with a nine-character alphanumeric password, which must be used to restore or read data contained in backup.
8. Operator audit trail for recording and reporting all changes made to user-defined system options.

B. Data Formats:

1. User-programmable export and import of data to and from commonly used Microsoft Windows spreadsheet, database, billing, and other applications; using dynamic data exchange technology.
2. Option to convert reports and graphics to HTML format.
3. Interactive graphics.
4. Option to send preprogrammed or operator designed e-mail reports.

C. Metered Data: Display metered values in real time and 15-minute intervals.

D. Equipment Documentation: Database for recording of equipment ratings and characteristics; with capability for graphic display on monitors.

E. Graphics: Interactive color-graphics platform with pull-down menus and mouse-driven generation of power system graphics, in formats widely used for such drafting; to include the following:

1. Pie-graphs comparing different categories, load points, etc..
2. Charts comparing different categories, load points, milestones, etc..

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3. Single-line diagrams showing location of meter with hyperlink to specific page showing output data.
- F. User-Defined Monitoring Events: Display and record with date and time stamps accurate to 0.1 second, and including the following:
1. Operator log on/off.
 2. Attempted operator log on/off.
 3. All alarms.
 4. Equipment operation counters.
- G. Trending Reports: Display data acquired in real-time from different meters or devices, in historical format over user-defined time; unlimited as to interval, duration, or quantity of trends.
1. Spreadsheet functions of sum, delta, percent, average, mean, standard deviation, and related functions applied to recorded data.
 2. Charting, statistical, and display functions of standard Windows-based spreadsheet.
- H. Alarms: Display and record alarm messages from discrete input and controls outputs, according to user programmable protocol.
1. Functions requiring user acknowledgment shall run in background during computer use for other applications and override other presentations when they occur.
- I. Data Sharing: Allow export of recorded displays and tabular data to third-party applications software.
1. Tabular data shall be in the comma-separated values.
- J. Activity Billing Software:
1. Automatically compute and prepare activity demand and energy-use statements based on metering of energy use and peak demand integrated over user-defined interval.
 2. Intervals shall be same as used by electric utilities, including current vendor.
 3. Import metered data from saved records that were generated by metering and monitoring software.
 4. Maintain separate directory for each activity's historical billing information.
 5. Prepare summary reports in user-defined formats and time intervals.
- K. Reporting: User commands initiate the reporting of a list of current alarm, supervisory, and trouble conditions in system or a log of past events.
1. Print a record of user-defined alarm, supervisory, and trouble events on workstation printer.
 2. Sort and report by device name and by function.
 3. Report type of signal (alarm, supervisory, or trouble), description, date, and time of occurrence.
 4. Differentiate alarm signals from other indications.
 5. When system is reset, report reset event with same information concerning device, location, date, and time.

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L. Display Monitor:

1. Backlighted LCD to display metered data.
2. Display four values on one screen at same time.

2.5 COMMUNICATION COMPONENTS AND NETWORKS

- A. Network Configuration: High-speed, multi-access, open nonproprietary, industry standard communication protocol; LANs complying with EIA 485, 100 Base-T Ethernet, BacNet MSTP and BacNet TCP/IP.

2.6 CURRENT SENSORS

- A. Provide split-core current sensors (CT) with ampacities equal to or greater than the load being monitored. CT's shall be able to be monitored a minimum of 2,000 feet from the metering point. CT's shall be compatible with the meters provided.
- B. The Contractor shall provide line voltage inputs to the terminal block of the metering equipment per the metering equipment manufacturer's recommendations. Provide line fusing as required by the National Electrical Code.

2.7 INTERVAL DATA RECORDERS

- A. Provide Interval Data Recorders (IDR) that reads and records up to 16 meters with the following:
1. External meter pulse input.
 2. RS-232/RS-485 communications.
 3. Ethernet
 - a. Modbus TCP.
 - b. BACnet IP.
 4. Modbus TCP.
 5. BACnet IP.
 6. Internal data storage for up to 36 days of 15 minute intervals.
 7. Selectable baud rate up to 19,200 bps.
 8. Maintains data in case of power failure.
 9. Mountable in multiple meter unit cabinet.
 10. Reads kWh and kW in 15, 30, or 60 minute intervals.
 11. Reads meters individually or in groups.
 12. MV-90 compatible.

2.8 POWER MONITORS

- A. Separately mounted, permanently installed instrument for power monitoring, complying with UL 1244.
1. Enclosure: NEMA 250, Type 1, unless otherwise noted.
 2. Where multiple meters are located in a single room, provide a multiple meter unit cabinet with both meters and interval data recorders mounted within the unit.

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- B. Environmental Conditions: System components shall be capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:
1. Indoor installation in nontemperature-controlled spaces that have environmental controls to maintain ambient conditions of 0 to 122 deg F (minus 18 to plus 50 deg C) dry bulb and 20 to 90 percent relative humidity, noncondensing.
- C. rms Real-Time Measurements:
1. Current: Each phase, neutral, average of three phases, percent unbalance.
 2. Voltage: Line-to-line each phase, line-to-line average of three phases, line-to-neutral each phase, line-to-neutral average of three phases, line-to-neutral percent unbalance.
 3. Power: Per phase and three-phase total.
 4. Accumulated Energy: Real kWh.
 5. Incremental Energy: Real kWh.
 6. Conditional Energy: Real kWh.
- D. Demand Current Calculations, per Phase, Three-Phase Average and Neutral:
1. Present.
 2. Running average.
 3. Last completed interval.
 4. Peak.
- E. Demand Real Power Calculations, Three-Phase Total:
1. Present.
 2. Running average.
 3. Last completed interval.
 4. Predicted.
 5. Peak.
 6. Coincident with peak kVA demand.
 7. Coincident with kVAR demand.
- F. Power Demand Calculations: According to one of the following calculation methods, selectable by the user:
1. Thermal Demand: Sliding window updated every second for the present demand and at end of the interval for the last interval. Adjustable window that can be set in 1-minute intervals, from 1 to 60 minutes.
 2. Block Interval with Optional Subintervals: Adjustable for 1-minute intervals, from 1 to 60 minutes. User-defined parameters for the following block intervals:
 - a. Sliding block that calculates demand every second, with intervals less than 15 minutes, and every 15 seconds with an interval between 15 and 60 minutes.
 - b. Fixed block that calculates demand at end of the interval.
 - c. Rolling block subinterval that calculates demand at end of each subinterval and displays it at end of the interval.
 3. Demand Calculation Initiated by a Synchronization Signal:
 - a. Signal is a pulse from an external source. Demand period begins with every pulse. Calculation shall be configurable as either a block or rolling block calculation.
 - b. Signal is a communication signal. Calculation shall be configurable as either a block or rolling block calculation.
 - c. Demand can be synchronized with clock in the power meter.

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G. Sampling:

1. Current and voltage shall be digitally sampled at a rate high enough to provide accuracy to 63rd harmonic of 60-Hz fundamental.
2. Power monitor shall provide continuous sampling at a rate of 128 samples per cycle on all voltage and current channels in the meter.

H. Minimum and Maximum Values: Record monthly minimum and maximum values, including date and time of record. For three-phase measurements, identify phase of recorded value. Record the following parameters:

1. Total power.

I. Current and Voltage Ratings:

1. Designed for use with current inputs from standard instrument current transformers with 5-A secondary and shall have a metering range of 0-10 A.
2. Withstand ratings shall not be less than 15 A, continuous; 50 A, lasting over 10 seconds, no more frequently than once per hour; 500 A, lasting 1 second, no more frequently than once per hour.
3. Designed for use with voltage inputs from standard instrument potential transformers with a 120-V secondary.

J. Accuracy:

1. Comply with ANSI C12.20, Class 0.5; and IEC 60687, Class 0.5 for revenue meters. Accuracy from Light to Full Rating shall meet the following criteria:
 - a. Power: Accurate to 0.25 percent of reading, plus 0.025 percent of full scale.
 - b. Voltage and Current: Accurate to 0.075 percent of reading, plus 0.025 percent of full scale.
 - c. Power Factor: Plus or minus 0.002, from 0.5 leading to 0.5 lagging.
 - d. Frequency: Plus or minus 0.01 Hz at 45 to 67 Hz.
2. For meters that are circuit-breaker accessories, metering accuracy at full-scale shall not be less than the following:
 - a. Current: Plus or minus 2.5 percent.
 - b. Voltage: Plus or minus 1.5 percent.
 - c. Energy, Demand, and Power: Plus or minus 4.0 percent.
 - d. Frequency: Plus or minus 1 Hz.

K. Input: One digital input signal(s).

1. Normal mode for on/off signal.
2. Demand interval synchronization pulse, accepting a demand synchronization pulse from a utility demand meter.
3. Conditional energy signal to control conditional energy accumulation.

L. Outputs:

1. Operated either by user command sent via communication link, or set to operate in response to user-defined alarm or event.
2. Closed in either a momentary or latched mode as defined by user.
3. Each output relay used in a momentary contact mode shall have an independent timer that can be set by user.

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4. One digital KY pulse to a user-definable increment of energy measurement. Output ratings shall be up to 120-V ac, 300-V dc, 50 mA, and provide 3500-V rms isolation.
5. One relay output module(s), providing a load voltage range from 20- to 240-V ac or from 20- to 30-V dc, supporting a load current of 2 A.
6. Output Relay Control:
 - a. Relay outputs shall operate either by user command sent via communication link or in response to user-defined alarm or event.
 - b. Normally open and normally closed contacts, field configured to operate as follows:
 - 1) Normal contact closure where contacts change state for as long as signal exists.
 - 2) Latched mode when contacts change state on receipts of a pickup signal; changed state is held until a dropout signal is received.
 - 3) Timed mode when contacts change state on receipt of a pickup signal; changed state is held for a preprogrammed duration.
 - 4) End of power demand interval when relay operates as synchronization pulse for other devices.
 - 5) Energy Pulse Output: Relay pulses quantities used for absolute kWh.

M. Onboard Data Logging:

1. Store logged data, alarms, events, and waveforms in 80 KB of onboard nonvolatile memory.
2. Stored Data:
 - a. Billing Log: User configurable; data shall be recorded every 15 minutes, identified by month, day, and 15-minute interval. Accumulate 24 months of monthly data, 32 days of daily data, and between 2 and 52 days of 15-minute interval data, depending on number of quantities selected.
 - b. Custom Data Logs: One user-defined log(s) holding up to 96 parameters. Date and time stamp each entry to the second and include the following user definitions:
 - 1) Schedule interval.
 - 2) Event definition.
 - 3) Configured as "fill-and-hold" or "circular, first-in first-out."
 - c. Alarm Log: Include time, date, event information, and coincident information for each defined alarm or event.
 - d. Waveform Log: Store captured waveforms configured as "fill-and-hold" or "circular, first-in first-out."
3. Default values for all logs shall be initially set at factory, with logging to begin on device power up.

N. Control Power: 90- to 457-V ac or 100- to 300-V dc.

O. Communications:

1. Power monitor shall be permanently connected to communicate via BacNet TCP/IP via a 100 Base-T Ethernet or RS-485 BacNet MSTP.
2. Local plug-in connections shall be for RS-232 and 100 Base-T Ethernet.

2.9 LAN CABLES

A. Comply with Division 26 Section "Control-Voltage Electrical Power Cables." All cabling shall be installed in a raceway system.

B. RS-485 Cable:

1. Plenum-Type, RS-485 Cable: As specified in Division 26 Section "Control-Voltage Electrical Power Cables."

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C. RS-232 Cable:

1. Plenum-Type, RS-232 Cable: As specified in Division 26 Section "Control-Voltage Electrical Power Cables."

D. Unshielded Twisted Pair Cables: Category 6 as specified for horizontal cable for data service in Division 26 Section "Control-Voltage Electrical Power Cables."

2.10 LOW-VOLTAGE WIRING

A. Comply with Division 26 Section "Control-Voltage Electrical Power Cables."

B. Low-Voltage Control Cable: Multiple conductor, color-coded, No. 18 AWG copper, minimum.

1. Sheath: PVC; except in plenum-type spaces, use sheath listed for plenums.
2. Ordinary Switching Circuits: Three conductors unless otherwise indicated.
3. Switching Circuits with Pilot Lights or Locator Feature: Five conductors unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine pathway elements intended for cables. Check raceways, cable trays, and other elements for compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting installation.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CABLING

A. Comply with NECA 1.

B. Install cables and wiring according to requirements in Division 26 Section "Control-Voltage Electrical Power Cables."

C. Wiring Method: Install wiring in raceway and/or cable tray except within consoles, cabinets, gutters, wireways. Conceal raceway and wiring except in unfinished spaces. All cabling shall be plenum rated.

D. Install LAN cables using techniques, practices, and methods that are consistent with specified category rating of components and that ensure specified category performance of completed and linked signal paths, end to end.

E. Install cables without damaging conductors, shield, or jacket.

3.3 IDENTIFICATION

A. Identify components and power and control wiring according to Division 26 Section "Identification for Electrical Systems."

B. Label each power monitoring and control module with a unique designation.

3.4 GROUNDING

A. Comply with IEEE 1100, "Recommended Practice for Powering and Grounding Electronic Equipment."

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- D. Tests and Inspections:
 - 1. Electrical Tests: Use caution when testing devices containing solid-state components.
 - 2. Continuity tests of circuits.
 - 3. Operational Tests: Set and operate controls at workstation and at monitored and controlled devices to demonstrate their functions and capabilities. Use a methodical sequence that cues and reproduces actual operating functions as recommended by manufacturer. Submit sequences for approval. Note response to each test command and operation. Note time intervals between initiation of alarm conditions and registration of alarms at central-processing workstation.
 - a. Coordinate testing required by this Section with that required by Sections specifying equipment being monitored and controlled.
 - b. Test LANs according to requirements in Division 26 Section "Control-Voltage Electrical Power Cables."
 - c. System components with battery backup shall be operated on battery power for a period of not less than 10 percent of calculated battery operating time.
 - d. Verify accuracy of graphic screens and icons.
 - e. Metering Test: Load feeders, measure loads on feeder conductor with an rms reading clamp-on ammeter, and simultaneously read indicated current on the same phase at central-processing workstation. Record and compare values measured at the two locations. Resolve discrepancies greater than 5 percent and record resolution method and results.
 - f. Record metered values, control settings, operations, cues, time intervals, and functional observations and submit test reports printed by workstation printer.
- E. Power monitoring and control equipment will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.
- G. Correct deficiencies, make necessary adjustments, and retest. Verify that specified requirements are met.
- H. Test Labeling: After satisfactory completion of tests and inspections, apply a label to tested components indicating test results, date, and responsible agency and representative.
- I. Reports: Written reports of tests and observations. Record defective materials and workmanship and unsatisfactory test results. Record repairs and adjustments.
- J. Remove and replace malfunctioning devices and circuits and retest as specified above.

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3.6 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain systems. See Division 01 Section "Demonstration and Training."
 - 1. Train Owner's management and maintenance personnel in interpreting and using monitoring displays and in configuring and using software and reports. Include troubleshooting, servicing, adjusting, and maintaining equipment. Provide a minimum of 16 hours' training.
 - 2. Training Aid: Use approved final versions of software and maintenance manuals as training aids.

3.7 ON-SITE ASSISTANCE

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to three visits to Project during other-than-normal occupancy hours for this purpose.

End of Section