METRO HEADQUARTERS BUILDING
DESIGN/BUILD
REQUEST FOR PROPOSALS

PROJECT MANUAL
BIDDING REQUIREMENTS, CONTRACT FORMS, CONDITIONS OF THE CONTRACT, AND SPECIFICATIONS

METROPOLITAN SERVICE DISTRICT
(METRO)
2000 S. W. FIRST AVENUE
PORTLAND, OREGON
(503)221-1646

ISSUED ON
OCTOBER 11, 1991

METROPOLITAN SERVICE DISTRICT

Metro Headquarters Project
Design/Build Competition

Request For Proposals (Stage 2)

TO:	Selected Design/Build Teams
SUBJECT:	Requests for Proposals (Stage 2) for facility design and construction/renovation of a Headquarters Building for the Metropolitans Service District
ISSUE DATE:	October 11, 1991
ISSUED BY:	Berit Stevenson Regional Facilities Department, Metro (503) 221-1646
MAILING ADDRESS:	Metro 2000 Southwest First Avenue Portland, Oregon 97201 Attn: Berit Stevenson
PROPOSALS DUE:	2:00 pm, PDT Friday, November 15, 1991

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I.
Invitation to Propose

INVITATION TO PROPOSE

for the

METRO HEADQUARTER BUILDING

Metro invites the three selected design/build teams to participate in the Request For Proposal (RFP) stage of the Metro Headquarters Building Design/Build Competition. The three teams will be given the RFP and allowed five weeks to prepare their proposal for the design and renovation of the former Sears Building into a new Metro Headquarters Building. Metro will select the proposal which best meets the criteria established for evaluation and intends to execute a Design/Build Contract with the successful team.

The work contemplated by the RFP includes the construction of core and shell, site work, and tenant improvements, complete architectural and engineering for such design, complete construction management services for such work, the procurement of all necessary permits, licences and special inspections and testing and all other items incidental to such work necessary to bring about a completely functional and fully renovated Metro Headquarters Building.

Each proposal must meet the requirements of this RFP and should be accompanied by proposal security in the form of a bid bond, certified check or cashier's check for 2% of the Proposal Amount. The successful Proposer will be required to furnish Performance and Payment Bonds as indicated by the RFP and to comply with all provisions of ORS 279.350 regarding prevailing wage rates.

All design/build teams are required to comply with Metro's Disadvantaed Business Program. Copies of the Metro Code Section containing the provisions of this Program will be provided to all design/build teams.

Metro reserves the right to reject any or all Proposals not conforming to the intent and purpose of the RFP, to waive any informality or irregularity in any Proposal, and to, for good cause, reject any or all Proposals upon a finding by Metro that it is in the public interest to do so.

Upon selection of the preferred proposal by Metro, each team submitting a complete proposal in accordance with the RFP document will be paid an honorarium of $25,000. For the winning team, this payment shall be deemed an initial progress payment of the compensation otherwise due the design/build team in accordance with the terms and conditions of the subsequently executed Design/Build Contract. For the losing teams, this payment is intended to cover some portion of the expense occasioned by the design/build team in preparing their Proposal. Acceptance of the Honorarium by any design/build team constitutes a waiver by that design/build team of any claim for additional compensation for services rendered as a result of preparation of the Proposal. Any proposal rejected by Metro for not complying with the rules and regulations of the RFP shall automatically disqualify the proposing design/build team from the $25,000 honorarium to be awarded to each participating team.

A mandatory single open session will commence the RFP stage of the competition. At this session, each of the three selected design/build teams will be given the RFP and will be briefed by Metro of competition procedures and requirements. A site visit to the former Sears building will conclude the session.

II.
Instructions to Design/Build Teams

INSTRUCTIONS TO DESIGN/BUILD TEAMS

ARTICLE 1

DEFINITIONS

1.1 RFP Documents or Contract Documents include the Invitation to Propose, Instructions to Design/Build Teams, the Proposal Forms, other sample response and contract forms, and the proposed Contract Documents including any Addenda issued prior to receipt of Proposals. The Contract Documents proposed for the Work consist of the Design/Build Contract, the Conditions of the Contract (General, Supplementary and other Conditions), the Concept Design Drawings, the Competition Schedule, the Contract Performance Specifications, Metro Headquarters Building Program, all Addenda issued prior to, and all Modifications issued after, execution of the Design/Build Contract.

1.2 All definitions set forth in the General Conditions of the Design/Build Contract for the Metro Headquarters Building, or in the other Contract Documents are applicable to the RFP Documents.

1.3 Addenda are written or graphic instruments issued by Metro prior to the execution of the Design/Build Contract which modify or interpret the RFP Documents by additions, deletions, clarifications or corrections.

1.4 A Proposal is a complete and properly signed proposal to do the Work for the sums stipulated therein, submitted in accordance with the RFP Documents.

1.5 The Contract Amount is the sum stated in the Proposal for which the design/build team offers to perform the Work described in the RFP Documents.

1.6 A Unit Price is an amount stated in the Proposal, if any, as a price per unit measurement for materials or services as described in the RFP Documents or in the Construction Documents.

1.7 An Alternate Price is an amount stated in the Proposal for either an additive or a deductive alternate being proposed by the design/build team.

1.8 The Proposer is the entity who assembles a design/build team and is the design/build team's contracting entity who submits a Proposal .

ARTICLE 2

PROPOSER'S REPRESENTATIONS

2.1 Each Proposer, by making a Proposal, represents that:

2.1.1 The design/build team has read and understands the RFP Documents and the Proposal is made in accordance therewith.

2.1.2 The design/build team has visited the Project premises, has reviewed the documents pertaining thereto, has become familiar with the general and local conditions, the physical conditions of the site and the existing building and all other matters which can in any way

affect the work or cost thereof under this Contract. The design/build team further acknowledges that they have satisfied themselves as to the character, quality and quantity of surface and subsurface materials to be encountered from inspecting the site. Any failure by the design/build team to acquaint themselves with all available information will not relieve them of responsibility for properly estimating the difficulty or cost of successfully performing the Work..

ARTICLE 3

STAGE 2 - RFP - COMPETITION REGULATIONS

3.1 Metro will deliver to the three participating design/build teams two complete sets of the RFP documents at a single open session which will commence the RFP Stage of the design/build competition. The three participating design/build teams will be notified of the exact time and location of the open session. Key representatives from the three participating teams must attend. A tour of the former Sears building will be included in the open session.

3.2. The three participating teams will be issued a key to the former Sears Building for their use during the preparation of their proposal. Each team will be allowed unchaperoned access to the building during normal business hours. No destructive testing will be permitted.

3.3 To maintain the integrity of the competition, all participating design/build teams are prohibited from contacting any jury member or Metro employees associated with this project for any reason whatsoever except for scheduled presentations and the designated contact person No individual meetings will be held with design/build teams. Any violation of this prohibition will disqualify the entire team from any further consideration. All questions are to be directed to Ms. Berit Stevenson.

3.4 Design/build teams shall use complete sets of the RFP Document in preparing Proposals; Metro assumes no responsibility for errors or misrepresentation resulting from the use of incomplete sets of RFP Documents.

3.5 Metro, in making copies of the RFP Document available on the above terms does so only for the purpose of obtaining Proposals on the Work and does not confer a license or grant for any other use.

3.6 Metro's maximum budget for the Design/Build Contract is $9,361,000. This amount includes allowances for the Gateway and for tenant improvements.

3.2 INTERPRETATION OR CORRECTION OF RFP DOCUMENTS

3.2.1 Design/build teams shall promptly notify Metro of any ambiguity, inconsistency or error which they may discover upon examination of the RFP Document or the Project premises and local conditions.

3.2.2 Design/build teams requiring clarification or interpretation of the Documents shall make a written request , directed to the designated contact person, which shall reach Metro at least seven days prior to the date for receipt of Proposals.

3.2.3 Any interpretation, correction or change of the RFP Documents will be made by Addendum. Interpretations, corrections or changes of the RFP Documents made in any other manner will not be binding, and Design/build teams shall not rely upon such interpretations, corrections or changes.

3.3 ADDENDA

3.3.1 Addenda will be mailed or delivered to all participating design/build teams.

3.3.2 No Addenda will be issued later than four days prior to the date for receipt of Proposals except an Addendum withdrawing the request for Proposals or one which includes postponement of the date for receipt of Proposals.

3.3.3 Each Design/build team shall ascertain, prior to submitting a Proposal, that all issued Addenda have been received, and their receipt shall be acknowledged in the Proposal.

ARTICLE 4

PROPOSING PROCEDURE

4.1 FORM AND STYLE OF PROPOSALS

4.1.1 All Proposals shall contain at least the following items:

1. Transmittal Letter
2. Supplemental Team Qualifications, if needed, to describe modifications or additions to the design/build team
3. Statement of Compliance with the RFP documents
4. Proposal Price Form
5. Project Schedule - commencing at Notice to Proceed
6. Description of Project Management Approach and Structure - include proposed modifications to the General and Supplementary Conditions
7. Resident/Non-resident design/build team Status
8. Non-collusion Affidavit
9. Proposal Security (Proposal Bond or Cashier's Check)
10. Design Documents:
    - a) Site Plan
    - b) Floor Plans (all floors) - include proposed locations for Council Chamber and Daycare
    - c) Roof Plan
    - d) Building Sections
        - i. minimum - 2; maximum - 4
    - e) Exterior Elevations
        - i. minimum - 4; maximum - 6
    - f) Typical Wall Section(s)
    - g) Exterior perspective sketches
        - i. minimum - 3; maximum - 6
        - ii. mandatory locations:
            SW corner of site [Grand Ave.]
            NW corner of site [Irving St.]

h) Exterior material and color sample board(s)
i) Alternate(s) Description
j) Narratives of proposed structural, mechanical, electrical and architectural elements

4.1.2 A study model may, at the teams discretion be prepared and submitted for review. In the event a team determines to present a study model for review, the study model should be submitted at the same time as the mandatory submittal items. The study model will be available for the design/build team's use at the scheduled presentation., .

4.1.3 All printed material shall be formatted 8 1/2" by 11" , bound vertically. Drawings may be 11" by 17" but should be bound along with printed material.

4.1.4 Proposal Forms shall be submitted on forms identical to those included in the RFP Document.

4.1.5 All blanks on the Proposal Forms shall be filled in by typewriter or in ink.

4.1.6 Each copy of the Proposal shall include the legal name of the Proposer and a statement that the Proposer is a sole proprietor, partnership, corporation or some other legal entity. Each copy shall be signed by the person or persons legally authorized to bind the Proposer to a contract. A Proposal by a corporation shall further give the state of incorporation. A Proposal submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Proposer.

4.1.7 No information which design/build team submits will be deemed proprietary in nature and no request that information be kept confidential will be honored.

4.1.8 In addition to the bound proposal, the design/build team shall submit one larger copy of items a, b, d, e, g and h of 4.1.1 (11) above. These items should be mounted on rigid backing suitable for presentation and should not be larger than 30" by 42". These items will be available for use by the design/build team at the scheduled presentation.

4.1.9 All proposals, including renderings, study models, reports and other data or material submitted, shall become the sole property of Metro, subject to copyright and patent restrictions. Metro reserves the right to display publicly any or all materiel submitted by any design/build team.. Upon submission, Metro intends to make portions available to Metro employees for review and comment.

4.2 PROPOSAL SECURITY

4.2.1 All Proposals shall be accompanied by a certified check, cashier's check or Proposal Bond in the form included herein in the amount of 2% of the total project costs made out to Metro. Forfeiture of the proposal security may result in the event of the withdrawal of the Proposal during the three month period Proposals are required to remain effective.

4.2.2 In the event a Proposal Bond is submitted, the Bond shall be in the form attached herein and the attorney-in-fact who executes the Bond on behalf of the surety shall affix to the Bond a certified and current copy of the power of attorney authorizing execution of such Bond.

4.3 SUBMISSION OF PROPOSALS

4.3.1 Submit Proposals to the Headquarters Project Office of Metro, attn: Ms. Berit Stevenson, 2000 S.W. First Avenue, Suite 150, Portland, Oregon 97201 on or before 2:00 pm, PDT, Friday, November 15, 1991 Proposals received after the time and date for receipt of Proposals will be returned unopened.

4.3.2 The Proposal shall be identified with the Project name and the Design/build team's name and address. If the Proposal is sent by mail,the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED PROPOSAL ENCLOSED" on the face thereof.

4.3.3 The design/build team shall assume full responsibility for timely delivery at the location designated for receipt of Proposals.

4.3.4 Oral, telephonic, telegraphic or facsimile Proposals are invalid and will not receive consideration.

4.3.5 Duplicate Proposals: Submit ten copies of the bound proposal; one copy of the mounted material.

4.3.6 Proposals shall remain in effect for a period of three months from Proposal submission date.

4.4 MODIFICATION OR WITHDRAWAL OF PROPOSALS

4.4.1 A Proposal may not be modified by the design/build team during the stipulated effective time period without the prior approval of Metro.

4.4.2 Prior to the time and date designated for receipt of Proposals, any Proposal submitted may be modified or withdrawn by notice to the party receiving Proposals at the place designated for receipt of Proposals. Such notice shall be in writing over the signature of the Proposer.

4.4.3 Withdrawn Proposals may be resubmitted up to the time and date designated for the receipt of Proposals.

4.4.4 Proposal security shall be in an amount sufficient for the Proposal as modified or resubmitted.

4.5 ALTERNATES

4.5.1 Each design/build team shall submit a base proposal which shall represent the requirements of the Contract Documents without modification. In addition, each design/build team is required to submit an Alternate No. 1 proposal which modifies the ceiling system of the base proposal of the Contract Documents per 4.5.2 below. Design/build teams may also submit other Proposed Alternates which modify the base proposal in addition to Alternate No. 1.

4.5.2. Prescribed Alternate No. 1 deletes the dropped ceiling and related basic fixture type identified for the Metro Office Areas and adds an exposed ceiling and pendant type florescent fixture. This alternate requires that the exposed ceiling, structure and all exposed equipment such as HVAC ductwork, electrical and fire suppression equipment, etc, shall be painted and that all exposed equipment shall be suitable for an exposed installation. The design/build teams shall include the cost of painting ceiling and exposed structures and equipment and the the cost of the light fixture on the floor in the core and shell element of the proposal price and the installation of the light fixture in the tenant improvement allowance element of the proposal price.

4.5.3 All alternates which are submitted for consideration, including Alternate No. 1, shall include an alternate proposal price identified on the Proposal Price Form and shall be supported with drawings, specifications, product literature and narratives as required to allow Metro to properly evaluate the alternate.

4.5.4 No Contract time extension will be granted to the successful design/build team due to alternate work being selected by Metro.

4.5.5. The acceptance or rejection of any and all alternates shall be at Metro's sole discretion.

ARTICLE 5

CONSIDERATION OF PROPOSALS

5.1 TECHNICAL AND JURY EVALUATION

5.1.1 Upon receipt, each proposal shall undergo a technical analysis to ascertain compliance with published program and performance requirements. Only those proposals which are found to be in full compliance as determined solely by Metro will be eligible for further consideration. Questions requiring clarification identified during the technical analysis will be submitted to the appropriate design/build teams. The teams must respond in writing to the questions posed within two working days of receipt of the question. The technical evaluation team will submit their written evaluations to the proposal jury.

5.1.2 The proposal jury, made up of Metro representatives and/or appointees, will receive proposals and technical evaluations. Presentations of the proposals will be made by each of the participating design/build teams. Presentations by the design/build teams will be limited to one hour and will be scheduled by Metro. Presentations may, at Metro's option, be followed by questions from the jury.

5.1.3 Upon review, analysis and discussion of the proposals and technical evaluations, the jury will select the winning proposal. The jury's selection may, at the jury's sole discretion, include any combination of alternates proposed by the selected design/build team. The jury's decision shall be final. The jury will issue a final written report which states its reasons for selection of the winning design/build proposal. The jury will also identify their next preferred proposal.

5.1.4 Prior to final contract award, any or all design/build teams may be required to provide additional information either in written form or via demonstration or interview. Any presentation, demonstration or interview will be conducted at the design/build team's expense.

5.1.5 The evaluation criteria Metro will consider when analyzing Proposals will be:

a. Project Costs
b. Design/Build Team Qualifications
c. Design
d. Compliance with Performance Standards and Program
e. Project Approach/ Management
f. Schedule

The above listing is stated in no particular order of preference. Each jury member will weight the evaluation criteria according to his or her inclination.

5.2 CONTRACT NEGOTIATION AND AWARD

5.2.1. It is the intent of Metro to award the Design/Build Contract to the design/build team whose proposal most fully meets the requirements of the Metro as identified in this RFP document. Metro shall have the right to waive any informality or irregularity in any Proposal or Proposals received and to accept the Proposal which,in Metro's judgment is in Metro's own best interest.

5.2.2 Upon selection by the proposal jury, the successful design/build team will be ssued a Notice of Conditional Award. The remaining two design/build teams will also be issued copies of such Notice of Conditional Award.

5.2.3 Representatives of the successful design/build team will meet with Metro representatives to review the proposal. If the selected proposal is a base proposal without alternates, the design/build team shall confirm that the proposal conforms to all program specifications and requirements. If the proposal contains selected alternates, the design/build team shall confirm that the proposal conforms to all program specifications and requirements as modified by the selected alternate(s). In the event Metro is unable to for any reason to enter into an agreement with the successful design/build team by the dates specified in the Competition Schedule, Metro reserves the right to terminate discussions with the successful design/build team and to enter into a design/build agreement with the next preferred team.

5.2.4 Upon completion of contract negotiations, Metro will issue a Request for Executed Bonds and Evidenece of Insurance to the successful design/build team. Upon receipt of such Notice, the successful design/build team shall have two working days in which to submit to Metro for review evidence of all required insurance and executed Payment and Performance Bonds as required in these Instructions to Design/Build Teams and the General Conditions of the Contract.

5.2.5 Upon determination by Metro that all required insurance and Bonds are in order, the Metro Council will award the Design/Build Contract for the Metro Headquarters Building to the successful design/build team.

5.2.6 Aggrieved design/build teams who wish to appeal the award of the design/build contract must submit their appeal in writing within five working days of the postmarked date of the Notice of Conditional Award. The written appeal must describe the specific citations of law, rule, regulation, or procedure upon which the appeal is based. Disagreement with the judgement exercised by the proposal jury will not be a basis for appeal. Their judgement, including the weighting of the evaluation criteria shall be final and binding on all design/build teams. The Metro Council, acting as the Contract Review Board, will review the grounds for appeal, all pertinent

information, including the Executive Officer's recommendation, and make a decision. The decision of the Contract Review Board will be final.

5.3 REJECTION OF PROPOSALS

5.3.1 Metro shall have the right to reject any or all Proposals and to reject a Proposal not accompanied by the required proposal security or by other data required by this RFP Document, or to reject a Proposal which is any way incomplete or irregular.

ARTICLE 6

HONORARIUM

6.1 Upon selection of the preferred design/build team and proposal by the jury, each team submitting a full and complete proposal in accordance with the RFP document will be paid an honorarium of $25,000. For the team winning the competition, this payment shall be deemed an initial progress payment of the compensation otherwise due the design/build team in accordance with the terms and conditions of the subsequently executed Design/Build Contract.

6.2 Acceptance of the Honorarium by any design/build team constitutes a waiver by that design/build team of any claim for additional compensation for services rendered as a result of preparation of the Proposal.

6.3 Any proposal rejected by Metro for not complying with the rules and regulations of this RFP shall automatically disqualify the proposing design/build team from the $25,000 honorarium to be awarded to each participating team. Additionally, any design/build team who, in Metro's determination, has contacted or attempted to contact any jury member or Metro employee inappropriately will automatically forfeit the $25,000 honorarium.

ARTICLE 7

PERFORMANCE AND PAYMENT BONDS

7.1 BOND REQUIREMENTS

7.1.1 Prior to execution of the Design/Build Contract, the design/build team will be required to furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder in an amount equal to the Contract Amount on the forms included herein.. The costs of the Bonds shall be included in the Proposal Amount.

7.1.2 The Bonds shall be issued by a surety authorized to issue such bonds in 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. Additionally, the Bonds shall be accompanied by a current copy of the power of attorney authorizing execution of such Bonds.

ARTICLE 8

8.1 PREVAILING WAGE

Except as limited by Oregon Revised Statutes, all on-site workers shall be paid the prevailing rate of wage as required by ORS 279.350, and all other requirements of ORS 279.350 shall be complied with. The Appendix of this RFP contains the requirements of ORS 279.350, including the existing prevailing rate of wage which may be paid to on-site workers in each trade or occupation required to perform the Work, either by the contracting entity of the design/build team or its Subcontractors or any other person doing or contracting to do the whole or part of the Work contemplated by the Design/Build Contract, and such on-site workers shall not be paid less than such specified minimum hourly rate or wage.

ARTICLE 9

9.1 All design/build teams are required to comply with Metro's Disadvantaged Business Program. Copies of the Metro Code Section containing the provisions of this Program will be provided to all design/build teams.

III.
Competition Schedule

III. COMPETITION SCHEDULE REVISED AND ISSUED WITH THE RFP

The following schedule will be utilized and maintained throughout the design/build competition for the Metro Headquarters Building. Modifications to the schedule, if required, shall be made by Metro by written notification to all competitors actively involved in each stage of the process.

STAGE 1: REQUEST FOR QUALIFICATIONS FOR THE METRO HEADQUARTERS BUILDING

RFQ STAGE COMPLETE

STAGE 2: REQUESTS FOR PROPOSALS FOR THE METRO HEADQUARTERS BUILDING

Competition Commencement Briefing/RFP issued	Oct. 11, 1991
Questions of Teams	Oct. 11 - Nov. 8, 1991
Submission of Design/Build Proposals	Nov. 15, 1991
Technical Evaluation of Proposals	Nov. 15 - 27, 1991
Presentations	Nov. 22, 1991
Jury Evaluation of Proposals	Nov. 22 - 27, 1991
Selection of Final Design/Build Team	Nov. 27, 1991
Notice of Conditional Award	Nov. 27, 1991
Contract Negotiations	Dec. 2-11, 1991

STAGE 3: CONTRACT AWARD FOR THE METRO HEADQUARTERS BUILDING

Design/Build Contract Award by Council	Dec. 12, 1991
Contract Execution	Dec. 13, 1991
Notice to Proceed	Dec. 16, 1991
Metro Occupancy/ Substanial Completion	Jan. 15, 1993*

*Based on Contract Duration of 396 days.

IV.
Proposal Forms

A. Proposal Price Form

B. Resident/Non-Resident Status Form

C. Non-collusion Affidavit

D. Bid Bond

E. Performance Bond

F. Payment Bond

G. Design/Build Contract Form

PROPOSAL PRICE FORM

FROM:

_____
(Name of Proposer)

TO:
METROPOLITAN SERVICE DISTRICT
2000 S.W. First Avenue, Suite 150
Portland, Oregon 97201-5398
Attn: Berit Stevenson

FOR:
METRO HEADQUARTERS BUILDING
DESIGN/BUILD CONTRACT

The undersigned Proposer declares that it has carefully examined the Contract Documents for completion of the Work, that it has personally inspected the Site, that it has satisfied itself as to the Work involved, and that this Proposal is made in accordance with the provisions and under the terms of the Contract Documents.

Addenda Numbers _____ have also been read and understood. Their provisions have been included in this Proposal.

In submitting this Proposal, it is agreed:

1. To hold my Proposal open for three months following Proposal Submittal.
2. To accept the provisions of the Instructions to Design/Build Teams.
3. Proposer has included all charges in the stated Proposal price for the Work.
4. To enter into and execute a Design/Build Contract, if awarded on the basis of this Proposal.
5. To accomplish the Work in accordance with the Contract Documents.
6. To not discriminate on the basis of race, color, national origin, sex or handicap.
7. To commence Work under this Contract immediately following Notice to Proceed and to substantially complete the Work in accordance with the Supplementary Conditions.

_____
Date

_____
Name of Firm

_____
Street Address, City , State, Zip

_____
Original Signature by Authorized Representative

CORE AND SHELL

SCHEDULE OF VALUES	BASE PRICE [1]	ALTERNATE 1[2] (exposed ceiling)	ALTERNATE(S)[2] (by proposer)
Sitework	$_____	$_____	$_____
Demolition	$_____	$_____	$_____
Foundation & Substructure	$_____	$_____	$_____
Superstructure	$_____	$_____	$_____
Exterior Closure	$_____	$_____	$_____
Roofing	$_____	$_____	$_____
Interior Construction	$_____	$_____	$_____
Equipment	$_____	$_____	$_____
Conveying	$_____	$_____	$_____
Mechanical	$_____	$_____	$_____
Electrical	$_____	$_____	$_____
General Conditions	$_____	$_____	$_____
O/H & P	$_____	$_____	$_____
A/E Consultant Fees[3]	$_____	$_____	$_____
Subtotal	$_____	$_____	$_____
Metro Interior Construction Allowance	$ 1,800,000	$ 1,800,000	1,800,000
TOTAL LUMP SUM	$_____	$_____	$_____

Construction Fee for Tenant Improvement Allowance[4] _____% of construction costs of actual tenant improvements.

END OF PROPOSAL PRICE FORM

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1 Core and Shell Base Proposal Price includes all requirements of the RFP and Contract Documents and exterior building enclosure and sitework of design/build team's design.

2 Alternates to RFP are to be fully described in an attached submittal narrative, including specifications, and drawings.

3 Architectural, Interior Design, Engineering, and all Consultatnt Fees for Metro's core and shell and tenant improvements allowance work as described in the Contract Performance Specification are included in A/E Consultant Fees.

4 Construction fee is included in the allowance and is the design/build team's construction markup for all bidding, project administration and general conditions as required in the RFP.

RESIDENT/NON-RESIDENT PROPOSER STATUS

Oregon law requires that Metro, in determining the lowest responsive Proposer, must add a percent increase on the Proposal of a non-resident Proposer equal to the percent, if any, of the preference given to that Proposer in the state in which that Proposer resides. Consequently, each Proposer must indicate whether it is a resident or non-resident Proposer. A resident Proposer is a Proposer that has paid unemployment taxes or income taxes in the state of Oregon during the twelve (12) calendar months immediately preceding submission of this Proposal, has a business address in Oregon, and has stated in its Proposal whether the Proposer is a "resident Proposer." A "non-resident Proposer" is a Proposer who is not a resident Proposer.

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

1. A resident Proposer _____

2. A non-resident Proposer _____

Indicate state in which Proposer resides: _____

NON-COLLUSION AFFIDAVIT
FOR THE
METRO HEADQUARTERS BUILD
DESIGN/BUILD CONTRACT

STATE OF _____)
) ss.
COUNTY OF _____)

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

I state that:

(1) The price (s) and amount of this Proposal have been arrived at independently and without consultation, communication or agreement with any other contractor, Proposer or potential Proposer, except as disclosed in the attached appendix.

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

(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 Proposal higher than this Proposal, or to submit any intentionally high or non-competitive Proposal or other form of complementary Proposal.

(4) This Proposal 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 Proposal.

(5) _____ (Name of Proposer), 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 Proposer) understand and acknowledge that the above representations are material and important, and will be relied on

by Metro in awarding the Contract for which this Proposal is submitted. Any misstatement in this Affidavit will be treated as fraudulent concealment from Metro of the true fact relating to the submission of Bids for its Contract.

_____
Signature of Affiant

_____
Printed Name of Affiant

Sworn to and subscribed before
me this _____ day of _____, 1991.

_____
Notary Public for _____
My Commission Expires: / /

BID BOND
FOR THE
METRO HEADQUARTERS BUILDING
DESIGN/BUILD CONTRACT

(NOTE: CONTRACTORS MUST USE THIS FORM, NOT A SURETY COMPANY FORM, AND MUST ATTACH A POWER OF ATTORNEY FOR SURETY SIGNATURE.)

KNOW ALL MEN BY THESE PRESENTS:

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 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 the MEDROPOLITAN SERVICE DISTRICT, as OBLIGEE, in the sum of_____ _____ Dollars ($ _____), in lawful money of the United States of America for 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 PRINICPAL has submitted to the Metropolitan Service District a certain Proposal for work required for the Metro Headquarters Building Design/Build Project, which Work is specifically described in the accompanying Proposal;

NOW, THEREFORE, if the Metropolitan Service District does not award a contract to the PRINCIPAL within the time specified in the Instructions to Design/Build Teams for the work described in said Proposal, or in the alternate, if said Proposal 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 Proposal, files the two bonds, one guarantying faithful performance of the work to be done and the other guarantying payment for labor and materials as required by 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 its bond shall be in no way impaired or affected by any

such change, extension of time, alteration or additions to the terms of the Metro Headquarters Design/Build Contract 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 (25) percent of the original amount of the obligations without the consent of the SURETY.

This obligation shall continue to bind the CONTRACTOR 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 sue 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 all obligations on this bond.

IN WITNESS WHEREOF, we have hereunto set our hands and seals:

CONTRACTOR	SURETY
By: _____	By: _____
Title: _____	Title: _____
Date: _____	Date: _____

PERFORMANCE BOND
FOR THE
METRO HEADQUARTERS BUILDING
DESIGN/BUILD CONTRACT

(NOTE: CONTRACTORS MUST USE THIS FORM, NOT A SURETY COMPANY FORM, AND MUST ATTACH A POWER OF ATTORNEY FOR SURETY SIGNATURE.)

KNOW ALL MEN BY THESE PRESENTS:

We the undersigned _____, as PRINCIPAL (hereinafter called "CONTRACTOR"), and _____ _____ (hereinafter called "SURETY"), 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 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, to pay to the Metropolitan Service District, as OBLIGEE (hereinafter called "METRO"), the amount of _____ _____ Dollars ($ _____), in lawful money of the United States of America.

WHEREAS, the CONTRACTOR has been conditionally awarded a contract with METRO, which contract is attached hereto and made a part hereof, for accomplishment of the project described as follows: METRO HEADQUARTERS BUILDING DESIGN/BUILD CONTRACT.

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 Contract, 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 Metro Headquarters Building Design/Build Contract, METRO, having performed their obligations thereunder, the SURETY may promptly remedy the default, or shall promptly complete the Metro Headquarters Design/Build Contract in accordance with its terms and conditions.

PROVIDED, FURTHER, that the said SURETY, for value received, hereby stipulates and agrees that all changes, extensions of time, alterations or additions to the term of the Metro Headquarters Design/Build Contact 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 said SURETY does hereby waive notice of any

such change, extension of time, alteration or additions to the terms of the Metro Headquarters Design/Build Contract 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 (25) percent of the original amount of the obligations without the consent of the SURETY.

This obligation shall continue to bind the CONTRACTOR 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 sue 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 all obligations on this bond.

IN WITNESS WHEREOF, we have hereunto set our hands and seals:

CONTRACTOR	SURETY
By: _____	By: _____
Title: _____	Title: _____
Date: _____	Date: _____

PAYMENT BOND
FOR THE
METRO HEADQUARTERS BUILDING
DESIGN/BUILD CONTRACT

(NOTE: CONTRACTORS MUST USE THIS FORM, NOT A SURETY COMPANY FORM, AND MUST ATTACH A POWER OF ATTORNEY FOR SURETY SIGNATURE.)

KNOW ALL MEN BY THESE PRESENTS:

We the undersigned _____, as PRINCIPAL (hereinafter called "CONTRACTOR"), AND _____ _____ (hereinafter called "SURETY"), 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 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, to pay to the Metropolitan Service District, as OBLIGEE (hereinafter called "METRO"), the amount 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 CONTRACTOR has been conditionally awarded a contract with METRO dated _____, 19 ___, which contract is attached hereto and made a part hereof, for accomplishment of the Metro Headquarters Building Design/Build Project.

NOW, THEREFORE, if the CONTRACTOR shall promptly make payments to all persons, firms, subcontractors, corporations and/or other furnishing materials for or performing labor in the prosecution of the work provided for in the aforesaid Design/Build Contract, including 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 defined in ORS 279.526.

2. The above-named CONTRACTOR and SURETY hereby jointly and severally agree with the OBLIGEE, and its assigns that every claimant as above-defined, 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 279.526 through 279.542 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 attorney's fees of any such suit.

PROVIDED, FURTHER, that the said SURETY, for value received, hereby stipulates and agrees that all changes, extensions of time, alterations or additions to the term of the Metro Headquarters Building Design/Build Contract 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 said SURETY does hereby waive notice of any such change, extension of time, alteration or additions to the terms of the Design/Build Contract 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 (25) percent of the original amount of the obligations without the consent of the SURETY.

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

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

IN WITNESS WHEREOF, we have hereunto set our hands and seals:

SURETY	CONTRACTOR
By: _____	By: _____
Title: _____	Title: _____
Date: _____	Date: _____

DESIGN/BUILD CONTRACT
FOR THE
METRO HEADQUARTERS BUILDING

This Design/Build Contract is by and between _____ hereinafter called Contractor, and the Metropolitan Service District, a political subdivision of the State of Oregon, hereinafter called Metro.

Contractor and Metro agree as follows:

1. Contract Documents

The contract documents consist of this Design/Build Contract, the Request for Proposals, the Invitation to Propose, the Instructions to Design/Build teams, the Competition Schedule, the Proposal Forms, the Performance Bond, the Payment Bond, other sample response and contract forms, Existing Conditions, the General Conditions, the Supplementary Conditions including Division I, the Contract Performance Specifications, the Metro Headquarters Project Building Program, the Concept Design Drawings, Mechanical Electrical Design/Build Specifications, and any modifications of any of the foregoing in the form of Addenda, Clarifications, or Change Orders in accordance with the terms of this contract. Where applicable, reference to this Design/Build Contract herein shall be deemed to refer to all of the Contract Documents.

2. 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, incorporated herein by reference. Contractor agrees to fully comply with each and every term, condition and provision of the Contract Documents.

3. Contract Amount

As consideration for Contractor's performance hereunder, Metro agrees to pay Contractor the Contract Amount as adjusted by approved Change Orders issued pursuant to the Contract Documents. Contractor agrees to accept the Contract Amount as full payment for Contractor's performance of the above-described Work.

The Contract Amount is

_____ and _____/100th DOLLARS ($_____).

Metro shall make payments to Contractor in the manner and at the times provided in the Contract Documents.

4. Additional or Deleted Work

Contractor shall, when so instructed by Metro under the procedures of the Contract Documents, perform additional Work or delete Work in accordance with the Contract Documents. When applicable, Unit Prices shall determine the value of additional or deleted work. When Unit Prices are not applicable, the increase or decrease in the Contract Amount shall be determined pursuant to the applicable provisions of the Contract Documents.

5. Time of Completion; Liquidated Damages

Time is of the essence of this Design/Build Contract. Contractor shall bring the work to substantial completion within the Contract Time as set forth in the Supplementary Conditions of the Contract Documents. The Contract Time shall commence upon issuance of the Notice to Proceed. By executing this Design/Build Contract, Contractor confirms and accepts that the Contract Time is a reasonable period for performance of all of the Work.

Should the Contractor fail to substantially complete the Work, as determined by Metro in accordance with the Contract Documents, within the Contract Time, Contractor shall be liable for liquidated damages to Metro as described in the Contract Documents.

6. Bonds

Contractor submits herewith a Performance Bond and a separate Payment Bond, both in a form acceptable to Metro and otherwise in accordance with the Contract Documents and each in the amount described in ARTICLE 7 of the Instructions to Design/Build Teams. The Performance Bond shall stay in force for a period of one (1) year after written acceptance of the Work by Metro as a guarantee of repair or replacement of any item(s) of work found to be defective by reason of faulty workmanship or defective materials. The Payment Bond shall remain in force for the time required for actions against the bond to be filed in accordance with ORS 279.536.

7. Laws of Oregon Apply

The laws of Oregon shall govern the interpretation and construction of this Design/Build Contract and all of the Contract Documents.

8. Entire Agreement

THIS DESIGN/BUILD CONTRACT SIGNED BY BOTH PARTIES AND SO INITIALED BY BOTH PARTIES IN THE MARGIN OPPOSITE THIS PARAGRAPH CONSTITUTES A FINAL WRITTEN EXPRESSION OF ALL OF THE TERMS OF THIS DESIGN/BUILD CONTRACT AND IS A COMPLETE AND EXCLUSIVE STATEMENT OF THOSE TERMS. ANY AND ALL REPRESENTATIONS, PROMISES, WARRANTIES, OR STATEMENTS BY CONTRACTOR OR CONTRACTOR'S AGENTS THAT DIFFER IN ANY WAY FROM THE TERMS OF THIS WRITTEN AGREEMENT SHALL BE GIVEN NO FORCE AND EFFECT. THIS CONTRACT SHALL BE CHANGED, AMENDED, OR MODIFIED ONLY BY WRITTEN INSTRUMENT SIGNED BY BOTH METRO AND CONTRACTOR. THIS CONTRACT SHALL NOT BE MODIFIED OR ALTERED BY ANY COURSE OF PERFORMANCE BY EITHER PARTY.

CONTRACTOR:	METROPOLITAN SERVICE DISTRICT
By _____	By _____
Title _____	Title _____
Date _____	Date _____

V.
Existing Conditions

October 11, 1991

EXISTING BUILDING INFORMATION

EXISTING SITE AND BUILDING DRAWINGS AND REPORTS

The following drawings and studies of the building are available for review by design-build teams:

Sears Roebuck & Company Retail Store Drawings

Nimmons, Carr & Wright Architects

Sheet No	Title	Scale	Date
0	Plot Plan	1:20	1/10/29
1	Basement Plan	1/8"	
2	First Floor Plan		
3	Second Floor Plan		
4	Third Floor Plan		
5	Roof Plan		
6	South & West Elevations		
7	North & East Elevations		
8	Sections		
9	Misc Details	Varies	
10	Tower Entrance Details		
11	Entrance Details		
12	Stair Details		
S-1	Foundation Plan	1/8"	1/26/29
S-2	First Floor Framing Plan		
S-3	Second Floor Framing Plan		
S-4	Third Floor Framing Plan		
S-5	Roof Framing Plan		
S-6	Spandrel Section & Column Schedule		2/1/29
S-7	Tower & Penthouse Plans & Sections		1/30/29

Alternations And Additions To Building For Sears Roebuck And Co.
Bear, McNeil, Schneider, Bloodworth & Hawes Architects

1A	Removal Of Existing Parapet	Varies	5/20/66
SK-12	Revised Details @ NW Corner		5/24/67
SK-S	Tower Exterior Details		10/9/66
101	Structural Plans & Details		11/15/66
102	Loading Dock & Details		
103	Structural Elevations & Details		
104	Structural West & South Canopy		

As-Built Drawings 1/15/68
Bear, McNeil, Schneider, Bloodworth & Hawes Architects

2	Basement Floor Plan	1/8"	1/15/68
3	First Floor Plan		

4	Second Floor Plan		
5	Third Floor Plan		
6	Roof Plan & Details		
8	Elevations & Details	Varies	
10	South Elevation & Details		
11	Elevations & Details		

Electrical As-Built Revisions 1/6/68

201	Basement Floor Plan	1/8"	1/6/68
202	First Floor Plan		
203	Second Floor Plan		
204	Third Floor Plan		
205	Kitchen Plan-Riser Diagram		

Mechanical As-Built Drawings 1/11/68

301	Plot Plan-2nd Floor Plumbing	1/8"	1/11/68
302	Basement Plan-Plumbing		
303	First Floor & Kitchen-Plumbing		
304	Toilet Room Plumbing & H&V	Varies	
305	Basement Plan-Heating & AC	1/8"	
306	First Floor Plan-Heating & AC		
307	Second Floor Plan-Heating & AC		
308	Third Floor Plan-		
309	Equip List & Misc Details	Varies	

Parking Garage Building For Sears Roebuck & Co.
Burns, Bear, McNeil & Schneider Architects

201	Paving Revisions	1/16"	6/16/60
1	Site Plan	1:40	2/25/60
2	Plot Plan	1/16"	
3	First Level Plan		
4	Second Level Plan		
5	Third Level Plan		
6	Fourth Level Plan		
7	Elevations & Sections		
8	Details & Door Schedule	Varies	
9	Stair No 1		
10	Stair No 2		
11	Stair No 2 & 3		
12	Foundation Plan	1/16"	
13	Column & Footing Schedule	Varies	
14	Second Level Framing Plan	1/16"	
15	Third Level Framing Plan		
16	Fourth Level Framing Plan		
17	Shipping Room & Loading Dock	Varies	
18	Beam Schedules		
19	Beam & Joist Schedules		
20	Exhaust System & Fan Room Details		
21	Partial Plot Plan-Electrical		
22	First Level Plan-Electrical	1/16"	
23	Second Level Plan-Electrical		
24	Third Level Plan-Electrical		
25	Fourth Level Plan-Electrical		
26	Riser Diagram-Electrical		

Plat Of Survey

OTAK	Drawing 1		November 1990

Preliminary Site Assessment
Sears Department Store Building Site
Dames & Moore — December 3, 1990

Magnetometer And Soil Gas Surveys
Sears Department Store Building Site
Dames & Moore — January 31, 1990

Due Diligence Report
Walker, Diloreto, Younie, Inc. — November 27, 1990

"Metro Headquarters Sears Building Study: Development Conclusions"
BOOR/A — December 5, 1990

EXISTING SITE AND BUILDING NARRATIVE

The former Sears building is a three-story plus basement building located on a 3.05 acre site on Northeast Grand Avenue between Northeast Irving Street and Lloyd Boulevard. The 180,000 square foot building was originally built in 1929 as a Sears store. The subject building is adjacent and connected to an existing parking structure outside the scope of this project. Zoning for the site is CRX.

The former Sears Building is a collection of several buildings, constructed and remodeled between 1929 and 1966. The Original Building was a 150' x 150', three-story, concrete framed building built in 1929. This building was built on Grand Avenue and Lloyd Boulevard. The Original Building had a full basement and a 50 foot tower containing a large water tank.

The second addition to the Original Building was a 150' x 250' extension toward the north to Irving Street. The majority of concrete framing of this addition was very similar to the Original Building. This addition included an expanded loading dock and receiving area on the east side.

A three-story, 163' x 287', cast-in-place parking garage was constructed in 1960 adjacent to the former Sears Building. The parking structure extends to the east of the Main Building. At this time, a second floor was added to the loading dock/receiving area.

The Main Building underwent a major renovation in 1966. A 10,000 square foot addition filled in the floor area at the second and third floor levels on the west side. A major exterior fascia renovation was completed at the same time; marblecrete and aluminum fascia were added around the entire Main Building. Canopies above the first floor windows at the southwest corner were also added.

Structural Observations:

All floors and roof systems of the Original Building and early additions were constructed using similar methods. The first, second, and third floor slabs are all 9-1/2" thick, and designed for a live load of 100, 125, and 130 pounds per square foot, respectively. The 7-1/2" roof slab is designed for a live load of 40 pounds per square foot. The two-way, flat plate floor and roof slabs are supported on 6 foot diameter conical column capitals and 8'-4" x 8'-4" x 4-3/4" drop panels.

The flat plate roof and floor slabs have sagged slightly at the mid-point between the columns. Sags of 1/2" to 3/4" are observed at the floor slabs and 1" to 1-1/2" at the roof slab. Cracks in the exposed floor slab on the third floor radiated from the column capitals. Closely spaced "alligator" cracks exist in areas of heavy traffic. A severe floor bump exists on the third floor adjacent to the tower support column in the northwest corner.

The interior columns are round, tied, and spiral columns ranging from 24" in diameter at the third floor level to 36" in diameter at the basement level. The perimeter end wall columns are square tied columns, ranging from 24" square at the third floor to 28" square at the basement. The longitudinal column reinforcing varied from column to column, but was found to be below 2% of the column gross area. Column ties on the first two floors are typically spiral, using 3/8" diameter spiral wire spaced at 1-3/4" to 2" in pitch. Ties at the upper floors are reduced to #2 ties, spaced at either 10" or 6" centers.

The perimeter window wall system consists of a series of concrete columns, monolithically constructed spandrel beams and covered with brick veneer. Typically three windows are spaced between the large pilasters on the grid lines. Wide storefront windows are installed on the ground level of the Original Building.

The intermediate piers vary in dimension from floor to floor; at the top two floors, the piers are usually 12-1/2" thick and 32" wide. The spandrel beams above and below these windows on the third floor are 8" thick. At the second floor, the spandrel thickness increase to 12-1/2".

In 1966, new 10" x 2'-8" concrete block parapet walls were installed on the south, east, and west sides of the building. These walls are anchored to the concrete roof w880Xset in concrete anchors at 24" on center. A new concrete parapet was added along the north wall. No details are available on how this wall was connected to the roof. Tall parapet screen walls were added to the roof along the north and east walls. These parapet screen walls are covered with marblecrete and braced by steel frames.

Partition walls constructed with 5-1/2" clay tile are observed throughout the Main Building. The walls span from slab to slab. Abandoned windows are closed in with 6" concrete block. Brick in-fill was found between frame members of the tower and the elevator and mechanical penthouse tower.

Brick veneer is attached with a dove-tail anchor system. The dove-tail slots are embedded vertically in the concrete exterior, and bricks are anchored with mortar joint ties. Ties are typically spaced at 12" on center, but are missing in some areas. Slots are also plugged with concrete, preventing ties in some areas. Cast stone is pulling off the south wall. No ties are used to attach the cast stone.

The tower on the south end of the Original Building was a three-level concrete frame supporting a 15,000 gallon water tank and mechanical equipment. The tower is 25 square feet and 54 feet tall. The 13" brick in-fill at the upper level of the tower is unbraced, spanning 20 feet. Slight movement between the interconnecting building and stair and elevator towers was observed.

Cracks between the adjoining columns were noticed at the interface of the Original Building with the addition to the north side. The gap between the elevator and stair towers on the west end of the Parking Structure has widened since construction.

ADJACENT PARKING STRUCTURE

Comments on the adjacent Parking Structure, not a part of this contract, are included due to structural and operational connections between the Parking Structure and the former Sears Building.

Three stories of the northwest stair tower were added to an existing one-story entry which extends to the basement level of the Main Building. Anchorage details of the added tower were noted on the drawings. This tower is not attached to the Parking Structure.

The five-story elevator tower along the west wall was built after the Parking Structure was completed. No plans were obtained for this tower. The tower is isolated from the Parking Structure, extending to the basement of the Main Building.

The southwest stair shaft extended through the loading dock area and is adjacent to the Main Building's east wall. This shaft is at the point of intersection between the Parking Structure, the Main Building, and the loading dock area.

DATA AND OBSERVATION/LATERAL

The older portions of the buildings were designed and constructed without the aid of earthquake engineering, that has been developed in the last five decades. The predominant lateral load resisting system of the Main Building are the interior concrete moment resisting frames, which are developed through the moment resisting interaction of the flat plate slab system and the concrete columns. Review of the reinforcement used in the frames determined that the reinforcement detailing did not meet ductile design requirements of the current Uniform Building Code. Lack of continuous reinforcing bars in the top and bottom of the slabs limits the ductility of the frames.

Lateral stiffness of the building is increased by perimeter interior concrete walls. The long uninterrupted walls along the east and west sides are very stiff compared to the interior frames of the building in the north/south direction. Interior concrete walls, such as stair and elevator shaft walls, add significant lateral stiffness to the building. To enhance the building, the cutting of windows in the perimeter walls and removing stiff elevator shaft walls is likely. The demolition of shaft walls and cutting new window openings may severely weaken the total lateral load resisting system of the building.

The interaction of the adjacent Parking Structure and the Building may have a significant effect on the lateral resisting systems of both buildings. The lateral resisting systems of the elevator and stair shaft of the Parking Garage are actually provided by the Main Building. Columns from the Parking Garage extend through the receiving room structure.

HVAC

The mechanical system remains essentially as it was originally installed. Five large air handling units, two located in the mechanical penthouse, two in the south tower, and one on the third floor, are equipped with steam heating coils, refrigerant cooling coils, a supply fan, and filter section.

A steam boiler in the basement provides steam heating to air handlers and fan coil units. An incinerator was used in conjunction with the boiler to provide steam by burning packing materials.

An air conditioning unit was added to the back of the air handlers in 1966. The system includes refrigeration compressors adjacent to each of the air handlers which eject heat to evaporative coolers. The addition of the refrigeration compressors provided cooling for the entire facility. All of this equipment had exceeded its economical life and is not suitable for reuse in the renovated structure for the following reasons:

Significant continuous maintenance and repair is required for proper operation.
Inefficient systems unsuitable for the required occupancy.

Fire Protection

The entire 208,000 square foot facility is protected with an automatic fire protection system. A 10" service is distributed throughout the facility with three separate valving stations located at the basement level. Testing is required to verify the operability of the systems. Modernization of all the tamper switches and flow alarms is required. The original ADT equipment cannot be integrated with an upgraded fire alarm.

Sprinkler heads require replacement. The entire system, if reused in any form, requires flushing and sterilization to remove any rust or debris that has collected in the piping main and branch lines.

Plumbing

The existing plumbing system, installed in 1934 and expanded with building renovations, is antiquated and does not meet present codes in the Portland area. The plumbing service utilities connect to the City's main in Grand Avenue and Lloyd Boulevard. The system utilities, from a 1966 renovation set are as follows:

a. 6" Sanitary Sewer: Connected to the main in Grand Avenue
b. 14" and 6" Storm Sewer Mains: Connected to the manhole in Lloyd Boulevard. Various drains around the building connect to the sewer independent of the building drain, and several drains terminate at the curb.
c. Water: A water meter vault with 2" meter and service is located adjacent to the main entry in Grand Avenue.
d. Gas meter and regulation assembly is located at the bottom of the ramp at the existing shipping area at Lloyd Boulevard.

The underground services to the building may be adequate to accommodate the proposed new occupancy. Utilities in their present condition require upgrading to handle heavy tenant water demand.

Remaining plumbing fixtures fail to meet any of the energy or handicapped codes, and many of them are heavily stained with rust.

The plumbing equipment, which consists of sump pump, sewage ejectors, and a packaged A. O. Smith Burkay domestic water heating system, has exceeded its useful economic life.

The sanitary, storm, rain water leaders, waste and vent piping are a mixture of cast iron and galvanized steel, and close examination of the exposed piping revealed internal and external corrosion. All of the above ground piping requires replacement. The underground piping should be video taped to verify exact conditions to the street main.

Floor drains are located throughout all levels in the interior open spaces. All roof drains should be replaced and overflow roof drains installed to meet new code requirements.

The undemolished portion of the domestic water system should be removed back to the point of building entry from the street main. A main backflow preventer will be required as none presently exists. The water pressure is 82 psi. A new PRV station will be required.

EXISTING ELECTRICAL SYSTEMS

The building is served underground by Pacific Power and Light at 208Y/120V 3-phase 4-wire, and is metered at primary voltage. A transformer, located in an underground vault belonging to the Owner, has a capacity of approximately 1500KW. This is not adequate for the projected building load and is of the wrong voltage.

Two service switchboards, one original and one installed in the '60s, require replacement because the electrical bus structure bracing and circuit breaker short circuit interrupting capacity do not meet today's values. The bulk of the building load is on the original switchboard.

Most distribution panels are original, have insufficient short circuit, interrupting capacity and the manufacturers are no longer in business. They require replacement.

Generation

The emergency generator is at least 50 years old, is inoperative and cannot be economically repaired. Its transfer scheme does not conform to current codes and its operation could prove hazardous to an untrained operator.

Lighting

Most lighting fixtures are the original fixtures. Parts are missing from some. Most ballasts probably contain PCBs. All lighting must be replaced with more modern sources.

Fire Alarm and Detection

The fire alarm system, by ADT, is part of the original building. The control panel is inoperative. There is no annunciator, per se; coverage needs supplementing and wiring needs upgrading. Replacement will be more cost effective than repair and is required.

As elevators travel more than 25 feet, smoke detectors are required in the elevator lobbies. A fireman's elevator recall is to be added, as will annunciation of sprinkler flow switches and tamper switches.

Data and Telephone

Existing telephone wiring satisfied the former occupant's needs. It is extensive, but is not distributed to meet Metro's requirements. It shall be removed and replaced.

ACCESS TO SITE AND BUILDING

Design-build teams will be provided with a key to the building to allow teams to become familiar with the existing conditions. All building doors are to remain locked at all times.

bldginfo.met

VI.
General Conditions

GENERAL CONDITIONS
FOR THE
DESIGN/BUILD CONTRACT

METRO HEADQUARTERS BUILDING

TABLE OF CONTENTS

ARTICLE 1. GENERAL PROVISIONS

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

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

1.01.03 Alternates--are portions of the Work for which a Proposer must submit a separate lump sum Proposal.

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

1.01.05 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.

1.01.06 Base Proposal--is the written offer of a Proposer to perform all of the Work except the Alternates.

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

1. a change in the Work;
2. the amount of the increase or decrease in the Contract Amount, if any; and
3. the extent of the adjustment to the Contract Time, if any.

1.01.08 City--means the City of Portland, Oregon.

1.01.09 Clarification--is a written document consisting of supplementary details, instruction or information issued by Metro after award of design/build Contract which modifies, interprets, clarifies, supersedes or supplements the Contract Documents and becomes a part of the Contract Documents. It is the design/build Contractor's responsibility to determine how Clarifications impact the Work.

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

1.01.11 Concept Design Drawings--consist of drawings included in the Contract Documents which represent Metro's original design intent for the proposed Metro Headquarters Building.

1.01.12 Construction Coordinator--the Metro employee on the construction site, who will represent Metro to the extent of his authority as delegated by the Executive Officer. The Construction Coordinator will be the conduit for all Change Orders, correspondence, Requests for Information, Clarifications.

1.01.13 Construction Documents--consist of drawings, technical specifications and shop drawings prepared by Contractor and submitted to the Construction Coordinator by the Contractor pursuant to the Design/Build Agreement.

1.01.14 Contract Amount--is the total amount shown in the Design/Build Agreement as revised by Change Orders.

1.01.15 Contract Documents or Contract or RFP Documents--consist of the Request for Proposals, the Invitation to Propose, the Instructions to Design/Build Teams, the Proposal Forms, the Competition Schedule, the Design/Build Contract, the Performance Bond, the Payment Bond, the General Conditions, the Supplementary Conditions including Division 1, the Contract Performance Specifications, the Concept Design Drawings, the Metro Headquarters Project Building Program, Mechanical and Electrical Design/Build Specifications, Prevailing Wage Requirements, All Employee Design Charette Summary, and any modifications of any of the foregoing in the form of Addenda.

1.01.16 Contract Performance 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 and includes Mechanical and Electrical Design/Build Specifications.

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

1.01.18 Contractor--is the design/build team member who has entered into t 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.

1.01.19 Contractor's Architect or Architect--is the architectural member of the design/build team and its agents, representatives, employees and consultants.

1.01.20 Contractor's Construction Manager--is the construction management member of the design/build team.

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

1.01.22 Days--means calendar days including Saturdays, Sundays and legal holidays.

1.01.23 Design/Build Team--is the team assembled and selected to design, construct and manage the Project.

1.01.24 Detailed Construction Schedule or Schedule--is the timeline detailing the work required to complete the entire Project.

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

1.01.26 Drawings--means the graphic and pictorial portions of the Construction Documents prepared by the design/build contractor, wherever located, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

1.01.27 Equal or 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 Metro. Equality in reference to the Project design requirements shall be determined by Metro prior to installation of any material or product in the Project.

1.01.28 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 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.

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

1.01.30 Force Account Work--is work, ordered in writing by Metro, for which Contractor must report its actual costs in accordance with Paragraph 8.04 of the General Conditions.

1.01.31 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.

1.01.32 Geotechnical Engineer--is an agent of the Contractor.

1.01.33 Inclement Weather--is a meteorological condition or conditions, abnormal to the Portland metropolitan area for the time of year in question, which cannot be reasonably anticipated and which has a significantly adverse effect on the Construction Schedule. Abnormality of the weather is defined as the number of days the weather parameters exceed the normal adverse weather days at the project. For work under this contract, Metro defines adverse weather days on which the Contractor is impacted by weather, normally defined as days with an average daily temperature of less than 32 degrees, significant daily precipitation or snow. Contractor will be cognizant of adverse weather days based upon long term averages when preparing project schedule, and shall refer to the annual publication of Local Climatological Data for Portland Oregon available at the Portland Weather Service Office.

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

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

1.01.36 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.

1.01.37 Metro--means the Metropolitan Service District of Portland, Oregon.

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

1.01.39 Metro Executive Officer or Executive Officer--means the Executive Officer of Metro.

1.01.40 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 to the direction, requirement, or permission or 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.

1.01.41 Notice of Conditional Award--is the document issued by Metro to the selected design/build team whose Proposal complies with all the requirements prescribed by the Contract Documents as modified by selected Alternates, if any. The Notice of Conditional Award shall be given pursuant to the provisions of the instructions to Proposers. It shall not entitle the party to whom it is given to any payment under the Contract apart from the honorarium, nor shall Metro be liable to such party for any action taken in reliance upon such notice.

1.01.42 Notice to Proceed--is the written notice given the Contractor to commence the prosecution of its Work as defined in the Contract Documents.

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

1.01.44 Overhead--when applied to the cost of the Work, shall include the following items, when reasonable and necessary for completion of the Work:

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.

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

3. Equipment maintenance and repairs.

4. Temporary construction, utilities, and safety requirements, other than falsework, forming and necessary scaffolding.

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

6. Parking fees for workers (if applicable).

7. Permit fees.

8. Cost of reproduction.

9. Field office costs.

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

1. Accounting functions of the Contractor's Home and Branch Office.

2. General expenses of the Contractor's Home and Branch Office.

3. Interest on capital.

4. Salaries of any home and branch office estimators and administration.

1.01.45 Owner--means Metro.

1.01.46 Profit--means that portion of the Contractor's Proposal, price, or Unit Price that is not Direct Costs or Overhead.

1.01.47 Project--means the Metro Headquarters Building as detailed in the Contract Documents. However, if so required by the context, it shall be understood to refer to the work of this contract only.

1.01.48 Proposal--is the written offer of a design/build team 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 Proposal Forms.

1.01.49 Proposal Documents--See "Contract Documents."

1.01.50 Proposal Forms--include the following: the Proposal Sheet, Resident/ Non-Resident Proposer Status Form, the Non-Collusion Affidavit, Proposal Bond.

1.01.51 Proposer--is any individual, partnership, corporation, or joint venture, acting directly or through a duly and legally authorized representative, who assembles a design/build team and submits or intends to submit a Proposal for the Work as described in these Contract Documents.

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

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

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

1.01.55 Schedule of Values--is the detailed breakdown by scheduled work items of the Contract Amount by assigning dollar values to each Schedule network activity as defined in Section 01310 of the Specifications.

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

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

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

1.01.59 Special Inspector--is the inspector defined in the applicable building code and/or may be required by the City of Portland.

1.01.60 Subconsultant--means a person, partnership, corporation or joint venture which has a direct contract with the Contractor to perform professional consultant services.

1.01.61 Subcontractor--means a person, partnership, corporation or joint venture which has a direct contract with the Contractor to perform a portion of the Work which requires use of labor at the Site, other than common carriers.

1.01.62 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 the Contractor for use in the Work. "Shop drawings" are the drawings and diagrams showing details of fabrication and erection which the Contractor is required to submit to Metro.

1.01.63 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 and Construction Documents so that the City of Portland has issued an occupancy permit, if required by the City, and Metro can occupy or use the Work for its intended use.

1.01.64 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.

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

1.01.66 Unit Prices--are the costs for specific units of work, if any, and include all costs, including, but not limited to, equipment, labor, materials, incidentals, Overhead and Profit, for the unit of work described.

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

1.02 Intent and Interpretation of Contract Documents

1.02.01 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, both design and construction, 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.

1.02.02 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 subheadings shall be referred to as Subparagraphs; and the third-tier subheadings shall be referred to as Clauses..

1.02.03 Mandatory Nature of Specifications and Drawings

Mention in the Contract Performance Specification or indication on the Concept Design Drawings of articles, materials, operations or methods requires the 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, and to provide therefor, 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 responsibility of Contractor unless the Contract Documents prescribe a specific type of operation or method, in which case Contractor shall comply with the prescribed operation 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 the Contractor to perform the services and/or provide the materials described.

1.02.04 Precedence of Contract Documents

All determination of the precedence of or discrepancy in the Contract Documents and Construction 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. Signed Design/Build Construction Agreement.
2. Supplementary Conditions including Division 1.
3. General Conditions, Instructions to Proposers, Proposal Forms, Performance Bond and Payment Bond.
4. Contract Performance Specifications including Mechanical and Electrical Design/Build Specifications, Concept Design Drawings, Metro Headquarters Project Building Program.
5. Construction Documents.

Detailed information takes precedence over general information and words take precedence over numbers unless obviously incorrect.

Addenda to the Contract Documents take the same order of precedence as the specific sections that they are amending.

1.02.05 Discrepancies, Errors and Omissions

The intent of the Contract Documents is to require Contractor to perform and provide every service detail and item necessary for completion of the Project. The Contract Documents are not complete in every detail, however, and the 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 or Metro. Should any error, omission, discrepancy or ambiguity appear in the Contract Documents, instructions or work done by others, the Contractor shall immediately upon discovery submit a Request for Information to Metro pursuant to Paragraph 3.02. If the 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 Contract 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 the Contract on the shop drawings and provided by the Contractor to the same extent as if both indicated and specified. Any work indicated on the concept design drawings but not specified in the Contract Documents, 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.

1.02.06 Standards to Apply Where Detailed Contract 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 the Contractor shall furnish materials or manufacture 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 Concept Design Drawings or Contract Specifications are set forth herein shall conform to the usual standards for first-class work of the kind required.

1.03 Use of Construction Documents

The Construction Documents will be prepared for use in the construction of this Project only. No part of the Construction 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 Construction 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.

1.04 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.

1.05 Notice of 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 the 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 Proposal is hereby designated as the legal business address of the 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 RESPONSIBILITIES AND ORGANIZATION

2.01

The Contractor covenants and warrants that it shall be responsible for furnishing the design and the construction of the Work, and that it shall do or cause to be done all labor, materials and services as are required in the Contract Documents and such additional collateral, and incidental tasks and services as may be necessary in order to complete the Work in accordance with the requirements of the Contract Documents, shall be responsible for providing the completed Work which meets the results required by the Contract Documents, and shall achieve Final Completion of the Work by the Date scheduled for Substantial Completion.

Design and construction services shall be performed in accordance with those professional standards applicable to projects, buildings, or facilities of similar type complexity, quality and scope and shall be performed by the entities and persons, Subcontractors and specific personnel identified in the Contractor's response to the Request for Qualifications in accordance with their respective degrees of participation provided and represented to Metro therein. Other design service shall be performed by qualified architects, engineers and other professionals selected (subject to the prior approval of Metro) and paid for by the Contractor. Other construction services shall be performed by qualified construction Subcontractors and Suppliers, selected and paid by the Contractor. Nothing contained in these Contract Documents shall be construed to create any obligation or contractual liability running from Metro to any such persons or entities.

Based upon the Contract Documents and other information furnished by Metro, the Contractor shall prepare and submit Schematic Design, Design Development and Construct Documents to Metro. In accordance with the definitions set forth in the Contract, the Construction Documents shall develop the intent of the Contract Documents in detail, provide information customarily necessary for the use of such documents by those in the building trades, and include documents customarily required for regulatory agency approvals. Metro's review of Construction Documents shall not relieve the Contractor from any of its responsibilities or liabilities under the Contract, or be deemed as an approval or waiver by Metro of any deviation from, or of any failure to comply with, any provision or requirement of the Contract Documents unless such deviation or failure has been specifically approved by a Change Order to the Contract.

2.02 The Contractor shall commence and diligently prosecute the preparation of Schematic Design, Design Development and the Construction Documents as set forth in a Notice to Proceed from Metro to the Contractor. The Schematic Design, Design Development and Construction Documents may be submitted at various stages of completion (each referred to as a "Document Submittal") to Metro for review, evaluation, and comment in accordance with the following schedule:

2.02.01 Upon completion of revisions or additions to the Supplements to the Proposal Form, if any, to accommodate any modifications which have been made a part of the Contract, or modifications required by any Change Order to the Contract executed after Contract execution and prior to the date of the Document Submittal. This submittal shall be made by the date indicated for same in the approved Contractor's Project Schedule. This submittal shall be referred to as Schematic Design Documents.

2.02.02 Upon completion of the Design Development Documents.

2.02.03 Upon completion of the Construction Documents, which shall occur later than the date indicated for same in the approved Project Schedule.

2.03 Metro shall promptly commence a review of each Document Submittal and, within 30 days from the receipt of the Document Submittal, complete the review and furnish a written report ("Review Report") to the Contractor setting forth comments, questions, directions and recommendations in connection with specific items set forth in the Document Submittal, which Metro, in its reasonable discretion, believes does not satisfy the requirements of the Contract Documents. Metro reserves the right to require resubmittal of the entire "Document Submittal" if it determines that the submittal in its entirety does not adequately describe the required quality and/or conform to the requirements of the Contract Documents. In such case, any delay that may result shall not be cause for an extension of the Substantial Completion date or change in the Contract Amount.

Metro will determine the "adequacy" of the document submittals.

Metro reviews do not constitute an undertaking on the part of Metro to assure or determine compliance with the Contract Documents. Each Review Report shall be accompanied with Metro's written authorization to proceed with the completion of the Construction Documents subject to the comments set forth in such Review Report unless the submittal is rejected. Should the Review Report fail to address any item, or aspect, of the Document Submittal, the Contractor may proceed at its own risk, subject to its continuing obligation to comply with the requirements of the Contract Documents.

The Contractor shall be entitled to an adjustment in the Contract Amount and the date of Substantial Completion (Change Order), as necessary to compensate the Contractor in accordance with the Contract and permit the Contractor to properly design and construct such items as may be required in order to comply with conclusions and instructions of Metro in a Review Report that are inconsistent with, or deviate from, the requirements of the Contract Documents. The Contractor shall be entitled to such adjustment unless such inconsistency or deviation arises as a result of any omission, error or ambiguity in the Construction Documents or any other failure of the Contractor to satisfy the requirements of the Contract Documents, the Contractor shall be entitled to such adjustment.

Within seven (7) days following the Contractor's receipt of a Review Report, the Contractor shall notify Metro in writing of any items set forth in a Review Report which, in the Contractor's reasonable judgment, constitute a Program Change (such notice referred to as a "Program Change Notice"). Each Program Change Notice shall also set forth all dates and information the Contractor relies upon in determining the work is beyond the scope of Contract Documents and any increased or decreased cost that the Contractor attributes to such item and an estimated adjustment, if any, to the date of Substantial Completion, or a reasonable time limitation for providing notice of such increased cost or time adjustment. In the event that the Contractor provides such reasonable time limitation, notice of such revised cost or adjustment shall be provided within such time.

Upon receipt of a Program Change Notice, Metro shall have the following options:

1) Within seven (7) days following the receipt of a Program Change Notice, Metro may accept the conditions of the Program Change Notice and execute a Change Order to the Contract incorporating the Program Change and modifications to the Contract Amount and, if necessary, the date of Substantial Completion.

2) Within seven (7) days following the receipt of a Program Change Notice, Metro may modify or revise those items in the Review Report which constitute a Program Change as necessary to avoid any increase in the Contract Amount or adjustment to the date of Substantial Completion.

3) Within seven (7) days following the receipt of a Program Change Notice, Metro may reject a Program Change Notice by written notice. The Contractor and Metro shall attempt to resolve their disagreement and identify elements of the Program Change Notice which can be resolved. If such disagreement is not resolved within fourteen (14) days, the items described in the Program Change Notice for which there is no agreement shall be identified and set forth in the Contractor's monthly report and resolved by such means as are allowed by paragraph 3.03. In such instance, the Contractor shall proceed with the instructions contained in the Review Report to avoid delay and to provide for the orderly progress of the Work.

If Metro does not within the contract time stipulations either accept in writing the Program Change Notice, issue new instructions to the Contractor, or advise the Contractor in writing of the disapproval of any Program Change Notice, Contractor shall file a claim in accordance with Article 3.

2.04 Ownership of Design Materials and Documents

The copies or other tangible embodiments of all design materials, whether or not such materials are subject to intellectual property protection, including but not limited to documents, shop drawings, data, plans, drawings, sketches, illustrations, specifications, descriptions, models,

samples, mock-ups, manufacturers' cut-sheets, product data, and any other documents developed, prepared, furnished, delivered, or required to be delivered by the Contractor or the Architect to Metro under the Contract (collectively "Construction Documents") shall be and remain the property of Metro and whether or not the Work is commenced or completed, provided, however, that Metro makes payment for such Construction Documents in accordance with the approved Schedule of Values. During the term of the Contract, the Contractor shall be responsible for any loss or damage to the Construction Documents, while such documents are in the possession of the Contractor and/or any of its Subcontractors, and any such Construction Documents lost or damaged shall be replaced and/or restored at the Contractor's expense. The intellectual property rights, if any, to the contents or concepts embodied in the Construction Documents shall become Metro property after issuance of a building permit by the appropriate governmental authority.

As to those Construction Documents subject to copyright or, to which a patent or trademark, or any other form of intellectual property protection has been, is, or will be obtained, the Contractor hereby grants, or causes, or will cause to be granted and delivered to Metro, a world-wide, paid up, nonexclusive, nontransferable (except as herein provided) license for the term of intellectual property protection, for Metro to use, reproduce and have reproduced, display and allow others to display, and to publish and allow others to publish, in any manner, at any time, and as often as it desires, with or without compensation, such Construction Documents, without further compensation to the Contractor or any third party subject to the following restrictions:

1) All copyright and other intellectual proprietary rights in or relating to any of the Construction Documents shall become Metro property after issuance of building permit.

2) If the Contractor is in default under this Contract and the Contract is terminated by reason thereof, Metro shall be entitled to use such Construction Documents by completion of the Work by others, without additional compensation, or a release, indemnification or other action by Metro.

2.05 Drawing Format

Final building design, including all plans, elevations, sections and details, must be on AutoCAD, or an AutoCAD compatible system, and submitted to Metro on disk at the completion of the final design. As-builts shall also be on AutoCAD or an AutoCAD compatible system.

CONTRACTOR'S ARCHITECT

The Contractor's Architect is the person lawfully licensed in the State of Oregon to practice architecture, or any entity lawfully practicing architecture, identified as such in the Contractor's response to Metro's Request for Qualifications. The term Contractor's Architect means the architect and engineers, including but not limited to structural, mechanical, electrical, and civil, licensed in the State of Oregon, employed or contracted by the Contractor to design the Work and prepare the Construction Documents. The term Contractor's Architect shall mean the architect's authorized representative(s). The Schedule of Values for the Project shall include an allocation for the cost of the Contractor's Architect, subdivided as appropriate for the schedule including line items for basic architectural and engineering services for preparation of the Construction Documents and for other services of the Architect.

The Contractor's Architect shall remain employed by or contracted to the Contractor throughout the term of this Contract and shall provide full architectural services throughout the duration of design and construction. When and if necessary, the Architect shall communicate with Metro through the Contractor or the Contractor's authorized representative.

The Contractor's Architect shall prepare the Schematic Design, Design Development, and Construction Documents from the Contract Documents prepared by Metro, and the Architect shall be the "architect-of-record" on the plans and specifications, and identified as such in the application for all permits and licenses necessary for the construction and occupancy of the Work.

The Contractor's Architect shall visit the site at intervals appropriate to the stage of construction, but not less than weekly, to familiarize the Architect with the progress and quality of the Work and to determine in general if the Work is proceeding in accordance with the Construction Documents. On the basis of the Architect's on-site observations, the Architect shall keep Metro informed through the Contractor of the progress and quality of the Work, and shall use the Architect's best judgment to guard the Contractor and Metro against defects and deficiencies in the Work.

The Contractor's Architect shall at all times have access to the Work wherever it is in preparation and progress.

The Contractor's Architect shall be the interpreter of the requirements of the Construction Documents prepared by the Architect.

The Contractor's Architect will render interpretations of the Architect's own work which are necessary for the proper execution of progress of the Work. Either party to the Contract may make written requests to the Architect for such interpretations.

All interpretations and decisions of the Contractor's Architect shall be consistent with and reasonably inferable from the Construction Documents and will be in writing or in the form of drawings.

The Contractor's Architect shall have the duty, responsibility and authority to reject Work which does not conform to the Construction documents prepared by the Architect.

The Contractor's Architect shall review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data, and Samples, for conformance with the intent of the Construction Documents for the Project. Each such Contractor's submittal shall bear the signature of the Architect stating it meets the Contract requirements and the requirements of the Architect's design.

In the event Metro disagrees with the Contractor's Architect relative to contractual requirements, Metro decision shall be final and binding.

2.06 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 Change Proposal (RFCP) and for what maximum dollar amount. The Contractor shall be fully liable for the acts, omissions and decisions of such representative to the extent stipulated in the written list submitted to Metro.

The Contractor shall at all times be represented at the Site by one or more of su 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.

2.07 Field Offices at the Site

Prior to commencement of Work at the Site, the Contractor shall establish a Contractor's field office at the Site acceptable to Metro. This office may be located in a job trailer or temporary building, or within the building. This office shall be the headquarters of the Contractor's representative authorized to receive notices, instructions, or other communications from Metro and to act on Change Orders and other actions. Such notices, instructions, or other communication given to such representative or delivered to Contractor's Site office in his/her absence shall be deemed to have been given to the Contractor.

The Contractor shall also provide on site facilities and services for Metro. These facilities shall include the following:

		Minimum
1)	Two-person office for Construction Coordinator and aid	200 SF
2)	Furnished conference room * (10 people)	225 SF
3)	Toilet room *	40 SF
4)	Closet/store room	60 SF
5)	Parking (on site): 2 full time, 4 visitor spaces	

* Use can be non-exclusive.

All facilities shall include heat, electrical, water, sewer and phone services as directed by Metro. All hook-up and disconnect charges are the responsibility of Contractor.

2.08 Key Personnel

The 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 such as the Contractor's Architect, Submittal Coordinator and the Quality Control Manager.

2.09 Contractor's Employees

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

Whenever Metro shall notify the 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.

The 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 the Contractor of 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.

2.10 Contractor to Supply Sufficient Material and Workers

The 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. The 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.

2.11 Construction Plant, Equipment and Methods

The construction plant and equipment provided by the 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 and in accordance with the Construction Schedule.

The Contractor shall give the Construction Coordinator 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 the Contractor's plant or equipment, or any of Contractor's methods of executing the Work, appears to the Construction Coordinator or Metro to be inadequate to ensure the required quality or rate of progress of the Work, Metro may order the Contractor to increase or improve its facilities or methods, and the Contractor shall promptly comply with such orders. Neither compliance with such orders nor failure of Metro to issue such orders shall relieve the Contractor from obligation or liability to secure the quality of work and the rate of progress required by the Contract. The Contractor shall be responsible for overload of any part or parts of structures beyond their safe calculated carrying capacities during and after erection by placing materials, equipment, machinery, tools or any other item thereon. Unless authorized by Metro in writing, no loads shall be placed on floors or roofs before they have attained their design strength without the provision of adequate temporary support.

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

2.12 Temporary Structures

The 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, all temporary structures, sheds, barriers, walks, hoisting equipment, scaffolds, etc., as are necessary for the Work pursuant to these Contract Documents.

All 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 the Contractor, as directed by Metro, at no cost to Metro.

ARTICLE 3. ADMINISTRATION OF THE CONTRACT

3.01 Authority and Relationships of Metro

The following provisions shall govern the authority of the various officers, agents, representatives, consultants and employees of Metro. Except as specifically provided in this section, no individual acting or purporting to act as an officer, agent, representative, consultant or employee of Metro shall have any authority to make representations, statements or decisions of whatever nature binding Metro 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 Executive Officer or a person who is designated in writing by the Metro Executive Officer as having authority to act for Metro but only to the extent that such authority is expressly delegated in writing.

3.01.01 Authority of Construction Coordinator

The Work shall be performed under the general oversight of the Construction Coordinator acting as representative for Metro, who shall oversee the conduct of the Work as may be necessary, in Construction Coordinator's opinion, to safeguard the interests of Metro.

Under the direction of Metro, the Construction Coordinator shall oversee the construction of the Work through the completion of the Work and shall see that the Work performed by the Contractor is in accordance with the Contract Documents. The Construction Coordinator's oversight shall in no way supersede or dilute the Contractor's obligation to perform the Work in conformance with all Contract requirements. Except as otherwise provided herein, the Construction Coordinator shall determine the amount, quality, acceptability, fitness and progress of the Work covered by the Contract. The Construction Coordinator and Metro 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 the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Construction Coordinator and Metro will not be responsible for or have control over the acts or omissions of the Contractor, Contractor's Architect, Contractor's Construction Manager, Subcontractors, Subconsultants, 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 the Contractor to comply with all procedures established and/or implemented by the Construction Coordinator and approved by Metro as stated above. In the event any such procedures are at variance with other provisions of these Documents, such procedures shall prevail.

The Construction Coordinator may call for meetings of the Contractor, the Contractor's Subcontractors, Subconsultants and Suppliers as the Construction Coordinator 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 the Construction coordinator. Attendance shall be mandatory for all parties notified to attend.

The Contractor shall immediately comply with any and all orders and instructions given in accordance with the terms of this Contract by the Construction Coordinator acting within the scope of the duties entrusted to the Construction Coordinator under this Contract.

Except as expressly provided herein, the Construction Coordinator shall not have authority to authorize changes in the Contract, be they Change Orders or Force Account work, nor shall they have any authority to approve, allow or authorize any claims made by Contractor for increases in the Contract Amount or extensions in the Contract Time. 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, 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 Construction Coordinator 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.

3.02 Clarifications

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, the Contractor shall immediately submit to Metro a written Request for Information which shall fully describe the information sought. It is Contractor's responsibility to request information under this Paragraph in sufficient time for review by Metro so that the orderly progress of the Work is not delayed.

Metro shall interpret the meaning and intent of the Contract Documents and shall issue a written Clarification within fourteen (14) days describing such meaning and intent. Additionally, Metro may at any time issue written Clarifications 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 Clarifications, the Contractor shall perform the Work as prescribed and in accordance with all such Clarifications.

Should the content of any Clarification, in the opinion of the Contractor, require the Contractor to perform any work beyond the meaning and intent of the Contract Documents, Contractor shall notify Metro within seven (7) calendar days of the receipt of the Clarification by submitting a Program Change Notice and before proceeding with the work affected thereby. Such notice shall include all data and information the Contractor relies upon in determining that the Clarification requires the Contractor to perform work beyond the scope of the Contract Documents and any increased or decreased cost and adjustments, if any, to the date of Substantial Completion. Failure of Contractor to submit such notice, or the installation of any such work by Contractor prior to submitting such notice, shall constitute a waiver by Contractor of any claim either for added cost or for extension of Contract Time arising therefrom.

If Metro decides that the Contractor is responsible under the Contract for the work in question, the Contractor shall do such work in accordance with the Clarification or as prescribed by Metro. If Contractor does not agree that the work in question is covered by the Contract Documents, the Contractor must still do the work in accordance with the Clarification or as prescribed by Metro, but Contractor may file a claim against Metro pursuant to Paragraph 3.03. If the Contractor perfects a claim pursuant to Paragraph 3.03, the performance of such work shall not constitute a waiver of, or in any way prejudice, such claim.

If notified by Metro that a Clarification is forthcoming, any related work done before receipt of the Clarification shall be coordinated with Metro so as to minimize the effect of the Clarification on work in progress.

Any related work not coordinated with Metro done before receipt of the Clarification shall be at the Contractor's risk and at no cost to Metro if that work does not conform to the Clarification.

If the Contractor proceeds with work which is not sufficiently detailed or explained in the Contract Documents without requesting and obtaining a Clarification 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.

3.03 Contractor's Claims

3.03.01 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.

3.03.02 Types of Claims

The types of claims which Contractor may make are limited to the following:

1. Claims based upon justifiable delays as described in Subparagraph 3.03.03;
2. Claims based upon differing Site conditions as described in Subparagraph 3.03.04;
3. Claims based upon Clarifications or Change Orders issued by Metro or any other decision, action or failure to act by Metro.

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

Contractor may make claims which include requests for extensions of the Contract Time and/or requests for increases in the Contract Amount. 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. IS COMPLETE ELSE

3.03.03 Claims for Justifiable Delays

3.03.03.01 Definition of Justifiable Delay

If the Contractor is significantly and justifiably delayed in the prosecution of the Work due to any of the acts, events or conditions described as justifiable delays below, the Contractor may make a claim for an increase in the Contract Time pursuant to Clause 3.03.03.02.

"Justifiable Delay" shall mean, and is limited to, the acts, events or conditions described in sections (a) through (j) below, if such act, event or condition has a materially adverse effect on the ability of Contractor to obtain the benefits of its rights or to perform its obligations under this Contract or materially increases the cost to Contractor to obtain the benefits of such rights or to perform such obligations and if such act, event or condition and its effect:

1. are beyond the reasonable control of Contractor (or any third party for whom Contractor is directly responsible);
2. 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
3. could not have been reasonably anticipated by Contractor.

The acts, events and conditions are:

(a) An Act of God.
(b) Inclement Weather.
(c) Acts of a public enemy, war (whether or not declared) or governmental intervention resulting therefrom, blockage, embargo, insurrection, riot or civil disturbance.
(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 shall not be 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 shall be taking or have taken or shall cause to or have caused 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 US or by any department, bureau, commission, committee, agent or administrator of any legally constituted public authority.
(i) Changes in the Work ordered by Metro insofar as they necessarily require additional time in which to complete the Work and adversely impact the critical path.

(j) The prevention by Metro of Contractor from commencing or prosecuting the Work.

No claim for extension of the Contract Time will be considered for Inclement Weather unless Contractor submits documentation that such weather conditions are abnormal for the area and period of time in question; that they could not have been reasonably anticipated; and that the Inclement Weather had a significantly adverse effect on the critical path of the Construction Schedule.

Delays in delivery of equipment or material purchased by the Contractor or its Subcontractors or Suppliers (including Metro-selected equipment) shall not be considered as a just cause for delay if timely ordering would have made the equipment available. The Contractor shall be fully responsible for the timely ordering, scheduling, expediting, delivery, and installation of all equipment and materials.

The term "delay" shall specifically not include and no extension of the Contract Time shall be allowed for (i) any delay which could have been avoided by the exercise of care, prudence, foresight and diligence on the part of the Contractor; (ii) 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; (iii) any reasonable delay resulting from the time required by Metro for review of Submittals or Shop Drawings submitted by the Contractor and for the making of surveys, measurements and inspections; (iv) 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; and (v) 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. If there is any delay to the Work for any of the reasons set forth in this Clause 3.03.03.01, Metro will not grant damages, but will grant a time extension only.

3.03.03.02 Justifiable 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 justifiable 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, the Contractor shall give written notice to the Construction Coordinator of any actual time extension and any increase in the Contract Amount requested as a result of the aforementioned occurrence in accordance with this Contract.

Within a reasonable period after the Contractor submits to the Construction Coordinator such a written notice for an extension of time and/or increase in the Contract Amount, the Construction Coordinator will make the decision on each request. If Contractor is dissatisfied with such decision, Contractor may preserve its claim as provided and prescribed by Subparagraph 3.03.06.

3.03.04 Claims for Differing Site Conditions

The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Construction Coordinator of (i) subsurface or latent physical conditions at

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 Coordinator shall investigate the Site conditions promptly after receiving the notice. If the conditions do materially so differ and cause an increase or decrease in the 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 Coordinator under this Subparagraph, Contractor may preserve its claim as provided and prescribed by Subparagraph 3.03.06.

3.03.05 Other Contractor Claims

Contractor claims based upon Clarifications, Program Change Notices, 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 immediately, and not more than seven (7) days after discovering the facts which give rise to its claim and prior to commencing the work conforming to the Clarification on which the claim is based, if any, notify the Construction Coordinator in writing of its intention to make a claim. Contractor's written notification shall include a description of:

1. the factual occurrences upon which the 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;

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

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;

4. the provisions of the Contract upon which the claim is based.

Submission of written notice of claim as specified above shall be mandatory and failure to comply shall be a conclusive waiver to any claim by the 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 Construction Coordinator, Contractor shall proceed without delay to perform the work pursuant to the direction of Construction Coordinator. While the work on an unresolved claim is being performed, Contractor shall keep 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 the 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 requirements of this Article, Construction Coordinator will consider and investigate the claim or claims of the Contractor. Within twenty-one (21) days of receipt of the above described written notification of claim Construction Coordinator will advise the Contractor of Construction Coordinator'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 Coordinator under this Subparagraph, Contractor may preserve its claim as provided and prescribed by Subparagraph 3.03.06.

3.03.06 Preservation of Claims

Within forty-five (45) days after a decision by the Construction Coordinator under Subparagraphs 3.03.03, 3.03.04 or 3.03.05, Contractor may preserve its claim by submitting a fully documented claim package to Metro. That package shall include substantiating documentation with an itemized breakdown of Contractor and Contractor's Subcontractors' and/or Subconsultants 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.

3.03.07 Limitation of Damages for Delay

Except as provided below, an adjustment of Contract Time as herein provided shall be the Contractor's sole remedy for any delay in completion of the Project arising from justifiable delays under this Contract and Contractor shall not be entitled to collect or recover any damages, loss or expense of whatever nature incurred by reason of such delay.

Notwithstanding any other provision of this Contract, if any unreasonable delay described in this Paragraph is caused by acts or omissions of Metro or persons acting for Metro, Contractor shall retain any rights available to it by law to damages or an equitable adjustment for such Metro-caused delays. The preceding sentence shall not be interpreted to release Contractor from its obligations to give all notices and follow all procedures required by this Contract including, but not limited to, Subparagraph 3.03.03, and to otherwise attempt to resolve contract disputes as provided in this Contract or to pay liquidated damages as provided herein.

3.04 Metro's Right to Damages

3.04.01 Liquidated Damages for Delay

Time is the essence of the performance of the Work under this Contract. If Contractor fails to substantially complete the Work within the Contract Time, the actual damage to Metro for the delay will be substantial but will be difficult or impractical to determine. It is therefore agreed that Contractor will pay to Metro, not as penalty but as liquidated damages, the per diem amount set forth in the Supplementary Conditions, for each and every day that the date of Substantial Completion extends beyond the Contract Time.

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.

3.04.02 Payment of Liquidated Damages Not a Bar to Metro's Right to Other Damages

Payment of liquidated damages shall not release Contractor from obligations in respect to the complete performance of the Work, nor shall the payment of such liquidated damages constitute a waiver of Metro's right to collect any additional damages which it may sustain by failure of Contractor to fully perform the Work, it being the intent of the parties that the aforesaid liquidated damages 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.

3.05 Resolution of Disputes

It shall be a condition precedent to Contractor's right to litigate a claim that Contractor has fully complied with all pertinent claims procedures contained in this Article.

If any dispute shall arise between Metro and Contractor, either before or after the completion of this Contract, both parties shall attempt to negotiate a resolution of the dispute in good faith. Furthermore, if any dispute shall arise concerning any aspect of this Contract or the Project which involves Metro, Contractor and any other party or parties, Contractor agrees to attempt to negotiate a resolution of the dispute in good faith.

ARTICLE 4. SUBCONTRACTING AND ASSIGNMENT OF THE CONTRACT

4.01 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 the 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.

4.02 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.

4.02.01 Objection to Subcontractors, Subconsultants or Suppliers

Metro reserves the right to make reasonable objection to any of Contractor's Subcontractors, Subconsultants 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, Subconsultants or Suppliers. Contractor shall not subcontract with any Subcontractor, Subconsultant or Supplier to which Metro has made a reasonable objection. In the event of Metro's reasonable objection to any Subcontractor, Subconsultant 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.

4.02.02 Substitution, Change or Addition of Subcontractors, Subconsultants or Suppliers

At any time that Contractor intends to substitute, change or add a Subcontractor, Subconsultant 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, Subconsultant or Supplier if Metro gives Contractor reasonable objection in writing within ten (10) days after Metro receives such notice.

When any Subcontractor or Subconsultant fails to prosecute a portion of the Work in a satisfactory manner, Metro may so notify the Contractor. If the Subcontractor or Subconsultant fails to cure the unsatisfactory work promptly, the Contractor shall remove su Subcontractor or Subconsultant immediately upon written request of Metro and Contractor sh request approval from Metro of a new Subcontractor or Subconsultant to perform this section of the Work at no increase in the Contract Amount, and with no change in the Contract Time.

4.02.03 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 of Contractor's Subcontractors, Subconsultants or Suppliers. Failure of Metro to detect or discover such unsatisfactory work shall not relieve Contractor of any of its obligations under this Contract.

4.02.04 No Contractual Relationships Between Metro and Contractor's Subcontractors, Subconsultants 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, Subconsultants, Suppliers or agents, save and except in relation to the bonds provided by Contractor.

4.02.05 Contractor's Agreements with Subcontractors and Subconsultants

Contractor shall provide in all subcontract and supply agreements that the Subcontractor, Subconsultant or Supplier will be bound by the terms and conditions of this Contract to the extent that they relate to the Subcontractor's, Subconsultant's or Supplier's work. Where appropriate, Contractor shall require each Subcontractor to enter into similar agreements

with sub-tier Subcontractors, Subconsultants and Suppliers. Contractor shall make available to each proposed Subcontractor, Subconsultant or 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, Subconsultant or Supplier. Subcontractors, Subconsultants and Suppliers shall similarly make copies of applicable portions of such documents available to their respective proposed sub-tier Subcontractors, Subconsultants and Suppliers.

All Subcontractors', Subconsultants' and Suppliers' agreements shall also provide that they are assignable to Metro at Metro's option, in the event that Metro terminates the Contract.

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

4.03 Assignment

The 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 the Contractor's rights, by power of attorney or otherwise, nor delegate any of its duties except with the prior written approval of Metro.

ARTICLE 5. TIME OF COMPLETION AND SCHEDULE FOR THE WORK

5.01 Prosecution of Work Generally

The Contractor shall commence the Work within ten (10) 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 preparation of Schematic Design Documents, attendance at conferences, preparation and submittal of Schedule of Values, preliminary schedule, and other similar activities, as described by these Contract Documents.

5.02 Time of Completion

Contractor shall bring the Work to Substantial Completion within the Contract Time as set forth in the Supplementary Conditions.

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

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

5.03 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.

5.04 Project Scheduling

The Contractor shall submit to the Construction Coordinator schedules for completion of the Work pursuant to Section 01310 of the Contract Specifications. The Detailed Construction Schedule shall, when approved and as updated and approved by Metro, become a part of the Contract Documents.

5.05 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 the Contractor of any part 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

6.01 Other Metro Contractors Generally

Metro reserves the right to award other contracts in connection with the Work. The 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 the Construction coordinator may direct.

6.02 Duty to Inspect Other Metro Contractor's Work

Where Contractor's work is associated with that of Other Metro Contractors, or is to interface in any way with such Other Metro Contractors' 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 Work, Contractor shall immediately, and before performing any work affected by the Other Metro Contractor's work, submit a Request for Information to the Construction coordinator pursuant to Paragraph 3.02. If the Contractor proceeds without examining or inspecting the work and submitting a Request for Information, Contractor shall be held to have accepted the Other Metro Contractor's work or material and the existing conditions, and shall be responsible for any defects in Contractor's Work resulting therefrom 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. The 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.

6.03 Duty to Maintain Schedule

It shall be the responsibility of the Contractor to maintain its schedule so as not to delay the progress of the Project or the work of Other Metro Contractors. The 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 the Contractor delays the progress of the Project or the progress of Other Metro Contractors, it shall be the responsibility of the 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.

6.04 Failure to Maintain Schedule

If, in the opinion of the Construction Coordinator, the 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, the Contractor shall perform all steps which are necessary, in the opinion of the Construction Coordinator, 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 the Construction Coordinator, 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:

1. Increasing manpower in such quantities and crafts as will substantially eliminate the backlog of work.

2. Increasing, 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.

3. Rescheduling activities to achieve maximum practical concurrency of accomplishment of activities.

4. Expediting delivery of materials and equipment such as use of air freight.

If the Construction Coordinator directs the Contractor to take measures described in this Paragraph, or if Contractor takes such measures without direction form the Construction Coordinator, the Contractor shall bear all costs of complying. Metro shall, however, reimburse the Contractor for reasonable costs of complying if such directive to accelerate from the Construction Coordinator was issued to overcome delay cause 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 Detailed Construction Schedule or to take action to regain the Schedule or to furnish a Schedule as outlined in the Contract Specifications may result in a withholding of all or part of the monthly progress payments.

6.05 Failure to Coordinate Work

If Contractor fails to coordinate its Work with the work of Other Metro Contractors as directed by the Construction Coordinator, Metro may, upon written notice to Contractor:

1. Withhold any payment otherwise due hereunder until the Contractor complies with the Construction Coordinator's directions.

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.

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

6.06 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 the Contractor, the Contractor shall immediately and before performing any affected Work submit a Request for Information to the Construction Coordinator pursuant to Paragraph 3.02.

6.07 Conflicts Among Contractors

Any difference or conflict that may arise between the Contractor and Other Metro Contractors in regard to their work shall be adjusted as determined by Metro. If directed by Metro, the Contractor shall suspend any part of the Work as 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.

6.08 Coordination Drawings

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

6.09 Conferences

At any time during the progress of the Work, Metro shall have authority to require the Contractor to attend any conference of any or all of the contractors engaged in the Project.

ARTICLE 7. CONTROL AND QUALITY OF WORK AND MATERIAL

7.01 Quality Assurance

All equipment, material, and articles incorporated into the Work covered by this Contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this Contract. References in the Contract Specifications to equipment, mate

articles, or patented processes by trade name, make or catalog number, shall be regarded as establishing a standard quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of Metro, is equal to that named in the Contract Documents, unless otherwise specifically provided in this Contract.

The Contractor shall obtain Metro's prior approval of the mechanical and other equipment to be incorporated into the Work. When requesting approval, the Contractor shall furnish to Metro the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the machinery and mechanical and other equipment. When required by this Contract or by the Construction Coordinator, the Contractor shall also obtain the Construction Coordinator's approval of the material or articles which the Contractor contemplates incorporating into the Work. When requesting approval, the Contractor shall provide full information concerning the material or articles. When directed to do so, the Contractor shall submit samples for approval at the Contractor's expense, with all shipping charges prepaid. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.

All work under this Contract shall be performed in a skillful manner. Metro may required that the Contractor remove from the Work any employee Metro deems incompetent, careless, or otherwise objectionable.

The Contractor shall do all cutting, fitting, or patching of the Contractor's work that may be required to make its several parts come together properly and fit it to receive or be received by work of other contractors shown upon, or reasonably implied by, the Construction Drawings and Technical Specifications for the completed structure, and the Contractor shall make good after them as the Construction Coordinator may direct.

Any cost caused by defective or ill-timed work shall be borne by the party responsible.

The Contractor shall not endanger any work by cutting, excavating or otherwise altering the Work and shall not cut or alter the Work of any other Contractor unless approved by the Construction Coordinator.

All cement, line, masonry blocks, and other materials affected by the weather shall be covered and protected to keep them free from damage.

Should any material be found defective, or in any way contrary to the Contract, this material, no matter in what stage of completion, may be rejected by the Construction Coordinator and shall be removed from the premises at once.

7.02 Quality Control--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 Contract and Construction Documents. Additionally, during the performance of the Work, Metro and Special Inspectors, 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 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 therefor, 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.

7.02.01 Quality Control Plan--Contractor shall prepare and submit to the Construction Coordinator 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.

7.02.02 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 Coordinator 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.

7.03 Inspection--Contractor has the primary responsibility to provide and pay for inspection and testing, except as otherwise set forth in the Contract Specifications. Metro and its agents will also inspect at their discretion.

7.03.01 Generally--Contractor shall at all times permit Metro and Special Inspectors, 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 Work with the Contract and Construction Documents.

7.03.02 Special Inspections--Contractor shall at all times permit Metro and Special Inspectors, 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 and Construction Documents. Contractor shall maintain proper facilities and safe access for all such inspections. Where the Contract required 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 Coordinator 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.

7.03.03 Notice to Metro for Certain Work Days

Whenever the Contractor intends to perform work on Saturday, Sunday or any legal holiday, it shall provide written notice to Metro through the Construction Coordinator 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 and Construction Coordinator may make the necessary arrangement for testing and inspection.

7.03.04 Correction of Defective Work Before Acceptance

Any defective work or work which otherwise fails to conform to the Construction Documents, which is discovered before Final Completion and Acceptance of the Work, shall be corrected immediately by the 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 shall not relieve the Contractor of any of its obligations to perform fully all of the terms and provisions of the Construction Documents.

7.03.05 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 Construction Documents.

7.04 Unsatisfactory Materials and Workmanship

7.04.01 Generally

Material, work or workmanship which, in the opinion of the Construction Coordinator, does not conform to the Construction Documents, or is not equal to the samples submitted to and approved by the Construction Coordinator, or is in any way unsatisfactory or unsuited to the purpose for which it is intended, will be rejected. The Contractor shall bear the cost of correcting all non-conforming materials, work or workmanship. The 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 the Construction Coordinator.

7.04.02 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 the 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 cost of removal charged against the 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 impractical to replace any defective or non-conforming work or materials, the compensation to be paid to the Contractor shall be reduced by Change Order or Force Account, as applicable, by such amount as, in the judgment or Metro, shall be equitable.

7.05 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 Metro, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract and Construction Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by Construction Coordinator,

the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment used.

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

7.06 Correction of Work by Contractor

Contractor shall be responsible for and shall promptly correct or replace any defective Work, whether due to faulty materials or errors in workmanship, or Work failing to conform to the requirements of the Contract and Construction Documents which may be discovered or which may develop within eighteen (18) months 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 eighteen (18) month 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 eighteen (18) month period shall commence again on the date of first beneficial operation by Metro of such corrected or replaced Work. Testing shall not be construed to mean beneficial operation.

If Metro does not require correction or replacement of defective Work or Work failing to conform to the Contract and Construction 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.

7.07 Warranty and Correction Agreements by Subcontractors

7.07.01 Generally

In addition to any requirements for written warranties required, Contractor shall require all of its Subcontractors and Suppliers of any tier to make the same warranty to Metro as Contractor makes under Paragraph 7.04. Contractor shall also require all of its Subcontractors, Subconsultants and Suppliers of any tier to agree to correct or replace defective Work or Work not conforming to the Contract and Construction Documents in the same manner as Contractor agrees to correct or replace such Work under Paragraph 7.05.

7.07.02 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 7.06.01 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 _____
(describe work performed and/or materials provided) which we have provided for the construction of the Metro Headquart

Building has been done in accordance with the Contract and Construction Documents and that the work as provided will fulfill the requirements of the warranty included in Article 7 of the Construction Documents.

"We agree to correct or replace any or all of our work, together with any other adjacent work which may be displaced or affected by doing so, that may be defective in its workmanship or materials or which may fail to conform to the requirements of the Contract and Construction Documents within a period of eighteen (18) months following the applicable date described in Paragraph 7.05 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 the 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 charges therefore upon demand."

7.08 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 and Construction Documents.

7.09 Proof of Compliance with Contract Provisions

In order for the Construction Coordinator to determine whether the Contractor has complied or is complying with the requirements of the Contract which are not readily enforceable by inspection and test of the Work, the Contractor shall, upon request, promptly submit to the Construction Coordinator such properly authenticated documents as may be necessary to demonstrate compliance with the Contract or other satisfactory proof of its compliance with such requirements.

7.10 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 Proposal for doing the Work. The 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 or articles to be supplied under the Contract and of which the Contractor is not the patentee or assignee or has not the lawful right to sell the name. This is in addition to all other hold harmless and indemnification clauses in these Contract Documents.

7.11 Anti-Trust Claim

By entering into this Contract, Contractor, for consideration paid to the Contractor under the Contract, does irrevocably assign to Metro any claim for relief or cause of action which the Contractor now has or which may accrue to the 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 with any

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

The 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 thereunder, 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 the Contractor in pursuance of the completion of the Contract.

In connection with Contractor's, Subcontractors' or Suppliers' assignment, it is an express obligation of the 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 the Contractor, Subcontractor or Supplier to advise the General Counsel of Metro:

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

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 pendency of such action; and

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 the 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

8.01 Change Orders Generally

Metro may order changes in the Work, 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 the Contractor and Metro may agree upon as reasonable in a written Change Order. The 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 the Contractor and Metro, unless the work is Force Account work. Metro may, at its discretion, also require the signature of the Contractor's surety on the Change Order.

8.02 Procedure for Determining Impact of Change Orders on Contract Amount

8.02.01 Price Before Proceeding--If Metro intends to order changes in the Work, it may issue a Request for Change Proposal (RFCP) to the Contractor for the proposed added or deleted work before directing Contractor to commence work. Within fourteen (14) days after issuance of such RFCP by Metro, Contractor shall furnish three (3) 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, effect 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, Subconsultants or Suppliers shall 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.

8.02.02 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 an RFCP 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 (3) 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, effect on Contract Time, if any, and Overhead and Profit on a form supplied 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.

8.02.03 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 the Contractor in calculating the increase or decrease in the Contract Amount attributable to the proposed additional or deleted work.

8.03 Limitations when Change Orders Impact Contract Amount

The following limitations shall apply in the calculation of the costs of changes in the Work:

8.03.01 Overhead and Profit

Contractor will be permitted a reasonable allowance for Overhead and Profit on its increased Direct Cost resulting from any changes in the Work ordered by Metro. Likewise, Overhead and Profit 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 fifteen percent (15%) 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 to Overhead and Profit for all tiers shall in no event exceed twenty-five percent (25%) of the Direct Cost of the changed work. Distribution of this Overhead and Profit among tiers is the responsibility of the Contractor.

8.03.02 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.

8.03.03 Bond Premiums

The actual rate of bond premium as paid on the additional Direct Cost plus the cost of taxes defined in 8.03.02 will be allowed. No Overhead and Profit will be allowed on bond premiums.

8.03.04 Equipment Costs

The allowance for equipment shall be based on actual rental rates of such equipment or those rates in the current rental rate bluebook published by Dataquest, Inc., 1290 Ridder Park Drive, San Jose, California, 95131-2398, (800) 227-8444 for contractor-owned equipment.

8.04 Force Account Work

If the Contractor does not respond to Metro's RFCP with a cost breakdown within 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 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:

1. Actual labor cost, including premium on compensation insurance (if insurance is Contractor-furnished) and charge for social security taxes, and other taxes pertaining to labor.

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

3. Actual cost of material (established by invoices), including applicable taxes pertaining to materials.

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 8.03.04 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.

5. Overhead and Profit as provided and limited in Paragraph 8.03.

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

Whenever any Force Account work is in progress, the Contractor shall furnish each working day to Metro through the Construction Coordinator a detailed written report signed by the Contractor and the Construction Coordinator 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.

8.05 Oral Modifications

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

8.06 Contractor Proposals for Changes in the Work

8.06.01 Generally--At any time during the performance of the Work, Contractor may propose to Metro changes in the 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. Metro may act or not act on such proposals as it deems appropriate and shall incur no liability whatsoever to Contractor for any failure to respond to such proposals. Any changes proposed shall be in accordance with the Supplementary Conditions Section 01195.

8.07 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 the 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

9.01 Scope of Payment

Payment to the 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 the Contractor for any purpose in connection with the performance and completion of said Work.

Whenever it is specified herein that the 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 Proposal.

9.02 Schedule of Values

9.02.01 Generally

Within fifteen (15) calendar days after issuance of Notice to Proceed and prior to the Contractor's application for the first progress payment, the Contractor shall submit a detailed breakdown of its Proposal by scheduled work items. The Contractor shall furnish this breakdown of the total Contract Amount by assigning dollar values (cost estimates) to each applicable Detailed Schedule network activity, which cumulatively equals the total Contract Amount. The format and detail of the breakdown shall be as directed by the Construction Coordinator to facilitate and clarify future progress payments to the Contractor. This breakdown shall be referred to as the Schedule of Values.

9.02.02 Review of Schedule of Values

The Construction Coordinator will review the Schedule of Values in conjunction with the approved Detailed Schedule to ascertain that the dollar amounts of the Schedule of Values are in fact fair cost allocations for the work items 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 items completed prior to the end of the payment period as more fully described below.

9.03 Progress Payment Procedure

9.03.01 Generally

Subject to the approval of Metro, disbursements shall be made by Metro of progress payments upon written request of the Contractor and pursuant to the Contract Documents as follows:

Before the end of each calendar month, Contractor shall file with the Construction Coordinator in duplicate a proposed payment estimate for the period commencing on the 26th day of the previous month through midnight of the 25th day of the calendar month in question. Metro and the Construction coordinator shall review Contractor's estimate and shall determine the value of the 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. On or about the 25th day of the following calendar month, Contractor shall be paid ninety-five percent (95%) of the value of the work as determined above. The remaining five percent (5%) shall be withheld by Metro as Retainage.

No inaccuracy or error in any monthly progress payment estimates shall operate to release the 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.

9.03.02 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 fifty percent (50%) of the Work under the Contract is, in Metro's opinion, completed. Elimination of additi

Retainage under this Subparagraph shall be allowed by Metro only upon written application by Contractor, which application shall include written approval of the 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 97.5 percent complete, Metro may, at its discretion and without application by Contractor, reduce the retained amount to 100 percent 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 279.575 or, at the option of Contractor, deposited in an interest bearing account pursuant to the following paragraphs and as authorized by the Director of Oregon's Department of General Services.

The 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 279.575. 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:

1. Bills, certificates, notes or bonds of the United States.

2. Other obligations of the United States or its agencies.

3. Obligations of any corporation wholly owned by the federal government.

4. Indebtedness of the Federal National Mortgage Association.

The 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, upon demand by Contractor, inform Contractor of all such accrued costs.

9.03.03 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 therefor 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. The Contractor must provide to Metro written consent from Contractor's surety approving the advanced payment for materials stored off site.

The maximum payment allowed by Metro shall be fifty percent of the actual fair market value of the item being considered. Metro and the Construction Coordinator shall be the sole judges of fair market value. The Contractor shall protect stored materials from damage, and damaged materials, even though paid for, shall not be incorporated into the Work.

9.03.04 Other Conditions Precedent to Payment

It is a condition precedent to Contractor's rights to any payments under this 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.

9.03.05 Payment Does Not Imply Acceptance of Work

The granting of any progress payment, or the receipt thereof by the Contractor, shall not constitute acceptance of the Work or any portion thereof, and shall in no way lessen the liability of the 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.

9.03.06 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 the 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.

9.04 Substantial Completion

When Contractor considers the Work to be substantially complete and an occupancy permit has been received from the City of Portland, Contractor shall submit to Construction Coordinator a written notice that the Work is substantially complete and a preliminary punch list of items to be completed or corrected. Within a reasonable time after receipt of such notice, Construction Coordinator will make an inspection to determine the status of completion. Should Construction Coordinator determine that the Work is not substantially complete:

1. Construction Coordinator will promptly notify the Contractor in writing, giving the reasons therefor.

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

The above described procedure shall be followed until the Work is, in the opinion of the Construction Coordinator, substantially complete. At that point in time, the Architect will prepare a Certification of Substantial Completion on AIA Document G704 which will be signed by the Contractor and Contractor's Architect, accompanied by the approved punch list of items to be completed or corrected as verified and amended by the Construction Coordinator. The Contractor shall complete the items on the approved punch list.

9.05 Final Completion and Acceptance

When Contractor considers the Work to be finally complete, Contractor shall submit written certification to the Construction Coordinator that:

1. Contract and Construction Documents have been reviewed.

2. Work has been inspected for compliance with Contract and Construction Documents.

3. Work has been completed in accordance with Contract and Construction Documents.

4. Equipment systems have been tested in presence of the Construction Coordinator and are operational.

5. Work is ready for final inspection.

Construction Coordinator will promptly make an inspection to verify the status of completion. Metro shall, within fifteen (15) days after receipt of Contractor's certification, either accept the Work or notify the Contractor of the work yet to be performed on the Contract as outlined below.

Should the Construction Coordinator consider that the work is incomplete or defective:

1. Construction Coordinator will promptly notify the Contractor in writing, listing the incomplete or defective work.

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

3. Construction Coordinator will reinspect the Work.

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

9.06 Closeout Submittals

Contractor shall submit the following items, as applicable, with its request for Final Payment:

1. Evidence of Compliance with Requirements of Governing Authorities.

2. Project record documents in accordance with Division 1 of the Specifications.

3. Operation and maintenance data in accordance with Division 1 of the Specifications.

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

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

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

7. Consent of surety to Final Payment.

8. Certificates of insurance for products and completed operations.

9. If Contractor is a "foreign contractor" as that term is defined in Subparagraph 14.03.06, complete documentation of Contractor's compliance with ORS 279.021.

9.07 Releases

The Contractor 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, the Contractor shall:

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.

2. Deliver to Metro written releases of all rights to file claims against Metro or to file claims on any bonds in connection with the Contract, signed by each Subcontractor, Subconsultant and Supplier who performed labor or furnished materials in connection with the Work.

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

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

B. 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.

9.08 Final Payment

Upon application of Contractor and Contractor's completion of and compliance with all of the provisions of the above Paragraphs, Metro shall pay Contractor the balance of the Contract Amount 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.

9.09 No Waiver of Rights

Neither the inspection 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

10.01 Safety Requirements

10.01.01 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 or present 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 OSHAs, 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.

10.01.02 Safety Program

Contractor shall develop, publish and implement the overall Safety Program for the Project. This Program shall conform to all applicable codes. Contractor shall submit the written Safety Program to Construction Coordinator for review and comment within thirty (30) days after the receipt of the written Notice to Proceed. The Program, as approved by Construction coordinator, shall 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.

10.02 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.

10.03 Protection of Work, Persons and Property Against Damages

Contractor shall protect the Work from damage due to construction operations, the action of the elements, the carelessness of other contractors, vandalism, or any other cause whatsoever 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 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 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 the Contractor.

The 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 the property. The Contractor shall also provide, place and maintain such lights as may be necessary for illuminating 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 and leave the entire Site clean and orderly.

ARTICLE 11. INDEMNIFICATION AND INSURANCE

11.01 Indemnification

Contractor agrees that for purposes of the Oregon Tort Claims Act (ORS 30.260 through 30.300) that neither Contractor, its officers, agents and employees nor any Subcontractor, Subconsultant or Supplier of Contractor of any tier and its officers, agents and employees are agents of Metro. Contractor for itself and its officers, agents, employees and its Subcontractors, Subconsultants 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 through 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 or Metro, their officers, agents and employees, or to others on account of the character of performance of the Work, unforeseen difficulties, accidents or any other cause whatsoever, 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 therewith, or the acts, omissions, operations, or conduct of the Contractor or any Subcontractor, Subconsultant 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, and irrespective of whether act, omission or conduct of the Contractor, Subcontractor, Subconsultant or Supplier is merely a condition rather than a cause of the claim, liability, loss, damage or injury.

Any specific duty or liability imposed or assumed by the 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 the Contractor by this Paragraph.

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

1. Special activities by the Construction Coordinator to verify and/or expedite delivery of materials which are fabricated off-site, and those losses incurred by Metro as a result of any delays to Other Metro Contractors resulting from acts of the Contractor or its failure to act.

2. Acceleration payments to Other Metro Contractors on the project resulting from Contractor falling behind the Detailed 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 the Construction Coordinator, in order to maintain progress.

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

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 the Contractor, its Subcontractors or Subconsultants, officers, employees or agents and all attorney's fees and court costs incident thereto.

11.02 Insurance

11.02.01 Public Liability and Property Damage Insurance

11.02.01.01 Contractor's Insurance

Contractor shall obtain, pay for and maintain, until 365 days after the date of Final Completion and Acceptance of the Work, public liability and property damage insurance policy or policies as shall protect Contractor in performing the Work covered by this Contract from claims for bodily and personal injury and property damage which may arise because of the nature of the Work or from operations under these Contract Documents. Such operations shall include, but not be limited to, use of owned, non-owned or hired automobiles, whether such operations be by Contractor or by any Subcontractor, Subconsultant or Supplier of any tier or anyone directly or indirectly employed by Contractor or any Subcontractor, Subconsultant or Supplier of any tier.

Such insurance covering the work shall include, but not be limited to, Blanket Contractual Liability (covering liability assumed by the Contractor under Paragraph 11.01 on indemnification); Bodily Injury, Broad Form Property Damage Liability (including coverage for explosion, collapse, underground and completed operations), Personal Injury Liability, and Products-Completed Operations Liability for one (1) year after Final Completion and Acceptance of the Work by Metro. Such insurance shall be written on an occurrence basis and shall include Metro, its Councilors, employees, and agents as additional named insured.

Contractor shall submit evidence of professional liability insurance coverage for the Contractor's Architect. Such insurance shall cover damages arising as a result of negligent acts, errors, mistakes, or omissions in rendering or failing to render professional services. Such coverage shall have limits of not less that $1,000,000. In no way will the insurance limit of the design team limit the liability of the contractor's indemnification in Article 11.01.

11.02.01.02 Builder's Risk Insurance

Metro will cause to be obtained and maintained until Final Completion and Acceptance of the Work, a standard "All Risk" Builder's Risk Insurance policy, including coverage for fire, earthquake, explosion, vandalism and malicious mischief and collapse at a cost considered to be reasonable by Metro. Such insurance shall be in an amount equal to the replacement cost of the Project (without deduction for depreciation) and shall be subject to a stipulated value in lieu of average clause of all structures constituting any part of the Project, including the cost of excavations, grading and filling. At Metro's option, this insurance may be subject to a deductible of $10,000 per occurrence. Such insurance will not cover loss or damage to the Contractor's equipment, scaffolding or other materials not to be incorporated in the Work nor will it cover materials not delivered to the site.

Metro and the Contractor waive all rights of subrogation against each other and any of their subcontractors, agents and employees, each of the other, for damages caused by fire or other perils to the extent covered by valid and collectible Builder's Risk Insurance obtained pursuant to this Clause 11.02.01.02 or other valid and collectible Builder's Risk Insurance applicable to the Work, by Metro as Owner.

The above-described policy shall provide that all proceeds thereunder shall be payable to Metro and will name Contractor, Contractor's Subcontractors and Suppliers of all tiers of the Work, as Metro may, in its discretion, designate as additional insureds, receive all monies which may become due and payable under said policy, compromise any and all claims thereunder and shall apply the proceeds of such insurance to the repair, reconstruction or replacement of the Project as provided in the resolution of the Metro Council authorizing the construction of the Project and the payment of expenses incidental thereto.

Contractor shall be responsible for the first $10,000 of any loss occurrence in which Contractor or Contractor's Subcontractor of any tier has an insurable interest unless such loss occurrence results solely from an Act of God in which event Metro may deduct the amount of any loss (plus expenses) incurred by Metro for which Contractor is responsible from sums due or to become due Contractor.

For further information regarding this Builder's Risk policy, the Proposers may request specifics of Metro's policy at the Construction Coordinator's office.

11.02.01.03 Insurance for Others

Contractor shall include Metro, its elected officials, employees, and agents as additional named insureds under the above policy or policies.

Such insurance shall provide coverage for Metro against direct or contingent loss or liability for damages for bodily and personal injury or death, or property damage, arising out of, in connection with, or incident to the execution of the Work until its Final Completion and Acceptance and Final Payment, and shall cover all Work performed by, for or on behalf of the Contractor, each of Contractor's Subcontractors of any tier, Subconsultants of any tier, Suppliers of any tier, and shall cover the supervisory acts of these insureds with respect to the Work. Both bodily and personal injury and property damage must be on an occurrence basis; and said insurance shall provide that the coverage afforded thereby shall be primary coverage (and non-contributory to any existing valid and collectible insurance to the full limit of liability stated n the declaration, and that if the insureds have other insurance against the loss covered by said insurance, then such other insurance shall be excess insurance only. Said policy or policies shall also include a "cross-liability" clause.

11.02.01.04 Policy Limits

Metro requires project endorsement for policy limits in aggregate on this project only. The policy or policies of insurance described in Clauses 11.02.01.01 and 11.02.01.02 shall provide a combined single limit of coverage, for bodily injury, personal injury and property damage of not less than $5,000,000 per occurrence and in the aggregate for Products and Completed Operations Liability and Contractual Liability. Contractor shall additionally provide Automobile Liability coverage, including Non-owned and Hired autos, in an amount not less than a combined single limit of $5,000,000 per occurrence.

11.02.02 Worker's Compensation and Employer's Liability Insurance

Contractor shall obtain, pay for and maintain until 365 days after the date of Final Completion and Acceptance of the Work full Worker's Compensation Insurance, and Employer's Liability Insurance in amounts necessary to provide statutory state of Oregon coverages to cover any compensation that Metro might be liable to pay under the provisions of ORS chapter 656. Contractor shall require that all of its Subcontractors, Subconsultants and Suppliers of any tier provide such coverage also. In the event that Contractor is self-insured, Contractor shall furnish a Certificate to self-insure issued by the Director of Oregon's Department of Insurance and Finance. If the Contractor fails to maintain such insurance, Metro may obtain Worker's Compensation Insurance to cover any compensation which Metro might be liable to pay by reason of any employee of the Contractor being injured or killed, and may deduct the amount of the premium for such insurance from any sums due the Contractor. Furthermore, if Metro is compelled to pay any compensation pursuant to ORS chapter 656 due to Contractor's failure or the failure of any of

Contractor's Subcontractors, Subconsultants or Suppliers of any tier to comply with this Subparagraph, Metro may deduct and retain from any sums due Contractor under this Contract an amount sufficient to cover such compensation and any other cost Metro may incur in paying such compensation.

If any injury occurs to any employee of Contractor or Contractor's Subcontractor, Subconsultant or Supplier of any tier for which compensation is claimed from Metro, to the extent that the claim is not covered by insurance, Metro may retain sums due Contractor under this Contract in an amount sufficient to cover such claim or claims. If it is determined that no compensation is due such employee, the retained amount will be paid Contractor. If Metro is required to pay such compensation, the amount paid shall be charged to the Contractor.

11.02.03 Forms of Policies and Other Insurance Requirements

Certificates of insurance evidencing the above described coverages shall be delivered to Metro within ten (10) days of receipt of Conditional Notice of Award and prior to commencement of the Work.

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 the Contractor or Contractor's Subcontractors and Suppliers or 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 thirty (30) days' prior written notice. Contractor shall file with Metro two (2) certified copies of the required new or renewed policy or two Certificates of Insurance for each such policy, as applicable, at least fifteen (15) days before the effective date of such cancellation, change or expiration.

Should the Contractor neglect to obtain or maintain in force any such insurance or to deliver such policy or policies, certificates or 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 the 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.

ARTICLE 12. EQUAL EMPLOYMENT OPPORTUNITY AFFIRMATIVE ACTION REQUIREMENT

Contractor and all of Contractor's Subcontractors, Subconsultants and Suppliers of any and all tiers shall be certified as Equal Employment Opportunity Affirmative Action Employers by the City of Portland, Oregon, for the entire term of the Contract. Contractor shall provide Metro with documentation evidencing the above described certifications within twenty-four (24) hours of request by Metro.

ARTICLE 13. MISCELLANEOUS STATUTORY RESPONSIBILITIES OF CONTRACTOR

13.01 Generally

The 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 of those persons employed or engaged therein. Contractor shall pay all taxes, including federal, state, regional, county and city or taxes of any other governmental entity applicable to the work performed or materials provided under this Contract.

13.02 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
- 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 Commission
Soil and Water Conservation Commission
State Engineer
State Land Board
Water Resources Board

LOCAL AGENCIES

City of Portland
Multnomah County
Metropolitan Service District
Planning Commissions

13.03 Other Provisions of Oregon Law

13.03.01 Generally

The provisions set out in Oregon Revised Statutes Chapters 187 and 279, 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 279.021, 279.312, 279.314, 279.316, 279.318, 279.320, 279.334, 279.338, 279.348, 279.350, 279.352, 279.354, 279.355, 279.356, 279.359, 279.361, 279.365, 279.400 through 279.430 and 279.575. Contractor shall fully comply with all applicable provisions of these statutes. The specific requirements of certain of these sections are set out below.

13.03.02 Payment to Subcontractors and Laborers

Pursuant to ORS 279.312, Contractor shall make payment promptly, as due, to all persons supplying such Contractor labor or material for the prosecution 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 corporations, 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.

13.03.03 Failure to Make Payment for Labor or Services

Pursuant to ORS 279.314, 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 payment against funds due or to become due Contractor by reason of such Contract. Metro's payment of such a claim in the manner authorized by ORS 279.314 shall not relieve Contractor or Contractor's surety from obligation with respect to any unpaid claims.

13.03.04 Hours of Work

Pursuant to ORS 279.316, no person shall be employed for more than eight (8) 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 for all overtime in excess of eight (8) hours a day and for work performed on Saturday or on any legal holiday specified in ORS 279.334. Contractor shall furthermore comply with any applicable provisions of ORS 279.334, 279.336 and 279.338.

13.03.05 Payment for Medical Care

Pursuant to ORS 279.320, 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.

13.03.06 Requirements for Foreign Contractors

Pursuant to ORS 279.021, any "foreign contractor" 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 provision 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.

13.03.07 Prevailing Wage

Except as limited by Oregon Revised Statutes, Contractor shall pay his/her on-site workers and require his/her Subcontractors to pay their on-site workers the prevailing rate of wage

as required in ORS 279.350, and shall comply with all other requirements contained therein. The Appendix to this Contract contains a provision stating 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.

13.03.08 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).

13.04 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 Information to the Construction coordinator pursuant to Paragraph 3.02 which shall fully describe the variance. If Contractor performs Work contrary to codes, laws, ordinances, rules, regulations or orders without submitting such Request to the Construction coordinator, 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.

13.05 No Additional Compensation Allowed for Compliance with Laws

The Contract Amount includes full compensation for compliance with all applicable laws, rules, 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 14. TERMINATION OR SUSPENSION OF THE WORK

14.01 For Default of Contractor

If the 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 the 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 the Construction Coordinator, 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, the 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 the 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 the 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 the Contractor, which difference will hereinafter be called the "unpaid balance," exceeds the expense incurred by Metro in completing the Work, including expenses 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 the 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 the 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 the 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, the Contractor shall as regards those portions of the Contract terminated or suspended:

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

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.

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.

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.

14.02 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, the 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 the 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, the Contractor will be paid a percent of the Contract price equal to the percentage of the work completed.

VII.
SUPPLEMENTARY CONDITIONS
DESIGN/BUILD CONTRACT
DIVISION I

Section 01040	Project Coordination
Section 01190	Project Procedures Manual
Section 01300	Submittals: Shop Drawings, Product Samples
Section 01310	Project Scheduling
Section 01440	Contractor's Quality Control and Standards
Section 01500	Construction Facilities and Temporary Controls
Section 01700	Contract Closeout
Section 01711	Cleaning
Section 01720	Project Record Documents

SUPPLEMENTARY CONDITIONS
DESIGN/BUILD CONTRACT

METRO HEADQUARTERS

October 11, 1991

SUPPLEMENTARY SPECIAL CONDITIONS FOR THE DESIGN/BUILD CONTRACT

METRO HEADQUARTERS BUILDING

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1.01 Scope of Work

The Scope of Work includes the construction of core and shell, tenant improvements, and complete architectural and engineering for such design, complete construction management services for such Work, the procurement of all necessary permits, licenses, special inspections and testing and all other items incidental to such Work necessary to bring about a completely functional and fully renovated Metro Headquarters Building pursuant to these Contract Documents.

A. Building Core and Shell.

1. Building core and shell is the total of all demolition, site work, building enclosure, HVAC, plumbing, electrical and conveying systems, finishes and equipment included in the base price. Building core and shell includes all work as indicated on the Concept Design Drawings and in the Contract Performance Specification and as required to provide a complete and fully functioning building ready for tenant improvements.

B. Tenant Improvement (Interior Finish).

1. Tenant Improvement is the interior finish items not included in the core and shell and include all elements of the Metro program including partitions, finishes and construction of general office space, specialized office and support areas, Metro council chambers, computer rooms, day care center, lobbies and corridor finishes, casework and storage, sinks, interior signage, power, communication and lighting layouts and the main lobby stair (Stair #4). Metro FF&E is not included in tenant improvement allowance. Construction fee is included in the allowance and is the Contractor's construction markup for all bidding, project administration and general conditions as required in the RFP.

All interior finishes and colors are to be developed with Metro and product samples submitted to Metro for review and approval prior to completion of Construction Documents. Based on the approved space plan and interior finishes, complete all related Construction Documents and specifications for work covered by the interior allowance. Submit all interior Construction Documents to Metro for final review and approval prior to construction.

Coordinate Metro FF&E requirements and integrate those required into building core and shell and interior improvements. Design, specifications, procurement, and installation of FF&E will be by Metro and outside this contract.

C. Architectural/Engineering Services. Contractor shall provide complete architectural and engineering services required to deliver a fully renovated building and site. The design/build team in addition to the Architect and

Landscape Architect, shall include structural, mechanical, electrical and civil engineers. All team members shall be licensed in the State of Oregon. The Architect shall be the Architect of Record for the plans and specifications of the Construction Documents and provide full architectural and engineering services throughout the duration of design and construction.

1. The scope of Architectural services shall include:

   a. For the 'building core and shell' shall include Schematic Design, Design Development and Construction Documents phases with submittals of design and documents to Metro for review and approval at the end of each phase. Architecture services to include normal construction administration services including reviews of shop drawings and submittals, visits to the site at intervals appropriate to the stage of construction and weekly site visits/project meetings to determine if the work is proceeding in accordance with the construction documents and review the work with Metro representatives.

   b. For tenant improvements, the interior design service includes the same full architectural and engineering services as required for the building core and shell portion and includes working with Metro to develop a space plan and interior design scheme that meets the Metro program, the allowance budget and is approved by Metro. Work shall include preparing an existing furniture inventory and layout(s) including both existing furniture and newly acquired furniture. Contractor shall provide indoor informational graphics and/or signage and consulting services necessary to determine text, quantity and locations.

   c. Included in the design/build team's proposal is the time for the design and construction team to participate in Metro's 1% for Art program. Specifically, the design/build team will meet with Metro and artists to select sites for art and review art/building coordination issues, if any. Design/build team is expected to work with Metro artists during the design phases of work to help identify the most appropriate integration of the art and building design.

2. The scope of structural engineering services shall include:

   a. The project structural engineer of record (SEOR) shall survey the general conditions of the building, review existing building construction documents, and develop necessary destructive testing program to determine existing structural systems and conditions of the building.

   b. SEOR shall review proposed building additions and modifications developed by the design/build team and determine feasibility and required structural modifications.

c. Calculations stamped by SEOR shall be prepared for submittal to the City of Portland for building permit. Calculations shall include analysis of all existing structure used to resist earthquake loads, live load capacity, analysis of existing floor and roof systems, and the analysis and design of all structural upgrades, additions and repairs.

d. Construction documents shall be prepared for submittal to City of Portland for building permit. Plans and details stamped by SEOR shall depict all structural upgrades, modifications, additions and repairs necessary to implement design/build proposal and meet applicable codes and requirements. Structural notes or specifications shall be prepared outlining design parameters, material requirements, and special inspection requirements.

e. Structural shop drawings and material submittals shall be reviewed by SEOR.

f. SEOR shall provide site observations of all major structural work. Work requiring observation by SEOR and special inspection shall be listed in the construction documents.

3. The scope of mechanical/electrical engineering services shall include:

a. The project Mechanical/Electrical Engineer of Record (M/EEOR) shall survey the general conditions of the existing mechanical/electrical system, review existing building construction documents, and define those systems to remain and be re-used and those demolished.

b. M/EEOR shall retain the services of PP&L's FinAnswer energy program. Submit computer model and analysis of energy conservation measures for incorporation into design. Assist modeler.

c. Calculations stamped by M/EEOR shall be prepared for submittal to Metro. Calculations shall include block/zone heating and cooling loads, panel loads, and ground fault.

d. Construction documents shall be prepared for submittal to City of Portland for building permit. Plans and details stamped by M/EEOR.

e. Mechanical/Electrical shop drawings and equipment submittals shall be reviewed by M/EEOR.

f. M/EEOR shall provide site observations to observe the progress and conformance with the contract documents of mechanical/electrical installations.

g. Attend all fire/life Safety meetings and tests and confirm the operation of buildings fire/life safety system. Conduct 40-hour building commissioning.

4. Design/build team shall have a licensed geotechnical engineer complete a geotechnical analysis and report on areas of the site requiring new foundations and footings. Report to include recommendations on soil bearing values, foundation and footing design, and moisture protection.

D. Offsite Improvements.

1. Contractor shall determine all City of Portland required off-site improvements or upgrades resulting from this Project, including but not limited to traffic signalization, signage, curb and gutters, landscaping, street lighting and utility relocation. Contractor shall be responsible for all design, construction and coordination of such required off-site improvements.

E. Layout.

1. The Contractor shall lay out its work from base lines and bench marks established by his own consultants, and shall be responsible for all field measurement in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the Work. The Contractor shall be responsible for executing the Work to the lines and grades that may be established or indicated by the city, Metro or existing conditions. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks.

F. Protection of the Work.

1. The Contractor shall protect from damage all existing equipment, improvements and utilities (1) at or near the work site and (2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage, including that to the property of a third party, resulting from failure to comply with the requirements of this Contract or failure to exercise reasonable care in performing the Work. If the Contractor fails or refuses to repair the damage promptly, Metro may have the necessary work performed and charge the cost to the Contractor.

2. Any weather protection and/or cleanups which are required for this Work, shall be performed by the Contractor at his expense, to the satisfaction of the Construction Coordinator.

G. Include all items required for a complete installation whether or not shown or described. Bidders shall visit the site to familiarize themselves with all conditions.

H. Contractor is responsible for obtaining all permits, special inspections, including the final Certificate of Occupancy and shall schedule and bear all costs of all required Fire and Life Safety testing, provide all equipment and devices for such testing and make all adjustments required by local authorities to obtain the Certificate of Occupancy by the Substantial Completion date.

I. The Scope of Work shall not include the following items:

1. Cost for specification preparation, procurement and installation of FF&E items.

2. Cost for procurement and installation of 1% for art items.

1.02 Concept Design Drawings

Concept Design Drawings included in the RFP indicate Metro's general design intent and specific design requirements. Drawings include existing conditions to remain and new construction. Refer to as-built drawings or site inspection to verify existing conditions to be modified or removed. Concept Design Drawings do not outline detailed requirements of the exterior closure or the site design as these are the responsibility of the design/build proposal.

Minor modifications to the Concept Design may be suggested and included in the design/build team's proposal and should be fully described in drawings and narrative submitted. Significant modifications in scope, quality or organization, if desired by design/build team, can be proposed and identified as an Alternate (See 1.03 Alternates). Significant modifications to the Concept Design cannot be included in the base price core and shell proposal.

1.03 Alternates

Design/build teams are required to provide a base proposal price based on Metro's RFP, Program, Concept Design Drawings, Contract Performance Specifications, and design/build team's exterior enclosure and site design. In addition, each design/build team is required to submit an Alternate No. 1 proposal which modifies the ceiling system of the base proposal. Design-build teams that provide a bonafide proposal price for the base contract are allowed to submit alternate proposals for any aspect of the project design or construction.

Alternate proposal prices are to be identified on the Proposal Price Form and supported with drawings, specifications, product literature and narratives as appropriate to allow Metro to evaluate alternatives.

Metro will evaluate alternate proposals against Metro's project goals and objectives, program, function, initial budget and long term operating costs. Metro retains the right to consider or reject any and all alternate proposals if deemed in the best interest of Metro.

Prescribed Alternate No. 1: Delete the dropped ceiling and related basic fixture type identified for the Metro office areas and add an exposed ceiling and pendant type florescent fixture. This alternate requires that the exposed ceiling, structure and all exposed equipment such as HVAC ductwork, electrical and fire suppression equipment, etc., shall be painted and that all exposed equipment shall be suitable for an exposed installation. The design/build teams shall include the cost of painting ceiling and exposed structures and equipment and the cost of the light fixture on the floor in the core and shell element of the proposal price and the installation of the light fixture in the tenant improvement allowance element of the proposal price.

1.04 1% for Art

Metro will participate in a 1% for Art program. Costs for art and installation are outside this proposal and contract. Some art installation may be integrated into or on the proposed building construction.

All construction costs, if any, associated with art installation, support or backing will be outside the design/build team's core and shell proposal costs and will be negotiated as a change order. If art funds are used to replace building materials or systems included in the core and shell base price, appropriate credits in the base price will be provided to Metro via change order.

1.05 Codes and Permits

All work shall be designed and built to comply with applicable city and state building codes, regulations, and ordinances including but not limited to:

Uniform Building Code
Uniform Mechanical Code
National Electric Code
Uniform Fire Code
ANSI 117.1 (Handicapped Accessibility)
Governing Fire Marshals Office
Oregon State Energy Code
OSHA Standards
City of Portland Zoning Ordinance
City of Portland Central City Plan

The building occupancy type shall be as required by code. Preliminary evaluation indicates:

Parking areas	B1 Occupancy
Office/Retail Areas	B2 Occupancy
Day Care Center	E3 Occupancy

Construction type to be as required by UBC.

Metro has a strong commitment to handicapped accessibility and requires proposals to meet the full intent (letter and spirit) of all applicable codes regarding accessibility. Metro also requires proposals to meet requirements of the Americans with Disabilities Act 1990 (ADA) where exceeding existing codes. Consideration will be given to proposals that include cost effective, functional solutions that exceed minimum accessibility requirements.

A. Permits

1. Design/build team to obtain and pay for all required permits and approvals including but not limited to building plan check fees and permits (site, electrical, mechanical, street and sidewalk closures, etc.), design review approvals and utility access permits and charges, including but not limited to public and private utility(s) hook-up(s) and extensions.

2. Design/build team to provide Metro with occupancy permits allowing complete use of parking levels (basement and Grand Avenue) and public areas (lobbies, elevators, stairs, corridors, toilets, service/loading areas) of Irving and upper levels.

3. Design/build team shall provide one copy of all permits obtained to construction coordinator and prior to final acceptance shall submit to Metro the approved signed permits and drawings.

1.07 Time of Completion

Pursuant to the provisions of the Time of Completion and Schedule for the Work (Article 5 of the General Conditions of these Contract Documents), the entire work including any selected Alternate(s) shall be brought to substantial completion within 396 calendar days.

1.08 Liquidated Damages

Pursuant to the provisions of Article 3.04 (entitled Metro's Right to Damages) of the General Conditions of these Contract Documents, the amount of damages to be paid by the Contractor for failure to substantially complete the Entire Work of this Contract (including Selected Alternates in accordance with the Time of Completion Paragraph 107 of these Supplementary Conditions shall be $4,250 (Four Thousand Two Hundred Fifty Dollars) per day.

END OF SUPPLEMENTARY CONDITIONS

SUPPLEMENTARY CONDITIONS DESIGN/BUILD CONTRACT DIVISION I

Section 01040	Project Coordination
Section 01190	Project Procedures Manual
Section 01300	Submittals: Shop Drawings, Product Samples
Section 01310	Project Scheduling
Section 01440	Contractor's Quality Control and Standards
Section 01500	Construction Facilities and Temporary Controls
Section 01700	Contract Closeout
Section 01711	Cleaning
Section 01720	Projct Record Documents

PART 1 - GENERAL

1.1 DESCRIPTION:

A. This Section specifies administrative and procedural minimum requirements for the Work progress meetings, including, but not limited to:

1. Presentations to Metro officials and Council (minimum of two).
2. Pre-design Conference
3. Design Phase Progress Meetings
4. Design Development Conference(s)
5. Construction Documents Conference
6. Pre-construction Conference
7. Pre-installation Meetings
8. Work Progress Meetings

B. Presentations to Metro Council and Officials

Subsequent to acceptance of the Proposal by Metro, the Contractor and Architect shall make presentation(s) of the selected design to Metro. The presentations are to familiarize the committee, Council and officials with the design solution selected by the Jury. Time and place to be determined.

C. Predesign Conference

The Contractor, Architect and Metro shall participate in a Predesign Conference conducted by the Contractor as soon as possible following Notice-to-Proceed, or earlier if mutually agreed. If necessary, a prior meeting between the parties will address discrepancies in the Proposal. This conference is intended to convey changes to the Program Criteria required by Metro, if any, or to note any deviations from the Program or Contract Documents in the Contractor's Proposal that may have been discovered during the Design/Build Proposal evaluation.

D. Design Phase Progress Meetings

Periodic design progress meetings shall take place at the Architect's office, at intervals not to exceed monthly, for the duration of the design phase, i.e., until the Design Documents have been completed and approved by Metro.

If more frequent meetings are required, they shall occur at a mutually acceptable location.

E. Design Development Conference

The Contractor shall submit the Design Development Documents prior to this conference according to the date indicated in the approved Project Schedule. The purpose of this conference is to communicate to the Contractor Metro's comments concerning the Design Development. At this conference the Architect shall present the Design Development to Metro. The Committee's comments shall be a part of Metro's response to the Submittal.

F. Construction Documents Conference(s)

The Contractor may review with Metro partially complete Construction Documents prior to the date indicated in the approved Project Schedule for submittal of completed documents. The Contractor shall review with Metro completed Construction Documents. After any such review, a conference to discuss Metro's response may be appropriate.

G. Pre-Construction Conference

To be held prior to any construction activity on the Site. The purpose of this conference is to acquaint all members of the construction team with the procedures of Metro with respect to the administration of the construction. Constraints of the site and location will be discussed. Construction Coordinator, the Contractor's Project Manager, Superintendent, and on-site staff will be introduced and the limits of their responsibilities and authority identified.

H. Pre-Installation Conference

1. The purpose of this conference is to insure the Contractor, Subcontractors, installers, craftsmen, suppliers, fabricators and others, as appropriate, are coordinated and understand the requirements of the Contract Documents, as well as those of the Architect's Construction Documents. Work under specific sections of the Architect's Construction Documents may indicate the need for pre-installation conferences(s).

2. These conferences shall be scheduled by the Contractor, as agreed by Metro, at least seven (7) days prior to any Work for the applicable section. All shop drawings and applicable submittals shall have been submitted by the Contractor and approved prior to this conference.

3. The Contractor's Project Manager and Superintendent, with the lead person performing the Work and/or the appropriate Subcontractor/supplier/fabricators shall attend this meeting. The Construction Coordinator will represent Metro.

I. Work Progress Meetings

1. Purpose is to communicate and discuss the schedule, impediments to progress, submittals, quality control, safety, site constraints, upcoming pre-installation conferences, and related timely subjects. Problems will be identified at these

meetings. If necessary, resolution of such problems may be at subsequently scheduled meetings attended by appropriate personnel.

2. This meeting shall be conducted weekly at a predetermined time agreed to by Metro and the Contractor on site. Metro reserves the right to have these meetings more or less frequently as determined appropriate for various stages of progress.

3. Attendees shall include Metro's representatives, the Contractor's Project Manager and Superintendent and Architect with appropriate Subcontractors involved with the current work.

J. Other Meetings as Determined by Metro.

1. Metro reserves the right to call for a meeting for a specific purpose at any time with 48-hour notice to the Contractor. Appropriate Contractor personnel shall attend such meetings as requested by Metro.

2. The Contractor shall notify appropriate Subcontractors and/or other appropriate personnel for attendance.

END OF SECTION

PART 1 - GENERAL

1.1 PROJECT PROCEDURES MANUAL

A. Contractor shall develop and publish within 90 days after Notice to Proceed a Project Procedures Manual (PPM) to be implemented during the construction process. Three copies of the Manual shall be submitted to the Construction Coordinator for approval.

At a minimum the Procedures Manual shall include:

1. An organization chart covering all Project personnel.

2. An organization chart pertaining to how the Project staff interfaces with the main and branch office personnel/services.

3. Detailed job descriptions of all Project positions.

4. Limits on fiduciary signatory authority of the various levels of Project personnel.

5. Drawing Change/Contract Modification Procedures:

   a. How are changes communicated to field?

   b. How are changes communicated to subcontractors?

   c. How are changes incorporated into field sets.?

   d. Descriptions and recommendations of documents/forms to be used.

   e. Methods/change order procedures for changes to subcontractors/vendors.

   f. Methods for authorizing additional work to subcontractors prior to their receipt of formal Change Order.

   g. Methods for responding to Metro Request for Change Proposals.

   h. Methods for authorizing and auditing work performed on a Force Account (i.e., Time and Material) basis.

6. Clarification request procedures.

7. Record "As-Built" Drawing update procedures.

8. Scheduling systems and implementation techniques.

9. Internal Management/Supervisory Meetings - when, where, how, who, what?

10. Subcontractor coordination procedures/meetings

11. Accounting Procedures:

    a. Preparation and control of monthly payment request.

    b. Control of payments to subcontractors.

    c. Waivers received.

    d. Insurance expiration updates.

12. Shop Drawings and submittal Procedures - review, coordination, approval, distribution, tracking system.

13. Contractor may include at his option the various other plans/programs and procedures required elsewhere by these Contract Documents (i.e. Safety Program, Temporary Electric Plan, etc.).

In addition to the above minimum requirements, Contractor should include in the Manual other information which will assist Metro in understanding the internal and day-to-day operations/procedures of the Contractor.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. General. Types of submittal requirements specified in this Section include administrative submittals, work-related submittals. Individual work-related submittal requirements are specified in applicable sections for each unit of work.

B. Submittals Specified Elsewhere: See "Responsibilities of the Contractor", "Contractor's Architect", and "Project Coordination", "Contractor's Architect", and "Project Coordination", for submittal requirements for design and construction documents prior to the commencement of construction.

C. General Distribution: Provide additional distribution of submittals (not included in following submittal copy requirements) to Subcontractors, suppliers, fabricators, installers, governing authorities and others as necessary for proper performance of the Work. Include such additional copies in transmittal to Metro where required to receive review before final distribution. Record distributions on transmittal forms.

1.2 GENERAL SUBMITTAL REQUIREMENTS

A. Submittal Register: Prepare and maintain submittal register as approved by Metro.

B. Coordination and Sequencing: Coordinate preparation and processing of submittals with performance of the Work so Work will not be delayed by the Contractor's preparation or Metro's review of submittals. Coordinate and sequence different categories of submittals for same Work, and for interfacing units of Work, so one will not be delayed for coordination of Metro review with another. If Contractor determines that the timely review of certain submittals is critical to maintain progress on the Work, Contractor shall identify such submittal to Metro and coordinate with Metro in scheduling such submittals and reviews.

C. Preparation of Submittals: Provide permanent marking on each submittal to identify Work, date, Contractor, Subcontractor, submittal name and similar information to distinguish it from other submittals; define location of submittal in the Work and its location in the Contract Documents. Show Contractor's and Architect's executed review and approval marking. When marking a document prepared by a Subcontractor or supplier, the Contractor

and/or the Architect shall identify and date their marks on the submittal prior to forwarding to Metro.

D. Transmittal Form: Transmit submittals on standard transmittal form as approved by Metro.

1.3 ADMINISTRATIVE SUBMITTALS

A. Project Schedule: Submit per "Project Scheduling".

B. Schedule of Values: Submit per "General Conditions".

C. Project Weekly Report: Prepare a report, recording the following information concerning events at the Site: submit to Metro on Monday of the following week.

1. List of Subcontractors at site (including testing laboratories) with description of work being peformed by each Subcontractor.

2. Count and description of personnel at the site on a daily basis.

3. High/low temperatures, general weather conditions on a daily basis.

4. Accidents (refer to accident reports).

5. Meetings and significant decisions.

6. Unusual events or problems (refer to special reports).

7. Stoppages, delays, shortages, losses.

8. Submittal of Contractor's Request for Information and subsequent response.

9. Change Orders

10. Services connected, disconnected.

1. Equipment or system tests and start-ups.

12. Partial completions, occupancies.

13. Substantial completions authorized.

14. Other information required by Metro.

1.4 WORK RELATED SUBMITTALS

A. Submit shop drawings and manufacturer's product literature to Metro for all major building materials, systems and assemblies for their review and approval prior to purchase and installation. Shop drawings and product

literature to be submitted to Metro after review by design/build team's architect and showing evidence of architect's review and comments (if any).

B. Definitions: Work related submittals of this section are categorized for convenience as follows:

1. Shop drawings include specially prepared technical data for this Work, including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instruction, measurements and similar information not in standard printed form for general application to several projects.

2. Product data include standard printed information on materials, products and systems; not specially-prepared for this Work, other than the designation of selections from among available choices printed therein.

3. Samples include both fabricated and unfabricated physical examples of materials, products and units of Work; both as complete units and as smaller portions of units of Work either for limited visual inspection or (where indicated) for more detail testing and analysis.

4. Mock-ups are a special form of samples, which are too large or otherwise inconvenient for handling in specified manner for transmittal of sample submittals.

5. Miscellaneous submittals related directly to Work (non-administrative) include warranties, guarantees, maintenance agreements, workmanship bonds, physical work records, statements of applicability, quality testing and certifying reports, copies of industry standards, record drawings, operating and maintenance materials, overun stock, devices and materials applicable to the Work and not processed as shop drawings, product data or samples.

1.5 GENERAL

A. Except as otherwise indicated in individual work sections, comply with requirements specified herein for each indicated category of submittal. Provide and process intermediate submittals, where required between initial and final, similar to initial submittals.

1. For the purpose of Work Related Submittals, "Contractor' shall also include "Architect" for required actions on all Work related submittals.

2. All Construction Documents shall be signed and sealed by the Architect and by the appropriate engineer or design professional, all currently licensed to practice in the State of Oregon.

3. Construction Documents shall be accompanied by appropriate engineering calculations, all signed and sealed as indicated above.

4. All prescriptive specifications listing materials, products, methods, and finishes shall be submitted in a CSI format.

5. Design Development Documents shall be accompanied by a general interior/exterior color scheme. Construction Documents shall specify all colors, finishes, patterns and other Architect selections.

6. Submit five (5) sets of construction and Design Development Documents to Metro.

1.6 SHOP DRAWINGS

A. Submit shop drawings of all fabricated work, and as required by specifications. Fabricate no work until shop drawings have been approved for fabrication. Fabrication of Work performed prior to Metro approval shall be at the Contractor's risk. Include following information:

1. Every item, material, article, nor note on installation, shown or required for fabrication or installation, shall be so designated. Each shop drawing shall be checked by Contractor and architect prior to transmittal. The Contractor shall verify all dimensions with actual and existing field measurements, check deviations and compatibility with related work and indicate such checking by a signed and dated stamp. Show materials, items, and installation not supplied or performed by entity submitting shop drawings and who will be providing such Work. Do not use the expression "by others" on any shop drawing.

2. Shop drawing details, drawing and plans, elevations, other drawings, shall show Architects detail number, and shall be referenced to Construction Document drawings nomenclatural and numbers, or shall show specification section as applicable.

3. If shop drawings show variations from requirements of the Construction Documents because of standard shop practices or other reason, the Contractor shall make specific mention of such variations. If any indicated departures will affect a correlated function, item, article, installation, construction, or Work of other trades of the Contractor, the Contractor shall so note, and if extra cost is involved in related changes, the Contractor shall assume all such costs.

4. If Metro makes changes in the shop drawings which vary from the requirements of the Contract and cause a deviation in the Contract Amount, Contractor shall notify Metro and shall not proceed with fabrication or installation until he receives written instructions from Metro or a Change Order in accord with the General Conditions.

5. Comply with the following submittal procedure:

a. Submit one Contractor certified reproducible ("sepia" or similar) and two prints to Metro.

b. Metro will review for general conformance with the design concept of the Project and general compliance with the information given in the Contract Documents. The review does not affect the Contractor's responsibility to perform all Contract requirements with no change in Contract price or time. The Contractor is responsible to confirm and correlate dimensions at the site, for information that pertains to the fabrication processes, for the means, methods, techniques, procedure, sequences and quantities necessary to complete the Contract and for coordination of the work of all trades and satisfactory performance of its work. Reproducible will be stamped "Reviewed" or ""Reviewed and Noted" in which case resubmittal is not necessary or it will be stamped "Coordinate as Noted" or "Revise and Resubmit" in which case correction and resubmittal are required. Make additional submittals in same manner until satisfactory review is indicated. When shop drawings are resubmitted, provide clear markings on each drawing "Resubmittal" with an appropriate date.

c. After satisfactory review, reproducible will be sent to a printer designated by the Contractor. Contractor shall pay for printing and submit to Metro two (2) sets of approved shop drawings. The Contractor shall pay for such additional sets as he requires for his use.

d. Product Data: Submit two (2) copies of product data to Metro, plus necessary copies for Contractor, Subcontractors, and maintenance and equipment manuals, for all manufactured products, and where required by specifications. Collect required data into one submittal for each unit of Work or system; and mark each copy to show which choices and options are applicable to Work. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked, and special coordination requirements. Maintain one set of product data (for each submittal) at the Work Site, available for reference by Metro and others. Retain necessary copies of maintenance and equipment manuals to be submitted at completion of the Work.

6. Samples: Provide units identical with final condition of proposed materials or products for the Work. Included"range" samples (not less than three units) where unavoidable variations must be expected, and describe or identify variations between units of each set. Provide full set of optional samples where Metro selection is required. Prepare samples to match Metro's sample where so indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards. Attach descriptive label to each sample identifying the product. Samples are submitted for review

and confirmation of color, pattern, texture and "kind" by Metro. Metro will not "test" samples (except as otherwise indicated) for compliance with requirements, which are therefore the exclusive responsibility of Contractor.

7. Mock-Ups and similar samples specified in individual work sections are recognized as a special type of sample. Comply with requirements for "samples" to greatest extent possible, and process transmittal forms to provide a record of activity.

8. Inspections and Test Reports; Classify each as either "Shop Drawing" or "Product Data", depending upon whether report is uniquely prepared for Work or a standard publication of workmanship control testing at point of production; process accordingly.

9. Standards: Where copy submittal is indicated, and except where specified integrally with "Product Data" submittal, submit one copy for Metro's use. Where workmanship at Work Site and elsewhere is governed by standard, furnish additional copies to fabricators, installers and others involved in performance of the Work.

10. Mechanical and Electrical Work: Make submittals required in the Performance Criteria and any additional submittals required in Contract and Construction Documents.

11. Closeout Submittals: Refer to "CONTRACT CLOSEOUT", for submittals required at closeout.

END OF SECTION

PART 1 - GENERAL

1.01 Project Scheduling

A. General. Overview. Provide scheduling for the Work as described in this section: a preliminary schedule, a detailed schedule, three (3) week schedules, daily progress reports, and a schedule report. Each of these schedules/reports shall be updated on the periodic basis indicated or more frequently as appropriate or as requested by Metro. By submitting his proposal, the Contractor acknowledges that he can schedule the Work to meet the completion date indicated herein. By submitting a proposal the Contractor also represents that they possess, and will maintain throughout the course of the Work sufficient resources, personnel and expertise to prepare, revise and update the types of schedules required herein. All days indicated herein are calendar days unless specifically noted otherwise.

1. Responsibility. The Contractor is responsible for developing its own schedule logic with appropriate durations, manpower, and cost data as accepted by Metro and compatible with the constraints and completion date specified herein. Metro reserves the right to reject any schedule or report that fails to indicate timely completion of the Work or which reflects unrealistic projections of performance or cost. Failure of the Contractor to deliver the schedules or reports in a timely manner will result in a temporary suspension of progress payments.

2. The detailed Construction Schedule shall be prepared by the Contractor's own "in-house" supervisory personnel. In the event Contractor does not have CPM and/or computer capability, a CPM Consultant acceptable to Metro may be used to augment the Contractor's supervisory personnel. It is intended the maximum input planning shall be provided by the Contractor's supervisory personnel.

3. Scheduling Personnel. The Contractor shall designate a Scheduler who shall have all responsibility for schedules and reports on this Work to insure continuity and consistency. The designated Scheduler may be an employee of, or a consultant to the Contractor. The Scheduler shall have a minimum of three (3) years of successful experience in the scheduling of major projects including at least one project with a Contract value in excess of $10,000,000.

1.02 Preliminary Schedule

A. General. The Contractor shall submit a preliminary schedule indicating progress during the first sixty (60) days (minimum). This schedule shall reflect the Contractor's detailed schedule for the first sixty (60) day period after Notice to Proceed and for the overall concept of the Work Schedule thereafter. This schedule is subject to review and approval by Metro for the purpose of general conformity with Contract requirements.

B. Format. This schedule shall be a gantt (bar) chart with the rows representing activities and columns for appropriate increments of time during the duration of the Work. Include a Schedule of Values showing costs for the activities within this sixty (60) day period and the expected submittal of progress payments for the entire Work. The same requirements and constraints for these activities apply as those described in Item 1.03, Detailed Schedule, following.

1.03. Detailed Schedule

A. General. The Contractor shall prepare and submit a detailed construction schedule using the Critical Path Method (CPM) for the Metro's review and comments. A precedence format shall be used for this schedule unless otherwise approved in writing by Metro. The Contractor shall integrate his original sixty (60) day schedule with this schedule so the detailed schedule shows the entire Work from beginning through completion. This schedule shall be computer generated from input prepared by the Contractor.

B. Format Requirements.
Activities. Include all the tasks necessary for the completion of the Work including but not limited to the planning, recruitment, procurement, delivery, detailing, designing, obtaining of permits, submittals, approvals, authorization, and performance of the Work under the Contract. It shall include all of the activities of all Subcontractors, vendors, suppliers, fabricators, and manufacturers as well as any other activities that expend time and are Work oriented. Activities do not necessarily have a monetary value.

For each activity, provide (or space for providing during updates) the following:

a. Description of Activity. Provide adequate information to readily identify each activity but do not use more than 40 alpha characters including spaces. This description may be abbreviated as required for the space available on plotted charts. When abbreviated, the activity number shall be used concurrently to insure positive identification of the activity.

b. Preceding and succeeding activities and milestones.

c. Duration in calendar days. Duration of any activity shall not exceed 30 days except 2% of the activities may exceed this limit without prior written approval of the State.

d. The following calendar dates for each activity:

. earliest start
. earliest finish
. scheduled start (or actual start on updated schedule)
. scheduled finish (or actual finish on updated schedule)
. latest start
. latest finish

e. Slack or float (hereafter called float), as determined by mathematical analysis. No more than 30% of the monetary value of the Work activities shall have float of less than seven days and no more than 20% of the monetary value of the Work shall have "zero" float without prior written authorization of Metro. Any schedule with "negative float" will not be acceptable.

f. Monetary value of activity where appropriate. The value for any one activity shall not exceed $50,000 except 2% of the total Contract Sum may exceed this limit without Metro's prior written approval. The monetary value of each activity shall be the basis of the "schedule of values" which will be used for determining periodic progress payments. Prorate construction overhead and profit to each activity on the basis of activity cost to total Work cost. Activity values shall be rounded to the nearest dollar. If, in the opinion of Metro, the schedule of values is unbalanced, the Contractor will be required to present documentation substantiating the cost allocation of those activities believed to be unbalanced and make changes as appropriate. Progress payments will not be approved until any conflict on unbalancing is resolved.

g. Activities or non-pay items which take time to complete and affect progress. This includes, but is not limited to, submittal of samples, product data, shop drawings, warranties, procurement and delivery of equipment and/or materials, fabrication, delivery, as-built drawings, inspections, testing, submittal of O&M Manuals, training of operating personnel, issuance of Certificate of Occupancy, and related activities.

h. Percentage of activity completed.

i. Contractor's earnings based on approved percentage completed.

j. All tasks and reviews required by Metro, City, County and State agencies the Contractor believes are necessary to support the time completion of the Work.

k. All tasks to be approved by others required for completion of the Contractor's work, including but not limited to, permanent electrical

power, water, gas and telephone. Provide a "Notice" activity on schedule a minimum of 180 days prior to time permanent service is required.

1. Identification of activities which are planned to be conditioned by use of overtime, double shifts, or work on weekends or holidays. Note that working beyond a normal 40-hour week and holidays will require payment to Metro for associated expenses of on-site representation.

m. The "lags" and "leads" for each activity.

C. Detailed Network Diagram. This diagram shall be time scaled with a continuous flow of activities from left to right. The unit of scale columns shall be calendar days. Weekends and holidays shall be indicated on the diagrams. Each activity shall be indicated by alpha and numeric identification showing preceding and succeeding event numbers and abbreviated description with associated costs and durations. Activities on the critical path shall be highlighted for ease of identification., For activities with float, show the time they are scheduled to be accomplished. This diagram shall be organized to zone the activities for each component of the Work. Submit in a format acceptable to Metro on an updated monthly basis.

D. Summary Network Diagram. The detailed network diagram previously described shall be summarized on a single 24" x 36" sheet with a minimum of 50 and maximum of 150 activities based on and supported by the detailed network diagram. Related activities shall be "hammocked" to each component of the Work by CSI section or division as space will allow and the critical path shall be clearly defined. This diagram shall be time scaled. Identify activities similar to that required for the detailed diagram and submit on an updated monthly basis.

E. Gantt Chart. Based on the detailed schedule, show the Work on a bar chart with the CSI divisions for each component of construction on a monthly time scale. Each line item shall be represented by a summary bar indicating early start/finish, and the progress on a monthly basis. This chart shall be on a 24" x 36" sheet.

F. Cumulative Cash Flow and Manpower Diagram. This diagram may be included on the same sheet as the Gantt Chart provided adequate details can be provided as approved by Metro. Show the CSI divisions for each phase of construction on a monthly time scale with the schedule of value for each of the CSI divisions. Plot the projected cumulative progress billings over the life of the Work. The vertical scale will show scheduled percentage from 0% to 100% and dollar value of Contract from $0 to Contract amount. The horizontal scale shall be a monthly time chart showing the duration of the Work. Three curves shall be plotted on this graph using the scheduled dates as follows:

. using early finish dates
. using late finish dates
. using average between early finish and late finish values

Using a different type of line, plot the actual monthly progress billings for each monthly update to compare "actual" to "projected".

Provide similar additional diagaram shownig manpower projections/utilitzation.

G. Submittal Schedule. Prepare on format acceptable to Metro showning proposed submittals of design(s), samples, product data, shop drawings, warranties, as built drawings, O & M Manuals, and related data.

H. Delivery Schedule. Show order dates and projected delivery dates for all critical and/or major equipment and materials, all cross referenced to the CPM schedule as approved by Metro. This shall be upgraded monthly and shall be keyed to the submittal schedule.

I. Three-Week Schedule. In addition to the detailed CPM schedule, submit a bar chart schedule showing the activities planned for the next three (3) weeks. Each week shall start on a Monday. This abbreviated schedule shall show the Work activities of the Contractor, each subcontractor performing work during this period, any expected submittals, deliveries of equipment or materials and expected support or activities by Metro , "Notices", testing or support to be performed, pre-installation conferences, and expected activities by others such as installation of utilities. This schedule shall include the previous week comparing the activities scheduled and those actually accomplished. This schedule shall be submitted to Metro on a weekly basis on Monday morning of each week.

J. Schedule Report. This narrative report shall indicate the activities completed or partially completed during each monthly reporting period and their total value as a basis for the Contractor's monthly request for payment. This report shall state the percentage of Work actually completed compared to that scheduled as of the report date and the progress along the critical path in terms of days ahead or behind schedule. The narrative shall outline a description of problem areas, current and anticipated, delaying factors and their impact, and a plan for corrective action to be taken or proposed identification of problems within this report will not be acknowledgement to constitute notification of any intended or potential claim. Any request for any additional compensation or extension of the schedule must be made the subject of separate correspondence. Enclosed with this report shall be the previously itemized schedule/reports for the monthly update.

K. Submittals. Preliminary schedule defining the Contractor's planned operations during the first sixty (60) days after Notice to Proceed shall be submitted by the Contractor within five (5) days after date of Notice to Proceed. This schedule is subject to the approval of Metro and Metro reserves the right to not proceed further until this preliminary schedule is approved.

1. The required schedules and reports described 1.03, Detailed Schedule, shall be submitted within forty (40) days after receipt of Notice to Proceed.

2. Upon submittal Metro will review and approve or confer with the Contractor to discuss revisions. This review with the Contractor will be within ten (10) days after initial submittal by the Contractor. Based on the conference between Metro and the Contractor, the Contractor will make necessary revisions to the schedule and resubmit to Metro within ten (10) days. When the schedule has been approved by Metro it will be the basis for the Contractor's execution of the balance of the Work and for monthly progress payments. Progress payments will not be approved beyond the preliminary 60 day schedule until all items of the Detailed Schedule are approved by Metro.

3. If the Contractor desires to make changes in its method or sequence of the Work after his schedule is approved, he shall notify Metro in writing stating reasons for the proposed change. Metro will consider approval if the completion date is not changed, no more activities are on the critical path, and that it is in the best interest of Metro to accept the revision. If approved by Metro, the Contractor shall revise the schedule at no additional cost to Metro with revisions to all submittals and reports as required after the notice to proceed.

L. Schedule Update. The Contractor shall submit monthly updates of the schedule and reports with his monthly request for payment. This update shall report the actual construction progress by updating the mathematical analysis of Metro approved percentage completion of each activity. A separate listing of all revisions and/or data entries made since the last report shall be provided including but not limited to logic changes, duration changes, and actual start and finish dates. Entering or updating information into the mathematical analysis is subject to the approval of Metro. Revisions causing changes in the detailed network shall be noted on the summary network and on affected portions of the critical path since the last submittal. With each submittal, the Contractor shall submit a certificate that each Subcontractor and major equipment/material supplier concurs with the CPM schedule as it relates to their work.

M. Form of Submittal. Submit reproducible and two (2) copies of each submittal. Maximum sheet size for diagrams shall be 24" x 36:" unless otherwise approved by Metro. The initial submittal and all subsequent submittals shall show the latest date and name of person who prepared the submittal. In addition to the previous, submit to Metro 5.25 inch double-sided high density floppy disk(s) with all information in each submittal. Provide identification on each floppy by Work and date submitted and other information for ease of retrieval. Provide necessary support to Metro for reading and printing these disks as requested.

N. Use of Slack or Float. This is defined as the amount of time between early start and late start or the time between early finish and late finish on any of the activities on the schedule. This time is not for the exclusive use or benefit of either the Contract or Metro. Extensions of time will be granted only to the extent that the equitable time adjustments for the activities affected exceed the total float or slack along the path involved at the time Notice to Proceed was issued for the change.

O. Review by Metro. Metro shall promptly review the Work schedule and approve or make request for changes, additions, deletions, or corrections so that the Schedule generally conforms to Contract requirements. The Contractor shall promptly make such changes as requested. Metro will approve the schedule when and if such revisions are satisfactory to Metro. Metro's review will not relieve the Contractor of the sole responsibility for the accuracy, adequacy, or completeness of the schedule, the logic to the schedule, and/or completion of the contract requirements in accord with such schedule. Metro's review or approval shall not constitute acknowledgement that the relationship between various Work items or activity durations are reasonable or appropriate.

P. Slippage of Schedule. If the substantial completion date is forecast to have slipped by fourteen (14) days or more, the Contractor shall immediately notify Metro and submit a plan for correcting the slippage similar to that required for the monthly schedule report. If Metro directs changes in the Work impacting the schedule, the Contractor shall revise the Work schedule when necessary to reflect changes in the network logic and/or activity durations and shall submit the revised schedule for review and approval.

Q. Failure to Submit Schedule on Time. If the Contractor does not submit the original schedules and reports or updates of same in a timely manner, Metro may withhold monthly progress payments to the Contractor until such time as the submittal is acceptable.

R. Submittal of Supplemental Information. The Contractor shall furnish to Metro within five (5) days of written notice from Metro, copies of any portion of the schedule, network, charts, printouts, or other data relative to the development or updating of the schedule.

END OF SECTION

PART 1 - GENERAL

1.1 QUALITY CONTROL SERVICES

A. Scope. This Section specifies administrative and procedural requirements for quality control services.

1. Quality control services include inspections and tests and related activities including submittal of reports performed by the Contractor and independent agencies. They do not include observation of construction in progress activities performed by Metro.

2. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with requirements of the Contract Documents.

3. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities, as indicated in the Contract Performance Specifications Project Manual or as otherwise required by Metro. Those requirements, including inspections and tests, cover production of standard products as well as customized fabrication and installation procedures.

4. Inspections, tests and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.

5. Requirements for the Contractor to provide quality control services required by Metro or other authorities having jurisdiction, are not limited by provisions of this Section.

B. Contractor Responsibility.

1. The Contractor shall call for inspections, tests and similar quality control services, specified in construction documents and required by governing authorities. The cost of inspection services including any and all special inspectors required by the City of Portland shall be paid by the Contractor. All quality control agencies, and/or laboratories used shall be approved by Metro prior to use of such agency. Such agencies shall have no affiliation with the Contractor.

2. The Contractor is responsible for retesting at no cost to Metro where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements.

3. Cost of retesting construction revised, or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.

4. The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:

a. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections.

b. Tests, including providing ladders, scaffolding, lifts, or other means to access such testing activities.

c. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.

d. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.

e. Providing the agency with a preliminary design mix proposeed for use for material mixes that require control by the testing agency.

f. Security and protection of samples and test equipment at the Work site.

C. Duties of the Testing Agency.

1. The testing agency engaged to perform inspections, sampling and testing of materials and construction specified in contract and construction documents shall cooperate with Metro in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.

2. The agency shall immediately notify Metro and Contractor of irregularities or deficiencies observed in the Work during performance of its services.

3. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.

4. The agency shall not perform any duties of the Contractor.

D. Coordination.

1. The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

2. The Contractor is responsible for scheduling and coordinating time of inspections, tests, taking samples and similar activities.

E. Submittals.

1. Certification.

a. The testing Agency shall submit a certified written report of each inspection, test or similar service, to Metro and the City of Portland as required by City of Portland and the Contractor. These reports shall also be submitted to the Contractor's Architect.

b. Written reports of each inspection, test or similar service shall include, but not be limited to:

Date of issue
Project title and number
Specification section number
Name, address and telephone number of testing agency
Dates and locations of samples and tests or inspections*
Names of individuals making the inspection or test with signature
Designation of the Work and test method
Identification of product and related Contract or Construction Document Section
Complete inspection or test data
Test results and an interpretation of test results
Ambient conditions at the time of sample taking and sample testing
Comments or professional opinion as to whether inspected or tested Work complies with contract document requirements
Name and signature of laboratory inspector
Recommendations on acceptance of required retesting
Other appropriate information

* Include a coded diagram to show graphically where each test was conducted, complete with a written description.

F. Quality Assurance

1. Qualification for Service Agencies

2. Engage inspection and testing service agencies, including independent testing laboratories, which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed. Testing laboratory shall meet requirements of ASTM E-329 Laboratory as accepted by Metro.

3. Each independent inspection and testing agency engaged on the Work shall be authorized by authorities having jurisdiction to operate in the State of Oregon and City of Portland.

G. Repair and Protection.

1. Upon completion of inspection, testing, sample taking and similar services, Contractor shall repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract documents requirements for "Cutting and Patching".

2. Protect construction exposed by or for quality control service activities, and protect repaired construction.

3. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

H. Standards.

1. Except where more explicit or stringent requirements are written into the specifications, referenced industry standards have the same force and effect as if bound into the specifications. Referenced standards have precedence over non-referenced standards although non-referenced standards are applicable as a general measurement of whether the performed work complies with recognized standards of the construction industry.

2. All work shall be designed and build to comply with current editions of the following standards where recognized in the industry as a normal and applicable standard for the work involved:

AA	Aluminium Association
AAN	American Association of Nurserymen
ACI	American Concrete Institute
ACI	American Carpet Institute
ACIL	American Council of Independent Laboratories
AGA	American Gas Association
AI	The Asphalt Institute
AIM	Acoustical and Insulating Materials Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCA	Air Movement and Control Association
ANSI	American National Standards Institute

APA	American Plywood Association
ARI	Air Conditioning And Refrigeration Institute
ARMA	Asphalt Roof Manufacturers Association
ASC	Adhesive and Sealant Council
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating And Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASPE	American Society of Plumbing Engineers
ASTM	American Society of Testing and Materials
AWI	Architectural Woodwork Institute
AWS	American Welding Society
AWWA	American Water Works Association
HBHMA	Builder's Hardware Manufacturers Association
BIA	Brick Institute of America
BSI	Building Stone Institute
CCI	Carpet Council Inc.
CISPI	Cast Iron Soil Pipe Institute
CRSI	Concrete Reinforcing Steel Institute
CTI	Ceramic Tile Institute
DHI	Door and Hardware Institute
FGMA	Flat Glass Marketing Association
FTI	Facing Tile Institute
GA	Gypsum Association
GTA	Glass Tempering Association
IAPMO	International Association of Plumbing & Mechanical Officials
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical And Electronic Engineers
IESNA	Illuminating Engineering Society of North America
IMI	International Masonry Institute
MCAA	Mechanical Contractors Association of America
MIA	Marble Institute of America
ML/SFA	Metal Lath/Steel Framing Association
NCMA	National Concrete Masonry Association
NEI	National Elevator Industry, Inc.
NEMA	National Electrical Manufacturers Association
NESSC	National Electrical Safety Code
NFPA	National Fire Protection Association
NPCA	National Point and Coatings Association
NSF	National Sanitation Foundation
PCA	Portland Cement Association
PDI	Plumbing and Drainage Institute
RTI	Resilient Tile Institute
SIGMA	Sealed Insulating Glass Manufactures Association
SMACNA	Sheet Metal And Air Conditioning Contractor's National Association
TCA	Tile Council of America
TIMA	Thermal Insulation Manufacturers Association
UL	Underwriters Laboratories

WRI Wire Reinforcement Institute

I. Design-build team to be responsible for costs of all testing required by governing authorities, performance specifications, and standard industry practices. All quality control and testing agencies/laboratories to be approved by Metro prior to use. Copies of all testing reports to be provided to Metro.

J. All inspections required by regulatory agencies to be completed by the architect or engineer of record to be included in design-build team's proposal and costs.

END OF SECTION

PART 1 - GENERAL

1.1 REQUIREMENTS OF REGULATORY AGENCIES:

A. Comply with applicable local codes.

B. Comply with NFPA 241 "Safeguarding Construction, Alteration, and Demolition Operations".

1.2 SUBMITTALS:

A. Before beginning construction of each temporary facility, provide to the Construction Coordinator information and drawings as required to describe fully the facilities.

B. Submit shop drawings of project identification signs.

1.3 WARRANTIES:

A. Where permanent equipment is used at the request of Metro for temporary facilities in the building, "substantial completion" of factory assembled equipment may be requested in writing. Warranty provisions will then begin at that substantial completion of such permanent equipment.

B. Where permanent equipment is used (with permission of Metro) at the request of the Contractor for temporary facilities in the building, warranty provisions (including extended warranties) and acceptance provisions of such permanent equipment will be as stated in the General Conditions and as specified in the various Specifications Sections. At the time of Substantial Completion, equipment previously accepted by Metro shall be completely cleaned (vacuum, wipe down interior components, replace filters, etc.). Where surfaces have been damaged, refinish to match original finish and texture.

PART 2 - TEMPORARY FACILITIES:

A. Construction Facilities & Temporary Controls. Provide all necessary temporary job site facilities and utilities including but not limited to construction office and telephone, sanitary facilities, construction utilities, fire prevention and protection, and temporary enclosures for protection of

the premises, workers and the public. All temporary facilities shall be removed by Contractor upon project completion.

B. Consumed Power. Contractor will pay the cost of all electric power consumed (both construction and job office/trailer electrical power) for the construction of this Project. The Contractor shall exercise reasonable care and economy in the design and operation of the construction power system so as to conserve energy where possible.

C. Temporary Fire Protection

1. The Contractor shall be responsible to design, implement and bear all costs of a complete Construction Fire Protection System for the building construction area, job office/trailer complex and storage areas. A written report describing the details of this system shall be provided to the Construction Coordinator for the record no later than 30 calendar days following Notice to Proceed.

a. Provide extinguisher equipment of adequate capacity to extinguish fires in the combustible material on the job site.

b. Maintain fire extinguishers in working condition with current inspection certificate attached to each extinguisher.

2. Contractor shall provide fire protection, as necessary, to meet the requirements for the work which are beyond those specified herein. Provide and identify location of at least one (1) fire extinguishers to each trade office, each job box and every 150' on each building level.

3. All work shall be performed in full accordance with all applicable safety codes including, but not limited to the State of Oregon, OSHA, Metro's Fire Insurance standards, and all applicable codes. All job personnel are to be knowledgeable of and comply with the above referenced requirements.

PART 3 - CONSTRUCTION AIDS:

A. Hoisting and Rigging

1. Each Contractor shall provide hoisting and rigging, as necessary, to meet the requirements for his work.

B. Scaffolding

1. Each Contractor shall provide his own scaffolding and/or motorized lifts for the work of this contract. Contractors may collectively coordinate their scaffolding and/or motorized lifting requirements for their own benefit at no cost to Metro.

2. The Contractor shall make available on demand to Metro Inspectors and Construction Coordinator one snorkel or scissor manlift to be used for inspection purposes. The Contractor shall bear all costs of the lift, including but not limited to rental, fuel, maintenance, protection of floors under hoist, etc. The Contractor shall provide the above for the full duration of the work and also for the punch list period that might occur after Substantial Completion.

C. Barricades

1. The Contractor shall provide and maintain temporary barricades and opening covers (in walls and horizontal slabs), as necessary, to comply with State of Oregon and OSHA requirements until the substantial completion of the work of his contract, as determined by Metro.

2. Each Contractor will replace any barricades, temporary railings, opening covers and other protection removed for his work daily, and at the completion of his work in that area.

PART 4 -SITE FENCE

A. Contractor shall install around the perimeter of the site a temporary panelized and portable 6' high No. 11 gage, 2-inch mesh galvanized fabric, chain link site fence.

B. Contractor shall coordinate gate locations with Construction Coordinator.

C. Costs of maintenance and any repair of damage thereto shall be borne by the Contractor. The fence shall be in place and maintained until removal is approved by Metro. The total cost of removal from the site will be paid by the Contractor.

D. The temporary fence is to be completely secured at the end of each day by the Contractor. Keys shall be supplied to Construction Coordinator for all locks.

PART 5 - SITE SECURITY

A. Contractor shall take the necessary measures for the security of his equipment, materials, etc. Metro, the Construction Coordinator and their employees, agents and authorized representatives take no responsibility for any loss or damage to the Contractors' equipment, materials, etc., as a result of vandalism and/or theft.

B. The Contractor will provide the following for the full duration of his on-site Contract work:

1. A uniformed, unarmed security guard for the Project site. This guard shall be employed by an independent company licensed to provide security services. This Guard shall be on site during all non-regularly scheduled working hours during the week and during all hours of the weekend and holidays.

2. The guard is to perform regularly scheduled random rounds and record all visitors at the project site.

3. The security guard will be responsible for unlocking and locking entrance gate on a daily basis prior to the start of work and the end of the work day.

4. Daily security reports will be prepared by the guard and will be forwarded to the Contractor with a copy to the Construction Coordinator for record purposes.

The fact that the above security is provided by the Contractor does not release each Contractor of the liability for any loss or damage to their equipment, materials, etc. as a result of vandalism and/or theft.

PART 6 - PLANT, STORAGE AND PARKING

A. Contractor shall coordinate all on-site plant, storage and parking requirements with Construction Coordinator prior to commencement of on-site activities.

B. Temporary utilities in plant, storage and parking locations shall be provided by the Contractor who shall bear all costs.

C. Each Contractor shall make prior arrangement with and notify the appropriate security personnel regarding deliveries for the work. Contractor must be available to receive and handle his deliveries as appropriate.

D. Equipment or materials stored either on-site or in other areas shall be fully protected from the elements as required. All costs of this protection shall be by the Contractor.

PART 7 - TRAFFIC CONTROL

A. Contractor shall not unnecessarily interfere with use of any public traffic facility (sidewalks, streets, pavements, etc.) required for vehicular or pedestrian traffic. If such interference becomes necessary to perform the work in a safe, proper and convenient way, and no satisfactory detour route exists, the affected Contractor(s) shall provide a satisfactory detour, as approved by Metro. The cost of this detour and the maintenance thereon shall be borne by the Contractor(s) affected.

B. Contractor is responsible to keep all public traffic facilities (sidewalks, streets, pavements, etc.) in the general vicinity of the site clean and clear at all times from debris, soils, etc., resulting from the work of his contract.

PART 8 -RESTORATION OF PUBLIC FACILITIES

A. Contractor shall protect all public facilities (streets, sidewalks, pavements, etc.) from damage except as otherwise noted in these Contract Documents. If damage does result, the responsible Contractor shall restore such facilities to the satisfaction of Metro pursuant to the Standard Specifications of the City of Portland.

PART 9 - EXISTING UTILITY SERVICES

A. Contractor shall maintain and protect all existing utilities that are to remain in service and protect them against damage during construction operations. Damaged utilities shall be repaired to the satisfaction of Metro at the Contractor's expense.

B. The Contractor is responsible to verify with the Construction Coordinator and the respective utility companies, prior to any operation in a specific area, that the area is clear for his work. The boundaries of each area shall be designated by the Contractor. If, during the course of the work, the Contractor encounters active utility installations which are not shown or indicated in the Contract Documents, the Contractor shall promptly notify Metro and comply with their instructions prior to proceeding with the work in this area. The Contractor shall follow the action with a written report to the Construction Coordinator.

C. Should the Construction Coordinator and/or the respective utility companies determine that the area in question is not clear of utilities, the Contractor shall coordinate his work to allow the utility company or any other person(s) performing the work sufficient time and space to clear the area.

PART 10 - JOB SIGNS

A. Job signs for traffic control, parking, etc., shall be provided by the Contractor. No Contractor signs shall be displayed on the site, plant and storage areas or surrounding areas unless prior approval has been received from Metro. Contractor shall provide, install and maintain a minimum of two job-site signs (minimum size = 8' x 8'). Design and text to be approved by Metro.

B. Contractor shall promptly remove any unauthorized signs (posters, handbills, graffiti, etc.), as determined by the Construction Coordinator, from his work or plant areas and repair surfaces to which they were attached.

PART 11 - PEST CONTROL

A. Pest control for new construction areas will be provided by the Contractor, as necessary.

END OF SECTION

PART 1 - GENERAL

1.1

A. Record Drawings (As-built Records)

1. At completion of Work and before final payment, Contractor shall transfer installed record information from a day-by-day working set to AutoCad record and to a complete set of mylar reproducible of the drawings. Each reproducible drawing shall be signed and dated by the Contractor and Architect. These mylar reproducible shall be AutoCad plotted and furnished by the Contractor and printed from the Architect's original Construction Documents. Contractor shall submit a copy of the reproducible record set for review, make corrections requested, and submit reproducible to Construction Coordinator marked "as-built", as a condition precedent to final payment. All drawings, whether based on appropriate Architect's original Construction Drawings or other drawings developed by the Contractor shall be the same size as those Construction Documents and shall be mylar reproducible. Contractor shall also submit AutoCad on a disk format.

2. Upon completion of Work, submit record Construction Specifications to Metro for their permanent records. Contractor shall submit the Architect's revised Construction Documents (specifications) on a word processor program on a disk format.

3. Upon completion of the Work, complete miscellaneous records such as related shop drawings, product data, samples, other related documents which arise from the Work which may not have been submitted for Metro's approval and place in good order, properly identified and bound or filled, ready for continued use and reference. Submit to Metro for review and approval.

B. Operation and Maintenance (O&M) Manuals.

1. Furnish one (1) preliminary review copy and six (6) finished copies of "Equipment Operation and Maintenance Manual", furnish separate volumes for mechanical and electrical equipment. Forward preliminary copies for review by Metro, obtain approval prior to producing the final copies. Deliver completed manuals to Metro one month prior to scheduled substantial completion of the Work.

2. Each manual shall contain operation and maintenance instructions and complete parts lists, as furnished by the manufacturer, for all systems and equipment provided in the Contract, unless otherwise approved.

3. When necessary, furnish supplemental drawings and diagrams to show system operation and servicing or maintenance points. Furnish data in clean, neat legible copies with all drawings accordion folded to 8-1/2 x 11 inch size. Include no inapplicable information and advertising.

4. Furnish each copy with printed or typewritten index and tabbed dividers between equipment categories. Preliminary copies shall conform with all requirements for final copies, except that intended layouts for covers may be submitted in lieu of finished covers.

C. Equipment Operating Instructions/Training.

1. Except as otherwise specified, arrange for each installation of Work requiring continuing maintenance or operation, to meet with Metro's personnel at Work site, to provide basic instructions needed for proper operation and maintenance of entire Work. Include instructions by manufacturer's representatives where installers are not expert in the required procedures. These training sessions shall be coordinated by the Contractor for continuity so one responsible person of both the Contractor and Metro facilitates (attends each of these classes). Metro shall designate in writing to the Contractor the individuals responsible to attend the appropriate training sessions.

2. Review maintenance manuals, record documentation, tools, spare parts and materials, lubricants, fuels, identification system, control sequences, hazards, cleaning and similar procedures and facilities. For operational equipment demonstrate start-up, shut-down, emergency operations, noise and vibration adjustments, safety, economy/efficiency adjustments, and similar operations. Include discussion on possible causes of equipment/system failures or shutdowns.

3. Review maintenance and operations in relation with applicable warranties, agreements to maintain, bonds, and similar continuing commitments.

4. Refer to individual section of the Performance Specifications for possible additional requirements.

D. Final Cleaning

1. Special cleaning for specific units of Work is specified in the Contract Documents. General cleaning during progress of Work is specified in General Conditions and elsewhere in the Supplemental Conditions. Provide final cleaning of the Work, at time indicated, consisting of cleaning each surface or unit of Work to normal "clean" condition expected for a first-class building cleaning and maintenance program. Comply with manufacturer's instructions for cleaning operations. Prior to final acceptance, provide runners of reinforced Kraft paper throughout completed facility to protect finish floor surfaces. Tape paper to floor as required to protect surface during final touchup and inspections. Following are examples, but not by way of limitation, of cleaning levels required.

2. Remove labels which are not required as permanent labels.

3. Clean transparent materials, including mirrors and window/door glass to a polished condition, removing substances which are noticeable as vision-obscuring materials. Replace broken glass and damaged transparent materials.

4. Clean exposed exterior and interior hard-surfaced finishes, to a dirt-free condition, free of dust, stains, films and similar noticeable distracting substances. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.

5. Wipe surfaces of mechanical and electrical equipment clean, including elevator equipment and similar equipment; remove excess lubrication and other substances.

6. Remove debris and surface dust from limited-access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.

7. Resilient floors. Provide one coat paste wax finish and polish with power buffer.

8. Clean concrete floors in non-occupied spaces broom clean.

9. Vacuum clean carpeted surfaces and similar soft surfaces.

10. Clean plumbing fixtures to a sanitary condition, free of stains including those resulting from water exposure.

11. Clean light fixtures and lamps so as to function with full efficiency in new condition.

12. Remove any temporary floor protection when all items of work have been completed.

13. Clean Work site, including landscape development areas, of litter and foreign substances. Sweep paved areas to a broom-clean condition; remove stains, petrochemical spills and other foreign deposits.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Related Requirements Specified Elsewhere, Cleaning for Specific Products or Work: Specification Section for that work.

B. Maintain premises and public properties free from accumulations of waste, debris, and rubbish, caused by operations.

C. At completion of Work remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave project clean and ready for occupancy.

1.2 QUALITY ASSURANCE

A. Standards: Maintain project in accord with applicable safety and insurance standards.

B. Hazard Control:

1. Store volatile wastes in covered metal containers.

2. Provide adequate ventilation during use of volatile or noxious substances.

3. Advise all trades and construction coordinator when and where this will occur.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.1 DURING CONSTRUCTION:

A. Clean up all waste material, rubbish and debris on the Site, in plant and storage areas and on surrounding areas resulting from his work on a daily basis.

B. Remove materials, tools, temporary structures and equipment no longer needed for the Contractor's work from the Site, plant and storage areas, or surrounding areas as soon as possible.

C. Remove waste materials, debris and rubbish from site and legally dispose of at public or private dumping areas off Metro's property.

D. Provide, as applicable to his work, the following prior to substantial completion and pursuant to the requirements of the Construction Coordinator:

1. restoration of marred or damaged surfaces
2. removal of all labels and protective coatings
3. disinfecting, cleaning and/or polishing of surfaces
4. removal of all grease, dust, dirt, stains, labels, fingerprints and other foreign matter from surfaces
5. vacuum clean interior building areas when ready to receive finish painting, and continue vacuum cleaning on an as-needed basis until building is ready for substantial completion or occupancy.

E. Rubbish containers of the number and size adequate for the rubbish of all Subcontractors working at the Site shall be provided by the Contractor at locations designated by the Contractor. Contractor shall be responsible for getting his waste material, rubbish and debris to and into these containers. Removal and disposal of the contents of these containers will be provided by the Contractor. No on-site burning or disposal shall be permitted.

1. Wet down dry materials and rubbish to lay dust and prevent blowing dust.

2. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.

F. If, in the opinion of the Construction Coordinator, any of the work described above is neglected by the Contractor, the Construction Coordinator shall have the work done and deduct the cost of such from the Contractor's Contract Price.

3.2 FINAL CLEANING:

A. Employ experienced workers, or professional cleaners, for final cleaning.

B. In preparation for substantial completion or occupancy, conduct final inspection of sight-exposed interior and exterior surfaces, and of concealed spaces.

C. Remove grease, dust, dirt, stains, labels, and other foreign materials from exposed interior and exterior finished surfaces.

D. Remove putty, paint, labels, lubricants, etc., from windows, mirrors, and sash, and then polish, taking care not to scratch glass.

E. Vacuum carpeting (shampoo where required), removing debris and excess nap.

F. Repair, patch and touch up marred surfaces to specified finish, to match adjacent surfaces.

G. Remove snow and ice from access to building.

H. Replace with all new air conditioning filters on units which were operated during construction.

I. Maintain cleaning until project, or portion thereof, is occupied by Metro.

END OF SECTION

PART 1 - GENERAL

1.1 Record Drawing (As-Build Records)

A. The Contractor shall legibly mark in ink on a separate set of construction drawings all actual construction to include depths of foundations, horizontal and vertical locations of internal and underground utilities and appurtenances referenced to permanent visible and accessible surface improvements, field changes of dimensions and details, actual suppliers, manufacturers and trade names, models of installed equipment, and change order. These record documents are to be updated at least weekly and be available to Metro at all times. Contractor shall revise all Construction Documents to reflect actual construction and shall revise and modify the AutoCad drawings and the computer program work processing record of the specifications to indicate the deviation from the approved Construction Documents. Contractor shall submit disks containing these completed and finalized "Project Records" and a single "hard-copy" of each to Construction Coordination prior to Final Acceptance.

1.2 Maintenance of Documents:

A. Maintain at Jobsite, one copy of: Construction Drawings, Specifications, Addenda, Reviewed Shop Drawings, Construction Change directives, Change Orders, Other Modifications to Contract and Field Test Records.

B. Store documents apart from documents used for construction.

C. Maintain documents in clean, dry, legible condition.

1.3 Recording:

A. Label each document "PROJECT RECORD" in 2 inch high printed letters.

B. Keep record documents current. Do not permanently conceal any work until required information has been recorded.

C. Record Set Shop Drawings, Construction Drawings and specially drafted "As-Built" Drawings shall be legibly annotated to record actual construction. The following information shall be recorded as <u>minimum</u>:

1. Measured depths of elements of foundation in relation to finish first floor datum.

2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.

4. Field changes of dimension and detail.

5. Changes made by Modifications.

6. Details not on original Contract Drawings. References to related shop drawings and Modifications.

7. Exact location, type and function of concealed valves, dampers and controllers.

8. Exact size, invert elevations and locations of underground and underfloor piping and ducts.

9. Exact location of all lines and depth of site utilities to facilitate maintenance and extension of site systems.

10. Layout dimensions of equipment and piping systems.

D. Specifications:

Legibly annotate each item to record actual construction, including:

1. Manufacturer, trade name and catalog number of each product actually installed, particularly optional items and substitute items.

2. Changes made by Addenda, Clarifications, Bulletins or Modifications.

1.4 Submittals:

A. Accumulate 3 copies of record data into 3 - 3 ring vinyl binders with suitable indexing. Include:

1. Guarantees and warranties.

2. List of subcontractors and material suppliers, with addresses, phone numbers and names of individuals to contact.

3. Other data printed on 11 inch high paper.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

VIII.
Contract Performance Specifications

CONTRACT PERFORMANCE SPECIFICATIONS
October 11, 1991

1. DEMOLITION

1.0 General:

A. Remove all existing site and building construction not intended to remain including paving, landscape, site utilities, floors, partitions, stairs; removal of or modification to structures, interior and exterior building finishes, roofing, elevators, and mechanical and electrical systems. Demolition to include all modifications to existing site and building structures and enclosure required to meet contract performance specifications, Metro Concept Design Drawings, and design-builder's proposal.

B. Protect all existing building and site components required to remain by the contract performance specifications, the Metro Concept Design Drawings, the Metro Program and the design-build team's proposal, and protect adjacent structures and public improvements not a part of the Metro project. Provide all necessary shoring and bracing required to support existing and adjacent structures and systems during demolition work and until adequate permanent support is provided.

C. Floor, roof and wall penetrations shall be saw-cut from the existing structure. Saw-cuts shall be straight and plumb to a tolerance of not more than 1/8" deviation in 10 ft. Spalling of concrete edges around new openings is not acceptable. A maximum of 1" overcut is allowed around openings.

D. Dispose of all removed materials off-site.

E. The Metro building contains asbestos which will be removed under a separate contract prior to and during this work. Metro anticipates that some asbestos abatement will be complete prior to this construction contract except for abatement of existing roof. However, some abatement, including abatement of the existing roof, may occur after the Notice to Proceed has been issued to the design/build team. The design/build team shall coordinate the Work with the work of the Abatement Contractor to minimize cost and delay. In the event the design/build team discovers additional, undiagnosed hazardous waste, including asbestos, during the course of their Work, the design/build team shall immediately notify Metro. Additionally, the design/build team shall take whatever measures are reasonable and necessary to protect all persons within the vicinity and to avoid or minimize any delay in the Work. Design-builder to coordinate construction schedule of roof abatement with Metro's asbestos abatement contractor to allow roof abatement to occur at an appropriate time prior to design-builder installation of new roof.

Design-build team is to include proposed timeline for Metro's asbestos abatement work and roof installation in design-build team's Project Schedule submitted as part of this proposal. Once design-build team and Metro agree on a schedule for asbestos abatement, there will be no claims for delays in the work related to asbestos abatement unless Metro fails to meet the agreed upon abatement schedule. Design-build team coordination with Metro is critical to assure timely and smooth flow of work and avoid claims for delays in the work by the design-build team.

2. SITEWORK

2.1 General:

A. Develop the project site and all off-site improvements necessary to meet the requirements

of the program, local codes, referenced standards, performance criteria, and Metro Concept Design plans.

B. Scope of sitework includes demolition and site preparation, earthwork and excavation, grading, on-site roadways, driveways and parking areas, walkways and pedestrian paths, on-site utilities (water, power, fire protection, sanitary, stormwater drainage, telephone), traffic control and signage, landscaping and irrigation, site lighting and site specialties, and off-site improvements including utilities, street improvements, street lights, street trees, and the Lloyd District "gateway",

Off-site improvements included in core and shell base price include:
All new sidewalks, street lights at street frontage of property
A new traffic control light at N.E. 7th Ave. and Lloyd Blvd.
Other improvements as required by City of Portland

C. Design-build team shall serve as applicant and be responsible for coordination, pre-submission, final submission and City of Portland approval of all site plans for on- and off-site development.

D. Design-build team shall develop the site design to:

(1) provide for a minimum of 20 surface parking spaces. Most surface parking is intended to be located on the east side of the building although a minimum of 3 short term parking spaces and 2 handicapped parking spaces are required on the Irving Street Entry Courtyard;
(2) provide drives and ramps to the parking structure.
(3) provide a service drive to the loading dock.
(4) provide an outdoor area for the Day Care Center play yard.
(5) provide a Lloyd District "gateway" on the southwest corner of the site to the Lloyd District with a maximum budget of $100,000.
(6) provide all site landscaping. Metro prefers that site design and development create an open, inviting, park-like setting that enhances the pedestrian environment.
(7) provide the Irving Street Entry courtyard/roof terrace. The Irving Street Entry courtyard is intended to be a high quality pedestrian environment that includes an area for automobile dropoff and limited short term parking. The courtyard is the entry court/garden to the Metro Headquarters and should be functional, attractive, inviting and distinctive to Metro's identity. Automobile use of the courtyard shall be incidental to the dominant pedestrian orientation. Pedestrian uses of the courtyard may include building entry, informal sitting areas for lunches, breaks, etc. as well as the potential for larger public assemblies or gatherings. Design/build proposals shall include a minimum investment of $250,000 in the Irving Street Entry courtyard construction.

E. Metro prefers that site design and development create an open, inviting park-like setting where possible and that the Irving Street Entry Courtyard be developed as an attractive pedestrian environment and front door to the building.

2.2 Site Demolition:

A. Remove all existing site construction not intended to remain including paving, lighting, utilities, and structures.

B. Protect adjacent structures and public improvements not a part of the Metro project during all demolition. Remove and dispose of all removed materials off-site.

2.3 Paving and Walkways:

A. Provide Portland cement concrete paving on compacted and prepared granular stone fill with minimum 6 x 6 10/10 wire mesh reinforcing for all walks and paths. Provide additional slab reinforcing where required to support anticipated loads.

B. Provide at least one handicapped accessible route having no steps or abrupt changes in level from surrounding public sidewalks to the main building entrance at the Irving Street Courtyard. Where ramps are necessary or desired they shall have a non-slip surface. Pedestrian ramps shall have a slope no greater than one foot rise in 12 feet of run.

C. Provide asphalt concrete paving or reinforced poured-in-place concrete paving with poured-in-place concrete curbs for parking areas and drives.

(1) Asphalt concrete assembly to be minimum 8" base course 1-1/2" minus crushed rock; leveling course to be 2-3/4" minimum crushed rock; asphalt concrete surface course to be minimum 3-1/2" Asphalt Institute Class "C" mix conforming to State of Oregon specifications for highway construction. Loading dock drive paving design to support minimum axle loading of 24,000 pounds.

D. Provide all pavement markings and signage for parking and traffic control including striping, directional signs, parking ramp signs, and handicapped parking signage.

E. Exterior stairways and any retaining walls required to be reinforced poured concrete.

2.4 Storm Drainage/Waterproofing:

A. Provide storm drainage system including catch basins, trench drains at parking ramps, perimeter drain tile and other devices as required for complete drainage system designed to prevent ground and surface water from entering the building or standing on the site.

B. Provide positive drainage and under-slab waterproofing system at north terrace adequate to assure no water penetration into Grand Level Parking Garage.

2.5 Site Utilities:

A. Provide on- and off-site utilities as required by the program, performance specification, regulatory agencies and as required for a fully functioning building including potable water, fire protection, storm, sanitary, electrical, gas, and telephone services.

B. Coordinate all site utility construction with City of Portland and utility companies and meet all associated codes and standards for construction. Pay all fees for plan review, hearings, permits, service connections, equalization surcharges, field inspection, etc., required by governing jurisdictions.

2.6 Landscaping:

A. Provide all elements necessary to complete aesthetically pleasing and environment enhancing landscape for the entire property and as required by the City of Portland ordinances and the Design Review Board. Landscaping shall meet or exceed all local agency and jurisdictional requirements. Planting design shall promote water conservation and minimize maintenance.

B. Provide all finish grading, topsoil and amendments, and plant materials. Plant materials shall comply with latest edition of ANSI Z60.1 "American Standard for Nursery Stock" published by the American Association of Nurserymen. Topsoil shall conform to USDA classification for Sandy Loam. Organic amendments shall be recycled waste yard debris compost or sewage sludge compost and shall be added to the topsoil to improve soil texture and moisture holding capability as appropriate.

C. Plant stock shall be fresh, well foliaged, in prime condition when in leaf, exhibiting vigorous normal habit of growth, be free of disease and harmful insects, and have no deformed trunks or other disfigurements. Minimum plant sizes shall be 6' height for conifer trees, 2" caliper for deciduous shade trees, 2 gallon containers for shrubs and 4" containers for ground cover or as required by regulatory agencies.

2.7 Irrigation:

A. Provide complete automatic underground sprinkler system for all planted areas. System shall be energy and water efficient and shall provide irrigation for optimal growth conditions for plantings. Provide irrigation zones, grouping plantings with similar watering requirements. Lay pipe in accordance with standard and accepted practices.

B. Scope of work includes pipe, sprinkler heads, automatic controller and valves, trenching, backflow prevention devices and water conservation devices. Controller, automatic valves and heads shall be from one manufacturer. Manufacturer to be Rain Bird or approved equal. Sprinkler heads shall be low gallon pop-up heavy duty for commercial application. All valves shall be located in locking boxes flush with finish grade.

2.8 Site Specialties:

A. Provide site furnishings including benches, bicycle racks, trash containers, decorative paving, flag poles, signage, etc., as required to enhance the appearance and use of the site and outdoor spaces.

B. Provide a minimum of two 30' high ground set aluminum flagpoles, cone tapered with seamless construction. Flagpoles to be manufactured by American Flagpole Co. or approved equal.

C. Provide bicycle racks for visitor parking in the Entry Courtyard and bicycle racks for staff parking in the garage. Bicycle racks to be constructed of 2" hot dip galvanized steel schedule 40 pipe. Bicycle racks to be manufactured by Brandir International, Bike Security Racks Co. or approved equal.

D. Provide uniform directional way-finding for parking, drop-off service, etc that meets handicapped standards of ANSI A117.1.

E. Provide two "monumental" Metro signs, one at the building entry on the north side of the building and one at the southwest corner of the building/site. Signs to be mounted on the building or freestanding, of sufficient size to provide building identity for Metro from the street, with internal or external artificial lighting, and integrated into the site and building exterior design.

F. Provide site lighting at all building entrances and exits, courtyards and terraces, parking areas, loading areas, "gateway" and building signs. Lighting to be integrated into the site and building design and to be attractive in appearance as well as functional.

G. Provide design and construction for Lloyd District Gateway to be located near southwest corner of site at Grand Avenue. Gateway design to be coordinated with building exterior design and approved by City of Portland Design Review Board. Gateway construction costs not to exceed $100,000.

Gateway design proposals are not required in the RFP submittal; they may be included in RFP submittal although final gateway design will be developed with Metro and other bodies having jurisdiction over the gateway design.

3. FOUNDATION AND SUBSTRUCTURE

3.1 General:

A. Provide all elements necessary to transmit vertical and lateral loads directly to the soil and prevent ground moisture from entering the building.

B. Foundation and substructure work includes excavation and backfill, formwork, concrete and reinforcing steel, foundation, wall footings and column bases, elevator pits, slabs on

grade, excavation and backfill for utilities, drainage tile, foundation insulation, dampproofing, dewatering, and engineered structural fill.

3.2 Excavation:

A. Excavate as required for all new utilities, structural loads, elevator pits, ramps, and other items as required. Provide shoring and bracing in excavations to maintain sides and protect adjacent streets, utilities, properties and the Metro Building as required. The base of all excavations to be inspected by an experienced geotechnical engineer to verify suitability of soils for bearing. All structural fill to be a graded mixture of clean crushed rock compacted to a minimum of 95% maximum dry density or as required by structural engineer and geotechnical engineer.

3.3 Footings and Walls:

A. Provide poured-in-place concrete spread footings or other special footings as required to support all new loads and construction and as required to meet structural criteria for building.

3.4 Foundation Waterproofing And Dampproofing:

A. Provide dampproofing at exterior of foundation walls at all new excavations to protect foundation and basement walls from hydrostatic moisture penetration.

B. Provide below slab/paver waterproofing at Irving Street Entry Courtyard to prevent water or moisture from entering parking level below. Waterproofing system to be fully flashed at perimeter and all penetrations and to include minimum ten year warranty.

3.5 Subdrainage Systems:

A. Provide perimeter foundation drains with filter fabric and (gravity or mechanical) drainage to storm water system at all new exterior wall excavations. Provide subdrainage (gravity or mechanical) at elevator pits and similar below grade wells. Provide subdrainage system at base of new parking garage ramps to prevent water from entering parking garage.

3.6 Slabs On Grade:

A. Provide a minimum of 6" of compacted granular fill directly below new concrete slabs on grade. Slabs on grade to be as required to meet structural requirements and a minimum of 4" thick with 6 x 6 10/10 woven wire mesh reinforcing.

4. SUPERSTRUCTURE

4.1 General:

A. Provide structural analysis and elements of sufficient strength to support the estimated required and actual imposed loads, including lateral forces, without exceeding the allowable working unit stresses and without excessive deflection of the elements used.

B. Superstructure includes horizontal and vertical framing members, moment, braced frame or shear walls for seismic forces, floor slabs, stairs, all structural attachment devices, anchor bolts and base plates, fireproofing as necessary, and expansion and construction joints.

4.2 Structural Analysis and Upgrades:

A. Structural Analysis and Upgrade Due To Changes In Occupancy

(1) The Basement and Grand levels will be converted to parking garage use. The

structural slab on the second level and the slab on grade in the basement require structural analysis to determine if live load capacities for the new use is adequate. Design of upgrading and or repairs of deteriorated structure and in-fill of abandoned floor penetration, if required, is a part of this contract.

(2) Design and construction of new access ramps, retaining walls, and new wall and floor penetrations are required for the conversion to the parking use. New wall and floor penetrations for stairs, elevators, mechanical equipment and chases require analysis and reinforcing design as required. Supporting capacity of existing structure shall be analyzed for added mechanical equipment weight and structure modified as required.

(3) The Irving Street and Upper levels of the building will be converted to office occupancies. Floor systems require structural analysis for the new intended use including all additional dead loads that are anticipated for the conversion to office occupancy. New floor and roof penetrations required for mechanical, electrical, skylights, lightwells, stairs and elevators require analysis and reinforcing design as required. In-fill for abandoned roof and floor penetrations shall be designed and built to support new loads.

(4) Provide all new structures as required for new stairs, elevator enclosures, skylights, lightwells, new mechanical and electrical equipment, and all other structural attachments.

(5) Program for Council Chambers requires a column-free area of 2,500 square feet with minimum widths of 40 feet and a minimum finished ceiling height of 12 ft. in the center of the Chamber area. Perimeter ceiling height may be 9-10 ft. over side aisles and display areas. Design-build team to propose a location for Council Chambers in RFP submittal that meets all program and specification requirements. Provide all structural modifications necessary (in the core and shell base contract) to accommodate Council Chamber program requirements.

(6) Remove existing water tank, HVAC equipment and all other equipment from tower structure. Tower structure to be removed or to receive structural upgrade to meet all applicable codes and requirements of this performance specification.

B. Structural Analysis and Upgrade For Lateral Loads

(1) A lateral load analysis is required for the entire structure. A three-dimensional dynamic analysis is recommended, although a static analysis that includes the interaction of the parallel moment resistant frames and shear walls is acceptable. If a dynamic analysis is used, the site specific response spectra should be developed specifically for this building site or a response spectra developed for a nearby site which is verified for the Metro Building site.

(2) The force levels for the lateral load analysis are to use Uniform Building Code, Chapter 23, Section 2312, Seismic Zone III values. All new construction shall meet all requirements for Zone III. All existing structure shall meet Zone III requirement with structural upgrades as required. If existing lateral load resisting systems are weakened by building modifications, upgrade structure to meet Zone III criteria.

(3) Ductility requirements of concrete moment resisting systems, such as existing shear walls and concrete frames must meet Zone III ductility requirements. Deficiencies in the ductility requirements for the lateral load resisting system shall be upgraded as required. The method of upgrade shall be coordinated and integrated into the total building design.

(4) Existing structural clay tile partition walls and brick in-fill walls, if retained, shall be analyzed using Zone III criteria. Lateral load resisting deficiencies of existing

masonry, if retained, must be upgraded to meet Zone III earthquake criteria.

(5) The interface between the adjacent parking garage and the Metro building (including the existing stair and elevator) shall be analyzed using Zone III earthquake requirements. The effects of the building pounding shall be considered. The two structures shall be isolated to prevent earthquake damage at their interface.

(6) The interface and connections between the different construction phases of the Metro building shall be analyzed for any damaging earthquake interaction such as pounding. The floor and roof systems, at the interface of the two buildings, shall be properly tied together to minimize earthquake damage.

5. EXTERIOR CLOSURE

5.1 General:

A. Provide an energy efficient, low maintenance exterior closure system that will prevent moisture from entering the interior spaces of the building, which provides an appropriate image for Metro. Design and detail all components of the exterior enclosure system to resist all dead, live and lateral loads and other forces, given or implied, without exceeding permissible stresses and deflections in accordance with specifications.

B. Quality and appearance of exterior closure shall be comparable to Class A office or institutional buildings and consistent with Metro goals and objectives. The building shall project a professional and aesthetically pleasing appearance from all approaches to the site. Design-build team shall serve as applicant and be responsible for coordination, pre-application conferences, and final submission and approval for all City of Portland site and design review requirements.

C. Exterior closure design at the Grand Level parking garage shall recognize Metro's intention to ultimately occupy the Grand Level for office use and the City of Portland and Metro's commitment to enhancing the pedestrian and street experience of buildings.

Metro intends to incrementally occupy the Grand Level for office uses, with the first phase of office occupancy occurring on the west side (or Grand Street side) of the building. Change to office occupancy will most likely occur within five years. Design proposals for the exterior enclosure shall anticipate this future occupancy and allow conversion from a parking use to an office use with minimum cost and disruption.

Design proposals shall comply with City guidelines and ordinances to avoid blank walls and add to the vitality of the pedestrian experience and streetscape. Design solutions for the short term shall avoid blank walls and visible openings into the parking structure and may include display windows or other window-like treatments that screen the parking and add to the vitality of the street. Initial solutions shall be flexible to allow a change to windows and/or doors into Metro office space in the future, and shall be approved by City of Portland planning staff and Design Review Board.

D. Exterior closure system is the exterior wall construction including all interior face of exterior wall and exterior wall facing materials, framing, insulation and vapor barriers, parapet walls, dampproofing, curtain walls and glazing, exterior balconies or railings, fireproofing as necessary, exterior and vestibule doors, frames, and hardware, soffits and fascias, sealants, exterior grilles, louvers and access panels, painting and finishing, and flashing as necessary.

E. Existing stair (Stair 1) and elevator at northeast corner of site to be reclad or otherwise refinished to be integrated into design-build team's proposal for the buildings exterior closure. At design-build team's option, Stair 1 can be removed above the Irving Street Level.

F. Existing tower to be either removed or integrated into design-build team's proposal for the exterior closure. If removed, proposal to include all necessary demolition and required repair. If left, proposal to include all necessary structural upgrade, finishing, lighting, etc. Favorable consideration will be given to proposals that leave the tower structure in place and incorporate it as a feature of the Metro building design.

G. Existing penthouse and parapet construction to be removed or, if retained, integrated into design/builder's exterior closure proposal. All major rooftop equipment to be fully screened from pedestrian view and all penthouse and mechanical screens to be integrated with the exterior closure design.

5.2 Performance:

A. Lateral Loads

(1) Wind load design in accordance with UBC Section 2311.

(2) Design all components to resist potential seismic stresses per Seismic Risk Zone 3 of UBC. All anchorages to be designed in accordance with Section 2312 of the UBC.

(3) Deflection of any framing member in a direction normal to the plane of the wall shall not exceed 1/175 of its clear span or 3/4", whichever is less, except that on plastered surfaces deflection shall not exceed 1/360 of the span.

B. Structural Analysis and Upgrade To Support Exterior Closure

(1) New exterior closure system requires that exterior wall systems be modified and exterior windows added to enhance the architectural appearance and function of the building facade. Structural design and analysis of the proposed exterior cladding and window system is required by the structural engineer of record.

(2) If existing masonry veneer is to remain on the existing exterior wall surface in design build team's proposal, either as an exposed finish or concealed behind new cladding, the structural engineer of record shall determine the adequacy of the masonry construction and anchorage and establish new structural requirements necessary to meet code and performance criteria including Seismic Zone 3 requirements. Engineer's testing shall include destructive testing of different conditions of attachment, structural evaluation of attachment, and design of repairs and upgrades required, including the attachment of new systems or equipment applied over the existing veneer, if any.

Adding or enlarging existing penetrations in exterior wall for windows or mechanical systems requires gravity load and lateral load structural analysis of the affected structure.

(3) If existing screen walls and parapets are to remain in service, the framing and connections shall be investigated and analyzed to determine if the existing system is capable of resisting current code lateral forces and requirements of the performance specification including Seismic Zone 3 requirements. Design of reinforcing and upgrading of existing systems to be provided if required.

(4) If existing veneer and fascia is removed, structural engineer of record shall design new exterior closure system including window wall system, cladding, and anchorage to existing concrete structure.

C. Impact Resistance

All exposed exterior closure panels shall withstand 18 inch pounds of impact without any indentation greater than 1/16" measured 24 hours after impact without any splitting or other permanent damage.

D. Accelerated Weathering

Provide for resistance of materials to deterioration due to soluble or insoluble salts, alkali attachment, corrosion, oxidation, insects, and chemical attachment and fading.

E. Thermal

The combined thermal performance for the gross areas of the exterior closure including exterior walls, roofs, skylights, etc., shall be as prescribed in UBC codes and this specification. All exterior closure wall components containing heated spaces (except doors and door frames) shall provide a "thermal break" from the inside surface to the outside surface with no continuous thermal conductor from the interior surface to the exterior surface.

F. Air Leakage

(1) Natural (non-mechanical) leakage of air from heated spaces shall not exceed 0.5 air change per hour. Air infiltration through walls and glazing shall not exceed 0.05 cubic feet per minute per square foot of wall.

(2) All exterior entrances shall have weather vestibules with two sets of doors separated by a vestibule. All exterior doors shall be designed to limit air leakage into or from the building when in a closed position.

G. Weatherproofing

The exterior closure shall be designed to completely exclude all water from outside to inside.

All exterior materials to have factory finish or be painted. All field painted materials to have the following minimum coatings:

Metal Surfaces:

(1) Primer:
  (a) Ferrous Metals: Rodda rust-inhibitive metal primer
  (b) Non Ferrous Metals: Rodda Zinc Chromate
  (c) Galvanized Metals: Rodda white Galvacling
(2) Finish:
  (a) Second and Third Coats: Rodda Porsa-Lite Exterior Enamel (semi-gloss or gloss).

Concrete, Plaster Surfaces:

(1) First and Second Coats: Rodda Krillicon

Traffic Lines:

(1) First and Second Coats: Rodda Traffic Lacquer

H. Condensation Control

Design of the exterior closure shall provide protection against cold weather water/vapor condensation on any interior heated surface. Opaque areas of walls shall provide a continuous vapor barrier located on the wintertime warm side of the insulation.

5.3 Materials and Products:

A. Provide windows in each bay of Metro office space. Windows in the Council Chambers and service areas shall have high sills to allow daylight without disrupting the use of

interior walls. Provide architectural grade aluminum frames with thermally insulted operable windows, shop-painted finish and locks.

Glass and glazing to be by Libby-Owens-Ford, Pittsburgh Plate Glass, Ford Glass Co. or approved equal. Glazing to be minimum 1" thick clear insulating glass with 1/4" thick glass both panes and 1/2" air space hermetically sealed. Glass to be tempered or safety glass as required.

B. All doors shall be minimum 3'-0" wide x 7'-0" high x 1-3/4" thick and constructed of steel or aluminum. Exterior entry doors shall be substantially or fully glazed with safety glass meeting all codes. Door from Irving Street Courtyard to Stair 2 to have programmable card key lock.

C. Provide 1" metal mini-blinds on all windows throughout the building. Blinds to be "Riviera" by Levolor Lorentzen, 1" wide, .010" thick in manufacturer's standard color.

D. Provide electric operated coiling doors at ramp entrances to parking garage. Equip doors with automatic reverse control switch in bottom rail and provide doors with programmable card key locks.

5.4 Evaluation:

A. Provide exterior drawings and specifications with proposal submittal. Provide complete structural and thermal calculations and detail construction drawings and specifications for exterior enclosure system during construction documents phase for Metro approval and to verify compliance with codes and specifications.

6. ROOFING

6.1 General:

A. Provide an energy efficient roof system that will restrict the heat flow from the building, require minimum maintenance, prevent moisture from entering the building, and provide for positive drainage.

B. Roofing assembly includes all roofing membranes, roof insulation, flashing, vapor barriers, cant strips and built-up curbs, expansion joints, skylights, roof hatches, overflow scuppers, vents and other roofing accessories.

6.2 Performance:

A. Flat roof membranes shall be 4-ply built-up roof with cap sheet or EPDM.

B. Roof design over heated interior spaces shall provide protection against cold weather water/vapor condensation on any interior surface by providing a continuous vapor barrier on the wintertime warm side of the insulation.

C. Roof membrane system shall have a minimum 10 year watertight single source warranty from the manufacturer.

D. Fire resistance of roof assembly shall be U.L. Class A.

E. Roof materials and construction shall be listed in and comply with Factory Mutual (FM) Approval Guide, latest edition for I-90 wind uplift.

F. Flat roof systems shall have a minimum slope of 1/4" per foot.

G. Flashings shall be non-corrosive, and shall allow for expansion and contraction and be compatible with roof membrane

Flashings to be minimum 26 gauge for general flashing, 24 gauge for copings up to 12" in width and 22 gauge for 13"-18" width. Use heavier gauge materials where required by design conditions. Downspouts to be minimum 24 gauge. Scuppers, splash pans and built-in flashings to be flashing grade stainless steel .018" thick.

H. Materials used in roofing shall comply with standards and recommended practices listed in National Roofing Contractors Association (NCRA) Roofing and Waterproofing Manual for type of system used.

I. Perimeter flashing shall comply with FM 1-49.

J. Provide roof access hatches and access ladders to provide access to all roof areas. Hatches to be by Bilco, Milcor, Dur-Red, Wasco or approved equal, single leaf with minimum 30" x 36" vertical ladder style or as required by design conditions.

K. Provide insulated skylights or clerestory monitors on curbs where indicated in plans. Skylights to be aluminum framed rafter skylight system with minimum 1" insulated laminated safety glass. Clerestory monitors, if any, to include 1" insulated glazing.

L. Roof systems to include integral cast roof drains with strainers and overflow scuppers.

7. INTERIOR CONSTRUCTION

7.1 General:

A. Provide interior construction elements as defined herein which will suit the function of the program spaces planned, will provide low maintenance and be highly resistant to damage. Interior construction includes all interior non-load bearing walls, interior wall finish materials, wall base and trim, interior glass and glazing, interior wall fire protection as necessary, interior doors, frames and hardware, floor coverings, ceilings, and railings.

B. Interior construction includes parking level elevator lobbies, stairwells, building lobby areas, public circulation and exit corridors, mens' and womens' toilet rooms, janitor closets, storage and service areas as indicated on plans and all required telephone, electrical and mechanical rooms and chases for a fully functioning system.

Core and shell finish requirements vary within the building, with some spaces finished complete and ready for occupancy and other spaces ready for finishes under a separate Metro interior finish allowance. The room finish schedule on the following page provides an outline of room by room requirements.

7.2 Performance:

A. Interior finishes shall meet all applicable codes and the following:

Flame spread of exposed surfaces shall not exceed the following:

Vertical Exits	25
Other Exits	75
Other Spaces	200

B. No materials shall have a smoke density greater than 450 when tested in accordance with ASTM E84.

C. Construction shall be capable of supporting all dead loads and normal live loads. Wall construction shall be capable of supporting superimposed loads resulting from attachment to one or both sides of wall of loaded 12" shelves up to 150 lbs per lineal foot of wall. Maximum deflection under load shall be no greater than 1/8".

D. Construction shall resist 5 lbs. of horizontal load per square foot of surface area with

deflection under load not exceeding L/120.

E. Exposed materials shall be free from all forms of cracking, crazing, splitting, spalling, blistering, delamination, breaks, or other forms of deterioration when examined visually.

F. Minimum exterior wall insulation of R-11, and minimum roof insulation of R-19.

7.3 Partitions:

A. Stairs, elevators, corridors, toilet rooms, mechanical and electrical rooms and shafts and similar rooms shall be enclosed with partitions from floor to bottom of structure with fire resistance ratings as required by code and regulatory agencies. Partition areas above finished ceilings to be fire taped and unpainted. All such partitions to have following minimum assembly:

(1) Provide one-hour rated telephone rooms in the core with no less than two continuous 8' walls and no less than 40 square feet net. Provide two telephone rooms on Irving Street Level and two telephone rooms on the Upper Level optimally located for future installation of Metro telephone/data station cables. Provide each room with door giving direct access to main public corridors.

(2) Provide one-hour rated electrical rooms in the core with adequate space to enclose all electrical service and distribution equipment. As a minimum two rooms each are required on the Irving Street and Upper Floor Levels, optimally located to facilitate the installation of wiring in the Metro office areas. Provide at least one room in the Basement or Grand Avenue Levels to house the main electrical service, distribution and control equipment for these areas. Provide doors from each room with direct access to public corridors or parking areas.

(3) Provide two-hour fire rated shafts to accommodate supply and return ducts from each rooftop air conditioning unit. Shafts shall be constructed to provide an STC rating of 55. Provide mechanical rooms for central water heater, sump pumps, and HVAC control panel.

(4) Provide all other rooms necessary for mechanical, electrical, telephone, elevator, systems and equipment whether shown on Concept Drawings or not. Rooms B03, B04, B05, B06, B07, G03, G04, G05, G06, and G07 are available for use as mechanical or electrical rooms. If not used by design-build team for building equipment, construct as indicated on plans for Metro's use as storage rooms.

(5) Typical construction of interior partitions to be minimum as follows except where special construction is required for fire ratings, acoustical ratings, etc.:

(a) 3-1/2", 25 ga. galvanized steel studs at 16" o.c.
(b) 5/8" gypsum wallboard each side
(c) 3-1/2" sound attenuation batts floor to ceiling in stud cavity
(d) Wall terminates at underside of floor structure above with foam tape

B. Gypsum wallboard shall conform to Federal Specification SS-L-30D and to ASTM C36. Water resistant gypsum board shall conform to ASTM C630. Finishing shall conform to minimum standards of Gypsum Association GA 216-85 and ASTM C840. Where indicated for paint or tenant finish, all finished gypsum surfaces to be smooth with no visible signs of joints or fasteners. Gypsum board to be minimum one layer each side, 5/8" thick Type X except where fire rated assemblies greater than one-hour are required. Gypsum wall areas above finished ceilings may be fire taped without finishing joints and fastener areas.

C. Interior walls and partitions to be typically formed with light gauge metal framing using 3-1/2" to 6" C-shaped galvanized steel studs with standard steel runners, blocking, lintels, clip angles, fasteners and accessories. Steel studs shall conform to ASTM C754 and AISC specifications.

D. Gypsum wall finish to be light orange peel texture and per ANSI A97.1.

E. At corridor, core, and exterior walls provide gypsum drywall ready to paint as part of base price.

F. All corridor, lobby, toilet, mechanical and electrical room walls to have sound batt insulation full length and height of wall.

7.4 Paint:

A. Provide painted finish on all exposed surfaces not otherwise provided with a factory finish. Paint shall be minimum of one coat primer and two coats acrylic latex wall paint at all walls and painted ceilings. Provide one coat primer and two coats eggshell enamel at all other painted surfaces. Paints to be Rodda, Kelly-Moore, Miller, Glidden or approved equal paints in standard colors.

Interior paints to be minimum:

Wood and Metal Surfaces:
(1) Prime Coat: Rodda Combo Enamel Undercoat
(2) Primer, Galvanized Metals: Rodda Galvacling
(3) Second and Third Coats: Rodda Porsa-Lite Enamel, semi-gloss or gloss

Gypsum Drywall, Plaster or Concrete:
(1) Gypsum drywall sealer under gypsum texture coat: Rodda Roseal polyvinyl acetate
(2) Prime Coat: Rodda Scots-Seal latex sealer
(3) Second and Third Coats: Rodda Lasyn Interior Latex Enamel

Enamel on Gypsum Drywall, Plaster or Concrete:
(1) Gypsum drywall sealer under gypsum texture coat: Rodda Roseal polyvinyl acetate
(2) Prime Coat: Rodda Scots-Seal latex sealer
(3) Sealer Coat: Rodda Undercoater
(4) Finish Coat: Rodda Porsa-Lite synthetic enamel

7.5 Ceramic Tile:

A. Ceramic tile selected and installed as recommended by the latest edition of the Tile Council of America Handbook for Ceramic Tile Installation and in accordance with ANSI A108.1 (Portland Cement Mortar) or A108.5 (Dry Set or Latex Portland Cement Mortar). Grout shall conform to ANSI A108.10.

B. Provide ceramic tile floor, base, and minimum 4'-6" high wainscot in all public toilets. Floor tile to be unglazed.

7.6 Doors and Hardware:

A. Doors shall be a minimum of 3'-0" wide x 7'-0" high x 1-3/4" thick solid core, fully bonded core hardwood per "good" grade Type II per National Woodwork Manufacturers Association Standard IS-1 or Hollow Metal per CS 242 with sound deadening material provided where door meets frame. Doors and frames to be by Grand Metal, Benson, Fenestra, Stiles, Curries or approved equal, and to be all by the same manufacturer.

B. Door frames shall be custom welded hollow metal with a minimum 16 gauge for openings over 40" wide and 14 gauge for pairs of doors. Door frames shall have a minimum of four anchors per jamb with no exposed fasteners. Doors and frames shall meet all requirements for fire ratings and U.L. for label classification.

C. Provide heavy duty door hardware including butts, full mortise locksets and latch sets, exit devices, automatic closers, stops, push plates, kick plates and other items as required for particular installation. Provide card locks for doors as required in the electrical

specification.

D. Mortise locks or latches shall be as manufactured by Schlage, Russwin, Corbin, or Sargent. All latches not required to have panic exit devices to have lever handles meeting handicapped accessibility codes. Provide minimum two keys for each lock and five master keys. Key and master key schedule to be per Metro requirements.

Door closers shall be LCN 4040 for exterior doors and 4041 for interior doors.

Exit devices to be Von Duprin 99.

Butts to be Stanley or approved equal

Thresholds to be Penko or Balco

Hardware finish shall be US 10B or as approved by Metro.

E. Provide overhead coiling doors at entries to parking garage. Doors to be Cookson, Kinnear, North American, or V.G. Wilson.

7.7 Floor Base:

A. Rubber base shall be 4" high, straight at carpet and coved at resilient floor.

7.8 Acoustical Ceilings:

A. Suspended acoustical ceilings shall include all ceiling suspension members, hangers and other attachments, edge trim, clips and spacers, and acoustical ceiling tiles. Where specified as "installed", provide complete ceiling assembly, lighting, sprinklers and mechanical systems installed in place and fully finished and operational. Where specified as "on the floor", provide complete ceiling suspension grid installed with ceiling tiles stacked on the floor in sufficient quantity for the intended room. Ceiling system to be in compliance with all seismic bracing requirements.

B. Provide 2' x 4' acoustical lay-in panels in an exposed painted metal ceiling grid. Panels to be 3/4" thick mineral fiber, regular edge panel with light reflectance of LR-1, NRC of .50-.60, flame spread of 25 or under, STC of 35-39, "Armstrong Second Look", white, or equal.

7.9 Interior Glass:

A. Interior glass shall conform to all code requirements.

7.10 Laminated Plastic:

A. Laminated plastic shall meet standards set by NEMA Publication LD3, Vertical Surface Type.

7.11 Vinyl Composition Tile:

A. Vinyl composition tile shall have through-color and graining, a minimum load limit of 50 psi, minimum gauge of 1/8", and shall be installed in accordance with manufacturer's recommendations.

B. 12" x 12" Armstrong "Excelon", or equivalent, manufacturer's standard colors.

7.12 Stair Rails and Guard Rails:

A. Enclosed exit stairs to have rails and guard rails meeting all applicable codes. Rails to be painted steel. Open public stairs and corridor guard rails to be painted steel, stainless

steel or similar material of a design appropriate with building.

7.13 Access Doors And Panels:

Provide all access doors and panels as required to complete access to systems and equipment necessary for maintenance. Doors and panels to be by Inland-Reyerson, Milcor, Bilco, Dur-Red, or approved equal. Style and model of door as appropriate to function and condition. Doors and panels to be fire rated as required by location. Provide minimum 22" x 30" doors for crawl access, with other sizes as appropriate to nature of access.

8. EQUIPMENT

8.1 Loading Dock Equipment:

A. Provide molded rubber 4" thick dock bumpers, 10" wide and length as required by design, extra-long arm loading dock light and hydraulic dock leveler at loading dock. Dock leveler to be minimum 66"-72" wide. Loading dock equipment to be by Kelly or approved equal.

8.2 Parking Control Equipment:

A. Provide card key control for overhead coiling doors at each parking garage entrance for after-hours use by employees.

8.3 Toilet Accessories:

A. Toilet partitions and urinal screens shall be ceiling hung, painted metal with baked enamel or integral color rosin panels. All doors shall be self-closing type hinged at bottom with latch. All hardware to be stainless steel. Provide all wall and ceiling blocking as required for attachment. Metal partitions to be Grand Metal, American Sanitary, Accurate, or approved equal.

B. Toilet Accessories

All accessories to be stainless steel with brushed finish. Provide a mirror above each lavatory from top of backsplash to ceiling, a double roll type toilet paper dispenser, coat hook, and disposable toilet seat cover dispenser in each toilet stall, and sanitary napkin dispenser, a sanitary napkin waste receptacle in each womens toilet stall, a minimum of one paper towel dispenser, soap dispenser and waste receptacle for every two lavatories, and a counter area at least two feet in length and eight inches wide, and one full length mirror for each lavatory. Provide stainless steel grab bars in all handicapped accessible toilet stalls. Accessories to be Bobrick, McKinney, Accessories Specialties, Bradley, Parker, or approved equal.

8.4 Fire Extinguishers and Cabinets:

A. Provide fire extinguishers and fire extinguisher cabinets as required to meet codes. Cabinets to be semi-recessed or fully recessed with steel and glass door. Extinguishers to be as required by location and code. Equipment to be by J.L. Industries, Standard Fire Hose, or approved equal.

9. CONVEYING SYSTEMS

9.1 Elevators:

A. Elevator work includes cab assemblies (doors, car controls, emergency telephone cabinets, ventilation, wiring and lights, interior finishes, acoustical controls and all required emergency, safety devices and fire features), propulsion equipment (hydraulic pumps, motors and valves, rail guides and fittings), control systems (hoist controllers, central

control panel, sensors, limit switches and safety and fire devices) and hoistway related items (all attachment devices, doors, closers and interlocks, call buttons, well hole, jack unit and casing) and all other items required for a complete assembly meeting all applicable codes. Equipment to be by Dover, Montgomery, Otis, Westinghouse, Schindler, or approved equal.

B. Provide three new passenger elevators with 4,000 pounds minimum Class A loading, speed 125 f.p.m. up and 150 f.p.m. down, with minimum 3'-6" power operated single speed center opening passenger entrance with stainless steel finish at main lobby and prime finish at other floors. Elevators to serve all floors. Provide one new service elevator with 5,000 pounds minimum class C3 loading, speed 150 f.p.m. with minimum 4'-6" x 8'-0" two speed side opening service entrance with prime finish at all floors. Provide computerized security system on all elevators. Provide cab finish allowance of $7,000. per passenger elevator. Provide manufacturer's standard cab finish with three-section removable pads covering walls and front returns for service elevator.

C. Elevators to be tied to fire alarm system and automatically return to ground floor when the system is in alarm mode.

D. Provide full preventive maintenance and 24-hour emergency repair service to Metro for 12 months from date of substantial completion.

10. METRO TENANT IMPROVEMENT (INTERIOR FINISH) ALLOWANCE

A Design-build team to include $1,800,000 construction allowance for construction of Metro tenant improvements (interior finish). Allowance to include all "tenant" build-out including partitions, relites, doors, frames and hardware, installing ceilings, floor covering, lighting, power, local distribution for mechanical system, interior casework and special construction for unique program areas such as build-out for Council Chambers, day care center, computer rooms, executive offices, Stair 4, etc.

B. Design-build team to include contractor fee for managing all interior allowance construction work. Fee quoted will be a percentage fee for all actual interior finish work completed under this allowance. Such fee shall be included in the allowance.

C. Construction of interior finish work under this allowance to be CM/GC arrangement where design builder for a fee (see 10.B above) will solicit a minimum of three bids for all components of the work, review the bids and select the subcontractors with Metro, and administer all phases of the interior finish construction work in the same manner as the base contract.

11. NOT USED

12. NOT USED

13. NOT USED

14. NOT USED

15. MECHANICAL

15.1 General:

Review the entire Performance and Technical Specifications for additional information.

Coordinate the mechanical design with all other disciplines to avoid interference. Field verify existing conditions. The Contractor shall design and install complete and fully operable HVAC, plumbing and fire protection systems.

15.2 HVAC:

A. System Description: Install two large packaged rooftop variable air volume air conditioning units to be located on the roof of the facility. Supply and return conditioned air through two central shafts. Provide a looped ductwork system on each level to distribute air to variable air volume terminal units. The perimeter units shall be fan powered boxes with electric heat. Low pressure ductwork shall be extended from the terminal units to the perimeter slot diffusers and the "core" under base building work. Interior terminal units shall provide cooling only. The interior terminal units shall be extended to registers under tenant improvement, except the "core" which shall be finished complete. A separate garage exhaust system shall be provided to ventilate the underground parking structure.

B. Equipment: The rooftop air conditioning units shall be equipped with air foil supply and return fans, bag filters, DX cooling, gas heat for morning warm-up and night setback, and an airside economizer to use outdoor air for free cooling when ambient temperatures are low enough. Separate constant volume rooftop air conditioning units shall be provided for the council chambers. The unit shall be equipped with a forward curved supply fan, power relief, DX cooling, gas heat and airside economizer. Garage exhaust fans shall be axial or centrifugal.

C. Design Criteria:

(1) Perimeter zones shall be 15' deep and shall not serve more than 1,500 sq. ft. Provide separate perimeter zones for each corner zone. Perimeter electric heat shall include a 20% warm up factor and a 15% safety factor.

(2) Minimum cooling air for fan powered boxes on the perimeter shall be 20% of box size to insure adequate outdoor air ventilation to perimeter zones.

(3) Interior zones shall not exceed 2,000 sq. ft. in area and shall supply not less than .70 c.f.m./sq. ft.

(4) HVAC system shall be designed so that noise levels do not exceed NC 35 in office spaces, NC 30 in Council Chamber, and NC 40 in public lobby.

(5) Ductwork shall be looped and interconnected on each floor to provide partial conditioning of entire building in the event one of the two air conditioning units fails.

(6) Provide a separate air conditioning unit for the council chambers to allow off-hour condition without running the main system.

(7) Provide a complete D.D.C. control system including D.D.C. control of terminal units. Provide four bypass switches for off-hour HVAC operation.

(8) Include shafts or louvers to accommodate exhaust of print shop hoods (under tenant improvement).

(9) Rooftop air conditioning units shall be designed to provide not less than .9 c.f.m./sq. ft. of air flow to net area. Net area shall be defined as gross area less elevator and mechanical shafts and enclosed stairwells.

(10) A C.O. monitoring system shall be provided to control the garage exhaust system.

(11) Exhaust electrical rooms at airflows as required to maintain 95° F maximum room

temperatures.

E. Energy Efficiency: Contractor is invited to submit alternate mechanical systems which will result in lower life cycle cost to the Owner. As a minimum, all work shall conform to the Oregon State Energy Code. The selected Contractor will be required to utilize the services of PP&L's FinAnswer Program for energy modeling and evaluation of ECMs. Providing a mechanical system which minimizes the potential of "Sick Building Syndrome" is of prime importance to the Owner. Only systems which will incorporate airside economizers will be considered. Minimum outside air systems will not be accepted.

15.3 Plumbing:

A. General: Provide a complete and fully operable plumbing system for the entire building. Remove all piping and equipment which is abandoned.

B. Waste and Vent: All new piping shall be cast iron. Utilize existing waste piping where feasible. Provide three waste and vent stacks at columns to serve coffee bars under tenant improvement.

C. Domestic Water: Remove all existing galvanized piping. Install new copper systems throughout the building. Install a new backflow preventer at the building service. Provide cold water valves for future coffee sinks. Provide under tenant improvement.

D. Water Heating: Provide a central gas fired domestic water heating system. Provide a recirculation pump.

E. Hose Bibbs: Provide six freezeproof wall hydrants around the perimeter of the building. Provide two hose bibbs at each level in the parking garage. The water piping in the garage shall be designed so it can be drained down in the winter.

F. Storm Drainage: Replace all existing roof drains. Provide new overflow drains piped to scupper outlet. Re-use existing rainwater leaders where possible. Provide area drains at both levels of the parking garage at not less than every 10,000 sq. ft. Provide trench drains at the bottom of the parking ramps. Provide a sand and oil interceptor for all garage drains. Install area drains and catch basins at plazas and above grade parking. Provide planter drains in planters provided. Provide sump pumps at the elevator shaft sumps.

G. Insulation: Insulate all domestic water and rainwater piping as specified. Heat tape piping exposed to freezing including P-traps in the ceiling of the parking garage.

H. Plumbing Fixtures: Plumbing fixtures shall be Commercial Grade vitreous china. Fixtures shall incorporate water-saving features to minimize water consumption. Provide fixtures as required by code and indicated on architectural plans. Provide electrical water coolers in the core and in the lobby outside the Council Chamber.

I. Miscellaneous: Provide drains and traps for all HVAC equipment. Provide roof sinks for each rooftop air conditioning unit. Provide an adequately sized hub drain for the sprinkler system drain down.

J. Handicapped: All plumbing fixtures shall meet the latest and most stringent handicapped codes. Metro is committed to providing a barrier-free building.

15.4 Fire Protection:

A. General: Provide a complete and fully operable automatic sprinkler system throughout the entire building in accordance with NFPA 13.

B. Parking Garage: Provide a new dry system for the parking garage. Ordinary Hazard Group II. System shall be finished complete.

C. Office: Provide a wet system for the office space. Light Hazard. Lobby and core shall be finished complete. Provide up heads with new for future down heads in "Shell" office space.

D. Existing Systems: Re-use existing piping systems as acceptable to local authorities. Replace all sprinkler heads and valves.

C. Ductwork: All ductwork shall be galvanized sheet metal, including low pressure ductwork. Fiberglass ductwork is not acceptable. Loop medium pressure supply ductwork on each floor. Provide central dampers at supply and return at each shaft outlet.

D. Controls: Full D.D.C. control system including control of terminal units. Install control wiring in cable tray. Provide by Division 16 where possible.

E. Building Commissioning: Provide 40 hours of testing, trouble shooting and fine tuning of HVAC and control system. Balancing engineer, controls contractor, rooftop equipment supplier, and project mechanical engineer of record shall participate in building commissioning to ensure proper operation of entire HVAC system. This requirement will be enforced by Metro. Include in your bid.

16. ELECTRICAL

16.1 General:

Review the entire performance and technical specifications for additional information. Coordinate the electrical design with all other disciplines to avoid interference. Field verify dimensions and other existing conditions. Visit the existing Metro facilities in Portland to detail requirements for reconnecting existing equipment in the new facility.

16.2 Service and Distribution:

A. Power Supply Characteristics

(1) Utility Service: 480Y/277V, 3-phase, 4-wire grounded.

(2) Distribution: 480Y/277V:208Y/120V.

(3) Lighting: 277V, except exterior on grade and interior Metro office (future) specialty lighting to be 120V.

(4) Convenience Receptacles: 120V.

(5) Equipment: 480V 3-phase for loads 1/2 HP and larger and perimeter heating over 4KW (with 277V fans if less than 1/2 HP).

B. Service Equipment: Provide a new 2,500 amp 480Y/277 volt 3-phase 4-wire service and main distribution switchboard. Tap switchboard bus on load side of utility metering to supply separately mounted emergency service disconnect. Provide surge arrestor at switchboard.

C. Electric Utility: Provide all provisions for a utility furnished pad mount transformer and utility revenue metering at secondary voltage. Provide service entrance secondary conductors in conduit (aluminum permitted).

D. Distribution Panels: Provide minimum 600 amp rated panels at the upper level to serve roof top mechanical equipment. Provide additional panels as required to serve lighting panels, dry-type transformers, and perimeter electric heat. Dry-type transformers to be fed from distribution panels other than those which serve large (over 10-ton cooling capacity) roof top mechanical equipment.

E. Computer Power: Provide separate isolated ground 208Y/120V computer power distribution with separate shielded dry-type transformers for the Irving Street and Upper Levels.

F. Power Branch Circuit Panels: Provide two 208Y/120 volt branch panels each having 82 poles with (60) 20 amp 1-pole spare breakers, for each 15,000 sq. ft. of Metro office (shell) space. One panel is for normal convenience loads; the other is for computer loads. Allow 1000VA load per spare breaker.

G. Duplex Receptacles: 15/20 amp rated, maximum five normal power at 200VA each and two computer power at 500VA each per 20 amp branch circuit. Provide one at each mechanical and electrical room, each stair well and lobby, 50' maximum in corridors, four equally spaced around each parking level, four in loading/storage room, GFI in each restroom, and GFI protected at each exterior grade entry.

H. Grounding: Wired ground in all receptacle circuits and all circuits with overcurrent protection set at greater than 50 amps.

I. Lighting Branch Circuit Panels: Provide 480Y/277 volt, minimum 125 amp rated panels at Irving Street and Upper Levels, each with minimum 30 poles, (15) spare 20 amp 1-pole breakers, and external low voltage relay and contactor controls. Provide additional panel(s) at Grand or Basement Levels, also with external low voltage relay and contactor controls. Allow 3000VA load per spare breaker.

J. Capacity: Provide minimum 30% additional demand load capacity in addition to the above allowances, including distribution breaker space, branch breaker space, transformer ratings and feeder and bus ampacities.

16.3 Lighting:

A. Illumination Levels: Conform to IESNA standards. Provide maintained average footcandle (fc) values as computed by the zonal cavity method:

(1) Overall Light Loss Factors: 0.69 for metal halide, 0.74 for T10, T12 and compact fluorescent, 0.81 for T8 fluorescent and high pressure sodium, unless otherwise indicated.

(2) Reflectances: 80% ceiling, 50% wall and 20% floor reflectances except indoor parking 50%, 30% and 20% respectively.

B. Parking and Exterior Areas: Provide indoor parking area illumination with new HPS fixtures to 10 - 15 fc in the driving lanes and 5 fc at the parking stalls with better than 4:1 average to minimum uniformity. Existing basement branch circuit wiring and conduit may be re-used. Replace the existing pole lights at the Irving Street parking area with new architectural style ("shoe box" or round form, with painted pole) HPS pole lights. Provide HID source exterior lighting in all areas to minimum 2 fc with average to minimum uniformity better than 4:1.

C. Egress Illumination and Exit Signs: Provide exit signs and egress illumination on emergency system with separate branch circuit wiring. Integrate unit equipment (self-charging sealed-lead battery packs) with the lighting fixtures in finished areas. Exit signs to be 277V compact fluorescent, universal surface mount with thin profile cast aluminum body and stencil face.

D. Metro Office (Shell) Areas: Furnish fixtures to maintain 55 fc

(1) Basic Fixture Type: Three-lamp 18-cell semi-specular parabolic 2' x 4' fluorescent. Deep (3.5" minimum) cells. Heat extract/return air via lamp cavity of >150 cfm at 0.05" water gauge with noise criteria <13. Three-level switchable with electronic ballasts. T8 3500°K tri-phosphor lamps. Up to 75% may be furnished as tandem

wired pairs.

(2) Calculations: Total light loss factor including ballast factor, heat extract factor, and dirt and lamp lumen depreciation = 0.87. Room cavity ratio = 5.00. Assume all basic type fixtures for quantity calculation.

(3) Dimming: Furnish 6% of the fixtures with three-lamp dimming electronic ballast in lieu of non-dimmable electronic ballasts. Furnish relay module and slide control for each six dimmable fixtures or fraction thereof.

(4) 2' x 2': Furnish 9% of the fixtures as 2' x 2' in lieu of 2' x 4'.

(5) Egress Fixtures: Furnish 5% of basic fixtures with self-charging emergency illumination packs for center lamp. Furnish 50% of the 2' x 2' fixtures with packs for two outside lamps.

(6) Exit Signs: Furnish 12.

(7) Delivery: Stack on floors as directed for installation under Metro office improvement allowance.

E. Interior (Core) Areas: Provide fully recessed lighting with 45° source cut-off utilizing T8 or compact fluorescent fixtures for a minimum illumination of 30 fc, except illumination in mechanical, electrical, telephone and elevator equipment rooms is to be 50 fc. In stairwells enclosed surface mounted fixtures may be utilized. Open strips are permitted in mechanical, electrical, telephone and elevator equipment rooms.

F. Controls: Provide complete for Interior (core) areas, Metro office (shell) areas, interior and exterior parking areas, and site.

(1) Interior Time-of-Day Switching: Main circulation areas lighting and parking garage lighting are partly switched ON and OFF according to two separate maintained dry contact signal furnished by Division 15 building automation system.

(2) Interior Daylighting Zone Switching: Main circulation day lighting zone lights are enabled by the same time-of-day signal as above but will be switched ON only if natural light levels are insufficient. This control is accomplished by placing a lighting contactor in series with the low voltage relay. Egress lighting in daylighting zones is switched by photocell controlled contactor only in a "FAIL ON" arrangement.

(3) Interior Office Area Switching: Each floor of the building is divided into areas which corresponding to the areas served by groups of HVAC terminal units. Each area's lighting circuits are switched together utilizing low voltage relays. Selected circuits are parallel switched by "crossover" relays to energize lighting in common areas such as restrooms, coffee rooms, copy rooms, etc. At any time, operation of the "bypass" pushbutton in each area will switch ON all the lighting circuits serving that area. Out of normal working hours, a two-second dry contact pulse will be generated periodically by the Division 15 building automation system; this signal will momentarily switch (sweep) OFF all office area lighting. After an adjustable time interval (0.1 - 10 minutes), the lighting circuits will be switched OFF automatically by this system. If the HVAC system bypass for a particular area of a floor has been activated, then the pulse signal from the building automation system will be inhibited for that area of that floor. This allows after hours use without nuisance switching. Provide controls to support five zones and five crossover circuits on the Irving Street Level and four zones and four crossover circuits on the Upper Level.

(4) Exterior Lighting Switching: Exterior site lighting is switched in response to a separate adjustable photocell signal.

(5) Switching for each interior room except where other control is provided.

16.4 Telephone/Data:

A. Telephone Service: Provide two 4" empty conduits to telephone utility point of presence (POP) from serving utility facilities in public right-of-way. Provide one additional terminal board as described below.

B. Terminal Boards: Provide a minimum of one 4' x 8' x 3/4" per 10,000 sf gross area of Irving Street and Upper Levels, with double duplex on individual emergency branch circuit. Provide #6 ground wire from main electric service ground bus to each terminal board or group of terminal boards.

C. Outlets: Provide one wall/pay telephone outlet with 3/4" conduit only to accessible ceiling space, at each elevator lobby, main lobby, and loading/storage. Provide outlet in guard console at main lobby.

D. Cable Tray: Minimum 12" x 3" system above ceiling looping around building approximately 20' from perimeter at Union, Irving and Upper Levels. Connecting sections from loop to telephone room from opposite sides at each level.

E. Sleeves: Provide minimum six 4" inside diameter connecting telephone rooms vertically including POP.

16.5 Fire Detection and Alarm System:

Annunciate and monitor smoke detection, tamper and flow switches, HVAC equipment duct detectors and manual stations. Tie to a 24-hour manned facility. Detection is required in all open areas, egress paths, electrical and telephone rooms, elevator equipment rooms, shafts, and lobbies, and mechanical ducts where required by mechanical code. Install manual stations at each exit from floor to stair and from building to exterior and Irving Street and Upper Levels. Provide separate zoning of manuals on each level, water flow, core at each level and two zones each for Irving Street and Upper Levels of Metro office space. Annunciate all zones plus waterflow at each level and system trouble in panel at Fire Marshal approved Irving Street lobby location.

16.6 Security System:

A. Provide fixed enclosed solid-state (CCD) camera, two-way intercom, call button, slotless card key reader, door/gate monitoring, and door/gate control at five locations:

(1) Vehicular Access Control: Roll-up gates at the Basement and Union Levels with intercom, call button and card reader in a weatherproof vandal-resistant kiosk accessible without leaving vehicle. Vehicular request-to-exit to be imbedded loop plus push-button for pedestrians. Imbedded loop to sense vehicle clear and reclose gate.

(2) Parking-to-Building Access Control: Man doors from parking area to passenger elevator lobby at Basement and Union Levels. Motion sensor request-to-exit.

(3) Irving Street Pedestrian Entry: Man door from street to main lobby. Motion sensor request-to-exit.

B. Guard Station: Video switcher to automatically sequence through selected cameras. Upon receipt of intercom call automatic video switching to calling location in automatic mode. Operator may select and hold any camera/intercom location. Intercom to be selectable open-speaking push-to-talk or handset push-to-talk operation. Free-controlled-locked switches for each location to allow operator to select free access, card key/manual, or manual only mode for each location. Gates open in free access mode. Monitor all other exterior doors. Fire alarm interface to automatically open access as required by Fire

Marshal. Locate controls and 13" monitor flush in guard station console at main lobby.

C. Intercom Only: Provide intercom with call button at two locations, one each parking level, in addition to the elevator lobby entrance door. These stations are for security audio monitoring and emergency assistance calls to guards console.

16.7 Existing Systems:

Disconnect and demolish to the extent necessary to complete the new work.

END OF PERFORMANCE SPECIFICATION

perform.spc

IX.
APPENDIX

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B. **Concept Design Drawings - Sheets 1-7**

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APPENDIX A.

Metro Headquarters Project Building Program

METRO HEADQUARTERS PROJECT

BUILDING PROGRAM

October 11, 1991

BROOME, ORINGDULPH, O'TOOLE, RUDOLF, BOLES & ASSOCIATES, P.C.

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METRO HEADQUARTERS PROGRAM

BACKGROUND

1.0 HISTORY

The Metropolitan Service District was created by the Oregon Legislature in 1977 and approved by the voters of Multnomah, Clackamas, and Washington Counties in 1978. Metro is the only directly elected regional government in the nation.

Metro is responsible for addressing issues of regional significance. Issues such as transportation planning and solid waste disposal which cross traditional city and county boundaries are coordinated on a regional basis with the goal of providing more efficient systems of planning and operations of services.

Metro is governed by an executive officer who is elected region-wide, and a 12 member council, for which each member is elected from one of twelve equally populated districts in the region. This ensures responsive policy decision making and citizen involvement in proposed programs and new facilities.

Metro is an organization of diverse parts. Over its relatively short history, it has evolved from being a unique "experiment" to a maturing and expanding regional government.

2.0 PURPOSE

With its continued expansion, Metro has outgrown its present offices. This program analyzes and develops a space determination to allow Metro to plan for its physical growth requirements over the next five to seven years. The intent is to establish the qualities and characteristics of space that are important to Metro's mission as well as to provide the physical environment needed to accomplish this mission.

The particular characteristics of an organization, when reflected in its physical environment, become the context in which specific practical needs can occur. For example, Metro has expressed that it sees itself as a young, dynamic governmental organization, unlike any other. It desires an open, participatory relationship with the public. These characteristics evoke certain images about Metro's physical environment, i.e., a structure and space whose basic concept is openness, glass, and daylight; one welcoming the public in from the outside; a traditional governmental image is not desired. Thus, the big picture context as well as the details are presented here.

3.0 CHARETTE SUMMARY

On February 15, 1991, a brainstorming session (charette) was held to develop issues impacting Metro's space and establish goals and objectives defining Metro's intended response to these issues. Those in attendance were Metro department heads and staff, with discussion led by BOOR/A Architects. The following summarizes the session's conclusions.

3.1 Image

Metro is young, dynamic, and progressive. At its inception it was considered brash and merely an experiment, but as Metro evolved it found a need to temper the early image without becoming a traditional "old guard" agency. It desires to present a credible, professional image to the public.

Metro wants to be seen as a Regional Government Center, a site of "urban regional consensus". It wants to open its doors to other government agencies to facilitate its goals of better communication and more efficient systems of regional planning. It wants to encourage the public to participate in the regional government process.

All the characteristics and goals of Metro describe a unique agency. The goal which seems to have the greatest priority to Metro is accessibility--by the public and by other governments. This goal can be translated into physical environment by creating an "accessible Metro building". It implies visual accessibility through exterior use of glass, particularly at the entry, the lobby, and other public spaces. The public should look at Metro's building and see people inside. These areas of transparency will convey a feeling of openness both inside and out.

The quality of the spaces should be warm and inviting. Finishes such as wood could be used throughout, particularly in public spaces, the Council Chamber, and Executive Conference Room. Traditional fortress government design may not be appropriate to express Metro's spirit. The quality of Metro's spaces should reflect the nontraditional, progressive spirit of Metro and reinforce their professional, credible image.

Public accessibility is also enhanced by a barrier-free environment, and a clearly organized floor plan. It should be apparent where public zones begin and end, and easy to locate the spaces most frequently visited by the public.

3.2 Council Chamber

The Council Chamber is the heart of the Regional Government Center. It is Metro's most public room. The chamber should have many of the same characteristics as Metro--it should be open, inviting, dynamic, progressive, and nontraditional, yet convey the same sense of credibility and professionalism as the rest of the building. Finishes could include wood paneling and wood furnishings to give the room warmth. Windows are desirable for their openness and light. Special volumes and carefully studied lighting can create more dynamic qualities within the space.

For this room, the major goal expressed by Metro is the need for a flexible, divisible, multi-use space. During the time the Council is not in session, it is desirable for Metro to divide the Chamber into two or more meeting rooms, using movable panels and flexible furniture arrangements (including the Council's seating area).

3.3 Access to Information

Metro sees itself as a provider of customer service. While it provides information for the public's use, Metro observes that currently the information is scattered among its various departments and is difficult for the public to access. Metro's goal is to pull information together into one place, such as a Metro Store or Agency Library, and deliver the information in a convenient, user-friendly manner.

The Metro Store is seen as a place to sell "Metro products", recycling containers, promotional materials such as mugs and postcards of the Convention Center artwork, and as a place to locate a self-service map display featuring the 12 or more maps most frequently requested by the public.

Metro is also aware that the public does not understand all the things that Metro does. Metro is more than the zoo and recycling, and their goal is that public areas should identify what Metro is about. Visible recycling areas, solid waste display areas, transportation planning information, MERC, and zoo displays could all be made part of lobbies, corridors, and the Metro Store.

3.4 Quality of Work Areas

The most frequently expressed goal besides accessibility was the seemingly contradictory desire to create distinct public and private zones within a Metro building. While the public should feel welcome within public zones, it is also necessary to "protect" the work zones from public distractions and allow privacy so that work can proceed uninterrupted. Security of work zones is desired to protect belongings and confidential materials; therefore, clear zones will help remedy the problems of who belongs where. A clearly organized floor circulation system and organizational plan is one way to achieve this goal.

Use of natural materials and access to natural light are goals requested for work areas. Noise-controlled work areas and tackable wall surfaces also were high priorities among Metro staff.

3.5 Departmental Organization

The goals expressed for departmental organization were initially contradictory, i.e., to mix or open up department areas to one another versus separating departments. However, the overall consensus was that departments should be separated from one another by walls. Those departments who often work together should be located as close as possible to one another in the space plan to allow easy access but to maintain their own identity.

Space organization within each department will vary depending on functional needs and management attitudes. Some departments require more enclosed offices, while others desire a high degree of openness and flexibility to arrange and rearrange workstations into team-sized groups.

A high priority for departmental organization is to provide more meeting space--ideally a conference room within every department. If this is not possible, a number of conference rooms should be distributed within the space plan to allow convenient access for shared use.

3.6 Staff Amenities

Among the goals and objectives relating to staff amenities at Metro is the resolution of conflicts between smokers and nonsmokers in the staff lounge. A possible solution was proposed which provides two separate lounge areas. The quality of the spaces should be relaxed, bright, and comfortable. Access to the outdoors is very desirable.

Other goals are an athletic/exercise space, on-site day care (with sick child care occurring at a future date), and a deli/cafe or restaurant on site.

3.7 Need for Parking

One of the recurring goals expressed in the charette is that Metro is a model and should visibly promote alternate transportation for its staff. Visible, accessible bicycle parking and carpooling are two ways to achieve this. The parking ratio for staff may need to be adjusted. Other staff expressed the desire to be able to purchase a parking space for a day for those individuals requiring only occasional automobile parking. Another goal expressed was to provide a parking space for each council member.

4.0 CHARETTE NOTES

Following are the itemized points of discussion of Charette No. 1, beginning with a list of questions BOOR/A posed to Metro staff:

4.1 How should this public agency project its desired image through its physical environment?
4.2 How should this agency develop spatial relationships that project the character and spirit of Metro?
4.3 How should different departments vary in image (real or perceived)?
4.4 How should Metro's environment, space use, and image be shaped by its positions on conservation, public service, etc.?
4.5 What are the functional relationships at Metro?
4.6 What are the functional idiosyncrasies at Metro?

5.0 IMAGE OF METRO

When asked to describe Metro's spirit and image, Metro staff made the following responses:

5.1 Metro protects livability in the region.
5.2 Metro is young, dynamic, and progressive.
5.3 Metro is still young and evolving.
5.4 Metro needs to balance the traditional "old guard" government image with its own "young and brash" image.
5.5 Metro is "slice of a pie" government.
5.6 Metro is no longer an experiment.
5.7 Metro is "yuppie government."
5.8 Metro is "urban regional consensus."
5.9 Metro's image is an educational campus.
5.10 Metro is a new government image.

5.11 No other government is like Metro.
5.12 Metro's is not a corporate image.
5.13 Metro is diverse.
5.14 Metro is customer service--friendly to the user.
5.15 Metro's image should include more than the zoo and recycling.
5.16 Metro should present a professional image to the public.

6.0 IMAGE OF METRO'S SPACE

Suggested images for the physical space included:

6.1 Use of natural materials and finishes.
6.2 Wood and warmth.
6.3 Glass and light.
6.4 Recycled materials as building materials.
6.5 Need to see people when you enter.
6.6 Public dollars must be used well.
6.7 Visible sensitivity to transportation alternatives.

7.0 ISSUES

Issues to be resolved in a new Metro facility:

7.1 Metro desires its own building lobby.
7.2 Open atmosphere versus security for staff.
7.3 Council needs citizen involvement.
7.4 Council chamber needs to be flexible, divisible, and multi-use.
7.5 Accommodate large groups of MERC applicants.
7.6 Sound control needed in office environment.
7.7 Management of growth and increased diversity.

8.0 GOALS AND OBJECTIVES

The goals and objectives expressed by Metro staff included the following:

8.1 Convey the vision of a regional government center.
8.2 The environment should invite people to participate.
8.3 Public areas should identify what Metro is.
8.4 Public areas should be friendly.
8.5 Convey credibility.
8.6 Create a barrier-free environment.
8.7 Metro is a model.
8.8 Provide visible recycling efforts.
8.9 Open Metro to other governments.
8.10 Communicate the positive things Metro does in the region.

8.11 Provide information for the public's use.
8.12 Pull answers together in one place for better customer service.
8.13 Portray Metro as a unit.
8.14 Create an organized floor plan in which it is easy to identify where one is.
8.15 Provide a clear distinction between public and "private" zones.
8.16 Provide good security.
8.17 Provide departmental conference rooms.
8.18 Provide more meeting rooms which are open to the public.
8.19 Need to be flexible in total outlook.
8.20 Facilitate functional commonality.
8.21 Mix departments which work together.
8.22 Define departmental areas.
8.23 Open up departmental areas.
8.24 Actively promote alternate transportation for Metro staff.
8.25 Provide parking for council members.
8.26 Provide ability to buy a parking space for the day.
8.27 Provide bicycle parking.
8.28 Provide a building which is easy to maintain.
8.29 Project needs for future technological requirements.
8.30 Provide natural light in work spaces.
8.31 Provide enclosed offices to reduce distractions.
8.32 Provide tackable wall surfaces.
8.33 Use one percent for art.
8.34 Create a Metro Store.
8.35 Provide smoke-free and smokers' lounges.
8.36 Provide athletic facilities.
8.37 Provide day care on site.
8.38 Provide sick child care on site (future).
8.39 Provide a deli/cafe/restaurant on site.
8.40 Council chamber should be accessible to media use.
8.41 Foster communication between Executive Management and Council Staff.
8.42 Provide individual offices for council members.
8.43 Provide display areas in public zones near Solid Waste Department.
8.44 Provide public access to Data Research.
8.45 Provide the Accounting Department with easy access to all departments.

SQUARE FOOTAGE SUMMARY

The following summary includes a list of all the spaces to be described in the Metro program and their required areas. The first group, identified as "Shared Spaces", includes all the spaces used jointly by Metro staff and/or the public (such as the Council Chamber, conference rooms, etc.)--spaces which are not part of a particular department. Following "Shared Spaces" are the departments, including a breakdown of departmental divisions and their areas, both separately and in total. The final items in the summary are General Storage and Archives. General Storage includes storage which is not within department areas and may be located in a basement level. Archive Storage has not been described in this space program, but it is a space requirement which will be satisfied in an off-site facility.

METRO PROGRAM
SQUARE FOOTAGE SUMMARY

1.	Shared Spaces		10,770
	--Reception/Lobby	675	
	--Metro Store	150	
	--Council Chamber	2,500	
	--Council Lounge	300	
	--Council Kitchen	100	
	--Conference Rooms		
	Large (1 @ 1,560)	1,560	
	Medium (2 @ 575)	1,150	
	Small (5 @ 215)	1,075	
	--Staff Lounge	1,080	
	--Copy Stations (4 @ 50) 200		
	--Coffee/Coat Room (4 @ 50)	200	
	--Fitness Area:		
	Workout Room	400	
	Locker/Shower Rooms (2 @ 200)	400	
	Subtotal	9,790	
	Plus Circulation	x 1.1	
		10,770	
2.	Executive Management		1,585 *
3.	Council Staff		2,915 *
4.	Office of Government Relations		470 *
5.	Legal Department		1,695 *
6.	Public Affairs		3,980 *
	--Public Affairs Staff	1,320 *	
	--Graphics	1,060 *	
	--Waste Reduction Education	565	
	--Recycling Information Center	800	
	--Audio/Visual Storage Room	235	
7.	Personnel Department		1,190 *
8.	Transportation Department		7,085 *
	--Management	1,345 *	
	--Planning	1,115	
	--Light Rail Planning	1,205	
	--Travel Forecasting	1,380	
	--Data Resource Center	2,040	
9.	Planning and Development		4,410 *

* Contingency added.

METRO PROGRAM
SQUARE FOOTAGE SUMMARY

10.	Solid Waste Department		6,250.*
	--Management Services		
	--Waste Reduction		
	--Operations		
	--Budget and Finance		
	--Engineering and Analysis		
11.	Metropolitan Exposition Recreation Commission (MERC)		3,795 *
12.	Finance and Information Management		3,175 *
	--Financial Planning	1,200 *	
	--Risk Management	375 *	
	--Office Services	1,600	
13.	Accounting Department		3,235 *
14.	Information Systems		2,355 *
15.	Regional Facilities Department		2,690 *
	--Facilities Development	1,345 *	
	--Facilities Construction	390 *	
	--Procurement	530 *	
	--Facilities Management	425 *	
16.	Day Care		4,035
17.	Building Services		900
18.	General Storage		2,450
19.	Archive		N/A
TOTAL SQUARE FOOTAGE			**62,985**

* Contingency added.

PROGRAM INTRODUCTION

The following program information describes the Metro Headquarters space requirements. The material was gathered from responses to a questionnaire, interviews, and walk-throughs of each department in the existing facility. The information was then assembled into three to six sections for each department (dependent on size and complexity) in the following format:

1. A Bubble Diagram of the department shows relationships of spaces within the department and relationships to other departments, if applicable.

2. The Department Description explains the department's function, general requirements, and relationships.

3. A Department Area Summary, where applicable, lists the department's divisions, their individual square footages, and the total area required.

4. The Division Description, where applicable, explains the function, general requirements, and relationships of each division.

5. The Space/Staff Requirements identify the titles of the spaces, quantities, workstation types, and the areas required of each item (note the standard office and workstation layouts which follow). It then adds a circulation factor of 1.175 and a contingency factor of zero to five percent, which varies in accordance with the percentage of enclosed spaces in the division or department in question. The Space/Staff Requirements also lists the total number of staff planned for in each division or department.

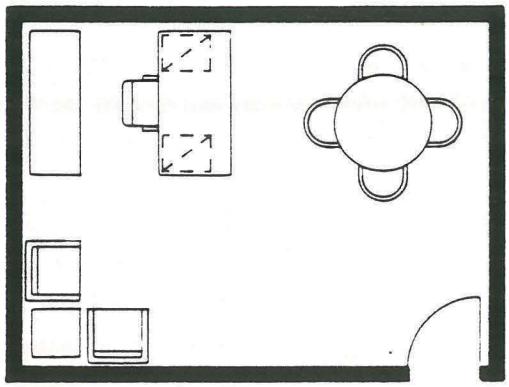
6. The Division Data section provides a "checklist" of notes regarding specific topics, such as Adjacencies, Furniture/Equipment, Finishes, Lighting, etc.

STANDARD OFFICE AND WORKSTATION LAYOUTS

The following diagrams illustrate office and workstation layouts to be utilized as guidelines in standardizing Metro's work space assignments. Each layout includes the size/area, the job titles typically assigned to the work space, and a suggested furniture layout.

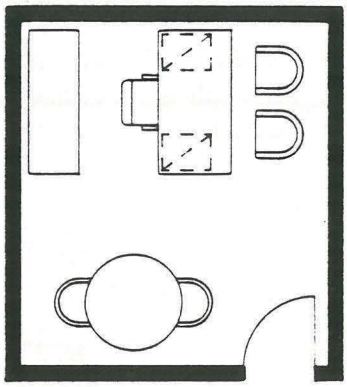
STANDARD ENCLOSED OFFICE LAYOUTS

EXECUTIVE OFFICER



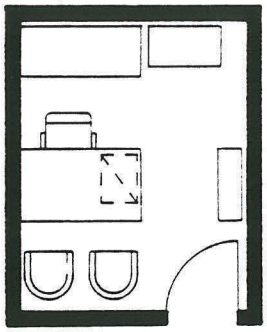
TYPE A
300 S.F./15'X20'
SUGGESTED FURNITURE:
36 X 72 DESK W/ 2 FILES
25 X 72 CREDENZA
DESK ARMCHAIR
CONFERENCE TABLE
4 CHAIRS
2 LOUNGE CHAIRS
SIDE TABLE

DEPARTMENT HEAD



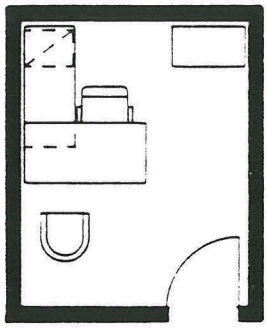
TYPE B
200 S.F./15'X13'-4"
FURNITURE:
36 X 72 DESK W/ 2 FILES
25 X 72 CREDENZA
DESK ARMCHAIR
4 VISITOR CHAIRS
CONFERENCE TABLE

MGR./SUPERVISOR



TYPE C
125 S.F./10'X12'-6"
FURNITURE:
30 X 60 DESK W/ FILE
25 X 60 CREDENZA/RETURN
DESK ARMCHAIR
BOOKCASE (36W X 42H)
3-DRAWER LATERAL FILE
2 VISITOR CHAIRS

ANALYST/ATTORNEY

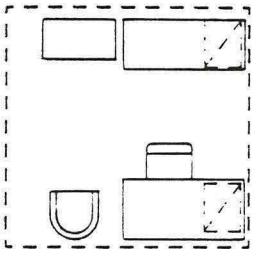


TYPE D
125 S.F./10'X12'6
FURNITURE:
30 X 60 DESK W/ FILE
25 X 60 CREDENZA/RETURN
DESK ARMCHAIR
3-DRAWER LATERAL FILE
1 VISITOR CHAIR

NOTE:
APPROXIMATELY 4 S.F. PER WORKSTATION
TO CONTAIN RECYCLING BOXES.

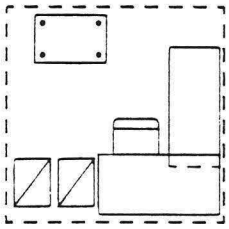
STANDARD OPEN OFFICE LAYOUTS

ANALYST/PLANNER



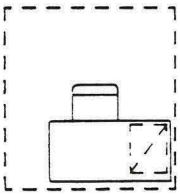
TYPE E
100 S.F./10'X10'
FURNITURE:
30 X 60 DESK W/ FILE
25 X 60 CREDENZA/RETURN
DESK CHAIR
2-DRAWER PEDESTAL FILE
3-DRAWER LATERAL FILE
VISITOR CHAIR

SECRETARIAL



TYPE F
80 S.F./8'X10'
FURNITURE:
30 X 60 DESK
25 X 60 CREDENZA/RETURN
DESK CHAIR
TWO 2-DRAWER PEDESTAL FILES
TYPING STAND

TEMP/INTERN

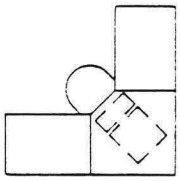


TYPE G
50 S.F.
FURNITURE:
30 X 60 DESK WITH FILE
DESK CHAIR

DESK SUBSTITUTIONS



DRAFTING BOARD



COMPUTER STATION

NOTE:
APPROXIMATELY 4 S.F. PER WORKSTATION
TO CONTAIN RECYCLING BOXES.

1. SHARED SPACES

Summary

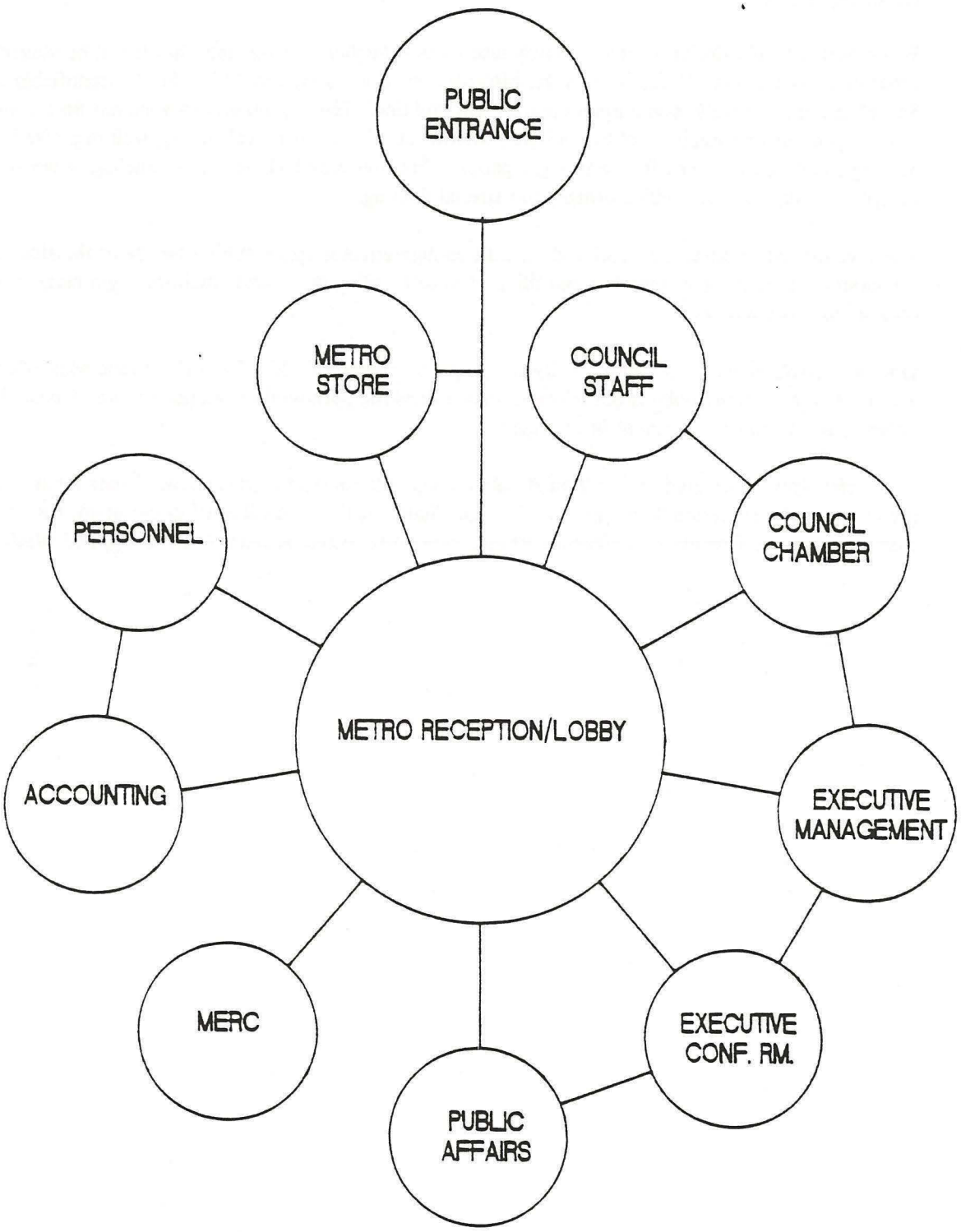
Shared spaces include Metro's Reception/Lobby, the Metro Store, Council Chamber, Council Lounge, Council Kitchen, Conference Rooms (small, medium, and large), the Staff Lounge, and the Fitness Area (workout room and locker/shower room). Some of these spaces are shared exclusively by Metro employees, while others are open for public use. All spaces are to be barrier-free.

Space Requirements

Title		Quantity	Area
a.	Metro Reception/Lobby	1	675
b.	Metro Store	1	150
c.	Council Chamber	1	2,500
d.	Council Lounge	1	300
e.	Council Kitchen	1	100
f.	Conference Rooms:		
	Large Conference Room	1 @ 1,560	1,560
	Medium Conference Rooms	2 @ 575	1,150
	Small Conference Rooms	5 @ 215	1,075
g.	Staff Lounge	1	1,080
h.	Copy Stations	4 @ 50	200
i.	Coffee/Coat Rooms	4 @ 50	200
Fitness Area:			
	Workout Room	1	400
	Locker/Shower Room	2 @ 200	400
Subtotal Net Square Footage			9,790
Plus Circulation			x 1.1
TOTAL GROSS SQUARE FOOTAGE			10,770

METRO PROGRAM
SHARED SPACES

METRO RECEPTION/LOBBY



A. METRO RECEPTION/LOBBY

Room Description

While Metro would prefer a separate entry into its new facility, it is possible that it will be shared with other building tenants. If this is the case, Metro's reception/lobby should be clearly identifiable as "Metro Space" and immediately visible upon entering the building. The reception/lobby should be a continuation of the open, inviting qualities of the building exterior and be a warm, welcoming, well-organized space. Seating should be provided for six to eight people. Finishes may include wood paneling, a wood-paneled reception desk, a special ceiling design, and special lighting.

The receptionist requires a reception desk with enough counter space behind her or to the sides to accommodate messenger deliveries and filing of inter-building mail, while maintaining a clear front counter to greet visitors.

One of Metro's goals for the new facility is that public spaces should inform the public what Metro is all about. The reception/lobby is one place to locate displays, photographs, maps, etc. which describe the diversity of Metro's involvement in the region.

If a Metro Store is created, its location should be adjacent to Metro's reception. Other areas requiring proximity to the reception/lobby are the Council Chamber, the Council Staff department, Executive Management, the Executive Conference Room, Personnel, Public Affairs, Accounting, and MERC.

METRO RECEPTION/LOBBY

Room Data

Net Square Feet:	675
Character:	Warm, open, inviting, well-organized space.
Relationships:	--All visitors and all departments will use the reception/lobby. --Location should be visible from the building entry.
Adjacencies:	--Council Chamber --Council Staff --Executive Management --Executive Conference Room --Public Affairs --Accounting --MERC
Furniture/Equipment:	--Lounge seating for six to eight. --Side tables.
Finishes:	Carpet, wood paneling, wall covering, special ceiling design.
Casework:	--Reception desk with wood panels. --Possible display units.
Storage:	--Secure coat closet/alcove. --File within reception desk.
Lighting:	--Special lighting design required. --Task lights at side tables in seating area.
Power:	Verify requirements.
HVAC:	Normal requirements.
Acoustics:	Buffer noise within the space.
Security:	--Create clearly defined public zone. --Future full-time security guard station should be considered in the design of the space.

B. METRO STORE

Room Description

For some time Metro has sold products and provided promotional materials to the public. A need was expressed to centralize these items into a highly visible space within Metro that would be open to the public.

The store is to be adjacent to Metro's Reception/Lobby for easy public access. It should be an inviting space, welcoming the public in to browse and buy. The storefront will be transparent; therefore, it is important that the store's interior be compatible with the reception/lobby area. All products and promotional materials are to be displayed in a tasteful and well-organized manner.

Metro's diverse involvements will be reflected in the sampling of the Store's merchandise. "Metro products" include recycling containers, posters and mugs, a self-service map display featuring the 12 most requested maps from the Transportation Department, Washington Park Zoo and Portland Center for the Performing Arts tee shirts, and postcards of the Oregon Convention Center's artwork.

Well-designed display racks and shelving will be required. A counter is needed for packaging and wrapping items. Sufficient inventory storage should be provided.

All transactions will be handled through the use of a cash register. Appropriate power requirements need to be provided. The storefront must have the ability to be secured when the store is closed.

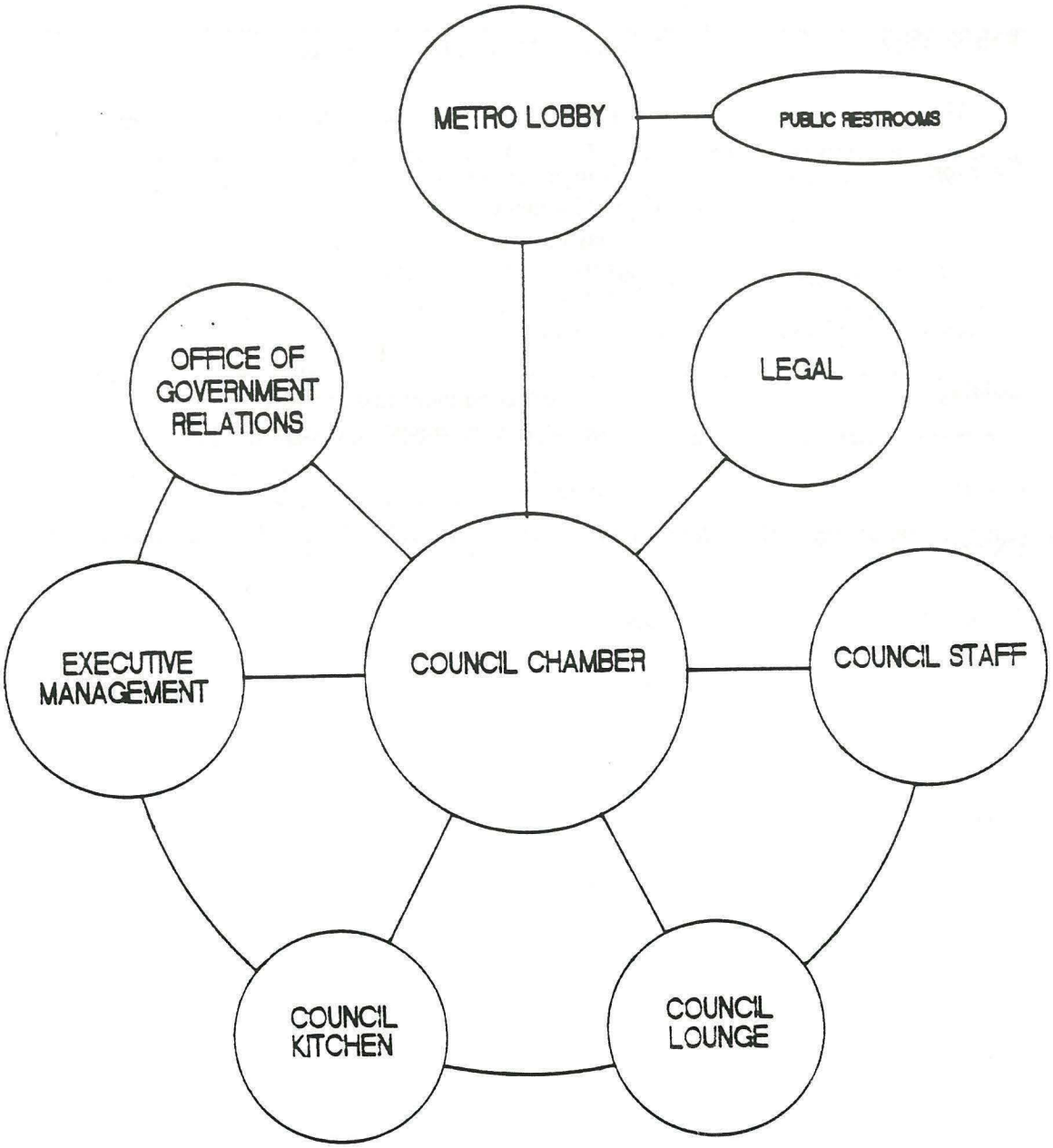
METRO STORE

Room Data

Net Square Feet:	150
Relationships:	Adjacent to Metro's Reception/Lobby.
Finishes:	Compatible with Metro's Reception/Lobby.
Casework:	--Built-in display cases. --Pamphlet racks. --Display counters. --Lockable storage cabinets.
Storage Requirements:	See Casework.
Lighting:	--Special lighting on individual controls. --Display lighting on individual controls.
Power:	Per cash register manufacturers requirements.
HVAC:	Normal requirements.
Acoustics:	Acoustical separation.
Security:	Secure store when it is closed.

METRO PROGRAM
SHARED SPACES SUMMARY

COUNCIL CHAMBER



C. COUNCIL CHAMBER

Room Description

The Council Chamber will provide the meeting space for Council members to perform their public legislative and quasi-judicial duties. The design should reflect an inviting and professional image of a dynamic regional government. This meeting space should have a prominent, easily accessible location near Metro's main lobby. It is here in the Council Chamber that the public has access to their elected officials and continued citizen involvement can be encouraged.

The Council Chamber will be a flexible, column-free, multi-purpose room. When the Council is not in session, it will be used by the public and governments for smaller meetings. Movable partitions will divide the room into two or more spaces for that purpose.

When arranged as a Council Chamber, the audience seating capacity should be 100. The design of the Council table should provide seating for thirteen Councilors. A panel may extend above the Council table to conceal microphones, recording equipment, and papers, but must be low enough for Councilors to easily view the audience. A curved table enables the Councilors to see one another during proceedings. Five additional spaces should be provided to the sides to seat two Council staff members, the General Counsel, the Executive Officer, and an Executive Management staff member. Two witness tables should be provided, each table with one microphone, and seating for two to three people. The Council table and all other furniture should be movable to facilitate the flexibility of the room.

Natural light is required in the Chamber. The walls are to have fabric-covered tackable panels with a wall-mounted marker board concealed behind doors. A large motorized projection screen should be located to one side of the Council table. The room should be planned with a sound system which records proceedings and broadcasts into the Executive Officer's office and into the Council Chamber lobby/breakout area. Media access is important. Cable access and filming positions should be considered in the room design and space plan. Acoustics in the Council Chamber must be designed to accommodate a large public meeting with individual participants. In addition, acoustic separation from adjoining areas is important.

The Council Chamber design shall include a specially designed ceiling which has a minimum height of 12 feet over its center area, but could be 9 to 10 feet over side aisles and display areas. Special lighting should be incorporated into the ceiling design.

Both the Executive Management staff and Council staff will require separate nonpublic entrances into the Council Chamber. A separate nonpublic Council Lounge and Council Kitchen will also be accessed from the Council Chamber.

COUNCIL CHAMBER

Room Data

Net Square Feet:	2,500
Character:	Reflects a dynamic regional government center.
Function:	--Councilor meeting space for public legislative and quasi-judicial duties. --Open to use by other governments and the public.
Reception Area:	Metro's main reception.
Adjacencies:	--Easily accessible to the public and Executive Management and Council staff. --Close to toilet rooms. --Adjacent to Council Lounge and Council Kitchen. --Public Affairs A/V Storage located near the Chamber for easy access.
Special Requirements:	--Column-free space. --Flexibility of arrangement. --Tackable wall panels. --Movable partitions. --Separate entries into the Chamber for the Council staff offices and the Executive Management offices and Council Lounge.
Furniture/Equipment:	--Movable Council and staff tables and chairs. --Seating for 100 visitors. --Two witness tables and six chairs. --Motorized projection screen visible from all parts of the room, large enough for two slide projector images. --Recording equipment capabilities. --A/V capabilities. --Marker board.
Finishes:	Carpet, fabric-covered wall panels, wood panels, wall covering and paint, special ceiling.
Storage:	Folding table and chair storage, including built-in niche or easily accessible storage for Council table.
Lighting:	--Special lighting design required. --Daylight required. --Blackout control.
Power:	--A/V recording equipment. --Capabilities for cable TV broadcast. --Flush-mounted floor outlets.

Room Data (cont.)

Communications:	Speaker system capable of broadcasting into Council Chamber's foyer and Executive Officer's office.
Acoustics:	--Designed to accommodate a large public meeting with individual participants. --Acoustic separation from adjacent areas.
Security:	Controlled access.

D. COUNCIL LOUNGE

Room Description

The Council Lounge is to be located adjacent to the Council Chamber and in close proximity to the Council Staff and Executive Management. It should have an entrance off of the Council Chamber.

Councilors will be using the lounge before, during, and after Council meetings. The lounge also serves as a dining area for Councilors. When both Executive Management's and the Council's Staff's conference rooms are in use, the lounge will function as an additional meeting room.

The Council Lounge will be furnished with two large sofas and a large conference table and chairs. A built-in credenza will provide storage for frequently used items.

Acoustical separation from the Council Chamber will be necessary. Daylight is required.

COUNCIL LOUNGE

Room Data

Net Square Feet:	300
Relationships:	--Adjacent to the Council Chamber and Council Kitchen. --Close proximity to the Council staff and Executive Management.
Common Use Furniture/Equipment:	--Two large sofas. --Side tables. --Large conference table and chairs.
Finishes:	Metro standards: Carpet, painted walls, acoustic ceiling.
Casework:	Built-in credenza.
Lighting:	--Full spectrum lighting. --Task lighting at side tables and credenza. --Daylight required.
Power:	Normal requirements.
HVAC:	Normal requirements.
Acoustics:	Acoustic separation required.
Security:	Controlled access--no public access.

E. COUNCIL KITCHEN

Room Description

The Council Kitchen is to be conveniently located adjacent to the Council Chamber and Council Lounge. Both Executive Management and the Council Staff will use the Council Kitchen on a daily basis. In addition, Councilors' meals are prepared here before many of their meetings.

A large sink with hot and cold water is required along with a garbage disposal, dishwasher, standard size refrigerator, microwave, and coffee maker. Cabinets will provide storage for items used in the kitchen.

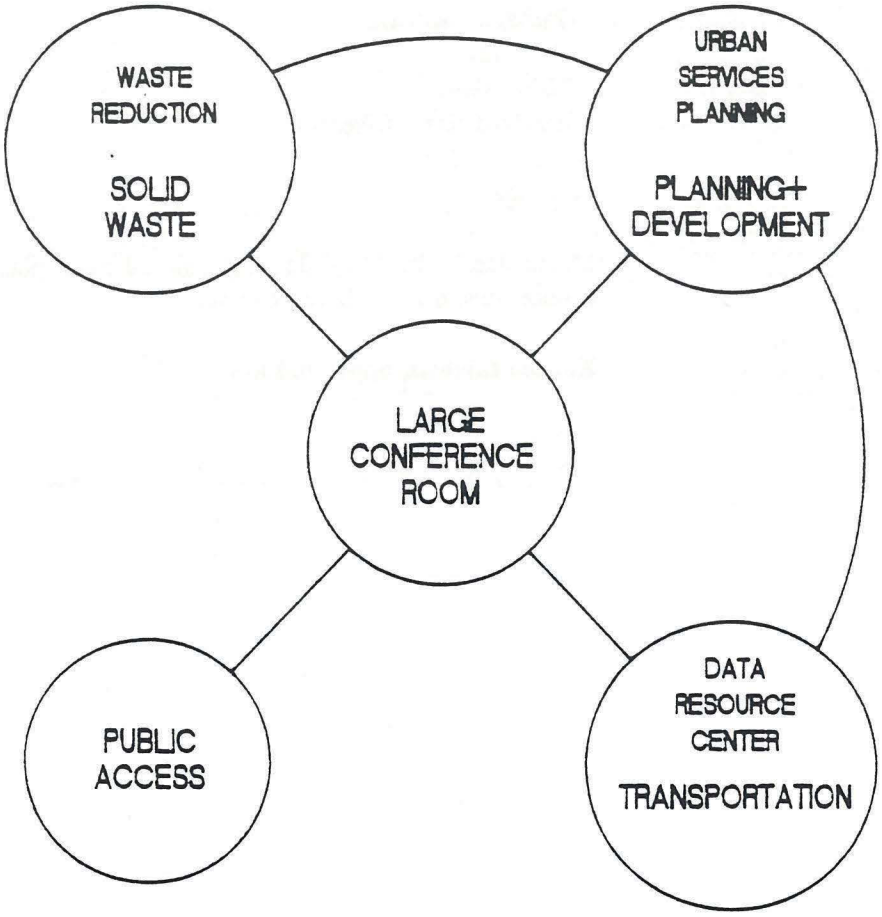
Acoustical separation between the Council Kitchen and the Council Chamber is imperative. Noise from the kitchen should not be overheard in the Council Lounge.

COUNCIL KITCHEN

Room Data

Net Square Feet:	100
Relationships:	--Accessible from Council Chamber and Council Lounge. --Close proximity to the Council Staff and Executive Management.
Common Use Furniture and Equipment:	--Large sink plumbed with hot and cold water. --Garbage disposal. --Microwave. --Dishwasher. --Standard size refrigerator. --Coffee maker. --Storage.
Finishes:	Metro standards: Vinyl flooring, painted walls, plastic laminate countertops, gypsum board ceiling.
Casework:	Kitchen cabinets, upper and lower.
Storage Requirements:	Cabinet storage for: --Coffee/food supplies (i.e., coffee, creamer, etc.). --Utensils and cookware (coffee pots, mugs, trays, dishes, flatware, etc.)
Lighting:	Full spectrum lighting.
Power:	Adequate power for appliances, plus outlets at counter height per normal kitchen requirements.
HVAC:	--Normal requirements. --Exhaust of food odors.
Plumbing:	Hot and cold water.
Acoustics:	Acoustic separation required.
Security:	Controlled access--no public access.

CONFERENCE ROOM, LARGE



F. CONFERENCE ROOM

1. Large Conference Room

Room Description

The large conference room is to be an inviting space despite its size. It will function in a variety of ways: meeting room, hearing room/quasi legal room, or be divided into smaller rooms with movable partitions.

Any department within Metro needing to accommodate 40 to 60 people at one time will be using this room. The Transportation Department has the most use for a meeting room of this size; however, because the public will also meet here, it must be easily accessible and in a "neutral" location (not within one specific department).

Due to the size of the room and its variety of functions, the furniture is to be flexible. Tables should fold and chairs stack. Provide storage space in the room for the furniture when not in use. Windows on two sides of the room are desirable.

Large scale presentations will require the use of microphones, audiovisual equipment, motorized projection screens, a large white board affixed to the wall, and tackable wall panels on two walls. Control of natural and artificial lighting is needed. The capability to darken the room completely when showing slides, etc. is required.

Large Conference Room

Room Data

Quantity:	1
Net Square Feet:	1,560
Character:	Inviting meeting room.
Function:	A flexible meeting room for large groups of people numbering approximately 40 to 60.
Relationship:	Used most frequently by Transportation, Solid Waste, and Planning and Development.
Furniture/Equipment:	--Folding tables. --Stacking chairs. --Motorized projection screens. --Large wall-mounted white board.
Finishes:	Metro standards: Carpet, painted walls, tackable wall panels on end and side walls, acoustical ceiling.
Storage requirements:	Area for storing folding tables and stacking chairs.
Lighting:	--Full spectrum lighting. --Special lighting to illuminate tackable wall surface. --Daylight desirable. --Blackout capabilities.
Power:	Provide adequate power for audiovisual equipment.
HVAC:	Normal requirements.
Acoustics:	Provide acoustic separation from adjacent work areas.

2. Medium Conference Rooms

Room Description

The two medium size conference rooms are to reflect the executive image of Metro. Each conference room will be located in a highly visible area and be easily accessible by the public. One conference room, to be located near Executive Management, is to be visible from Metro's reception area. Public Affairs will share this room for television/media interviews and press conferences. The second conference location will be determined during space planning.

A conference table with comfortable seating for 15 to 20 people in swivel conference chairs is needed. Additional audience seating will be provided along the back and side walls. Millwork will consist of a built-in credenza with lockable storage for frequently used supplies and equipment (audiovisual). Two walls (front and side) will have tackable panels, plus one fixed marker board behind doors. A ceiling-mounted motorized projection screen is also required in the conference room adjacent to Executive Management.

Light and acoustical control are vital. Natural light is desirable along with full spectrum lighting and blackout capabilities. It was requested to have windows on two sides of the room (exterior windows and interior glass partitions). Soundproofing is needed to ensure privacy of confidential matters discussed in these rooms. Sound control and light control are vital.

Carefully located power outlets are necessary to provide flexible A/V setup.

Medium Conference Room

Room Data

Quantity:	2
Net Square Feet:	(2) 575 each.
Character:	Executive Conference Room.
Function:	Meeting room. Also available for public use.
Relationships:	--One medium size (575 s.f.) conference room to be adjacent to Executive Management in "neutral" location. Coffee or kitchen nearby. --Close to Metro reception area. --Location of second medium conference room to be determined during space planning. --Close to public area.
Furniture/Equipment:	--Conference table to seat 15 to 20 in swivel conference style chairs. --Space on end/side of room to seat observers. --Provide recording equipment capability. --Motorized projection screen (conference room adjacent to Executive Management only). --A/V capabilities (i.e. slides, overhead projectors). --Wall-mounted white boards behind wood doors. --Telephone.
Finishes:	--Carpet, painted walls, tackable wall panels, and special ceiling design. --Finish materials: Colors and textures to personify the executive meeting room.
Casework:	Built-in credenza at one end of the room.
Lighting:	--Full spectrum lighting. --Daylight required in room adjacent to Executive Management. Desirable in remaining room. --Public Affairs is to use Executive Management's conference room for interviews with the media and others. --Black-out capabilities (for slide presentations, etc.) is required.
Power:	--Flush-mounted floor outlets for projectors and recorders. --Motorized projection screen.
HVAC:	Normal requirements.
Acoustics:	Soundproof.

3. Small Conference Rooms

Room Description

These rooms are to provide meeting space for department vendor meetings, "team" meetings, personnel related meetings, etc. They are to be located close to the public circulation areas to effectively discourage visitors going into department work areas and distributed throughout the space plan to allow convenient sharing by departments.

Acoustic separation is necessary to provide privacy. Any audiovisual equipment needed will be brought into the room. A marker board is to be wall mounted. Tackable wall surface is required. Natural light is desirable.

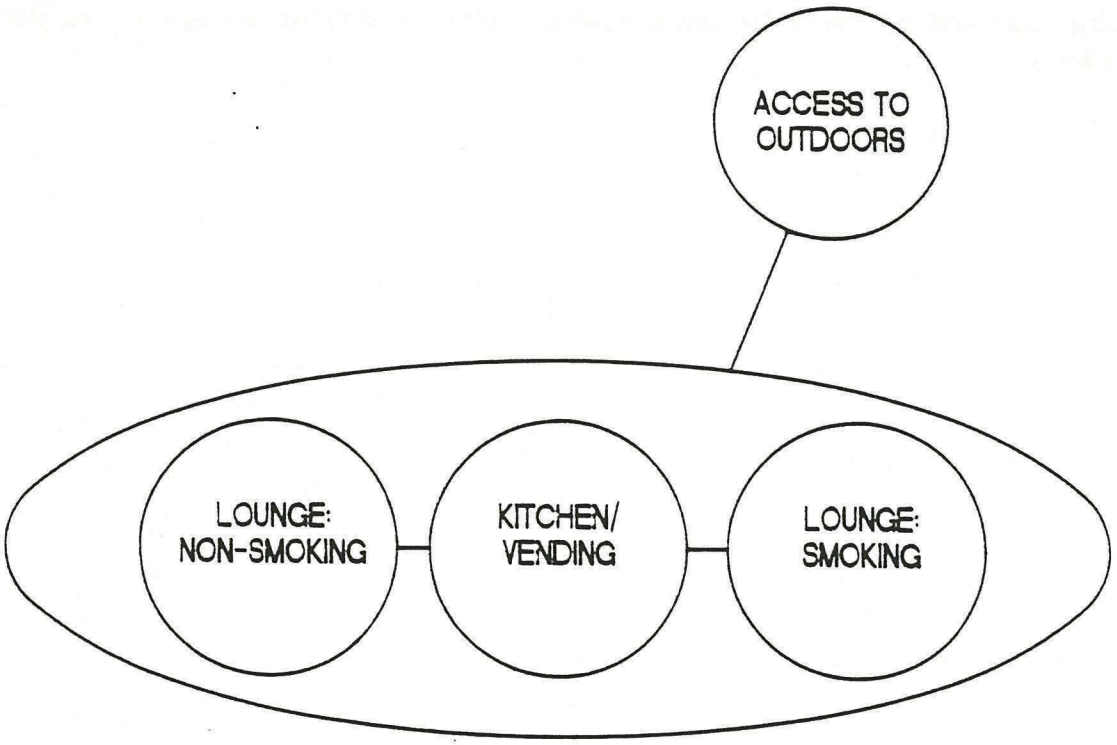
Small Conference Rooms

Room Data

Quantity:	5
Net Square Feet:	215
Function:	Shared department conference room (see description above).
Relationships:	--Close to public circulation areas. --Distributed throughout the space plan to facilitate convenience and shared use.
Furniture/Equipment:	--Table with eight chairs. --Wall-mounted white board.
Finishes:	Metro standards: Carpet, painted walls, tackable wall panels, acoustical ceiling.
Lighting:	--Full spectrum lighting. --Daylight where possible.
Power:	Provide adequate power for audiovisual equipment.
HVAC:	Normal requirements.
Acoustics:	Provide acoustic separation from adjacent work areas.

METRO PROGRAM
SHARED SPACES SUMMARY

STAFF LOUNGE



G. STAFF LOUNGE

Room Description

The area given for the staff lounge is to be divided into two adjacent, enclosed lounges (a smoke-free room and a smokers' room) and situated between the two is a vending/kitchen area. The lounges should have simple, comfortable, and durable lounge furniture, plus a group of small tables with seating for four people each. The smokers' lounge should be separately ventilated to exhaust the smoke. Both rooms should have a large amount of window area and be bright, comfortable, relaxed spaces. Access to the outdoors is desirable from both lounges.

The adjoining kitchen/vending area shall be large enough to include a sink with hot and cold water, coffee maker, dishwasher, full size refrigerator, microwave, and from three to five vending machines, plus a dollar bill change machine.

STAFF LOUNGE

Room Data

Net Square Feet:	Three area total: 1,080
Function:	Lounge and kitchen.
Relationship:	Access to outdoor space is desirable.
Furniture/Equipment:	--Lounge chairs. --Sofas. --Tables with seating for four. --Coffee maker. --Dishwasher. --Full size refrigerator. --Microwave. --Vending machines (3 to 5) --Dollar bill changer.
Finishes:	Vinyl flooring, painted walls, acoustic ceiling, plastic laminate countertops.
Casework:	Kitchen cabinets.
Storage Requirements:	Cupboard and drawer storage in Kitchen.
Lighting:	--Adjustable full spectrum lighting with controls for each room. --Daylight required.
Power:	Verify requirements of equipment in Kitchen/Vending Area.
HVAC:	Separate HVAC for smoking lounge.
Plumbing:	Sink with hot and cold water.
Acoustics:	Acoustical separation from adjacent areas.
Security:	Not required.

H. COPY STATION

Room Description

A total of four centrally-located copy stations are to be provided by Metro, at two 50 s.f. rooms per floor. These copy stations are to be shared by departments which do not have their own copy machines. Close proximity to those departments is required. Departmental copy rooms have similar requirements.

A typical copy station will consist of a copier with adequate space around it to comply with the manufacturer's operating requirements. Provide a layout counter with storage underneath for paper and copier supplies. Recycling containers and a waste paper basket are also to be located in the station.

COPY STATION

Room Data

Net Square Feet:	50 (typical). Refer to individual departments' data for further information.
Finishes:	Metro standard: Carpet, painted walls, acoustic ceiling.
Casework:	Layout counter with shelves large enough to accommodate the different sizes of copy paper, copier supplies, correction fluid, scissors, etc.
Lighting:	Full spectrum lighting.
Power:	As required by manufacturers.
HVAC:	Normal requirements, unless noted otherwise.
Acoustics:	--Buffer noise within the space. --Acoustic separation from adjacent spaces.

I. COFFEE/COAT ROOM

Room Description

There are to be four centrally-located coffee/coat rooms shared by Metro departments. Each coffee/coat room is to be 50 s.f., with two rooms per floor.

Presently, Executive Management and the Council Staff use the Council Kitchen as a coffee room. For the other departments, centrally-located coffee/coat rooms would provide a convenience and eliminate "make-shift" coffee counters within their own departments.

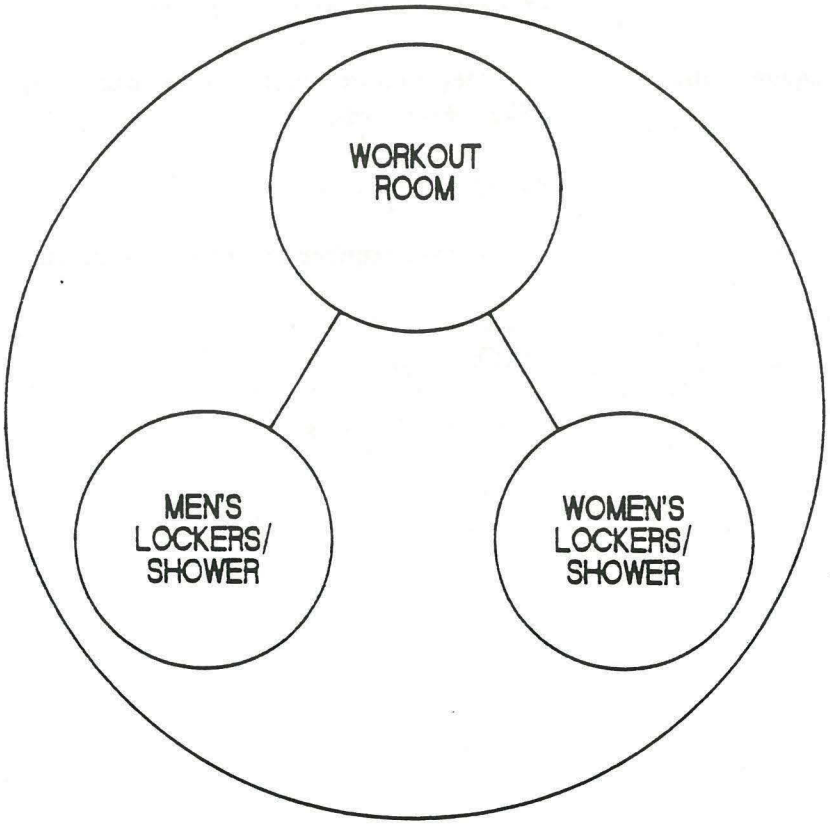
A typical coffee/coat room is to consist of a counter with a small sink plumbed with cold water and cabinets above and below the counter. A coat hanging rod with a shelf above is to be mounted on another wall.

COFFEE/COAT ROOM

Room Data

Finishes:	Metro standard: Carpet, painted walls, acoustic ceiling.
Casework:	--Counter with sink. --Cabinets above and below counter.
Storage Requirements:	--Cabinets to store coffee supplies (coffee, cups, paper goods, etc.). --Shelf above coats.
Lighting:	Full spectrum lighting.
Power:	Verify power requirements of all equipment.
Plumbing:	--Sink with cold water. --Coffee maker.
HVAC:	Normal requirements.

FITNESS AREA



J. FITNESS AREA

Room Description

"Club Met" is a room set aside for exercise equipment which is purchased with contributions from Metro staff. For insurance purposes, it is a locked room which Metro employees must sign up to use. The room has a special fitness flooring and should be approximately 400 square feet.

Adjacent to "Club Met" are the men's and women's locker rooms. These spaces should be organized into an area with 20 full-height lockers, a full-height mirror and a bench, an area with a sink and mirror/shelf unit, and a shower area. Complete visual privacy is required from the adjoining corridor.

"Club Met" and the locker rooms must be acoustically isolated from adjacent spaces.

FITNESS AREA

Room Data

Net Square Feet:	Workout Room:	400
	Locker/Shower Rooms (2 @ 200):	400
	Total	800

Function: Exercise equipment room.

Relationship:
--Location near vertical circulation preferred.
--Easy access to outdoors desirable.

Furniture/Equipment:
--2 locker room benches.
--Exercise equipment to be provided by others.
--Verify space requirements for:
- 2 rowers
- 2 bicycles
- Free weights
- 1 Universal gym

Finishes:
--Workout Room: Fitness flooring, painted walls, acoustic ceiling.
--Locker Rooms: Vinyl flooring/tile, painted walls, gypsum board ceiling.

Storage Requirements:
--None required in Workout Room.
--20 full height lockers in each locker room.

Lighting:
--Full spectrum lighting.
--Daylight preferred.

Power: Power outlets near mirrors in locker rooms.

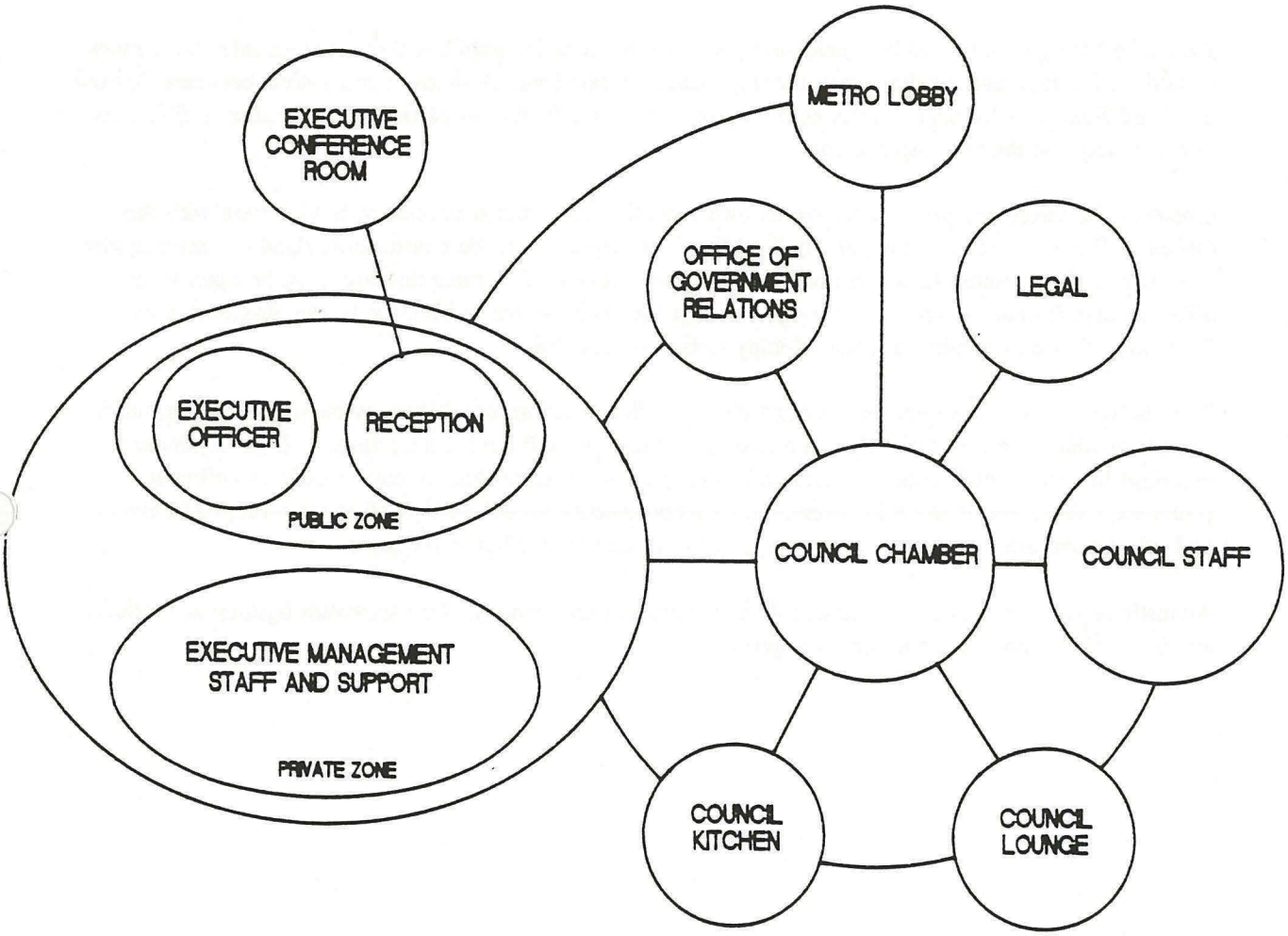
HVAC: Provide adequate ventilation for workout and locker rooms.

Plumbing: Locker Rooms: 1 shower and 1 sink in each.

Acoustics: Acoustical separation from adjacent areas.

Security: Controlled access with key-card or combination locks.

EXECUTIVE MANAGEMENT



2. EXECUTIVE MANAGEMENT

Department Description

The character of this area is to personify the executive arm of Metro, giving a sense of arrival to the leadership position.

Executive Management is to be conveniently located up front for public access. Access into the Council Chamber, Lounge, and Kitchen from the department is required. A discreet separation between Council Staff and Executive Management is necessary to allow for a feeling of equality and signifies a difference of purpose between the two departments.

Executive Management prefers to have its own reception area, but if necessary, it will share with the Office of Government Relations or Public Affairs. Reception is to be comfortably sized to accommodate four arm chairs, a round table, and maintain an open feeling. The reception area can be open to an adjacent department. A common supply area and fax machine are to be close to the Administrative Secretary. Close proximity to a shared copy station is required.

The configuration of the department must clearly define those areas which may be visited by the public and those which are for staff only. The Executive Manager will need a soundproof office to conduct meetings involving confidential matters and to prepare work materials. A corner office location is preferred. The room is to be large enough to accommodate an 84" x 36" conference table, eight chairs, and office furniture. An intercom system into the Council Chamber is required.

Acoustic separation is necessary to enable concentration and privacy. Full spectrum lighting is needed to eliminate eye strain. Natural light is required.

METRO PROGRAM
EXECUTIVE MANAGEMENT

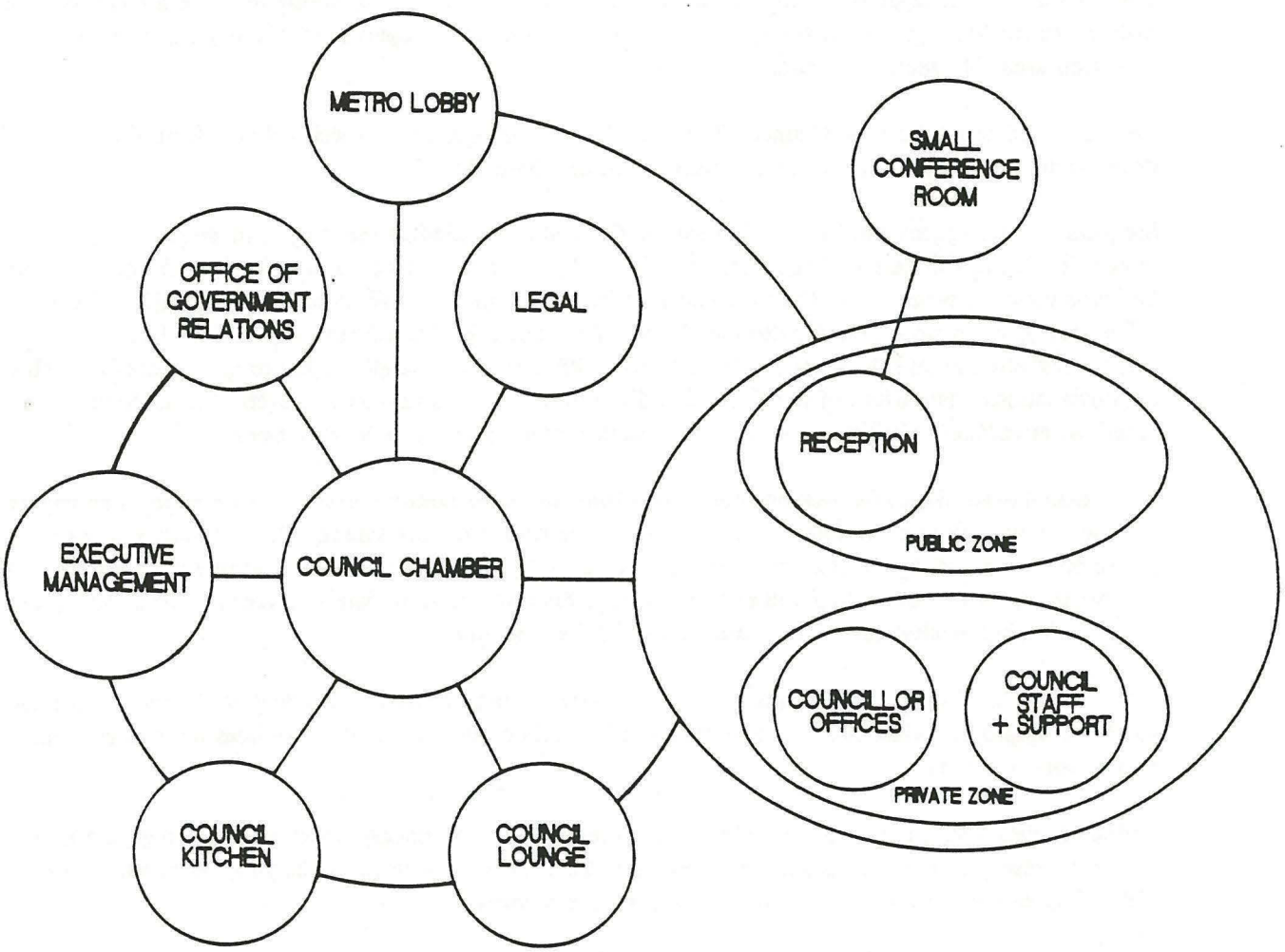
Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Reception Area	1	(seating for 4)		90
Executive Officer	1	A	300	300
Deputy Executive Officer	1	B	200	200
Executive Assistant	1	C	125	125
Senior Public Affairs Specialist	1	E	100	100
Administrative Assistant	1	E	100	100
Administrative Secretary	1	F	80	80
Intern	1	G	50	50
Visitor's Office	1	D	125	125
Office Supply Area	1			100
Lockable Coat Closet	1			15
Subtotal Net Square Footage				1,285
Plus Circulation				x1.175
Subtotal				1,510
Plus 5% Contingency				75
TOTAL GROSS SQUARE FOOTAGE	7 staff			1,585

Department Data

Reception Area:	--Prefers its own reception area. --If necessary, is willing to share with Office of Governmental Relations or Public Affairs.
Relationships:	--Adjacent to Office of Governmental Relations, Public Affairs, the back door of Personnel, or Legal. --Close to Council with a discreet separation. --Close enough to Council to share the Council Chamber kitchen. --Close proximity to a shared copy area.
Staff Adjacencies:	--Executive Officer easily accessible from Metro's Reception/Lobby. --Executive Assistant and Deputy Director near reception. --Visitor's office near department conference room. --Administrative Secretary close to common area.
Common Use Furniture/Equipment:	File area (see Storage Requirements).
Common Use Furniture/ Equipment Proximities:	Fax machine close to Administrative Secretary.
Finishes:	Metro standards: Carpet, painted walls, acoustic ceiling.
Storage Requirements:	Existing storage: --6 vertical files, 18" w. x 54" h. --6 lineal feet of bookcases --5 lineal feet of supply cases Lockable coat closet for personal property and visitors' coats.
Lighting:	--Full spectrum lighting throughout. --Daylight required for private offices.
Power:	Normal requirements.
HVAC:	Normal requirements.
Acoustics:	--Executive Officer's office and department conference room to be soundproof. --Quiet work areas.
Security:	--Clearly defined public zone. --Lockable coat closet.

COUNCIL STAFF



3. COUNCIL STAFF

Department Description

The need for coordination between the Council Staff and Executive Management occurs daily; therefore, convenient access and proximity between the two is required, as long as the "discreet separation" discussed in the Executive Management section is maintained. The Council Staff is willing to share a reception area with Executive Management, if the space plan permits. If not, the department will require its own reception area with seating for two.

Proximity and access into the Council Chamber, Council Lounge, and Council Kitchen from the department is required. These access points are to be nonpublic.

Six private office spaces will be provided for the Councilors to conduct meetings and prepare work materials. There will be two Councilors per office. They are to be located in a "suite" with the Presiding Officer's office. Entrance into the Councilors' offices needs to be visible by all Council Staff, and the offices are to be in close proximity to the Council Chamber and Council Staff offices. Both the Councilors' offices and the Council Administrator's office require soundproofing to ensure confidentiality of conversations. The Clerk of the Council and the three Analysts require enclosed offices; three Administrative/Clerk positions and Office Assistant require open office workstations.

The Council Staff, Executive Management, and Office of Governmental Relations departments anticipate sharing a new copier and will need a photocopy station with two work tables. Council Staff will continue to use Executive Management's fax machine. If Council Staff and Executive Management do not share a photocopy station, Council Staff will need a space planned to accommodate one copier, two printers, and a large work table located near the Administrative/Clerk positions.

A document distribution center should be conveniently located adjacent to Council Staff's reception area so Metro employees wishing to place materials in Councilors' boxes can do so without disrupting Council Staff's work activities.

Office supplies, council records (including ordinances, resolutions, packets from past meetings, etc.), and legislative research materials are to be stored in a fireproof room with open shelving. A minimum of eight filing cabinets are needed to store administrative records.

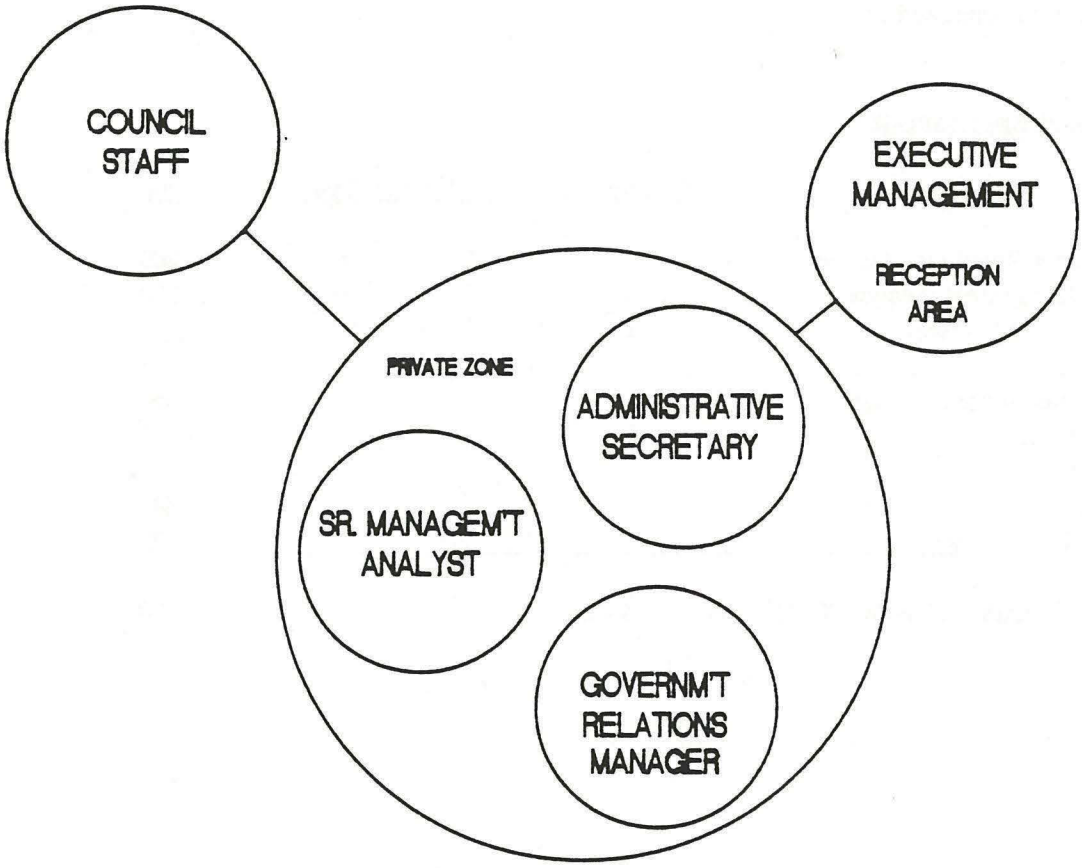
Space/Staff Requirements:

Title	Quantity	Workstation Type		Area
Reception Area		(seating for 2)		70
Presiding Officer	1	A	300	300
Councilor's Offices	6	D	125	750
Council Administrator	1	B	200	200
Council Clerk	1	C	125	125
Analysts	3	D	125	375
Administration Clerk	3	F	80	240
Office Assistant	1	G	50	50
Files/Mail/Legal Materials	1			110
Copier/Printers/Supply Storage	1			90
Fireproof Records Storage	1			50
Subtotal Net Square Footage				2,360
Plus Circulation				x1.175
Subtotal				2,775
Plus 5% Contingency				140
TOTAL GROSS SQUARE FOOTAGE	16 staff			2,915

Department Data

Reception Area:	Provide seating for two people.
Relationships:	Close proximity to Executive Management, General Council, the Council Chamber, Lounge, and Kitchen.
Staff Adjacencies:	--Presiding Officer in "suite" with Councilors' offices. --Storage room in close proximity to the Clerk of the Council.
Common Use Furniture/Equipment:	--Two printers. --Photocopier. --Two to three large work tables. --Eight file cabinets (currently six). --Document and distribution center.
Common Use Furniture/ Equipment Proximities:	--Printer and photocopier, centrally located for easy access by Executive Management and Council Staff; if not shared, centrally located for Council Staff use. --Document distribution center conveniently located for all Metro staff . --Large work table near Administrative/Clerk positions.
Finishes:	Metro Standards: Carpet, painted walls, acoustic ceilings.
Storage Requirements:	--Fireproof storage of records. --Disks and office supplies (include open shelving in storage room to accommodate legislative research materials).
Lighting:	--Full spectrum lighting. --Daylight required in closed offices.
Power:	Normal office requirements.
HVAC:	Normal in office areas (verify requirements in equipment areas).
Acoustics:	--Seven soundproof offices (refer to Department Description above). --Remaining offices to be quiet work areas.
Security:	Lockable personal storage.

OFFICE OF GOVERNMENT RELATIONS



4. OFFICE OF GOVERNMENT RELATIONS

Department Description

The responsibility for the coordination of Metro's programs with federal, state, and local governing bodies and regulatory agencies lies within the Office of Government Relations. This department will serve all of Metro, but its most frequent daily interactions will be with Executive Management and Council Staff.

The Office of Government Relations needs some separation from the Executive Management and Council Staff departments; however, it should be located as close as possible to Executive Management to share the support functions of reception, the Executive Conference Room, and fax machine. Natural light is required in the enclosed offices.

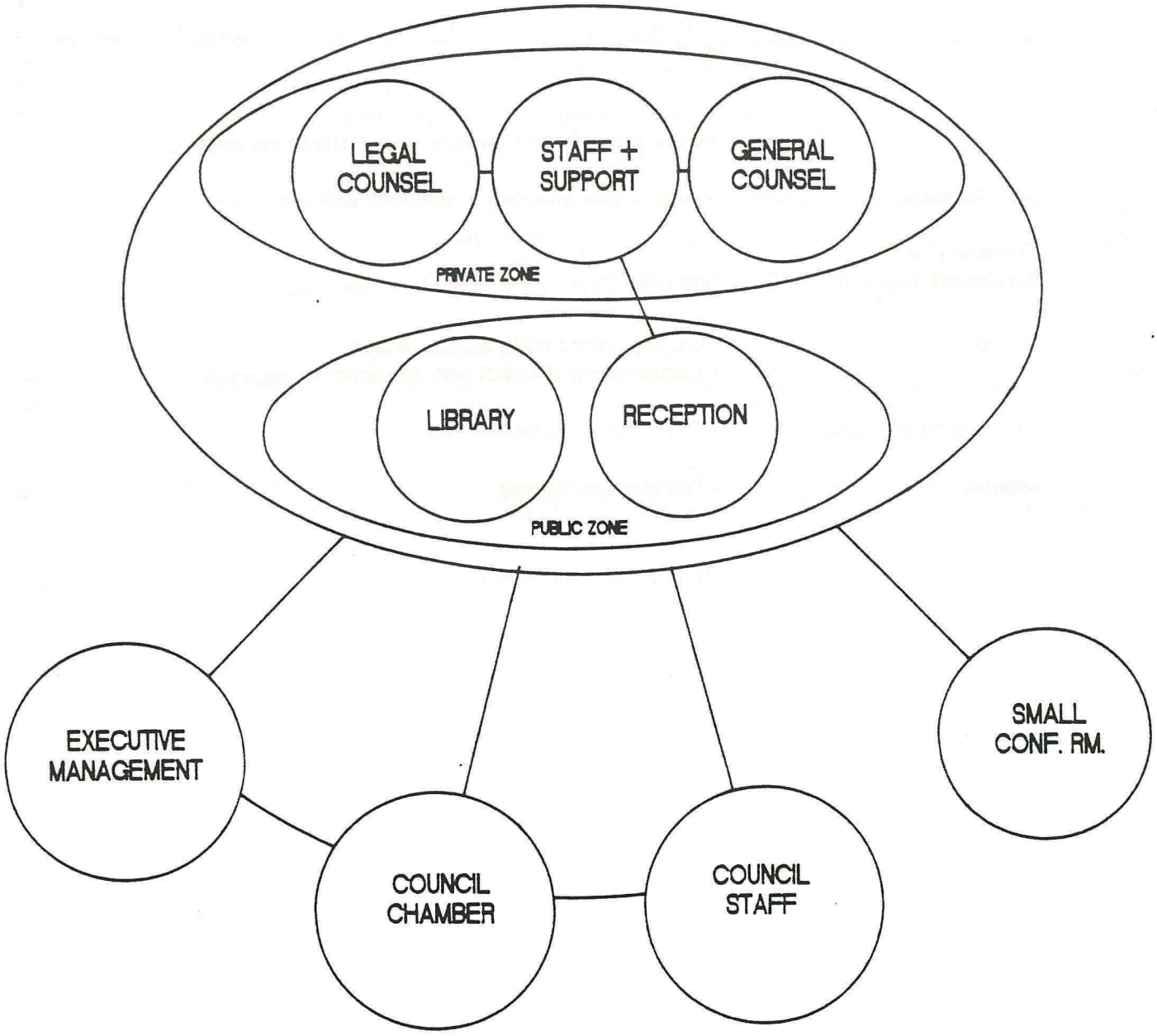
Space/Staff Requirements:

Title	Quantity	Workstation Type		Area
Government Relations Manager	1	B	200	200
Senior Management Analyst	1	E	100	100
Administrative Secretary	1	F	80	80
Subtotal Net Square Footage				380
Plus Circulation				x1.175
Subtotal				445
Plus 5% Contingency				25
TOTAL GROSS SQUARE FOOTAGE	3 staff			470

Department Data

Reception Area:	Executive Management's reception area may be shared with Office of Government Relations and/or Public Affairs.
Relationships:	--Adjacent to, but separate from, Executive Management and Council Staff. --Close proximity to Executive Conference Room. --Close proximity to shared copy station. --Close proximity to Executive Management's fax machine.
Staff Adjacencies:	Administrative Secretary with view of enclosed offices.
Common Use Furniture/Equipment:	Will share Executive Management's fax machine.
Finishes:	--Carpet, painted walls, acoustic ceiling. --Compatible in character with Executive Management.
Storage Requirements:	Filing within workstations only.
Lighting:	--Full spectrum lighting. --Daylight required in enclosed offices.
Power:	Normal office requirements.
HVAC:	Normal office requirements.
Acoustics:	Quiet work areas.
Security:	Lockable files and offices.

LEGAL DEPARTMENT



5. LEGAL DEPARTMENT

Department Description

The Legal Department is to be accessible to Executive Management and Council Staff, but Legal feels a need to be symbolically equidistant from these two departments to maintain neutrality. Seating for four is required in Legal's reception area.

Currently, the Legal staff consists of one General Legal Counsel, three Legal Counsels, and two Secretaries. The secretaries require visual and physical proximity to the attorneys to monitor when they are away from their desks. Close proximity to a shared copy station is required.

The filing system is to be centralized and accessible to everyone in the department. Files will date back three to five years. There is a plan to double the file capacity in the future. All files within the department are to be lockable. Any files dating back more than five years are kept in General Storage where they can be referred to occasionally.

Office supplies are to be in a lockable storage area. The printer, which is linked to the workstations of the three attorneys and the two secretaries, is to be located in the secretarial area. In addition to the printer, there will be a layout table on which briefs will be assembled and a small copier will sit.

A law library/conference room is required in this department. It needs to be sound isolated to enable concentration and privacy, and should contain a conference table with seating for six to eight.

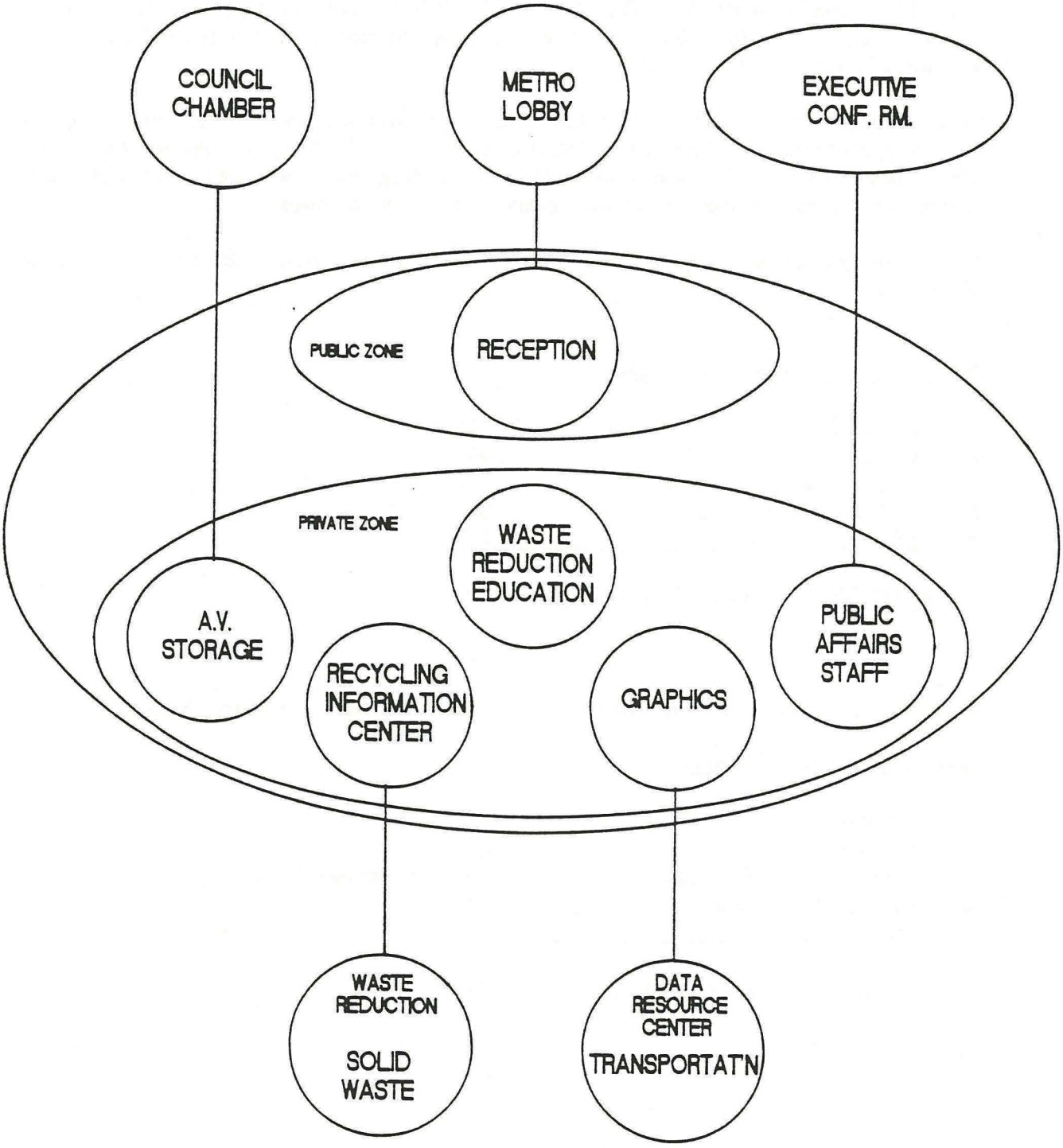
Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Reception Area		(seating for 4)		90
General Legal Counsel	1	B	200	200
Legal Counsel	3	C	125	375
Legal Secretary	1	F	80	80
Secretary	1	F	80	80
Library/Conference Room	1			215
Lockable Office Storage/Supply	1			50
Printer/Layout Area	1			85
Centralized Filing Area	1			200
Subtotal Net Square Footage				1,375
Plus Circulation				x1.175
Subtotal				1,615
Plus 5% Contingency				80
TOTAL GROSS SQUARE FOOTAGE	6 staff			1,695

Department Data

Reception Area:	Seating for four.
Relationships:	--Equidistant from Executive Management and Council Staff. --Close proximity to shared Copy Station.
Staff Adjacencies:	--Secretaries near Attorneys. Require visual access.
Common Use Furniture/Equipment:	--Fax machine. --Printer. --Small copier. --Large layout table. --Conference table with seating for eight.
Common Use Furniture/ Equipment Proximities:	--Fax machine, small copier, and printer close to Secretaries. --Large layout table in secretarial area. --Conference table in Law Library.
Finishes:	Metro standards: Carpet, wall paint, acoustical ceiling.
Storage Requirements:	Lockable file cabinets: --File cabinets for three to five years of files--plan for double file capacity. --Office supplies.
Lighting:	--Full spectrum lighting throughout. --Daylight required in private offices.
Power:	Normal office requirements.
HVAC:	Normal requirements.
Acoustics:	Quiet work areas.
Security:	Clearly-defined public zone.

PUBLIC AFFAIRS



6. PUBLIC AFFAIRS

Department Summary

The Public Affairs Department is divided into five areas: Public Affairs, Graphics, Waste Reduction Education, the Recycling Information Center, and Audiovisual Storage. A total of 21.9 staff are anticipated for the 1991-92 fiscal year.

There are frequent public visitors to the Public Affairs Department, which necessitates a Reception Area with seating for four to six people. Public Affairs is willing to share its Reception Area with Executive Management. Public Affairs desires proximity to Executive Management and shared use of the Executive Management Conference Room for television interviews and larger meetings.

Close proximity to a shared copy station is required, particularly for Graphics' staff who are frequent users of the copier.

Public Affairs Department Area Summary

a.	Public Affairs Staff	1,320
b.	Graphics	1,060
c.	Waste Reduction Education	565
d.	Recycling Information Center	800
e.	Audiovisual Storage	235
TOTAL GROSS SQUARE FOOTAGE		3,980

The following Public Affairs storage requirements are included in the Metro General Storage.

General Storage Area Summary

a.	Public Affairs Staff	50	
b.	Graphics	N/A	
c.	Waste Reduction Education	180	(near Loading Dock)
d.	Recycling Information	200	
e.	Audiovisual Storage	N/A	
TOTAL GROSS SQUARE FOOTAGE		430	

A. PUBLIC AFFAIRS STAFF

Division Description

The Public Affairs staff area consists of three offices and five workstations. There should be direct access from offices to the Reception Area and Clerical Areas, with easy access to the Executive Management Conference Room and the smaller department conference room. The Clerical staff will oversee use of the Audiovisual Storage Room and will need visual access and physical proximity to it.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Reception Area		(Seating for 4)		90
Director of Public Affairs	1	B	200	200
Supervisor	1	C	125	125
Senior Specialist	1	D	125	125
Public Affairs Specialists	2	E	100	200
Administrative Secretary	1	F	80	80
Secretary	1	F	80	80
Clerical	1	F	80	80
Common Work Area	1			70
Office Supply Area	1			30 *
Subtotal Net Square Footage				1,080
Plus Circulation				x1.175
Subtotal				1,270
Plus 4% Contingency				50
TOTAL GROSS SQUARE FOOTAGE	8 staff			1,320

* Additional storage to be located in General Storage (50 s.f.)

PUBLIC AFFAIRS STAFF

Division Data

Reception Area:	Waiting area for 4 to 6 people. Could be shared with Executive Management.
Relationships:	Will need public access. Greatest need for proximity to Executive Management.
Staff Adjacencies:	--Clerical staff to Director, Supervisor, and Specialists. --Clerical staff to Audiovisual Storage Room. --Clerical staff to Common Work Area and Office Supply Storage.
Common Use Furniture/Equipment:	--Laser printer. --Fax machine.
Common Use Furniture/ Equipment Proximities:	--Laser printer and fax machine near Clerical. --Telephone required in Common Work Area.
Finishes:	Metro standards: Carpet, painted walls, acoustic ceiling.
Storage Requirements:	--Organized storage of promotional materials in Common Work Area required. --Reuse existing Office Supply Area storage units for office supplies. --Access to lockable storage for stock of promotional materials in General Storage Area.
Lighting:	--Full spectrum lighting. --Daylight desired.
Power:	Normal office requirements.
HVAC:	Normal in office areas.
Acoustics:	Quiet work areas.
Security:	--Distinct public zone/reception area. --Lockable storage for personal items.

B. GRAPHICS DIVISION

Division Description

The Graphics area requires plenty of natural light and an ability to control its artificial light levels. Acoustical separation from the busier, noisier divisions within the Public Affairs Department is required. The Graphic Designers' workstations need to share a Common Work Area with a large work table for layout and group consultation, tackable wall surface for pin-up and display, and shared graphics equipment. The common area should include or have access to a storage area with file cabinets, vertical roll files, flat files and vertical files, supply cabinets, and reference materials. Close proximity to a shared Copy Station is required. A separately ventilated area is required as a spray room for use of spray glues and paints.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Senior Public Affairs Specialist	1	C	125	125
Graphic Designers	2	E	100	200
Graphic Assistants	2	E	100	200
Common Work Area	1		250	250
Supply Storage	1		70	70
Spray Room	1			30
Subtotal Net Square Footage				875
Plus Circulation				x1.175
Subtotal				1,030
Plus 3% Contingency				30
TOTAL GROSS SQUARE FOOTAGE	5 staff			1,060

GRAPHICS DIVISION

Division Data

Relationships:	--Responsible for Public Affairs graphics projects. --Close proximity to a shared Copy Station is required.
Staff Adjacencies:	All Graphics staff adjacent to Common Work Area.
Common Use Furniture/Equipment:	Common Work Area: --Large worktable (4' x 6') --Six chairs --Light table (3' x 5') with chair --Bookcase (3' x 1' x 7' h.) Spray Room: Table (2'6" x 5'0")
Common Use Furniture/ Equipment Proximities:	Shared graphics equipment to be in Common Work Area.
Finishes:	--Metro standards: Carpet, painted walls, acoustic ceiling. --Sealed concrete floor in Spray Room. --Tackable surfaces in workstations and Common Work Area
Storage Requirements:	--Filing Cabinets: (Verify size and quantities). --Vertical files for large envelopes, material boards, foam core, etc. Flat files for paper supplies and samples. --Vertical roll file. --Supply and reference material cabinet/shelves.
Lighting:	--Full spectrum lighting with separate controls for this area. --Task lighting at each workstation. --Daylight required.
Power:	Provide adequate power for outlets to Common Work Area and workstations.
HVAC:	--Normal in office areas --Separate ventilation for Spray Room --Operable windows preferred.
Acoustics:	Quiet work areas.
Security:	--Distinct public zone/work area. --Lockable personal storage --Reduce visibility of PCs and secure personal computers.

C. WASTE REDUCTION EDUCATION

Division Description

Waste Reduction Education (WRE) is a space used primarily by volunteers who present educational programs in the Metro region's schools. Public Affairs anticipates that 15 volunteers and 2 full-time staff members will occupy this area in fiscal year 1991-92.

The volunteer area should be an open, pleasant space with easy access from the reception area. It needs to be acoustically separated from the remainder of Public Affairs. WRE volunteers will need to use a shared conference room for rehearsals and need their own storage area for presentation materials, props, puppet show materials, and exhibits. Larger and bulkier presentation materials need storage space near the loading dock for easy transfer to a Metro vehicle.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Associate Public Affairs Specialist	1	E	100	100
Assistant Public Affairs Specialist	1	E	100	100
Common Work Area	1		180	180
Storage Room	1		100	100 *
Subtotal Net Square Footage				480
Plus Circulation				x1.175
TOTAL GROSS SQUARE FOOTAGE	2 staff, 15 volunteers			565

* An additional WRE General Storage Room is needed near the Loading Dock (180 s.f.).

WASTE REDUCTION EDUCATION

Division Data

Relationships:	WRE volunteers work primarily outside Metro in the schools.
Staff Adjacencies:	Full-time staff need visual supervision of volunteer area.
Common Use Furniture/Equipment:	--Conference table with seating for six. --Two desks and desk chairs. --Undercounter refrigerator. --Small microwave.
Common Use Furniture/ Equipment Proximities:	None requested.
Finishes:	Metro standards: Carpet, painted walls, acoustic ceiling.
Casework:	Coffee station with storage above and below.
Storage Requirements:	--Files --Lockable storage for: Volunteers' personal property Presentation material
Plumbing:	Sink with hot and cold water at coffee station.
Lighting:	--Full spectrum lighting. --Daylight required.
Power:	--Normal office requirements. --Adequate power for appliances.
HVAC:	Normal requirements.
Acoustics:	Separation of volunteer area.
Security:	--Distinct public zone/work area. --See Storage Requirements.

D. RECYCLING INFORMATION CENTER

Division Description

The Recycling Information Center (R.I.C.) is the only Metro division staffed seven days a week. In 1990, four R.I.C. staff received 69,000 telephone calls and provided recycling information over the telephone and by mail to those callers. It is a stressful work situation and will, therefore, require a carefully designed work area to accommodate the staff's needs. Windows and natural light are required in this space.

The Recycling Information Center will be staffed by six people in fiscal year 1991-92. The R.I.C. workroom will have five workstations and a small reference library which is open to public use. The five workstations need to be acoustically buffered, but the staff needs the ability to see and hear one another, so partitioning must still allow this to occur. The reference library will be supervised by the R.I.C. Project Assistants so visual access is required, but acoustical separation is desirable. A work table in the library area could serve as the required conference table for R.I.C.'s daily staff meetings.

Security is an issue for the staff working on weekends.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
R.I.C. Coordinator	1	F	80	80
Project Assistants	5	E	100	500
Reference Library/Conference	1			100 *
Subtotal Net Square Footage				680
Plus Circulation				x1.175
TOTAL GROSS SQUARE FOOTAGE	6 staff			800

* Additional storage to be located in General Storage (200 s.f.)

RECYCLING INFORMATION CENTER

Division Data

Relationships:	--Needs public access. --Public Affairs would like R.I.C. to be a "more visible" service of Metro. --Works frequently with Solid Waste Department.
Staff Adjacencies:	--Project Assistants need visual proximity to one another and to the Reference Library. --Project Assistants desire proximity to coffee station.
Common Use Furniture/Equipment:	--One conference/library table with six chairs. --Bookshelves. --File cabinets.
Common Use Furniture/ Equipment Proximities:	--Computer printer close to database management system. --One typewriter near the Reference Library and one near database management. --For cabling: R.I.C. mainframe to other Metro computers. --R.I.C. telephone machine and call printer are hooked up to the main Metro telephone system; therefore, proximity to the Telephone Room may be desirable.
Finishes:	Metro standards: Carpet, painted walls, tackable wall surface at each workstation and Reference Library, acoustic ceiling.
Storage Requirements:	--Files: --4 lateral files (verify size and quantity) --4 single-face bookstacks (3'-0"w. x 7'-6"h. x 1'-0"d.) to store handouts. --Materials, magazines, books, videos, films and slide presentations. --Storage for unassembled recycling boxes, approx. 12"w x 29"l x 40"h. --Lockable storage cabinet for videos, petty cash, and personal belongings. --Fire-resistant storage for backup computer tapes. --General storage (not in department) is needed for pamphlets/handouts (10 boxes, 12 s.f.) and recycling boxes (100 s.f.). Both are expected to double in size within five years.
Lighting:	--Full spectrum lighting. --Daylight required.
Power:	Verify requirements of R.I.C. equipment.
HVAC:	Normal requirements.

Division Data (cont.)

Acoustics:	Noise control in work rooms.
Security:	--R.I.C. staff security after normal work hours is a concern. --Need secure storage of personal belongings.

E. AUDIOVISUAL STORAGE ROOM

Division Description

The Audiovisual Storage Room is used by all of Metro, but it is the responsibility of the Public Affairs Clerical staff to monitor the room and check equipment in and out. Therefore, proximity to this area is critical for proper functioning of the space.

Space/Staff Requirements

Title	Quantity	Workstation Type	Area
Audiovisual Storage Room	1		200
Subtotal Net Square Footage			200
Plus Circulation			x1.175
TOTAL GROSS SQUARE FOOTAGE	0 staff		235

Division Data

Relationships:
--Used by all Metro departments.
--Proximity to Council Chamber is desirable.

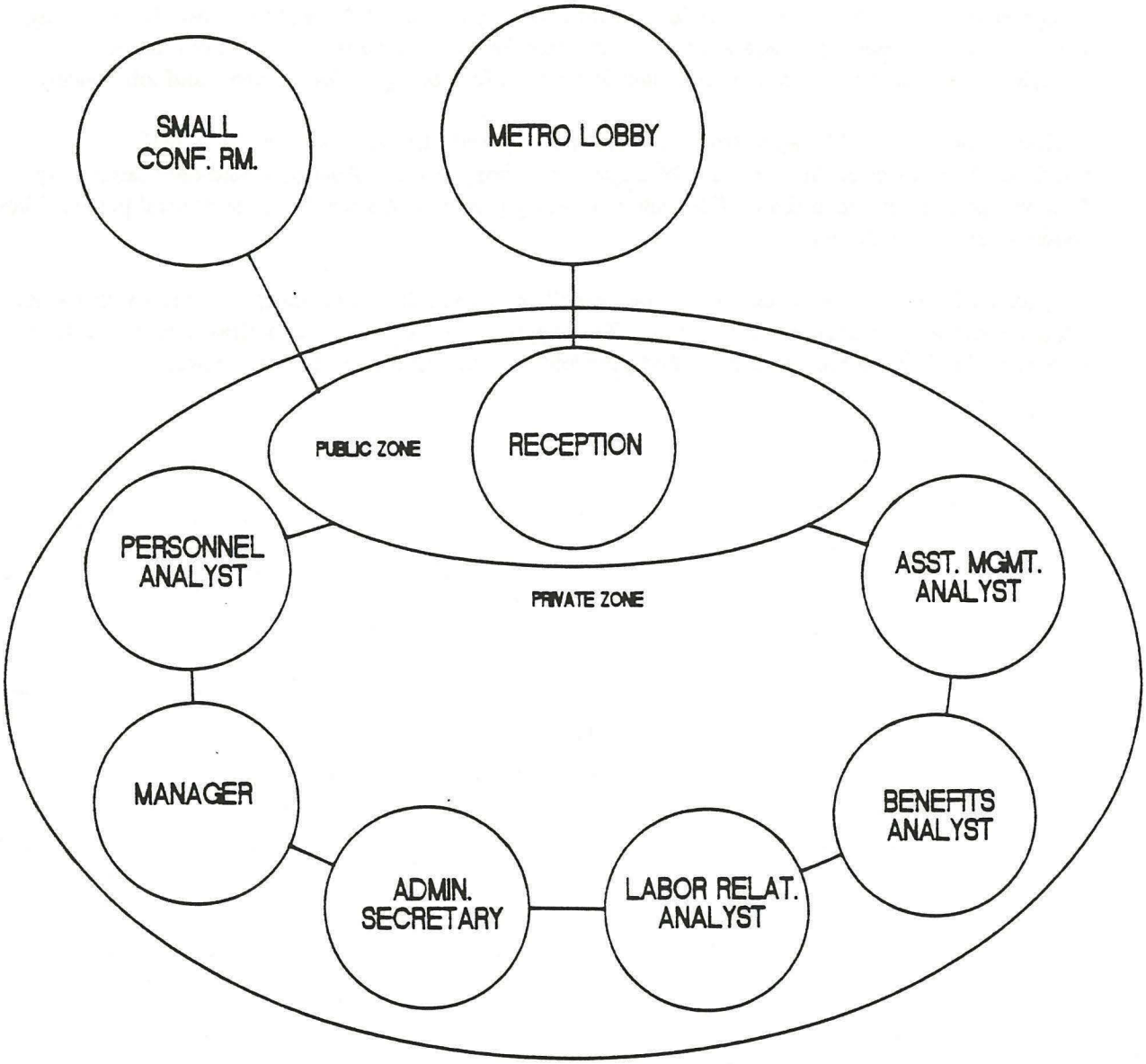
Staff Adjacencies:
Proximity to Public Affairs' administrative staff is required.

Storage Requirements:
--Easy access door wide enough for carts and equipment.
--Deep heavy duty shelving units.
--A system of hooks, racks, and drawers designed to fit the equipment.

Lighting:
Normal (adequate to see stored materials).

Security:
Typically the room will be kept locked.

PERSONNEL DEPARTMENT



7. PERSONNEL DEPARTMENT

Department Description

Personnel is a very public-oriented department, with many visitors filling out applications and frequent interaction with Metro staff. This department should be located immediately adjacent to Metro's reception area and as close to the building's front door as possible. Personnel requires a large waiting area with three lounge chairs and a counter with space for four people to sit and fill out application materials. An area with tackable wall surface is required for posting announcements and job notices.

A clear definition of public areas from work areas is required. Convenient access to a conference room is required. The offices of the Personnel Manager and Labor Relations Analyst should be located away from reception to maintain the confidentiality of agency personnel matters from the general public. These rooms must be soundproof.

The fax machine will be in a central location near filing and supplies. Personnel requires a lockable file storage room for Personnel records and an office supply room. Additional department records will be located in the General Storage area. Close proximity to a shared copy station is required.

METRO PROGRAM
PERSONNEL DEPARTMENT

Space/Staff Requirements

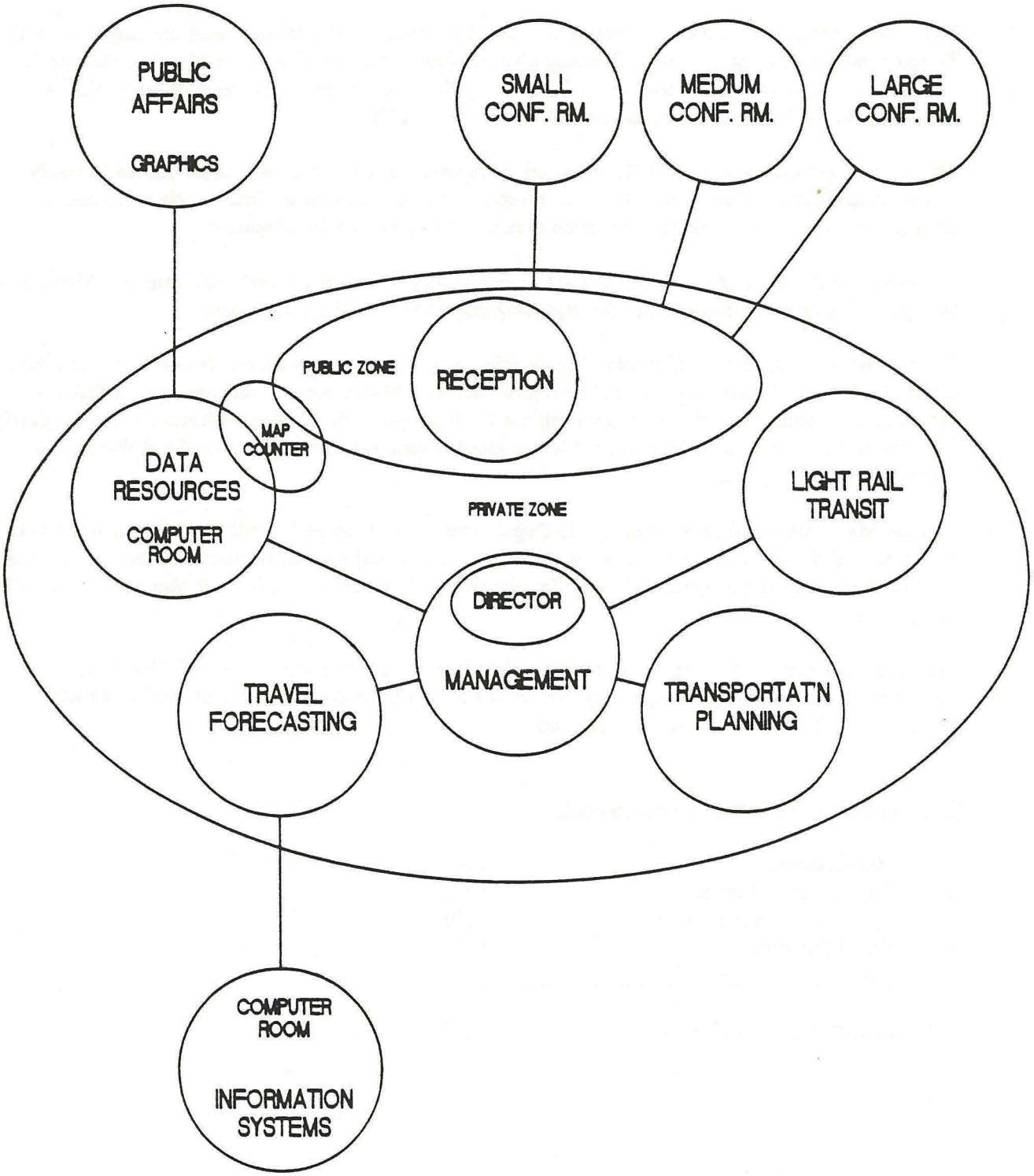
Title	Quantity	Workstation Type		Area
Reception Area	1	(seating for 7)		120
Personnel Manager	1	C	125	125
Personnel Analyst	1	E	100	100
Labor Relations Analyst	1	D	125	125
Benefits Analyst	1	E	100	100
Assistant Management Analyst	1	E	100	100
Administrative Secretary	1	F	80	80
Payroll Clerk	1	F	80	80
Copier/Fax	1			10
Supply Room	1			70
File Storage Room	1			55 *
Subtotal Net Square Footage				965
Plus Circulation				x1.175
Subtotal				1,135
Plus 5% Contingency				55
TOTAL GROSS SQUARE FOOTAGE	8 staff			1,190

* Additional area for storage of Personnel records is listed as part of General Storage (100 s.f.)

Department Data

Reception Area:	--Lounge seating for three. --Desk height counter with seating for four.
Relationships:	--Needs direct public access from Metro reception area. --Works with all Metro departments. --Needs adjacency to Accounting. --Close proximity to a shared Copy Station.
Staff Adjacencies:	--Personnel Manager and Labor Relations Analyst near reception/conference room. --All staff need access to central file/copier/fax/supply areas.
Common Use Furniture/Equipment:	--Fax machine.
Common Use Furniture/ Equipment Proximities:	--Central file/fax/supply areas.
Finishes:	--Metro standards: Carpet, wall paint, acoustical ceiling. --Tackable surface area in reception area.
Storage Requirements:	--Lockable file cabinets: 3 @ 18" w. x 26.5" d x 52" h. 4 @ 15" w. x 26.5" d. x 52" h.
Lighting:	--Full spectrum lighting. --Daylight desirable.
Power:	Normal office requirements.
HVAC:	Normal requirements.
Acoustics:	--Acoustic isolation of Personnel Manager, and Labor Relations Analyst's offices. --Acoustic buffering of fax machine area.
Security:	--Lockable file storage room. --Lockable personal storage.

TRANSPORTATION DEPARTMENT



8. TRANSPORTATION DEPARTMENT

Department Description

The Transportation Department is comprised of the five divisions: The Management division, Light Rail Transit Program and Transportation Planning divisions (under the direction of the Planning Manager); and the Data Resource Center and Travel Forecasting divisions (under the direction of the Technical Manager). A total of 46 FTE are anticipated for fiscal year 1991-92.

There frequently are visitors to the Transportation Department; therefore, its location should be easily accessible and highly visible to the public. A reception area with seating for four people is necessary. Transportation is willing to share a reception area with Planning and Development.

The public needs easy and clearly defined access to the Data Resource Center's map counter. There is an average of five or more inquiries per day regarding map services and special orders.

The department is to have its own small library adjacent to the Director's office. It will double as a layout area to review and discuss work. In addition, proximity to a 20-plus person executive-type conference room has been requested. Transportation will use the large (40 to 60 person) conference room frequently and prefers it not be in their department but in a location central to Transportation, Solid Waste, and Planning and Development.

Division Managers are to be adjacent to the Department Director as well as adjacent to their respective divisions. Individual division work areas are to be partitioned workstations clustered around, and opening into, an area containing a layout table with flat files below. Included in this space is also an area with files and shelves.

Transportation requested a location close to Public Affairs to facilitate their work with Graphics. Also, occasional interaction with the Legal Department raises the desire to be in closer proximity. Close proximity to a shared Copy Station is required.

Transportation Department Area Summary

a.	Management	1,345
b.	Transportation Planning	1,115
c.	Light Rail Transit Program	1,205
d.	Travel Forecasting	1,380
e.	Data Resource Center	2,040
TOTAL GROSS SQUARE FOOTAGE		7,085

A. TRANSPORTATION MANAGEMENT

Division Description

The Transportation Management staff consists of two closed offices and four workstations. Direct access from the closed offices to the reception and Secretary/Clerical areas and library is necessary.

Currently, the Secretarial staff consists of two people. One focuses on reception-related tasks, while the other produces a high volume of word processing. Acoustical separation between the two is necessary. However, some visual contact to the reception area by the secretary doing word processing is required to provide assistance in reception/related duties.

The Technical Manager should have easy access to the Data Resource Center and Information Systems.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Reception Area		(seating for 4)		90
Department Head	1	B	200	200
Technical Manager	1	C	125	125
Administrative Assistant	1	E	100	100
Secretary	2	F	80	160
Temporary/Clerical (new)	1	F	80	80
Library	1			100
Shared Equipment Area	1			60
Storage	1			150
Fireproof Storage	1			25
Subtotal Net Square Footage				1,090
Plus Circulation				x1.175
Subtotal				1,280
Plus 5% Contingency				65
TOTAL GROSS SQUARE FOOTAGE	6 staff			1,345

TRANSPORTATION MANAGEMENT

Division Data

Reception Area:	--Waiting area for four people. --Could be shared with Planning and Development.
Relationships:	--Needs public access. --Data Resource Center in close proximity to reception area (if possible).
Staff Adjacencies:	--Secretaries/Clerical adjacent to reception area. --Transportation Director adjacent to Administrative Assistant and Secretaries. --Technical Manager easy access to Data Resource Center and Information Systems.
Common Use Furniture/Equipment:	--Six bookcases: 8' x 4' x 1'-3". --Two-shelf bookcase. --Printer. --Supply cabinet. --Typewriter --Work table: 30" x 60". --Library table: 30" x 60". --Cabinet/shelf: (2) 4' x 4' x 2'.
Common Use Furniture/ Equipment Proximities:	--Printer, supply cabinet adjacent to Secretarial area. --Six bookcases and table in library.
Finishes:	Metro standards: Carpet, painted walls, acoustic ceiling.
Storage Requirements:	--Seven or eight shelves: 4' x 7' x 1'-3". --Storage for printed reports. --Fireproof computer backup storage. --See General Storage.
Lighting:	--Full spectrum lighting. --Natural light in all areas including conference rooms.
Power:	Normal office requirements.
HVAC:	Normal requirements in office areas.
Security:	--Distinct public zone/reception area. --Lockable storage for personal items.

B. TRANSPORTATION PLANNING

Division Description

Transportation Planning division members are to be clustered around a central work area with the Division Manager and Supervisor adjacent to the cluster. The work area contains an 8' x 4' map table with flat file drawers beneath. Located in the cluster is a file and storage area.

The Transportation Manager also manages the Light Rail Transit Program and requires proximity to both divisions.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Transportation Planning Manager	1	C	125	125
Transportation Planning Supervisor	1	C	125	125
Transportation Planner	2	E	100	200
Transportation Planner (vacant)	3	E	100	300
Public Access/Intern Space	1	E	100	100
Shared Work Table/File	1			100
Subtotal Net Square Footage				950
Plus Circulation				x1.175
TOTAL GROSS SQUARE FOOTAGE	8 staff			1,115

TRANSPORTATION PLANNING

Division Data

Staff Adjacencies:	--Transportation Planning Manager in closed office adjacent to cluster and to Light Rail Transit Division. --Transportation Planning Supervisor in closed office adjacent to cluster. --Division cluster to consist of five Transportation Planners.
Common Use Furniture/Equipment:	Map table (8' x 4').
Common Use Furniture/ Equipment Proximities:	Map table (8' x 4') in center of division cluster.
Finishes:	Metro standards: Carpet, painted walls, acoustic ceilings.
Storage Requirements:	--Flat files (beneath map table). --File cabinet. --Storage cabinet.
Lighting:	--Full spectrum lighting. --Daylight required.
Power:	Normal office requirements.
HVAC:	Normal requirements in office areas.
Acoustics:	Quiet work areas.
Security:	--Distinct public zone/work area --Lockable personal storage.

C. LIGHT RAIL TRANSIT PROGRAM

Division Description

Light Rail Transit Program Division members are to be clustered around a central work area with the Division Supervisor adjacent to the cluster. The work area contains an 8' x 4' map table with flat file drawers beneath. Located in the cluster is a file and storage area.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Supervisor	1	C	125	125
Senior Transportation Planner	1	E	100	100
Associate Transportation Planner	1	E	100	100
Senior Transportation Planners (new)	3	E	100	300
Associate Transp. Planner (vacant)	2	E	100	200
Senior Transp. Planner/Public Involvement (vacant)	1	E	100	100
Shared Work Table/Files	1			100
Subtotal Net Square Footage				1,025
Plus Circulation				x1.175
TOTAL GROSS SQUARE FOOTAGE	9 staff			1,205

LIGHT RAIL TRANSIT PROGRAM

Division Data

Staff Adjacencies:	--Supervisor in closed office adjacent to cluster. --Division cluster to consist of eight Transportation Planners.
Common Use Furniture/Equipment:	Map table (8' x 4').
Common Use Furniture/ Equipment Proximities:	Map table (8' x 4') in center of division cluster.
Finishes:	Metro standards: Carpet, painted walls, acoustic ceilings.
Storage Requirements:	--Flat files (beneath map table). --File cabinet. --Storage cabinet.
Lighting:	--Full spectrum lighting. --Daylight required.
Power:	Normal office requirements.
HVAC:	Normal requirements in office areas.
Acoustics:	Quiet work areas.
Security:	--Distinct public zone/work area --Lockable personal storage.

D. TRAVEL FORECASTING

Division Description

The Travel Forecasting Division uses the computers every day. It needs convenient access to the Computer Room shared with the Data Resource Center, which houses a plotter and other computer-related equipment. Travel Forecasting division members are to be clustered around a central work area with the Division Supervisor adjacent to the cluster. The work area contains an 8' x 4' map table with flat file drawers beneath. Located in the cluster is a file and storage area.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Supervisor	1	C	125	125
Senior Transportation Planner	2	E	100	200
Associate Transportation Planner	1	E	100	100
Assistant Transportation Planner	3	E	100	300
Associated Transp. Planner (new)	2	E	100	200
Intern	1	E	100	100
Shared Work Table/Files w/2 Terminals	1			150
Subtotal Net Square Footage				1,175
Plus Circulation				x1.175
TOTAL GROSS SQUARE FOOTAGE	10 staff			1,380

TRAVEL FORECASTING

Division Data

Staff Adjacencies:	--Supervisor in a closed office adjacent to cluster. --Division cluster to consist of eight Transportation Planners. --Division adjacent to Computer Equipment Room.
Common Use Furniture/Equipment:	Map table (8' x 4').
Common Use Furniture/ Equipment Proximities:	Map table (8' x 4') in center of division cluster.
Finishes:	Metro standards: Carpet, painted walls, acoustic ceilings.
Storage Requirements:	--Flat files (beneath map table). --File cabinet. --Storage cabinet.
Lighting:	--Full spectrum lighting. --Daylight required.
Power:	Normal office requirements.
HVAC:	Normal requirements in office areas.
Acoustics:	Quiet work areas.
Security:	--Distinct public zone/work area --Lockable personal storage.

E. DATA RESOURCE CENTER

Division Description

The Data Resource Map Center should be in close proximity to the department's reception area or another publicly accessible location. Map sales are handled at the Data Resource Center's map counter. On an average, there are five or more public inquiries a day for map services and RLIS products. It is imperative that there be a clearly defined public zone at the map center.

If the Metro Store becomes a reality, about 12 frequently sold maps would be handled through the Store. Only special orders would then be taken in the Data Resource Center and its public access requirements would be less critical.

Currently, the map counter handles all transactions from map sales and will require locked storage for the money. One of the Planning Technicians will require visual contact with the map counter and will assist with the orders. Both the blueline machine and map copier are to be adjacent to the map counter. Special venting will be needed for the blueline machine.

The computer room is to be adjacent to the Data Resource Map Center and the Travel Forecasting Division.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Data Resource Center Supervisor	1	C	125	125
Senior Regional Planner	1	E	100	100
Senior Economist	1	E	100	100
Associate Regional Planner	1	E	100	100
Assistant Regional Planner	2	E	100	200
Planning Technician	2	E	100	200
Planning Technician (vacant)	4	E	100	400
Intern (visiting team)	1	G	50	50
Public Access Terminal	1	G	50	50
Shared Work Table/Equipment	1			200
Map Counter Area	1			110
Computer Room	1			100
Subtotal Net Square Footage				1,735
Plus Circulation				x1.175
TOTAL GROSS SQUARE FOOTAGE	13 staff			2,040

DATA RESOURCE CENTER

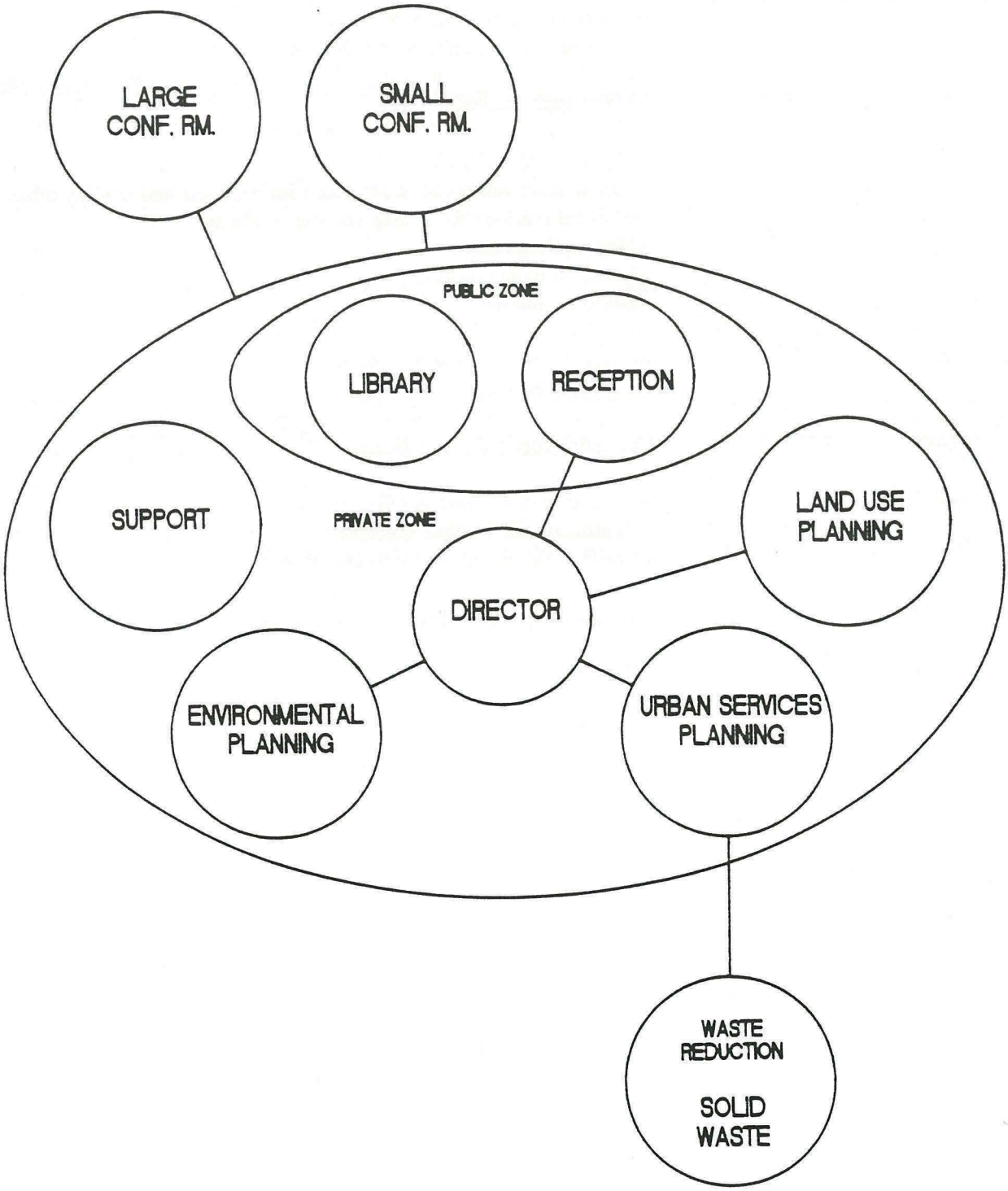
Division Data

Staff Adjacencies:	--Supervisor in closed office adjacent to work area. --Senior Economist to be away from map counter. --Planning Technicians to have visual contact with map counter. --Senior Economist and Assoc. Regional Planner require proximity to Library. --Two analysts workstations to be in individual cubicles near equipment. --Two Associate Regional Planners need access to plotters and layout tables.
Common Use Furniture/Equipment:	--Electrostatic plotter. --Blueline machine. --Map copier. --Pen plotter. --Layout tables. --Public access terminal. --Sun computer and console. --G-track tape drive. --Bookshelf.
Common Use Furniture/ Equipment Proximities:	--Electrostatic plotter near HP computer (with easy access to GIS personnel) in computer room. --Blueline machine in map counter area. --Map copier near map counter. --Pen plotter access to GIS personnel. --Layout table in close proximity to GIS personnel. --Public access terminal near map counter in public zone. --Sun computer, console, tape drive, and bookshelf in computer room.
Finishes:	--Metro standards: Carpet, painted walls, acoustic ceilings. --Computer Room to have computer vinyl flooring, painted walls, and gypsum board ceiling. --Tackable wall surface.

Division Data (cont.)

Storage Requirements:	--Two map storage cabinets. --Diazo file storage (42" x 36" x 30"). --Flat drawers and light table (104" x 40" x 38"). --Flat drawers and map storage (104" x 40" x 38") (present map storage). --Map supply cabinet. --Two flat drawers stacked (54" x 44" x 40"). --Flat drawers "52" x 40" x 38"). --Ten or more boxes (14" x 14" x 22") for products and mailing tubes. --40 boxes (various sizes) map counter products. --Map mailing tubes. --Lockable money storage. --Diazo supplies.
Lighting:	--Full spectrum lighting throughout. --Daylight required.
Power:	Computer connections to plotter.
HVAC:	--Normal requirements in office areas. --Ventilation for blueline machine. --Verify requirements in Computer Room
Acoustics:	Acoustical separation between work areas.
Security:	--Distinct public zone/work area --Lockable personal storage. --Lockable money storage. --Controlled access to Computer Room.

PLANNING AND DEVELOPMENT



9. PLANNING AND DEVELOPMENT

Department Description

The Planning and Development Department consists of three divisions managed by the Department Director. The divisions are Environmental Planning, Urban Services, and Land Use Planning. Planning and Development anticipates a staff of 28 for fiscal year 1991-92.

Planning and Development requires a reception area with seating for four but is willing to share reception with the Transportation Department. Planning and Development desires close proximity to Transportation's Data Resource Center and adjacency to the Solid Waste Department. It is important that Planning and Development be close to the Data Resource Center yet maintain separation between itself and the Map Center's walk-in traffic.

It is the desire of the Planning and Development staff to maintain their own identity as a department. They view each department as a separate business and, therefore, should have walls to define their department's boundaries. The large 40 to 60 person conference room could double as a common work area for Planning and Development, Transportation, and the Solid Waste Department. The overall plan of the department should effectively utilize the space, grouping each division's workstation together to enable privacy and quiet. Secretarial work areas need acoustical separation and to be kept away from closed offices.

Planning and Development prepares a large number of mailings. This necessitates a production area where reports and mailings can be assembled. Close proximity to the secretarial area is required. Sound isolation will be needed for the dot matrix printer used to create mailing labels.

Enclosed office supply and paper storage is to be kept within the department. Contracts and personnel files will be placed in locked storage, and computer backup disks will be in fireproof storage. A layout table and map storage area will also be required.

Presently, Planning and Development has a library within the department which contains archival records. It is referred to frequently and should be centrally located near the reception area of the department where it can be accessible to the public.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Reception Area		(seating for 4)		90
Department Director	1	B	200	200
Regional Planning Supervisors	3	C	125	375
Senior Regional Planner	7	E	100	700
Senior Solid Waste Planner	1	E	100	100
Senior Management Analyst	6	E	100	600
Assoc. Management Analyst	1	E	100	100
Assoc. Solid Waste Planner	2	E	100	200
Assoc. Regional Planner	1	E	100	100
Management Technician	1	E	100	100
Loaned Executive	1	E	100	100
Program Assistant	1	F	80	80
Administrative Secretary	1	F	80	80
Secretary	1	F	80	80
Intern	1	G	50	50
Copier/Printer/Supply	1			150
Locked Fireproof Storage Area	1			70
File/Map Storage Area	1			200
Work Area	1			100
Reference Library	1			100
Subtotal Net Square Footage				3,575
Plus Circulation				x1.175
Subtotal				4,200
Plus 5% Contingency				210
TOTAL GROSS SQUARE FOOTAGE	28 staff			4,410

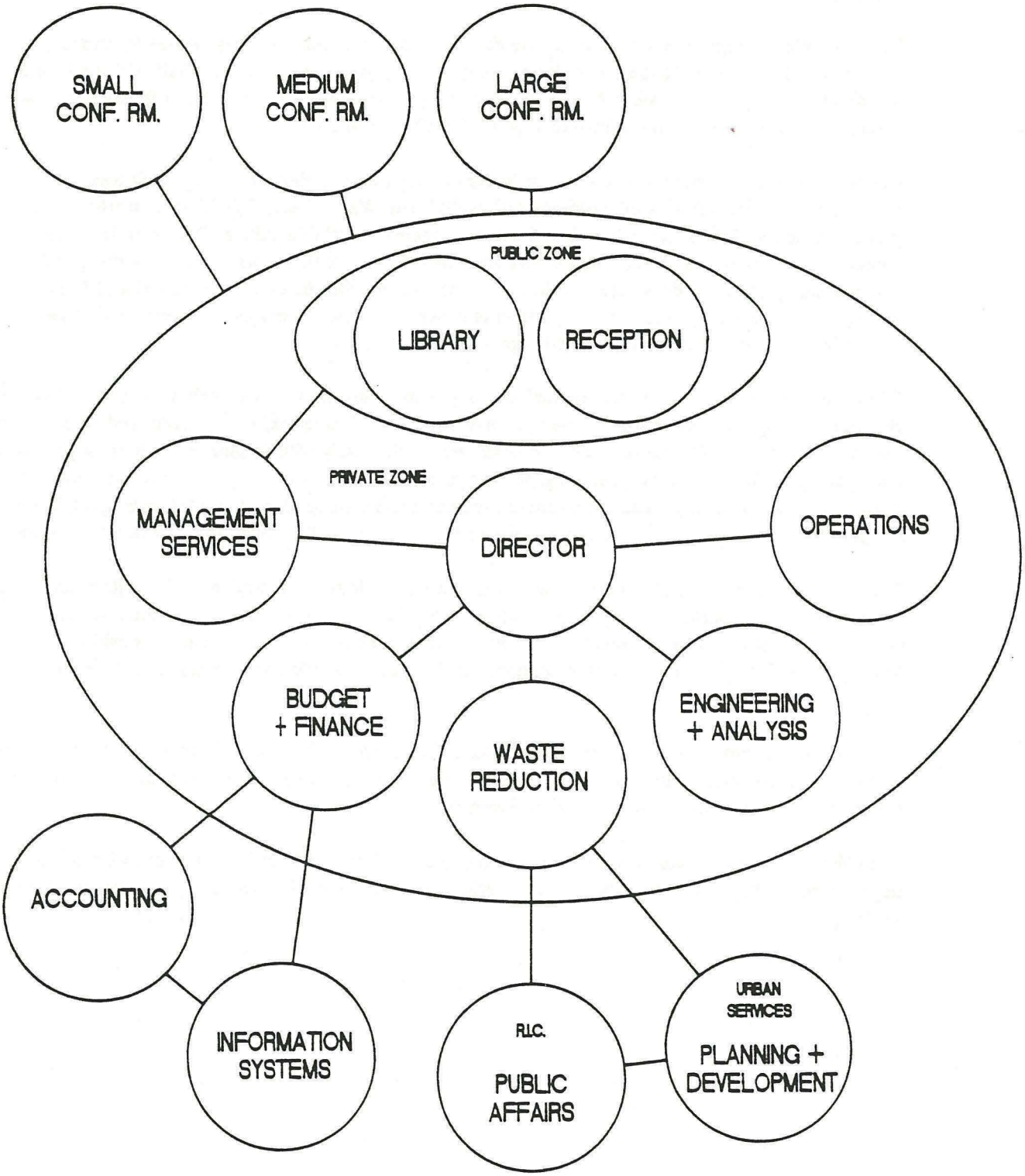
Department Data

Reception Area:	--Provide seating for four people. --Display for brochures and newsletters. --Could share with Transportation and Solid Waste.
Relationships:	--Close proximity to Transportation's (Data Resource's) map counter without being near its walk-in traffic. --Adjacent to Solid Waste. --Library centrally located.
Staff Adjacencies:	--Land Use Planning. --Environmental Planning. --Urban Services Planning.
Common Use Furniture/Equipment:	--Two RLIS machines. --Production area assembly table. --Dot matrix printer. --Two laser printers. --One photocopier. --One fax machine. --Bulletin board.
Common Use Furniture/ Equipment Proximities:	--RLIS workstation close to printers. --Production area assembly table next to the Secretaries. --Printer and fax near the Secretaries and Work Area.
Finishes:	Metro standards: Carpet, wall paint, acoustical ceiling.
Storage Requirements:	--Three lateral files (36" x 54"h.). --Twenty vertical files (15" x 30" x 52"h.). --Map flat files (verify size and quantities). --Storage Room: Past project records. Official records. Office supply/paper storage. --Locked Storage: Financial, Personnel, contracts and confidential information. --Fireproof storage for computer back-up disks and original report and study materials. --General Storage: Land use records, etc.

Department Data (cont.)

Lighting:	Full spectrum lighting.
Power:	Normal office requirements.
HVAC:	Normal requirements.
Acoustics:	Noise controlled Copier/Printer/Supply Room. Quiet work areas.
Security:	--Clearly defined public zone. --Lockable personal storage.

SOLID WASTE DEPARTMENT



10. SOLID WASTE DEPARTMENT

Department Description

The Solid Waste Department consists of five divisions: Management Services, Waste Reduction, Operations, Budget and Finance, and Engineering and Analysis. Approximately half of Solid Waste's staff are off-site employees who will not be working within the new Metro facility. Solid Waste anticipates having 40 staff positions at the Metro facility for the 1991-92 fiscal year.

The Solid Waste Department is in favor of "merging" departments that frequently work together. It prefers not to define Metro's departments with walls. The Waste Reduction Division works frequently with Planning and Development's Urban Services Planning and Public Affairs Recycling Information Center. The Budget and Finance and Operations Divisions work frequently with Accounting and Information Systems. Solid Waste also has frequent contact with the General Counsel and Executive Management. Proximity with these departments is desirable since "merging" is determined to be impractical. Close proximity to a shared copy station is required.

Within the department, the Waste Reduction group is most involved in the work of other Solid Waste divisions. The greatest need for proximity is between Waste Reduction, Engineering, and Management Services. In addition, Operations Division personnel work closely with Engineering Division personnel. The space plan for Solid Waste should group the division's workstations together with the manager of each division in close proximity. The Department Director prefers to be close to all the managers, but if this is not possible, the greatest need for proximity is to the Management Services and Operations Managers.

Solid Waste requires a small reception area with seating for four. It is willing to share its reception with a number of other departments including Public Affairs, Planning and Development, and Accounting. The two Office Assistants from Management Services will oversee the reception area. It is critical for Management Services to be close to reception, the department's reference library, and the printers in the computer room.

The computer room requires acoustical separation and controlled access. It houses the printers, plotter, and LAN servers, along with files and computer supply storage. All personnel require access to the computer room, making a central location desirable.

Solid Waste's Divisions will need to share a small and medium-sized conference room with other departments. They will also participate in meetings in the large conference room, so adjacency to that space is desirable.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Reception Area		(seating for 4)		90
Solid Waste Director	1	B	200	200
Management Services:				
Manager	1	C	125	125
Associate Management Analyst	1	E	100	100
Administrative Assistant	2	E	100	200
Administrative Secretary	1	E	100	100
Secretary	1	E	100	100
Office Assistant	2	E	100	200
Waste Reduction:				
Waste Reduction Manager	1	C	125	125
SW Planner Supervisor	2	E	100	200
Senior SW Planner	2	E	100	200
Associate SW Planner	4	E	100	400
Assistant SW Planner	1	E	100	100
SW Interns	2	E	100	200
Operations:				
Facilities Manager	1	C	125	125
Assistant Facilities Manager	1	E	100	100
Associate Management Analyst	1	E	100	100
Budget and Finance:				
Budget and Finance Manager	1	C	125	125
Senior SW Planner	1	E	100	100
Senior Management Analyst	3	E	100	300
Program Assistant	1	E	100	100
Management Technician	1	E	100	100
Engineering and Analysis:				
Engineering/Analysis Manager	1	C	125	125
Senior SW Planner	2	E	100	200
Senior Engineer	2	E	100	200
Associate Engineer	2	E	100	200
Associate Management Analyst	1	E	100	100
Project Assistant I	1	E	100	100

Space/Staff Requirements (cont.)

Title	Quantity	Workstation Type	Area
Reference Library	1		300
Computer Room	1		300
Copier/Supply Room	1		150
Work/File Area	1		150
Subtotal Net Square Footage			5,215
Plus Circulation			x1.175
Subtotal			6,130
Plus 2% Contingency			120
TOTAL GROSS SQUARE FOOTAGE	40 staff		6,250

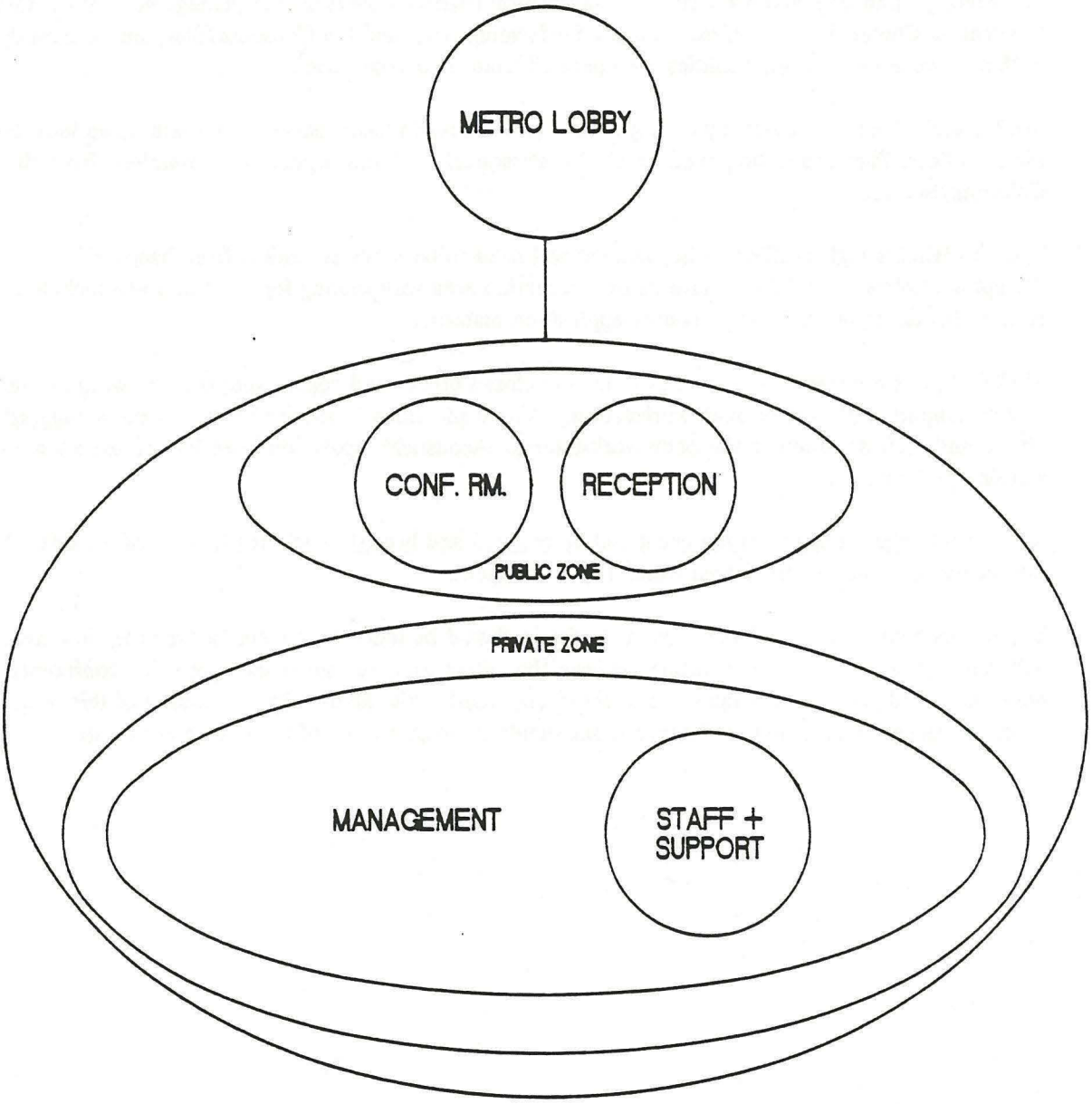
Department Data

Reception Area:	--Seating for four. --May be shared with Public Affairs, Planning and Development, or Accounting.
Relationships:	--Waste Reduction frequently works with Urban Services Planning and the Recycling Information Center. --Budget and Finance works frequently with Accounting and Information Systems. --Frequent contact with General Counsel and Executive Management. --Close proximity to a shared copy station.
Staff Adjacencies:	--Group division staff together in space plan. --Waste Reduction close to Engineering and Analysis and Management Services. --Department Director close to division managers, especially Management Services and Operations. --Office Assistant close to reception.
Common Use Furniture/Equipment:	--Reference Library: --Bookcases. --Table and chairs. --Fax machine. --Computer Room equipment: --3 printers and stands. --1 plotter. --1 modem. --LAN servers. --1 bookcase.
Common Use Furniture/ Equipment Proximities:	--Reference Library near Reception/Management Services. --Fax machine near Management Services. --Computer Room equipment centrally located. --Work area in Engineering and Analysis.
Finishes:	--Metro standards: Carpet, wall paint, acoustical ceiling. --Computer Room: Computer floor vinyl floor covering and gypsum board ceiling.

Department Data (cont.)

Storage Requirements:	--Lateral files: --4 @ 42" w. x 54" h. --1 @ 42" w. x 42" h. --Computer Room files: 3 four-drawer files. --Engineering work area: --Drafting table. --2 flat files. --2 map racks. --2 rolled map cases.
Lighting:	--Full spectrum lighting. --Task lighting at drafting table. --Daylight desirable.
Power:	--Normal office requirements. --Verify requirements in Computer Room.
HVAC:	--Normal requirements in work areas. --Verify equipment requirements in Computer Room.
Acoustics:	--Acoustic isolation of Computer Room. --Acoustic buffering within and between division workstation groupings.
Security:	--Clear distinction between public and private zones. --Lockable personal storage. --Controlled access to Computer Room.

MERC


METRO LOBBY
CONF. RM.
RECEPTION
PUBLIC ZONE
PRIVATE ZONE
MANAGEMENT
STAFF + SUPPORT

11. MERC

Department Description

The Metropolitan Exposition Recreation Commission (MERC) oversees the management of the Oregon Convention Center, Portland Center for the Performing Arts, and the Coliseum/Stadium. Currently, due to their diverse natures, the facilities are operated from their respective sites.

MERC individuals who currently occupy offices at the Oregon Convention Center will move into the new Metro offices. They are to be joined by MERC Personnel staff and support staff members from the Coliseum/Stadium.

Due to MERC's high profile, the department will need to be easily accessible from Metro's Reception/Lobby. MERC will have its own reception area with seating for eight and will include a writing counter for filling out MERC personnel application materials.

MERC desires a department layout in which the closed offices and copier/supply room wrap around a central support staff area of open workstations. Visual proximity is required between the managers' closed offices and their assistants in the open workstations. Acoustical separation is desired to maintain a quiet working environment.

After events, the money from the event will be counted and brought back to MERC's office safe. The safe needs to be in a secured area within the department.

The department's small conference room (215 s.f.) should be located adjacent to the reception area. This will help to maintain a clear definition between the public zone and the work area. The conference room description and room data is the same as those described in the Shared Spaces section of this program. Both the reception area and conference room should be close to one of the shared coffee stations.

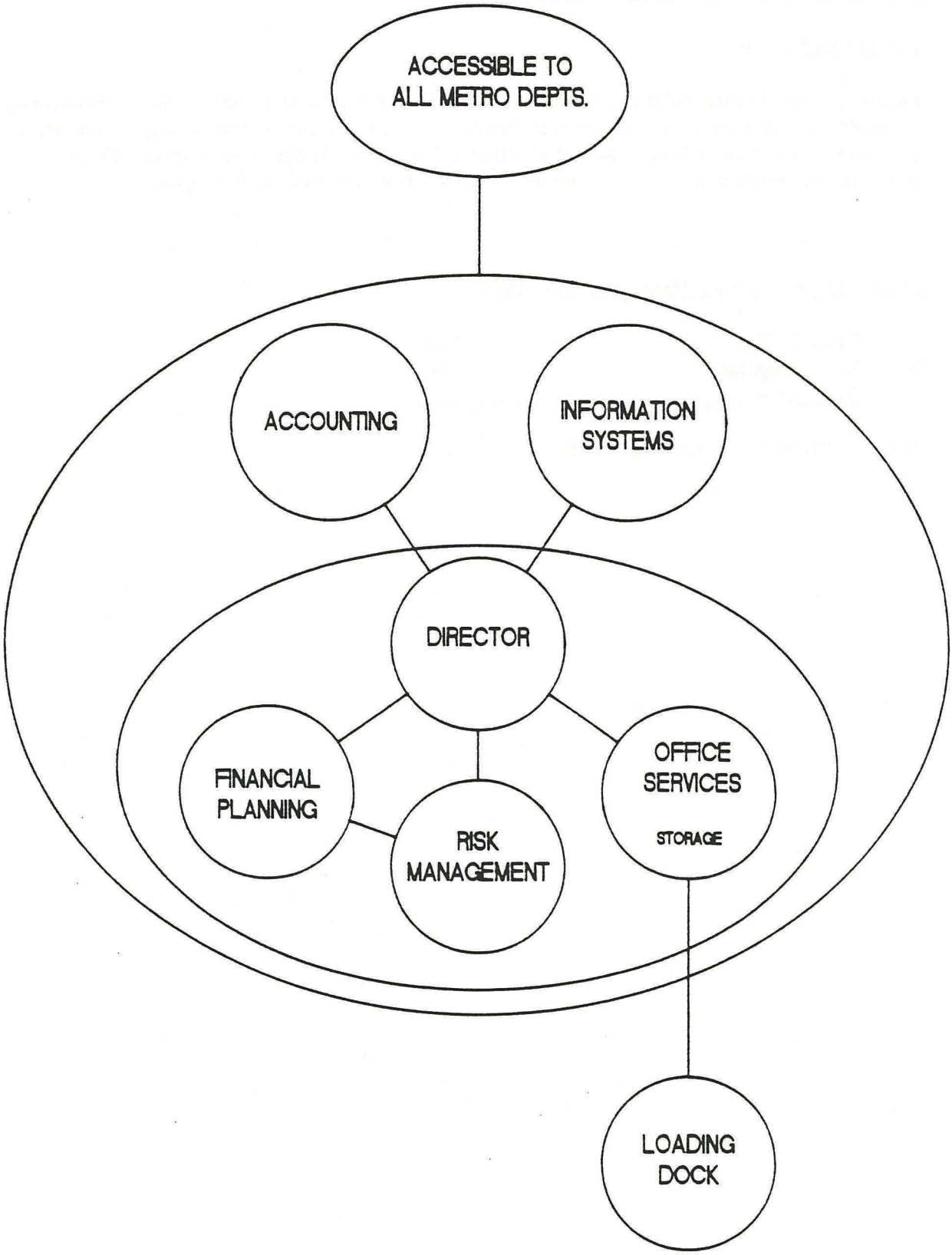
Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Reception Area		(seating for 8)		200
Receptionist	1	G	50	50
General Manager	1	B	200	200
Assistant to the Manager	1	C	125	125
Director of Finance and Administration	1	C	125	125
Controller	1	C	125	125
Purchasing Coordinator	1	D	125	125
Accountant	1	D	125	125
Assistant Accountant	1	E	100	100
Bookkeeper	3	E	100	300
Accounting Clerk	1	E	100	100
Administrative Assistant	1	E	100	100
Temporary Assistant	3	E	100	300
Human Resources Manager	1	C	125	125
Special Services Coordinator	1	E	100	100
Staff Assistant	1	E	100	100
Personnel/Office Assistant	1	E	100	100
Personnel Clerk	1	E	100	100
Conference Room	1			215
File Area/Support Space	1			300
Copier/Supply Room	1			100
Safe/Storage	1			50
Subtotal Net Square Footage				3,165
Plus Circulation				x1.175
Subtotal				3,720
Plus 2% Contingency				75
TOTAL GROSS SQUARE FOOTAGE	21 staff			3,795

Department Data

Reception Area:	--Prefers its own reception area. --Waiting area for 8, plus writing counter for 3.
Relationships:	--Requires public access. --Close proximity to Metro's Reception/Lobby and to Finance. --Reception adjacent to Small Conference Room. --Reception/Conference adjacent to shared coffee station.
Staff Adjacencies:	All Assistants and Secretaries need to be in central location and adjacent to filing/support area.
Common Use Furniture/Equipment:	--Photocopier. --Printer tables (3)
Common Use Furniture/ Equipment Proximities:	--Photocopier located in copy/supply room. --Printer tables in staff work area.
Finishes:	Metro standards: Carpet, wall paint, acoustical ceiling.
Storage Requirements:	--22 lateral files (36" x 18" x 60" h.). --2 upright files (2' x 3'). --1 safe (2' x 3'). --Small bookcase (5 @ 3' x 1').
Lighting:	Full spectrum lighting throughout.
Power:	Normal office requirements.
HVAC:	Normal requirements.
Acoustics:	Quiet work areas.
Security:	--Clear distinction between public and private zones. --Secure access to safe.

FINANCE AND INFORMATION MANAGEMENT



12. FINANCE AND INFORMATION MANAGEMENT

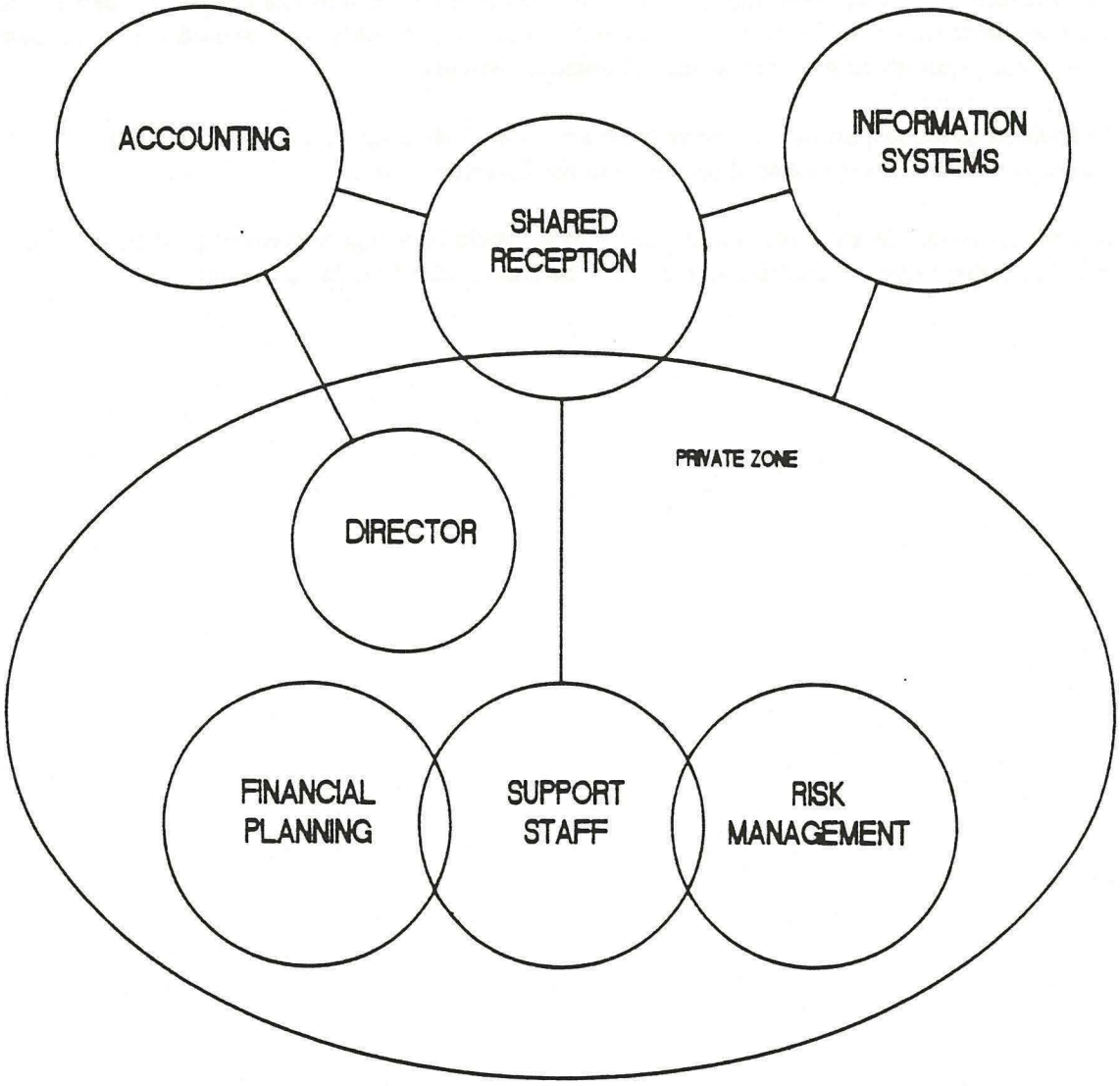
Department Summary

Finance and Information Management consists of five divisions: Financial Planning, Risk Management, Office Services, Accounting, and Information Systems. Due to their size and complexity, Accounting and Information Systems have been described as separate departments in this space program. Financial Planning, Risk Management, and Office Services are described on the following pages.

Finance and Information Management Summary

a.	Financial Planning	1,200
b.	Risk Management	375
c.	Office Services	1,600
TOTAL GROSS SQUARE FOOTAGE		3,175

FINANCIAL PLANNING/RISK MANAGEMENT



A. FINANCIAL PLANNING

Division Description

The Financial Planning staff interfaces with all of Metro's departments; however, they have little contact with the public. A separate reception area is not required, although since this division requires adjacency to Accounting and Information Systems, reception could be shared with either one.

The Finance and Information Management Director's office is listed in this program as part of Financial Planning since they have frequent need to interact, but the Director's office should also be located in convenient proximity to Accounting and Information Systems.

In addition to the Department Director there are six staff members in Financial Planning. The Administrative Assistant will need proximity to the Director's office.

A printer/central file area, and shared copy station should be within convenient proximity to the Administrative Secretary's workstation and will be shared with Risk Management.

FINANCIAL PLANNING

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Finance and Information Management				
Department Director	1	B	200	200
Management Analyst Supervisor	1	C	125	125
Senior Management Analyst	2	D	125	250
Associate Management Analyst	2	E	100	200
Administrative Assistant	1	F	80	80
Copier/Printer/File Area	1			130
Subtotal Net Square Footage				985
Plus Circulation				x1.175
Subtotal				1,155
Plus 4% Contingency				45
TOTAL GROSS SQUARE FOOTAGE	7 staff			1,200

* Additional area for storage to be part of General Storage (500 s.f.) and will be shared with Risk Management.

FINANCIAL PLANNING

Division Data

Relationships:	--Public access not required. --Works with all Metro departments. --Most frequent work relationship is with Accounting, Information Systems, and Risk Management.
Staff Adjacencies:	Group Financial Planning staff together in close proximity to Department Director.
Common Use Furniture/Equipment:	--Printer. --See Storage Requirements.
Common Use Furniture/ Equipment Proximities:	Copier/printer/file area to be near Administrative Secretary and shared with Risk Management.
Finishes:	Metro standards: Carpet, wall paint, acoustic ceiling.
Storage Requirements:	Four lockable lateral files (42" w. x 54" h.)
Lighting:	--Full spectrum lighting. --Daylight desirable.
Power:	Normal office requirements.
HVAC:	Normal requirements.
Acoustics:	--Department Director office requires soundproofing. --Acoustic separation desirable in work spaces.
Security:	--Lockable personal storage. --Lockable filing.

B. RISK MANAGEMENT

Division Description

The Risk Management staff interfaces with all of Metro's departments, and like Financial Planning, has little contact with the public. A separate reception area is not required, but reception could be shared with Accounting, Information Systems, and Financial Planning.

Risk Management will have three staff members by fiscal year 1991-92. The three work spaces shall be arranged to allow the Administration Secretary visual access to both the Risk Manager and the Associate Analyst.

Risk Management will share the printer/central file area and the copy station included as part of Financial Planning's area summary.

RISK MANAGEMENT

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Risk Manager	1	C	125	125
Associate Analyst-Workers' Comp.	1	E	100	100
Administrative Secretary	1	F	80	80
Subtotal Net Square Footage				305
Plus Circulation				x1.175
Subtotal				360
Plus 4% Contingency				15
TOTAL GROSS SQUARE FOOTAGE	3 staff			375

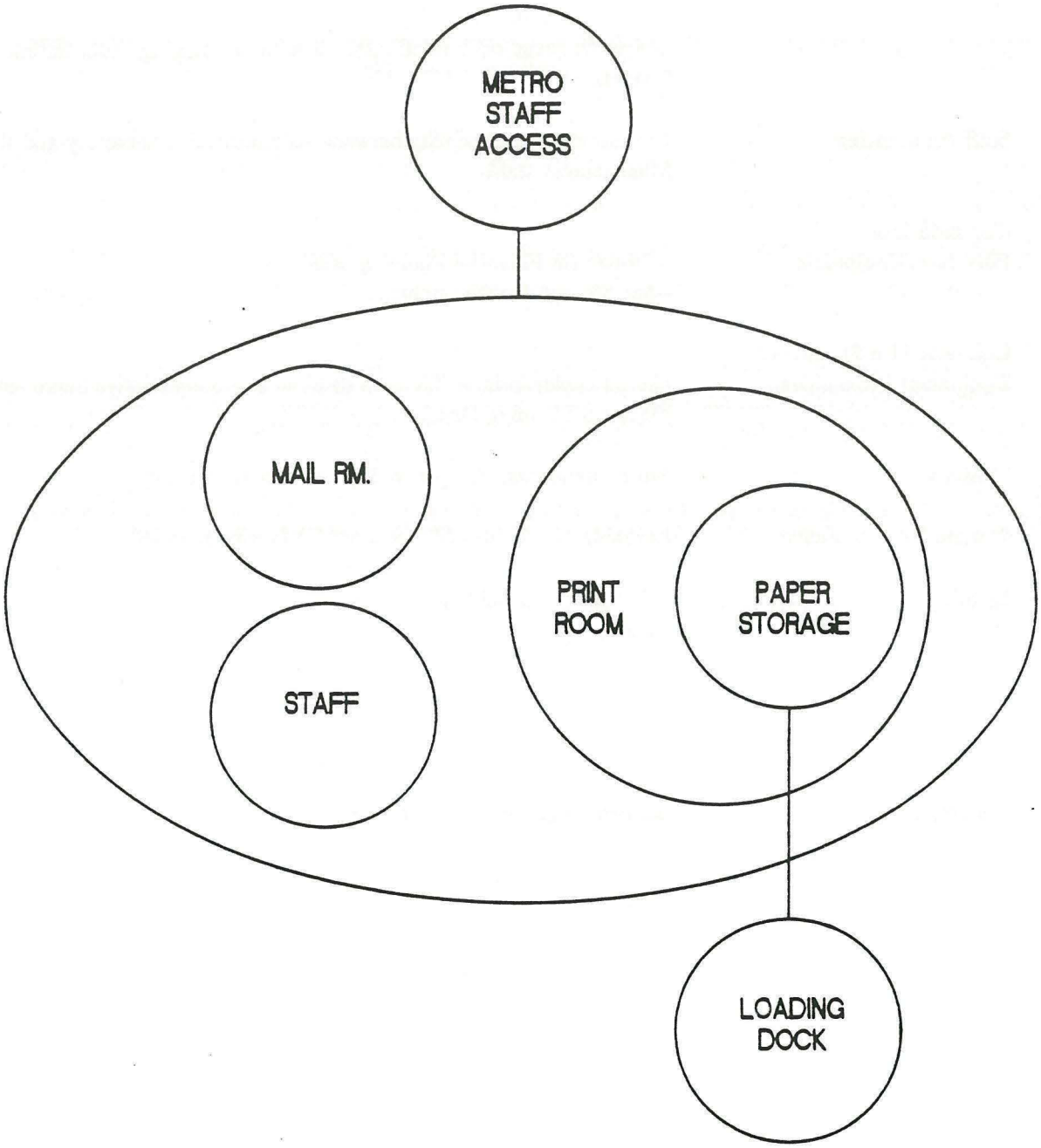
* Additional area for storage to be part of General Storage (500 s.f.) and will be shared with Financial Planning.

RISK MANAGEMENT

Division Data

Relationships:	--Public access not required. --Works with all Metro departments. --Most frequent work relationship is with Accounting, Information Systems, and Financial Planning.
Staff Adjacencies:	Provide visual accessibility between Administrative Secretary and Risk Management staff.
Common Use Furniture/Equipment:	--Printer (in Financial Planning area). --See Storage Requirements.
Common Use Furniture/ Equipment Proximities:	Shared copier/printer/file area to be near Administrative Secretary of Financial Planning Division.
Finishes:	Metro standards: Carpet, wall paint, acoustic ceiling.
Storage Requirements:	Lockable lateral files (42" w. x 54" h.) (verify quantity).
Lighting:	--Full spectrum lighting. --Daylight desirable.
Power:	Normal office requirements.
HVAC:	Normal requirements.
Acoustics:	Acoustic separation desirable in work spaces.
Security:	--Lockable personal storage. --Lockable filing.

OFFICE SERVICES



C. OFFICE SERVICES

Division Description

Office Services coordinates repair of office machines, copiers, and arranges and provides courier services, reproduction services, and mail services for all Metro employees.

The Print Shop houses a Kodak printer, offset printer, collator, hydraulic paper cutter, two paper joggers, paper stitcher, paper folder, and paper drill. The print area should include heavy-duty shelving units for paper supplies and a work counter with a sink plumbed with hot and cold water. Additional paper and printing chemicals will be located in a storage room, which is easily accessible from the freight elevator and building loading dock for delivery of large palettes of paper stock.

The Print Shop requires a separate HVAC system with proper humidity for paper storage. Several pieces of equipment also need direct venting to the exterior. The equipment is noisy, and the room requires sound absorptive wall and ceiling materials as well as acoustical isolation from adjacent areas, such as the two workstations within the Print Shop/Mail Room. The floor in the print area should be sealed concrete, easy to clean. Employees are required to stand a lot and will require cushioned support flooring in work areas.

The Mail Room requires easy access by Metro staff who use the postage meter and stapler and who need access to the departmental mail boxes and mail room supply storage (paper, envelopes, etc.). This area requires open layout and assembly space on counters or work tables. Equipment should be arranged for efficiency of use.

The Print Shop/Mail Room currently has one workstation and anticipates a second by fiscal year 1991-92. Space for four lateral files should be provided nearby. Both workstations should have visual access to both the Mail Room and the Print Shop and acoustical separation from the Print Shop.

OFFICE SERVICES

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Reproduction Clerk	1	E	100	100
Program Assistant I	1	F	80	80
File Area	1			20
Storage Room	1			200
Print Room	1			875
Mail Area	1			85
Subtotal Net Square Footage				1,360
Plus Circulation				x1,175
TOTAL GROSS SQUARE FOOTAGE	2 staff			1,600

OFFICE SERVICES

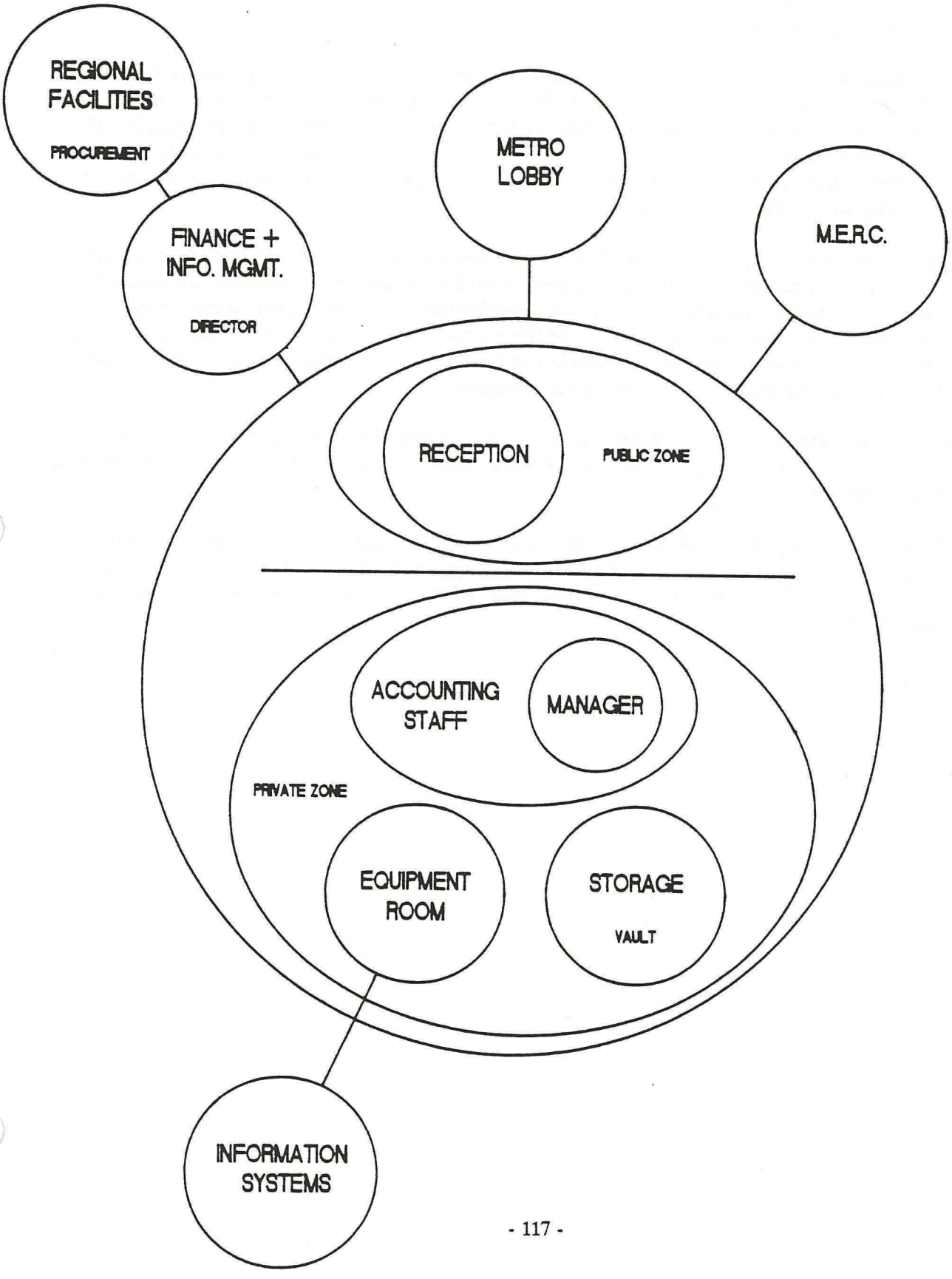
Division Data

Function:	Equipment and work area.
Relationships:	Near freight elevator and building loading dock.
Staff Adjacencies:	Visual access to Mail Room and Print Shop.
Common Use Furniture/Equipment:	Print Shop: --Kodak printer. --Offset printer. --Collator. --Hydraulic paper cutter. --Paper joggers (2). --Paper stitcher. --Paper folder. --Paper drill. Mail Room: --Postage meter. --Stapler. --Departmental mailboxes.
Finishes:	--Print Shop: Sealed concrete floor, painted walls, acoustic ceiling. --Work areas: Cushioned support flooring where employees will be standing for long periods of time. --Mail Room: Vinyl flooring, painted walls, acoustic ceiling.
Casework:	--Work counter/sink in Print Shop. --Work counters in Mail Room.
Storage Requirements:	--File area near workstations (3 laterals at 36"w x 42"h). --Heavy-duty shelving in Print Shop. --Storage room with heavy-duty shelving for paper stock. --Fireproof cabinet (existing) for printing chemicals.
Lighting:	--Full spectrum lighting. --Task lighting on equipment. --Daylight desirable.
Power:	--Verify power requirements of all equipment. --Provide separate fuse box for equipment area.
Mechanical:	Direct venting to the outside.

Division Data (cont.)

Plumbing:	Sink with hot and cold water.
Acoustics:	--Acoustic buffering within Print Shop. --Acoustic separation of Print Shop from adjacent space. --Acoustic separation of workstations from Print Shop.
Security:	--Lockable personal storage. --Controlled access to paper stock.

ACCOUNTING DEPARTMENT



13. ACCOUNTING DEPARTMENT

Department Description

Accounting works frequently with all of Metro's departments. In addition to a large amount of in-house traffic, it currently has frequent public visitors who need to be received in a clearly defined public zone. While the public traffic may diminish following the opening of a "Metro Store", a security point is still needed within the department. The clerical staff who handle public purchases and petty cash should be separated from the public by a counter or window but should remain accessible to the professional Accounting staff within the department.

The majority of the Accounting staff work in partitioned workstations. The detailed nature of the work requires quiet for concentration; therefore, acoustic control is needed. An equipment room should be incorporated into the work area to house the noisy equipment and should be easily accessible to the Accounting and Information Systems staff. The five enclosed offices (Manager of Accounting, Accounting Supervisor, and Senior Accountants) all require side-lites to allow views into the Accounting staff work areas. Exterior windows into the department are desirable.

An additional work area is required for auditors who need a space for four to six months of the year. A separate work area (preferably enclosed) near the clerical staff is desirable. A table and seating for six or more is required.

The Accounting Department has large storage requirements. An area within the department is needed for frequently consulted documents dating back two years. Records beyond that date can be stored elsewhere in the building in General Storage or sent off-site to Archives. Office and paper supplies will need storage within the department.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area	
Reception Area	1	(seating for 2)		70	
Manager of Accounting	1	C	125	125	
Accounting Supervisor	1	C	125	125	
Senior Accountants	3	E+	100	300	
Junior Accountants	2	E	100	200	
Accounting Clerks	4	E	100	400	
Accounts Payable Clerk	1	E	100	100	
Accounts Receivable Clerk	1	E	100	100	
Payroll Clerks	2	E	100	200	
Secretary	1	F	80	80	
Office Assistant	1	G	50	50	
Temporary Clerk I	1	G	50	50	
Auditor Work Area	1			150	
Equipment Room	1			150	
Copier/Supply/Storage Room	1			70	
Records Storage Room/Vault	1			500	**
Subtotal Net Square Footage				2,670	
Plus Circulation				x 1.175	
Subtotal				3,140	
Plus 3% Contingency				95	
TOTAL GROSS SQUARE FOOTAGE	20 staff			3,235	

\+ Enclosed office at 100 s.f.

** Additional area for storage is part of General Storage (500 s.f.).

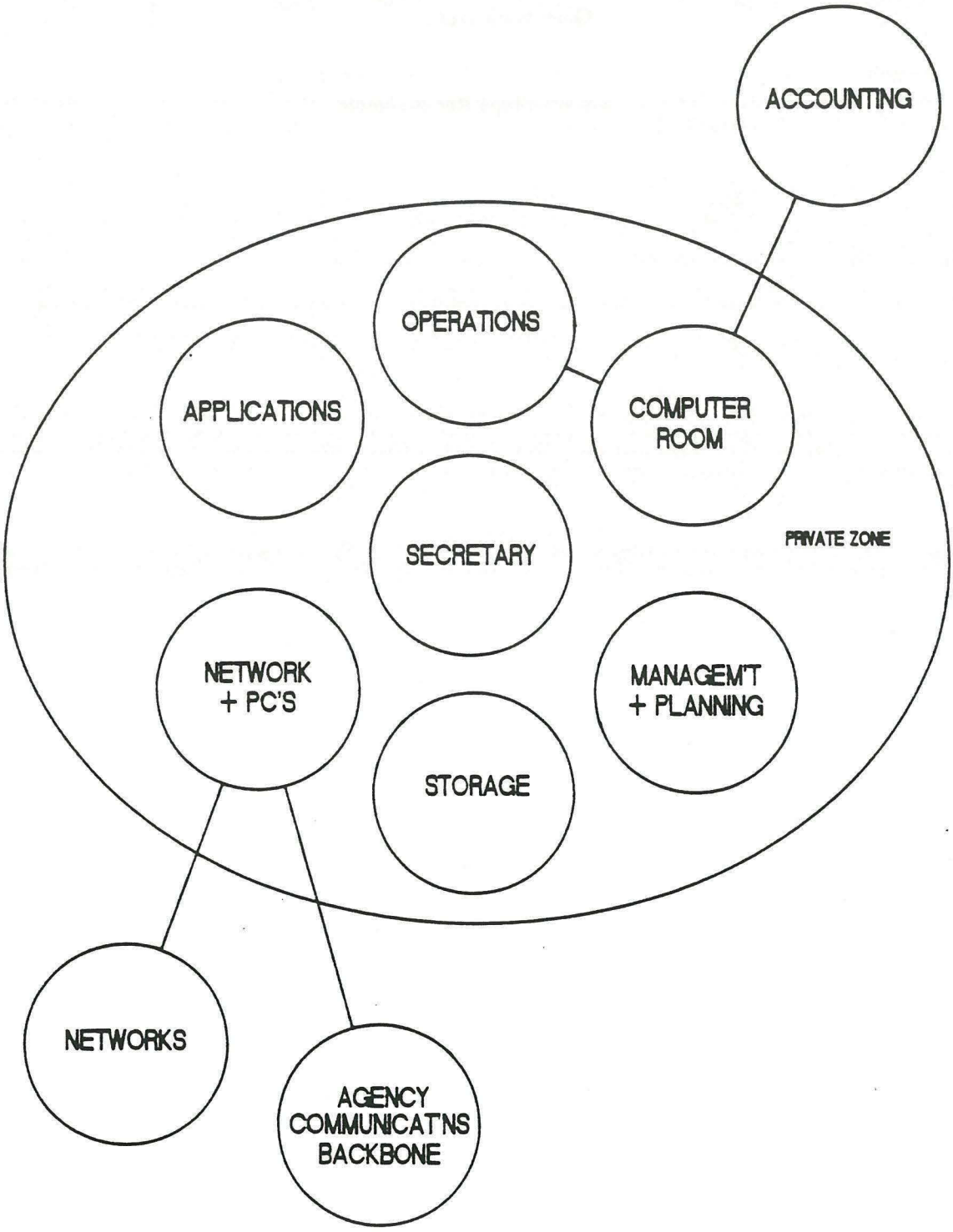
Department Data

Reception Area:	A waiting area for 2 to 4 people could be shared with Finance and/or Information Systems.
Relationships:	--Will need public access, but it is less important if a "Metro Store" is created. --Greatest need for proximity is to Finance and Information Management and Information Systems. --Proximity to Personnel and the Procurement Division of Regional Facilities is also desirable.
Staff Adjacencies:	--Secretary to Manager of Accounting. --Secretary to Accounting Supervisor. --Manager of Accounting to Senior and Junior Accountants. --Accounting Supervisor to Clerical Staff. --Auditor work area to Manager, Senior Accountants, and Clerical Staff.
Common Use Furniture/Equipment:	Equipment Room: --Kodak copier --Check burster/signer --Laser printer
Common Use Furniture/ Equipment Proximities:	--Kodak copier. --Check burster/signer. --Laser printer for mainframe computer to Clerical Staff (but physically separated for noise reduction and security). --Laser printer for mainframe computer to Data Processing.
Finishes:	Metro standards: Carpet, wall paint, acoustical ceiling.
Storage Requirements:	--Lateral Files: 12 at 30"w x 42"h (verify quantity). --Lockable storage for computer printouts, form stock, check stock, office supply, and petty cash vault. --Fire resistant storage of data disks.
Lighting:	--Full spectrum lighting. --Task lighting at partitioned workstations.
Power:	--Verify requirements of Equipment Room. --Auditor work area needs adequate power supply.
HVAC:	--Normal in office areas. --As required in Storage and Equipment Room.

Department Data (cont.)

Acoustics:	--Noise controlled Equipment Room. --Quiet work areas.
Security:	--Distinct public zone/reception area. --See Storage Requirements.

INFORMATION SYSTEMS



14. INFORMATION SYSTEMS

Department Description

The Information Systems department's responsibility is the primary care of the financial accounting system. Fifty percent of their time is spent providing Accounting Department support and fifty percent as support to the rest of Metro, primarily Transportation, Finance and Information Management, and Solid Waste. Information Systems does not require public access and does not require a reception area. The department should be close to stairs and elevators to allow easy access to computer rooms in other departments. Its closest proximity to other departments should be to Accounting and Transportation.

Information Systems can be divided into five primary areas: Applications, Operations, Networks and PCs, Computer Room, and Storage. The Applications group needs a quiet work area and should be isolated from the rest of Information Systems. Operations needs to be adjacent to the Computer Room. The Network and PCs group needs a work area, lockable room for test equipment, space for newly-delivered equipment and convenient access to the freight elevator and building loading dock. The Computer Room houses Metro's central mainframe computer. Control of noise, temperature, humidity, power supply, and access are critical to the stability and safety of the system. This room needs to be isolated from the public for security of the equipment and data. In addition, it is a noisy room which will require acoustic separation from adjacent work areas. The ceiling of the Computer Room needs to be a nonflaking material and provision should be made for accessibility to the ceiling space.

The department needs to have central computer equipment rooms on each floor (the Computer Room serves as one floor's equipment room). These should be located above each other with easy cabling access between floors. Critical to the structure of networks is the length of lines. Many are limited to 1,000 feet and distances beyond that require extra cost and occasional performance loss. Therefore, if possible, the Computer Room should be centrally located in the Metro facility.

There are two storage areas: a smaller room for computer supplies and a larger room for department supplies. There is presently no need for storage outside the department, such as in General Storage. Information Systems anticipates having 11 staff in fiscal year 1991-92.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Information Services Director	1	C	125	125
Applications:				
Senior Management Analyst	1	E	100	100
Systems Analyst	1	E	100	100
Programmer	1	E	100	100
Operations:				
Systems Analyst	1	E	100	100
Operators	1	E	100	100
Network and PCs				
Senior Management Analyst	1	E	100	100
Systems Analyst	1	E	100	100
Technical Specialist	1	E	100	100
Work Area	1			25
Secretary	1	F	80	80
Computer Room	1			400
Computer Equipment Room	1			150
File Area	1			65
Computer Supply Storage	1			70
Office Supply Storage	1			100
Library and Reference Materials	1			85
Electronics Supply and Repair	1			45
Subtotal Net Square Footage				1,945
Plus Circulation				x 1.175
Subtotal				2,285
Plus 3% Contingency				70
TOTAL GROSS SQUARE FOOTAGE	11 staff			2,355

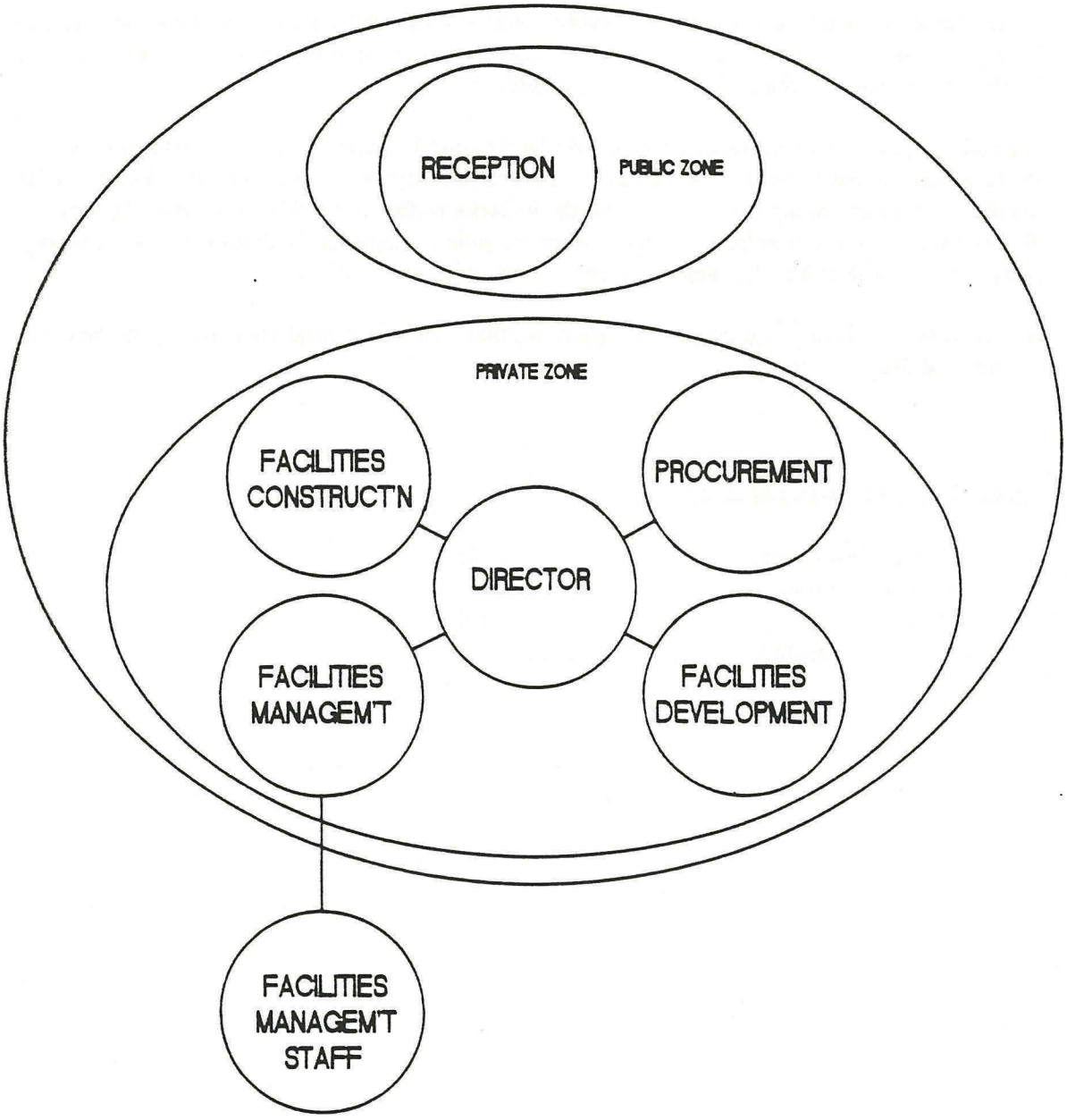
Department Data

Reception Area:	Not required, but willing to share reception with another department.
Relationships:	--Public access is not required. --Greatest need for proximity is to Accounting and Transportation. --Accounting also works frequently with Finance and Information Management, and Solid Waste and needs to be close to stairs, elevators, and freight elevator, if possible. --There is a preference that the Computer Room be on the highest floor level or where water damage will not be a problem.
Special Requirements:	To reduce cabling from I.S.'s mainframe computer to other Metro computers it may be desirable to locate all the computer equipment rooms above one another or within one zone in the building, preferably centralized.
Staff Adjacencies:	--Director and Secretary. --Applications Analysts and Programmer. --Operations Systems Analysts and Operator. --Network and PCs Analysts and Technical Specialist. --All the workstations require visual and/or acoustical separation, despite required proximities.
Common Use Furniture/Equipment:	--Two printers and a switch box need to be located in a common use area. --Bookshelves are needed for 30 current periodicals and one year's back issues in Library area. --Approximately eight linear feet of UNISYS reference manuals should be shelved near analysts and programmer. --Thirty linear feet of electronic parts and service supplies. Requires work bench located near Technical Specialist. --See Storage Requirements.
Common Use Furniture/ Equipment Proximities:	As noted. Information Systems currently uses a printer in Accounting.
Finishes:	--Metro standards: Carpet, painted walls, acoustic ceiling. --Computer Room requires non-flaking ceiling material. Access is required to ceiling space.

Department Data (cont.)

Storage Requirements:	--For departmental storage (100 s.f.) provide a lockable Storage Room with 24" deep heavy-duty shelving on three walls. --For computer supply storage (70 s.f.) provide lockable Storage Room with 12" deep shelving on two walls, adjacent to Computer Room. --Provide for a file area twice the size of existing lateral files (two at 42"w x 27"h) and vertical files (one at 17"w x 27"h).Lighting:--Full spectrum lighting. --Daylight is desirable in office/workstation areas.
Power:	Verify power requirements in all equipment areas.
HVAC:	--Normal in office areas. --Verify requirements in equipment areas.
Acoustics:	Quiet work areas.
Security:	--Lockable storage rooms required. --Computer Room security is also required.

REGIONAL FACILITIES DEPARTMENT



15. REGIONAL FACILITIES DEPARTMENT

Department Summary

Regional Facilities is organized into four divisions: Facilities Development, Facilities Construction, Procurement, and Facilities Management. Facilities Development, Facilities Construction, and Procurement desire a location away from public zones and near the Planning and Development and Transportation Departments. The majority of Facilities Management staff will be located elsewhere in the building to be closer to the staff's areas of responsibility.

A small reception area with seating for two will be required by Development, Construction, and Procurement. A public bulletin board shall be located in reception for Procurement. Because of the number of vendors visiting Procurement and the in-house traffic to the other two divisions, these three divisions will require proximity to a small conference room.. Regional Facilities is willing to share its reception area with either Planning and Development or Transportation.

It may be beneficial to group division file areas together into one central area along with the copier, printer, and fireproof storage.

Regional Facilities Area Summary

a.	Facilities Development	1,345
b.	Facilities Construction	390
c.	Procurement	530
d.	Facilities Management	425
TOTAL GROSS SQUARE FOOTAGE		2,690

A. FACILITIES DEVELOPMENT

Division Description

Facilities Development does not require public access or proximity to any other department. The development staff is primarily overseeing the planning and design of new Metro facilities. This division has requested proximity to the department reception area. The six Facilities Development staff members need to be close to one another but also desire acoustical separation between workstations.

Facilities Development requires a large common filing area to house existing four-drawer and lateral file cabinets and plan racks. A fireproof storage room will house original drawings stored in flat files. The department copy station should be adjacent to the filing areas.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Reception Area		(seating for 2)		70
Director	1	B	200	200
Program Manager	1	C	125	125
Senior Management Analyst	2	E	100	200
Assistant Management Analyst	1	E	100	100
Administrative Secretary	1	F	80	80
Central Filing Area/Plan Racks	1			150
Copier/PC/Printer Area	1			100
Fireproof Storage	1			75
Subtotal Net Square Footage				1,100
Plus Circulation				x1.175
Subtotal				1,295
Plus 4% Contingency				50
TOTAL GROSS SQUARE FOOTAGE	6 staff			1,345

FACILITIES DEVELOPMENT

Division Data

Reception Area:	Departmental reception area with seating for two.
Relationships:	--Public access is not required. --Facilities Development division works frequently with Procurement Division.
Staff Adjacencies:	--Except for the Department Director, all six workstations require proximity to one another. --Department Director to be adjacent to Facilities Construction and Procurement.
Common Use Furniture/Equipment:	--Three shelving units (3' w. x 1' d. x 7' h.). --See Storage Requirements.
Common Use Furniture/ Equipment Proximities:	--Shelving units. --Lateral files. --Four-drawer files and plan racks in file area. --Flat files in fireproof storage.
Finishes:	Metro standards: Carpet, painted walls, acoustic ceiling.
Storage Requirements:	--Filing: --8 lateral files (36" w. x 48" h.). --16 four-drawer files. --Plan racks. --Fireproof room with flat files.
Lighting:	--Full spectrum lighting. --Daylight desirable.
Power:	Normal office requirements.
HVAC:	Normal requirements.
Acoustics:	Acoustic separation between workstations.
Security:	Lockable personal storage.

B. FACILITIES CONSTRUCTION

Division Description

The Facilities Construction staff is responsible for construction observation and administration; therefore, the majority of time they will be working outside the Metro facility. This division does not require public access or adjacencies with other departments, but it may be desirable to locate Facilities Construction near a building entrance. The Regional Facilities Director should be in close proximity to this division, and Facilities Construction should be adjacent to Facilities Development.

The Construction Project Manager's primary office is at a construction site, but an office is still required within Metro. Space for plan files and plan racks should be convenient to the workstations of the Assistant Management Analyst and Management Intern.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Construction Project Manager	1	C	125	125
Assistant Management Analyst	1	E	100	100
Plan Files/Racks	1			100
Subtotal Net Square Footage				325
Plus Circulation				x1.175
Subtotal				380
Plus 2% Contingency				10
TOTAL GROSS SQUARE FOOTAGE	2 staff			390

FACILITIES CONSTRUCTION

Division Data

Reception Area:	Not required.
Relationships:	--Manager works off-site most of the time. --Construction Division close to Facilities Development Division.
Staff Adjacencies:	Department Director in close proximity to Facilities Construction Division.
Common Use Furniture/Equipment:	See Storage Requirements.
Common Use Furniture/ Equipment Proximities:	Plan files and plan racks near Manager, Analyst, and Intern.
Finishes:	Metro standards: Carpet, painted walls, acoustic ceiling.
Storage Requirements:	Filing: --Plan files. --Plan racks.
Lighting:	--Full spectrum lighting. --Task lighting. --Daylight desirable.
Power:	Normal office requirements.
HVAC:	Normal requirements.
Acoustics:	Normal requirements.
Security:	Lockable personal storage.

C. PROCUREMENT

Division Description

Procurement is frequently visited by vendors and other Metro staff and should be located close to the Regional Facilities reception area and a shared, small conference room. A public bulletin board should be located in the reception area. It is desirable to have Procurement near Facilities Development, and both near the Regional Facilities Director.

Procurement requires a small filing area adjacent to the Secretary's and Clerk's workstations.

Space/Staff Requirements

Title	Quantity	Workstation Type		Area
Procurement Officer	1	C	125	125
Senior Management Analyst	1	E	100	100
Administrative Secretary	1	F	80	80
Accounting Clerk I	1	F	80	80
Central Filing	1			50
Subtotal Net Square Footage				435
Plus Circulation				x1.175
Subtotal				510
Plus 4% Contingency				20
TOTAL GROSS SQUARE FOOTAGE	4 staff			530

PROCUREMENT

Division Data

Reception Area:	Not required.
Relationships:	--Adjacent to Regional Facilities reception area. --Close proximity to Facilities Development Division.
Staff Adjacencies:	Department Director in close proximity to Procurement Division.
Common Use Furniture/Equipment:	--Bulletin board in departmental reception area. --See Storage Requirements.
Common Use Furniture/ Equipment Proximities:	File area near Administrative Secretary's and Clerk's workstations.
Finishes:	Metro standards: Carpet, painted walls, acoustic ceiling.
Storage Requirements:	Lateral files.
Lighting:	--Full spectrum lighting. --Daylight desirable.
Power:	Normal office requirements.
HVAC:	Normal requirements.
Acoustics:	Acoustical separation of Procurement Officer.
Security:	Lockable personal storage.

D. FACILITIES MANAGEMENT

Division Description

The Facilities Management Division includes five staff members: two with work spaces located within the Regional Facilities department and three with workstations elsewhere.

The Facilities Manager's office and the Administrative Secretary should be located near the Regional Facilities reception area. The Building Worker and the Temporary Worker should have workstations located near Metro's General Storage and the loading dock. The Security Officer should have a station adjacent to the building's loading dock with a console housing camera monitors.

Space/Staff Requirements

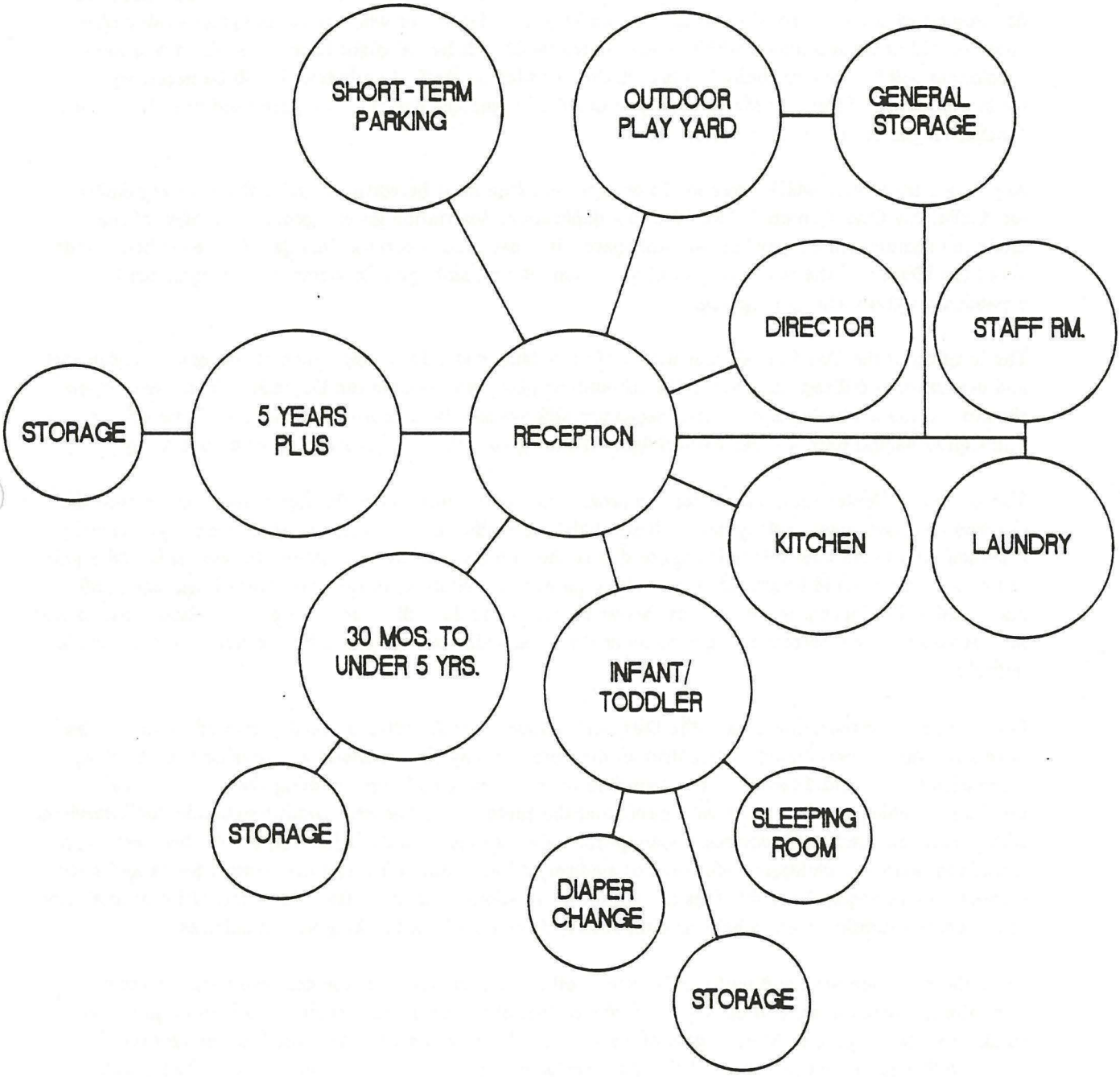
Title	Quantity	Workstation Type		Area
Facilities Manager	1	C	125	125
Building Worker	1	G	50	50
Temporary Worker	1	G	50	50
Secretary	1	F	80	80
Security Officer	1	G	50	50
Subtotal Net Square Footage				355
Plus Circulation				x1.175
Subtotal				417
Plus 2% Contingency				8
TOTAL GROSS SQUARE FOOTAGE	5 staff			425

FACILITIES MANAGEMENT

Division Data

Reception Area:	Not required.
Relationships:	Works with all Metro departments.
Staff Adjacencies:	--Facilities Manager close to Administrative Secretary. --Facilities Manager close to department reception area. --Building Worker and Temporary Worker close to General Storage and building loading dock. --Security Officer close to building loading dock.
Common Use Furniture/Equipment:	
Common Use Furniture/ Equipment Proximities:	
Finishes:	--Metro standards: Carpet, painted walls, acoustic ceiling. --Security Officer's station should be compatible with surrounding finishes.
Storage Requirements:	--Files. --Tool storage for Building Worker and Temporary Worker.
Lighting:	--Full spectrum lighting. --Task lighting as required. --Daylight desirable.
Power:	Normal office requirements.
HVAC:	Normal requirements.
Acoustics:	Normal requirements.
Security:	--Lockable personal storage. --Lockable tool storage. --Video monitors required at Security Officer's station.

DAY CARE


SHORT-TERM PARKING
OUTDOOR PLAY YARD
GENERAL STORAGE
DIRECTOR
STAFF RM.
STORAGE
5 YEARS PLUS
RECEPTION
KITCHEN
LAUNDRY
30 MOS. TO UNDER 5 YRS.
INFANT/ TODDLER
STORAGE
SLEEPING ROOM
DIAPER CHANGE
STORAGE

16. DAY CARE

Department Description

Metro has stated that one of their goals is an on-site Day Care Center. At this writing it had not been determined whether Metro will manage its own Day Care Center or whether an independent day care operator will become a tenant within a new Metro facility. It had also not been determined whether enrollment will be open or limited to the children of Metro's staff. In addition, it will be necessary to verify the zoning of the new Metro facility to determine whether day care is a permitted use. If it is not, a conditional use permit must be obtained.

Any Day Care Center which cares for 13 or more children must be certified under the state regulations for "Child Day Care Centers." The following department description gives a general overview of the minimum requirements regarding physical space. It is assumed that once final decisions have been made about the identity of the day care operator, enrollment size, and age mix, a revised and significantly expanded program will be prepared.

The location of the Day Care Center within Metro's facility should be one which allows convenient arrival and departure and direct access to a fenced outdoor play yard. Should the Day Care Center have open enrollment, the convenience of arrival/departure and availability of short-term parking will be critical. The Center should have a lot of natural light. Tinted glass will be required in all exterior glazing.

The Day Care Center requires a reception area. This room functions as the foyer which opens onto the children's age-separated activity areas. It is a hub where children, parents, and staff come together daily. It should be a warm and welcoming space that is cheerful but uncluttered. A comfortable sofa and a pair of lounge chairs should be provided for waiting parents or children. A view outdoors is desirable, and doors and walls adjacent to building entries or corridors should include areas of glass to allow views in and out. A tackable wall surface is required on at least one wall. Storage space for strollers and car seats is desirable.

Opening onto the reception area is the Director's Office. The Director is the day care administrator and in centers with an enrollment of less than 40 the Director may also be the Head Teacher with teaching responsibilities. Head Teachers are responsible for developing and implementing the programs and activities for children of all age levels enrolled at the center. The Director conducts confidential interviews with parents and staff and requires a soundproof room. In his or her administrative role there are many records to maintain--children's information, medical and personnel files, and operational forms and state records requirements. Lockable files are required. In addition, it is advisable that this office have a view of the entry/reception area to help monitor who is dropping off and picking up the children.

From the reception area and past the Director's office, one should enter the children's activity areas. According to regulations, a minimum of 35 square feet of usable indoor activity area is to be provided per child. For the purpose of Metro's goal of a model child care center, the area used in this program is based on 50 square feet per child. This figure excludes kitchens, hallways, toilet rooms, offices, staff rooms, storage, and isolation areas.

Department Description (cont.)

The activity area for the children must be divided according to age group and staff-child ratios. Infants six weeks and older and toddlers up to 30 months can be grouped together, with a minimum ratio of one staff member per four children and a maximum of eight infants/toddlers per group. Children between the ages of 30 months and five years require a minimum of one staff member per ten children and a maximum of 20 children per group. Children five years and older require one staff member per 15 children, with a maximum of 30 children per group.

For the purpose of this space plan, the following assumptions were made:

Group One and Two: Infants/Toddlers:	13 children/4 staff	13 x 50	=	650 nsf
Group Three: 30 months to under 5 years:	8 children/1 staff	8 x 50	=	400 nsf
Group Four: 5 years and older	6 children/1 staff	6 x 50	=	300 nsf
Totals	27 children/6 staff*		=	1,350 nsf

* As the age mix changes, the number of staff required will vary.

Groups One and Two (infants and toddlers) require two activity areas totalling 650 nsf. Children must be provided the opportunity to move freely by creeping and crawling in a warm, open, uncluttered area, as well as have space for playpens, high chairs, toys, play equipment, toddler arts and crafts, projects, and room for toddlers to run and climb. Each activity area must have at least one comfortable chair or sofa to sit in while feeding infants. In addition to the activity area is a sleeping area with one crib per child, spaced at least two feet apart. The area requires sound and light control, and space for a rocking chair is desirable.

For every group of infants/toddlers, a day care center must provide a diaper changing area with bathing facilities. The diaper changing area includes a changing table with a washable surface, a handwashing sink, and a method of disposing of or cleansing the diapers. To bathe the children, a tub, bathinette, or shallow sink is required. Foot-operated controls for the sink/tub are desirable. It is also important to provide storage for each child's diaper bag above or below the changing table and an area for charts and record-keeping. The Changing Table design and location should allow the staff person changing diapers to have a complete view of the activity area.

Toddlers must be provided with one toilet, and a training seat or child-size toilet for every eight toddlers. This should be located adjacent to the diaper changing area for the convenience of the staff monitoring the other children.

Department Description (cont.)

Group Two (ages 30 months to five years) needs an activity area which includes opportunities for arts and crafts, dramatic play, fine and gross motor development, music and movement, sensory play, quiet play, and a nap or rest period. It shall be acoustically and physically separated (with movable or permanent dividers) from the infant/toddler activity area. Quiet play areas and nap areas should have physical separation from gross motor development areas--again, either movable or fixed partitions. Children will nap on cots or mats which must be spaced at least two feet apart; and storage must be provided for the cots or mats when not in use. A work counter with a sink and storage above and below should be provided for the arts and crafts project area. Wall area for storage of large rolls of art paper is desirable.

This age group requires one toilet for every 15 children. The toilet rooms should be located adjacent to the group activity area.

Group Three (ages five years up to age 13) requires similar opportunities and facilities as Group Two. Toilet rooms for school age children require privacy and may be located outside the immediate activity area. An isolation area must be provide for children who become ill and need a quiet place to rest or wait for parents to pick them up. The child in the isolation area must be visible and audible to a staff member.

In general, the detailing of counters, tables, partitions, and furniture should be rounded or bull-nosed. Sharp corners or edges should be avoided wherever possible for safety of the children.

A staff work area is programmed for each group. It should include a desk or work surface, lockable personal storage, two 2-drawer file cabinets, and overhead shelving. It is intended as a planning and preparation area and as a place to confer with parents away from (but with a view of) the activity area.

A separate kitchen should be provided for dishwashing, storage, and preparation of food. Health Department regulations include smooth, washable, easy to clean wall and floor finishes. Food service equipment, utensils, and food-contact surfaces must be easy to clean, durable, nontoxic, and nonabsorbent. The kitchen shall include a handwashing sink, food preparation sink, at least one refrigerator (with a visible temperature gauge), and a commercial dishwasher. Children are not allowed in the kitchen except during supervised learning activities. A laundry area will be required with separated clean and soiled linen storage nearby.

A sound isolated Staff Room is required.away from the children's area. It should contain a table with seating for four, a counter area with sink, undercounter refrigerator, microwave, coffee maker, and storage above and below. It should be a bright and inviting room, and daylight is required. A barrier-free Staff Toilet Room is required adjacent to the Staff Room.

The Day Care Center will require storage in each of the activity areas for toys and supplies, as well as a central storage area for general supplies. An area of 300 s.f. has been allocated, which should serve all these needs.

Safe access to an outdoor play yard is required. There shall be at least 75 square feet of outdoor space for each child using the area at one time. In centers where groups of children are scheduled at different times for outdoor play, there shall be 75 s.f. times one-third of the center's capacity, if permitted by local zoning regulations.

Department Description (cont.)

The outside activity area shall be suitably surfaced and well drained, and shall be equipped with age-appropriate activities for gross motor development. It is required that the play yard of a center serving children under five years of age be enclosed by a barrier (fence, wall, or building) at least three feet high. A portion of the outdoor play area should be covered.

Space/Staff Requirements

Space Name	Area
Reception Area	100
Director's Office	125
Children's Activity Areas (27 children x 50 s.f.)	1,350
Infant/Toddler Sleeping Room (2)	560
Diaper Changing Area (2)	110
Children's Toilet Rooms (3)	120
Isolation Area	55
Staff Work Area (80 s.f. per group x 4)	320
Kitchen	100
Laundry Area/Linen Storage	55
Staff Room	200
Staff Toilet Room	40
Storage	300
Outdoor Play Yard (1/3 x 27) x 75	(670)*
Subtotal n.s.f.	3,435
Plus Circulation	x 1.175
TOTAL GROSS SQUARE FOOTAGE	4,035

* Outdoor play yard not included in total area.

Division Data

Character:	Warm, inviting, stimulating children's environment.
Reception Area:	--Views to exterior and/or building corridor required. --Comfortable seating for four to six. --Storage for strollers and car seats.
Relationships:	--Location to provide convenient arrival and departure. --Short-term parking will be required. --Safe access to outdoor play yard required. --Diaper changing area with view of activity area.
Staff Adjacencies:	--Director's Office requires view of entry/reception area. --Staff work area with view of children's activity area. --Staff toilet room adjacent to Staff Room.
Finishes:	--Reception Area, Activity Areas: Carpet and/or vinyl flooring, painted walls, tackable wall panels and bulletin boards, acoustic ceiling. --Diaper Changing Areas, Toilet Rooms, Kitchen and Laundry Areas: Vinyl flooring, washable walls, plastic or stainless steel countertops, gypsum board ceilings. --Director's Office, Sleeping Rooms, Isolation Area, Staff Room: Carpet, painted walls, acoustic ceiling.
Casework:	--Diaper Changing Areas and Bathing Areas: Counters and cabinet storage. --Arts and Crafts Areas: Work counter and cabinet storage. --Kitchen: Cabinet storage --Staff Room: Counter and cabinet storage.
Storage Requirements:	--Files in Director's office and Staff Work Area. --Cabinet storage (see Casework). --Storage closets in each Activity Area. --General Storage Room. --Separate clean and soiled linen storage in Laundry Area.
Lighting:	--Full spectrum lighting. --Infant/Toddler Sleeping Rooms, Isolation Area require incandescent lighting. --All Activity Areas and Staff Room require daylight. --All exterior glazing to be tinted.
Power:	All unused power outlets must be securely covered.
HVAC:	A temperature of 68 degrees must be maintained when children are present.

Division Data (cont.)

Plumbing:	--Sink at arts and crafts counter in Activity Areas --Handwashing sink, and tub or bathing sink at Diaper Changing Areas. Foot controls desirable. --One child-size toilet and sink at three Children's Toilet Rooms. --Handwashing sink, food preparation sink, and commercial dishwasher at Kitchen. --Laundry tub and washer at Laundry. --Sink and coffee maker at Staff Room. --Toilet and sink at Staff Toilet Room. --Exterior water source at Outdoor Play Yard.
Acoustics:	--Sound isolation for Director's Office, Infant/Toddler Sleeping Rooms, and Staff Room. --Sound separation between Activity Areas.
Security:	--Visual control of entry required. --Lockable personal storage. --Lockable Director's Office.

17. BUILDING SERVICES AREAS

Room Description

The Building Services Areas consist of the Recycling Room and Telephone Room.

The Recycling Room should be located near the building loading dock and freight elevator. This 400 s.f. space is the primary depository and interim storage area for recyclables generated in the Metro facility.

In addition, an enclosed area of 100 s.f. should be located on each floor near the freight elevator for the collection of recyclables. Also included as apart of every workstation is approximately 4 s.f. for recycling boxes.

The Telephone Room location may need to be near Public Affairs' Recycling Information Center or in a central location for efficient wiring capability.

Space/Staff Requirements

Space Name	Quantity	Area
Central Recycling Room	1	400
Recycling Storage Rooms	2 @ 100	200
Telephone Room	1	215
Subtotal Net Square Feet		815
Plus Circulation		x 1.10
TOTAL GROSS SQUARE FEET		900

RECYCLING ROOM

Room Data

Quantity:	1 @ 400 2 @ 100
Net Square Feet:	600
Adjacencies:	--Central Recycling Room near loading dock and freight elevator. --Recycling Storage Rooms needs to be one per floor, near the freight elevator.
Finishes:	Sealed concrete floors, painted walls, unfinished ceiling.
Storage Requirements:	Verify the size of storage containers required to hold the following: --White paper. --Computer paper. --Colored paper. --Newspaper. --Scrap paper. --Other recyclables, as required.
Lighting:	Artificial lighting on individual control.
Power:	As required.
HVAC:	As required.
Acoustics:	No separation required.
Security:	Not required.

TELEPHONE ROOM

Room Data

Quantity:	1
Net Square Feet:	215
Adjacencies:	May need to be near Public Affairs Recycling Information Center.
Finishes:	Unfinished space.
Lighting:	Artificial lighting on individual control.
Power:	As required.
HVAC:	As required for equipment room.
Acoustics:	Acoustic separation desirable.
Security:	Controlled access.

18. GENERAL STORAGE

Department Description

Metro will have an on-site area for departmental general storage. Surplus departmental office supplies, furniture and equipment, records and files, etc. will be stored in this area. Close proximity to the freight elevator or loading dock is required. Each department will have its own secured storage space within General Storage.

Departments such as Executive Management, Council Staff, the Office of Government Relations, the Legal Department, Public Affairs Staff, the Personnel Department, Planning and Development, the Solid Waste Department, MERC, Finance and Accounting will need to store records and files. The Regional Facilities and Transportation departments will require flat file storage, as well as record and file storage. Public Affairs Waste Reduction Education Division needs storage space near the loading dock for their bulkier presentation materials. Public Affairs Recycling Information Center requires storage of pamphlets/handouts (10 boxes, 12 s.f.) and recycling boxes (100 s.f.). Both the W.R.E. and R.I.C. storage needs are expected to double in size within five years. Day Care will need storage space for outdoor toys and equipment. Building Services will need to store building supplies.

Depending upon the individual department's storage needs, 12" and/or 24" deep heavy-duty shelving units will be mounted on two or three walls of the storage unit. The typical archive storage box is a 1' x 1' cubic box. Therefore, for records storage, the shelf heights are to be one box high to eliminate the stacking of boxes on top of each other. Other departments may require flat files within the storage unit and some will store pallets of paper.

Heating and ventilating is necessary as well as a sprinkler system and fire separation. In areas with large amounts of paper storage, humidity control is required.

METRO PROGRAM
GENERAL STORAGE

Space Allocations			Area
1.	Shared Spaces		N/A
2.	Executive Management		50
3.	Council Staff		50
4.	Office of Government Relations		50
5.	Legal Department		50
6.	Public Affairs:		430
	a. Public Affairs Staff	50	
	b. Graphics	N/A	
	c. Waste Reduction Education	180 *	
	d. Recycling Information Center	200	
	e. Audiovisual Storage Room	N/A	
7.	Personnel Department		100
8.	Transportation Department		75
9.	Planning and Development		75
10.	Solid Waste		75
11.	Metropolitan Exposition Recreation Commission (MERC)		50
12.	Finance and Information Management		500
13.	Accounting Department		500
14.	Data Processing		N/A
15.	Regional Facilities		75
16.	Day Care (outdoor equipment storage)		50
17.	Building Services		100
Subtotal Net Square Footage			2,230
Plus Circulation			x 1.10
TOTAL GENERAL STORAGE			**2,450**

* Near loading dock.

Space Data

Net Square Feet:	2,230
Relationship:	Close proximity to freight elevator or loading dock.
Furniture/Equipment:	--Industrial shelving 12" d. --Industrial shelving 24" d.
Finishes:	Sealed concrete floors and walls, exposed ceiling.
Lighting:	--Artificial lighting. --Each storage locker on individual control.
HVAC:	Normal requirements.
Security:	--Controlled access to each departmental storage locker. --Controlled access to General Storage room.

19. ARCHIVE

To be located off site.

90043\newprog.bkt

PROJECT TEAM

METRO

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LinaBeth Barber, Architect
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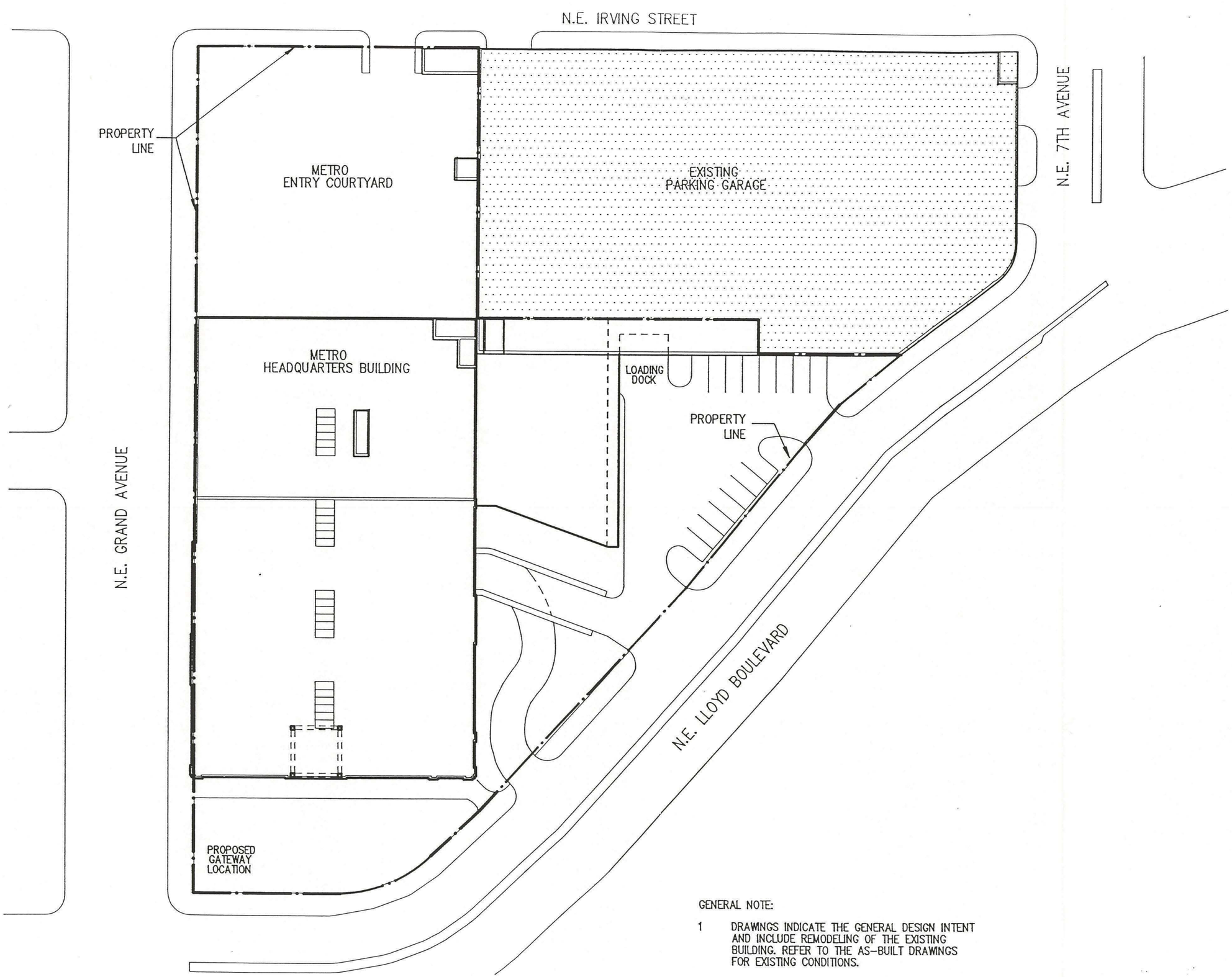
APPENDIX B.

Concept Design Drawings - Sheets 1-7



GENERAL NOTE:

1 DRAWINGS INDICATE THE GENERAL DESIGN INTENT AND INCLUDE REMODELING OF THE EXISTING BUILDING. REFER TO THE AS-BUILT DRAWINGS FOR EXISTING CONDITIONS.

METRO HEADQUARTERS PROJECT

CONCEPT DRAWINGS

SITE PLAN

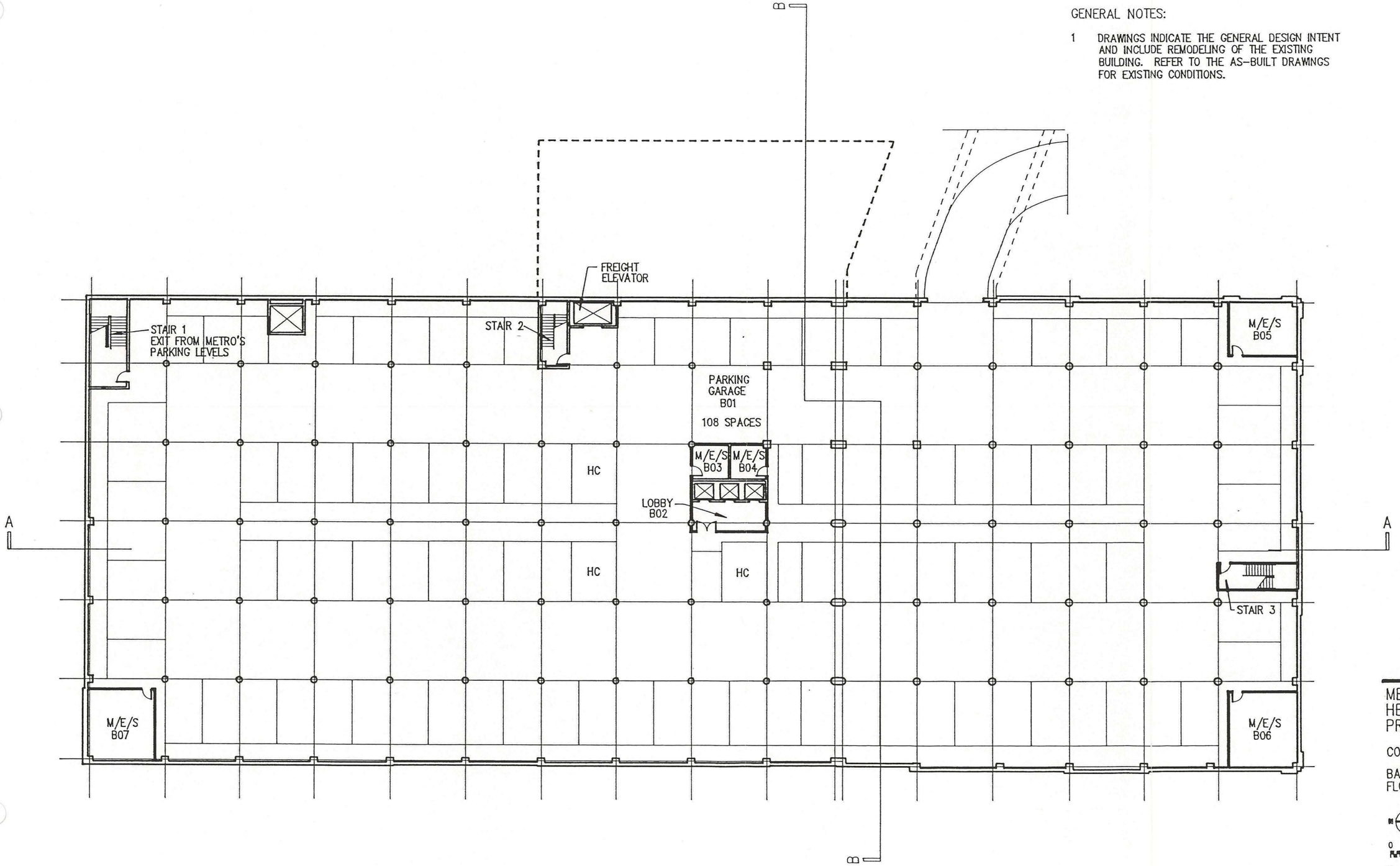
0 10' 20' 30' 50'

Date: Oct. 11, 1991

Sheet 1

GENERAL NOTES:

1 DRAWINGS INDICATE THE GENERAL DESIGN INTENT AND INCLUDE REMODELING OF THE EXISTING BUILDING. REFER TO THE AS-BUILT DRAWINGS FOR EXISTING CONDITIONS.



METRO HEADQUARTERS PROJECT

CONCEPT DRAWINGS

BASEMENT LEVEL FLOOR PLAN

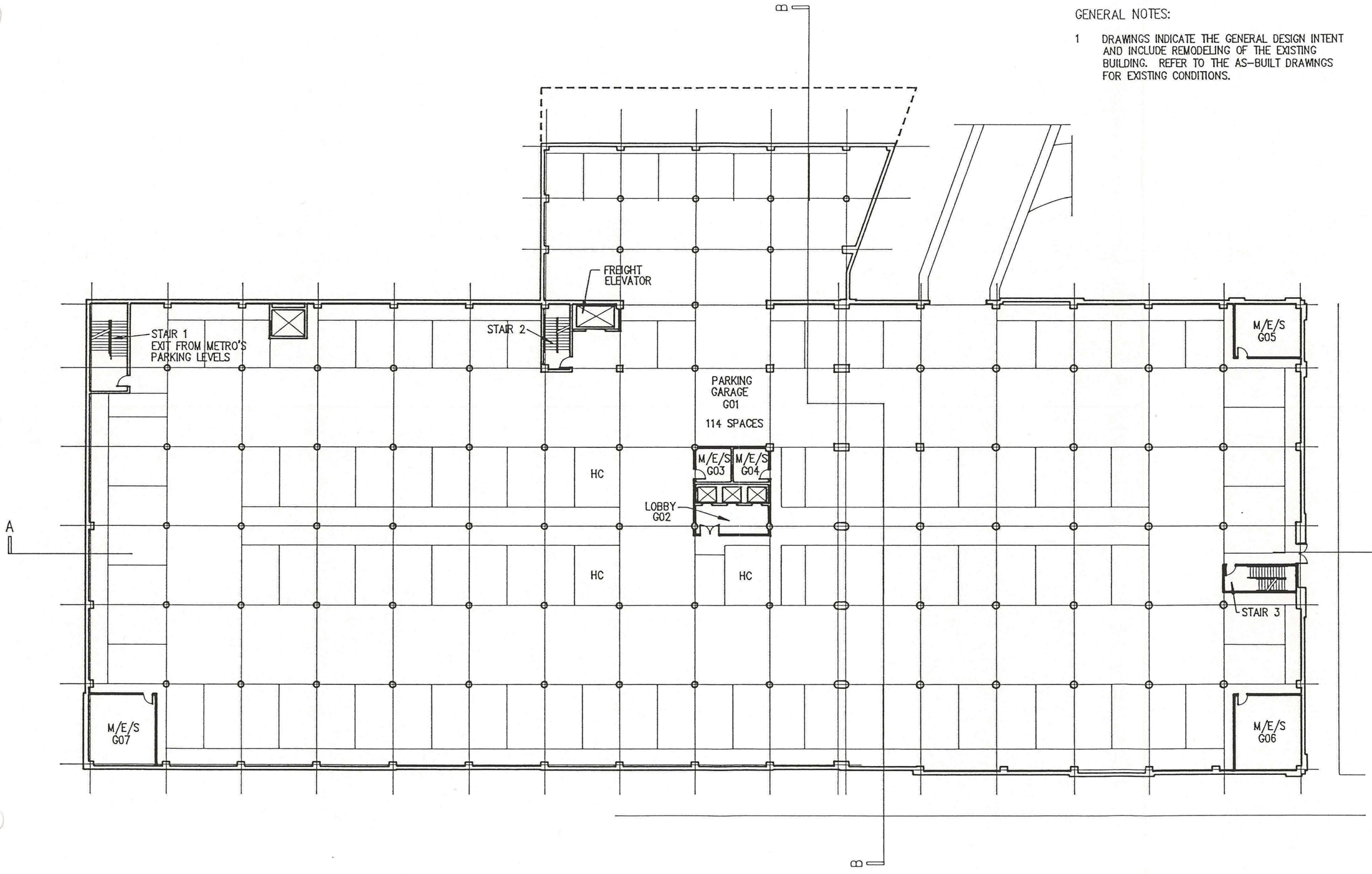
0 5' 10' 15' 30'

Date: Oct. 11, 1991

Sheet 2

GENERAL NOTES:

1 DRAWINGS INDICATE THE GENERAL DESIGN INTENT AND INCLUDE REMODELING OF THE EXISTING BUILDING. REFER TO THE AS-BUILT DRAWINGS FOR EXISTING CONDITIONS.



METRO HEADQUARTERS PROJECT

CONCEPT DRAWINGS

GRAND AVEMUE LEVEL FLOOR PLAN

0 5' 10' 15' 30'

Date: Oct. 11, 1991

Sheet 3

N.E. IRVING STREET

EXISTING
PARKING GARAGE

LOADING
DOCK

LOADING/
BUILDING SERVICE
108

(3) PARKING GARAGE
ELEVATOR

PARKING GARAGE
EXIT STAIR

(2)

STAIR 1

EXIT FROM PARKING
GARAGE (MAY BE REMOVED
ABOVE THIS LEVEL)

EXIT FROM METRO'S
PARKING LEVELS
TO REMAIN

STAIR 2

JAN. RM.
111

CORR. 104

METRO OFFICE SPACE
107

TOILET ROOMS
106

105

CORRIDOR 103

METRO OFFICE SPACE
109

A

METRO ENTRY
COURTYARD

LOBBY
101

STAIR 4

CORRIDOR
102

OPEN ABOVE

STAIR 3

METRO OFFICE SPACE
110

A

B

B

N.E. GRAND AVENUE

GENERAL NOTES:

1 DRAWINGS INDICATE THE GENERAL DESIGN INTENT AND INCLUDE REMODELING OF THE EXISTING BUILDING. REFER TO THE AS-BUILT DRAWINGS FOR EXISTING CONDITIONS.

2 STAIR TOWER MAY BE REMOVED ABOVE THE IRVING STREET EXIT LEVEL. TO MAINTAIN ITS CURRENT HEIGHT THE DESIGN-BUILD PROPOSAL MUST INCLUDE ANY NECESSARY STRUCTURAL UPGRADE AND RECLADDING WHICH INTEGRATES IT INTO THE METRO BUILDING EXTERIOR DESIGN.

3 THE ELEVATOR TOWER IS TO REMAIN. THE DESIGN-BUILD PROPOSAL MUST INCLUDE ANY NECESSARY STRUCTURAL UPGRADE AND RECLADDING WHICH INTEGRATES IT INTO THE METRO BUILDING EXTERIOR DESIGN

METRO
HEADQUARTERS
PROJECT

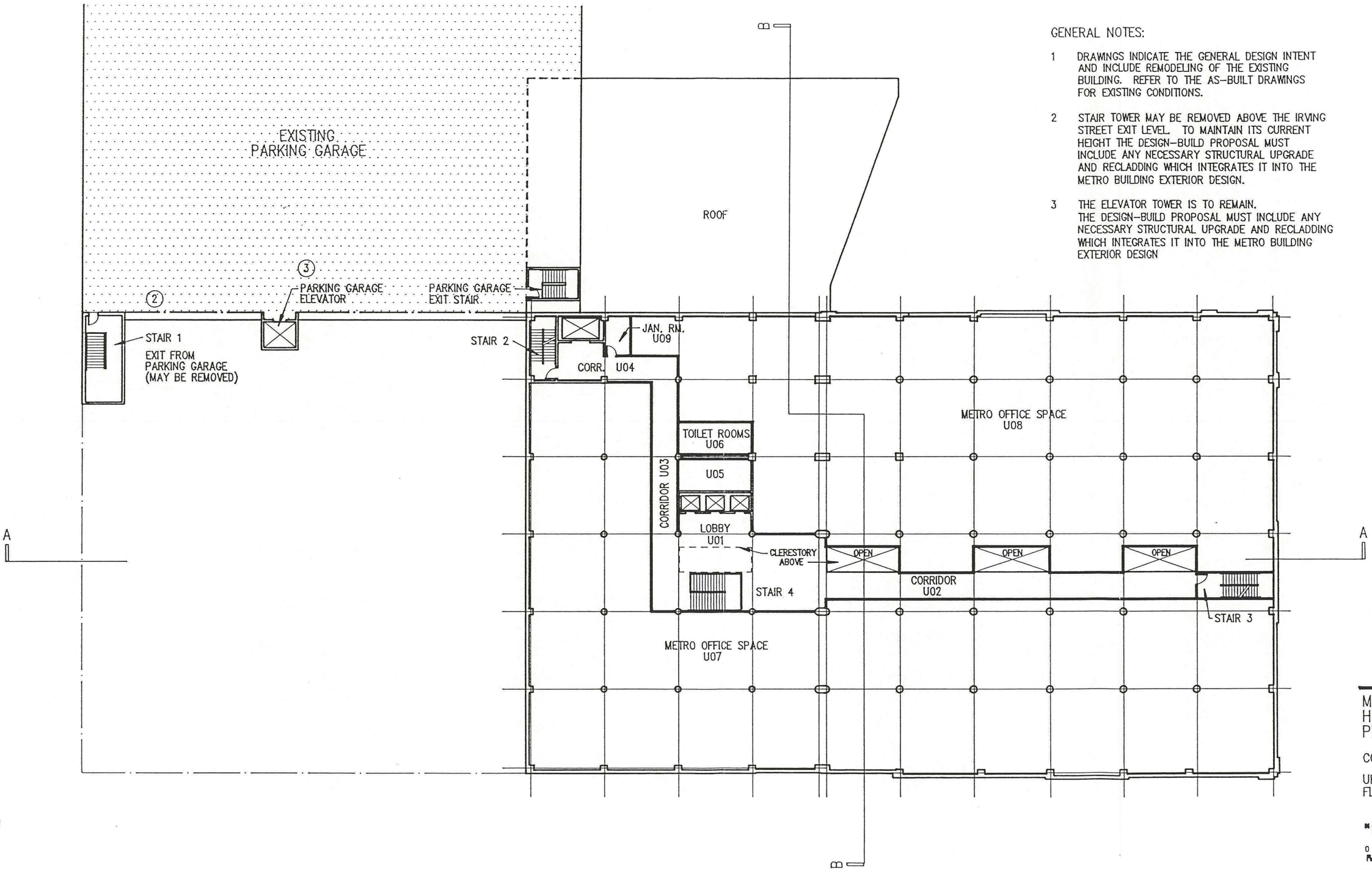
CONCEPT DRAWINGS

IRVING STREET LEVEL
FLOOR PLAN

0 5' 10' 15' 30'

Date: Oct. 11, 1991

Sheet 4



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METRO
HEADQUARTERS
PROJECT

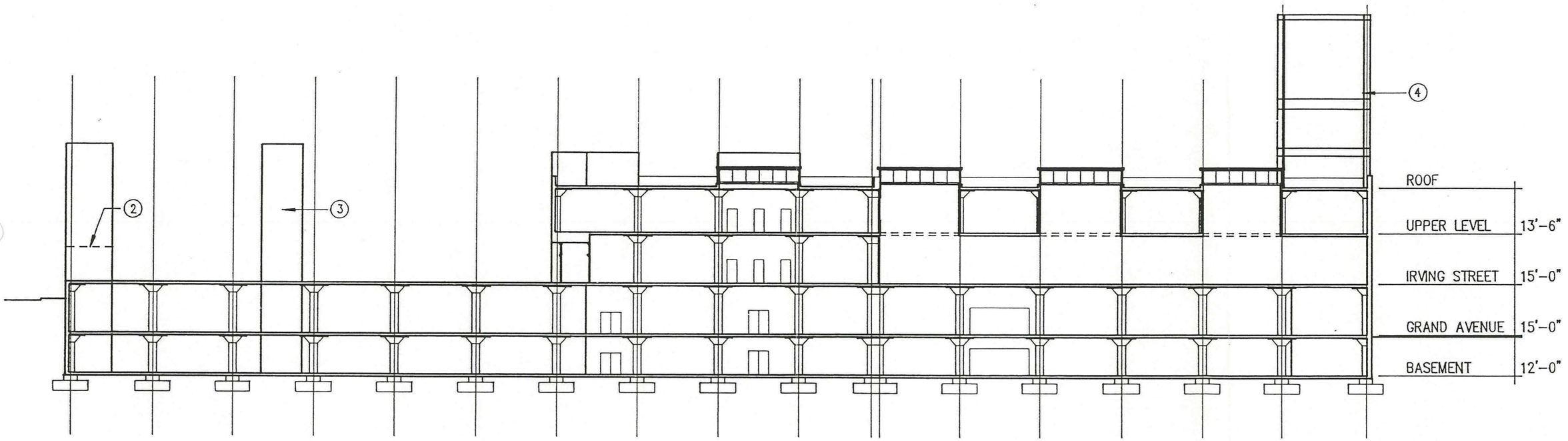
CONCEPT DRAWINGS

UPPER LEVEL
FLOOR PLAN

0 5' 10' 15' 30'

Date: Oct. 11, 1991

Sheet 5



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3 THE ELEVATOR TOWER IS TO REMAIN. THE DESIGN-BUILD PROPOSAL MUST INCLUDE ANY NECESSARY STRUCTURAL UPGRADE AND RECLADDING WHICH INTEGRATES IT INTO THE METRO BUILDING EXTERIOR DESIGN

4 EXISTING STRUCTURAL FRAME OF TOWER. DESIGNER-BUILDER TO PROPOSE SPECIFIC DESIGN FOR RE-USE OR REMOVAL.

METRO HEADQUARTERS PROJECT

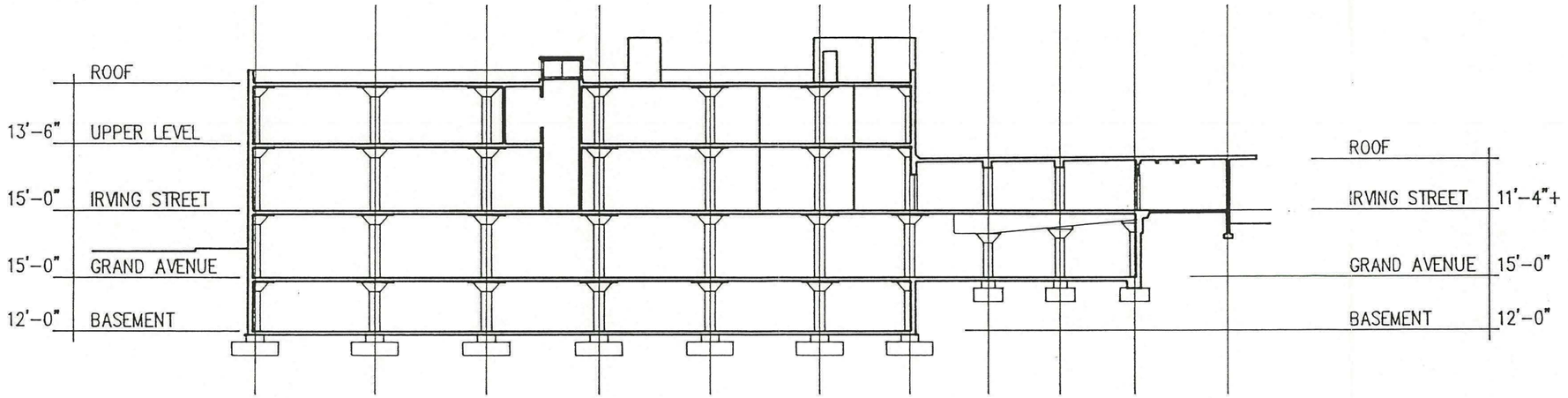
CONCEPT DRAWINGS

NORTH-SOUTH SECTION

0 5' 10' 15' 30'

Date: Oct. 11, 1991

Sheet 6



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METRO
HEADQUARTERS
PROJECT

CONCEPT DRAWINGS

EAST-WEST SECTION

0 5' 10' 15' 30'

Date: Oct. 11, 1991

Sheet 7

APPENDIX C.

Mechanical & Electrical Design/Build Specifications

METRO HEADQUARTERS

MECHANICAL & ELECTRICAL DESIGN-BUILD SPECIFICATIONS

OCTOBER 11, 1991

Prepared By:

GLUMAC & ASSOCIATES, INC.
920 S. W. 3rd Avenue
Portland, OR 97204
(503) 227-5280

MECHANICAL GENERAL

PART 1 - GENERAL

1.1 WORK INCLUDED

A. All work under this Section shall comply with the requirements of Division 1, and shall include all Mechanical Sections specified herein.

1.2 SCOPE

A. These specifications are intended to call for and provide that all material and labor be furnished to design and install complete base building plumbing, heating, ventilating, air conditioning and fire protection systems for the building. Contractor shall refer to the Narrative Description of the work involved. These specifications are provided to clarify the quality of materials and coordination between trades.

B. THE CONTRACTOR SHALL UTILIZE THESE SPECIFICATIONS AND THE ACCOMPANYING PROGRAM IN DESIGNING AND CONSTRUCTING COMPLETE AND FULLY OPERATIONAL MECHANICAL SYSTEMS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. ALL ROOFTOP AIR CONDITIONING UNITS, MEDIUM PRESSURE SUPPLY AND RETURN, TERMINAL UNITS, DDC CONTROLS AND EMS FOR A FULLY OPERABLE SYSTEM.

2. ALL LOW PRESSURE DUCTWORK AND REGISTERS DOWNSTREAM OF TERMINAL UNITS FOR THE BUILDING PERIMETER, PUBLIC HALLWAYS AND CORE. TEST AND AIR BALANCE THE ENTIRE SYSTEM. LOW DUCTWORK FOR INTERIOR SPACES SHALL BE PROVIDED UNDER TENANT IMPROVEMENT. EXHAUST ELECTRICAL ROOM.

3. COMPLETE TOILET EXHAUST SYSTEMS, INCLUDING LOW PRESSURE DUCTWORK REGISTERS AND BALANCING.

4. A COMPLETE GARAGE VENTILATION SYSTEM INCUDING EXHAUST DUCTWORK, EXHAUST FANS, SOUND ATTENUATION AND C.O. MONITORING.

5. A COMPLETE AND FULLY OPERABLE PLUMBING SYSTEM, INCLUDING ALL PLUMBING FIXTURES, DRAINS, ROOF AND DECK DRAINAGE, WATER HEATERS AND ALL NECESSARY WASTE, VENT, WATER, STORM AND NATURAL GAS PIPING.

REFER TO THE ARCHITECTURAL PROGRAM FOR QUANTITY AND LOCATION OF PLUMBING FIXTURES AND DRAINS.

6. PROVIDE A COMPLETE DRAINAGE SYSTEM FOR THE PARKING GARAGE, INCLUDING FLOOR DRAINS SERVING AN AREA NOT EXCEEDING 15,000 SQ. FT., SAND/OIL INTERCEPTOR, AND SUMP PUMP IF REQUIRED.

7. COMPLETE AND FULLY OPERABLE FIRE PROTECTION SYSTEMS, INCLUDING DRY STANDPIPES, WET SPRINKLER, ALARMS, VALVES, PIPING, FIREMAN'S CONNECTION, AND DOWN HEADS INSTALLED THROUGHOUT THE BUILDING. SPRINKLER HEADS WILL BE CENTERED IN THE CEILING TILE AND FINISHED COMPLETE UNDER TENANT IMPROVEMENT.

C. CONTRACTOR SHALL SUBMIT DRAWINGS, SPECIFICATIONS, AND CALCULATIONS TO THE PROJECT MANAGER FOR REVIEW. ALL DRAWINGS, SPECIFICATIONS AND CALCULATIONS SHALL BE STAMPED BY A REGISTERED MECHANICAL ENGINEER. DRAWINGS SHALL BE APPROVED BY THE PROJECT MANAGER IN WRITING PRIOR TO COMMENCING WITH WORK.

D. THE CONTRACTOR, IN SUBMITTING HIS BID, CERTIFIES THAT THE FINAL DESIGN AND INSTALLATION OF THE MECHANICAL SYSTEMS ADHERE TO THE REQUIREMENTS SET FORTH IN THESE SPECIFICATIONS, SHALL BE IN ACCORDANCE WITH ALL APPLICABLE CODES AND ORDINANCES, AND SHALL BE INSTALLED AND OPERABLE AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL PROVIDE A SYSTEM THAT MINIMIZES THE DISTURBANCE OF THE CONSTRUCTION AS PLANNED.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Division 2 - Site Work: Coordination of excavation of trenches and the installation of mechanical items on site.

B. Division 3 - Concrete is related to provisions for:

1. Concrete Curbs, housekeeping pads for the mechanical equipment.

2. Thrust blocks, pads, boxes for mechanical equipment.

3. All concrete work for mechanical section shall be included in Division 3. Division 15 shall be responsible for detailing and proper coordination of equipment pad and curb sizing.

C. Division 9 - Painting: Painting of all exposed steel, piping, ductwork, insulation, equipment and materials.

D. Division 16 - Electrical is related to work of:

1. Fire Protection alarms and relays.

2. Smoke detectors monitoring.

3. Power connections to all mechanical equipment.

4. Life safety provisions.

1.4 PERMITS AND INSPECTIONS

A. Procure and pay for all licenses, permits, fees and inspections.

1.5 CODES AND STANDARDS

A. All work shall be in full accordance with all codes, ordinances and code rulings.

B. The Contractor shall furnish without any extra charge the labor and material required for the compliance of codes.

C. Perform all tests required by governing authorities.

D. Electrical devices and wiring shall conform to the latest standards of NEC; all devices shall be UL listed and so identified.

E. Provide all work in accordance with rules and regulations of the following:

1. City of Portland, Oregon -
2. Multnomah County, Oregon -
3. Governing fire marshal's office -
4. Uniform Building Codes, 1988 Edition (with State of Oregon Amendments) - UBC
5. National Electric Code - NEC
6. National Fire Protection Association - NFPA

F. Provide in accordance with appropriate referenced standards of the following:

1.	Air Moving and Conditioning Association	- AMCA
2.	American National Standards Institute	- ANSI
3.	Air Conditioning and Refrigeration Institute	- ARI
4.	American Gas Association	- AGA
5.	American Society of Heating, Refrigerating & Air Conditioning Engineers, Inc.	- ASHRAE
6.	American Society of Mechanical Engineers	- ASME
7.	American Society for Testing Materials	- ASTM
8.	American Water Works Association	- AWWA
9.	American Welding Society	- AWS
10.	Associated Air Balance Council	- AABC
11.	Manufacturer's Standardization Society	- MSS
12.	National Electrical Manufacturer's Association	- NEMA
13.	Factory Mutual	- FM
14.	Sheet Metal and Air Conditioning Contractors National Association	- SMACNA
15.	Underwriter's Laboratories, Inc.	- UL

1.6 PLUMBING DESIGN CRITERIA

Design a fully operable plumbing system in accordance with the governing codes and the following criteria.

A. Maximum domestic water velocity is 6 FPS.

B. Size waste, vent, and domestic water in accordance with UPC.

C. Size water heater in accordance with ASHRAE and ASPE recommenda-tions.

1.7 HVAC DESIGN CRITERIA

A. Indoor Summer Design: 75° F, 50% RH.

B. Indoor Winter Design: 70° F, 50% RH.

C. Outdoor Summer Design: 90° F db/68° F wb.

D. Outdoor Winter Design: 17° F.

E. Lights at 2W/sq. ft. and power at 1 W/sq. ft. and as specified by Project Manager. Verify load calculations upon final submission of power and lighting loads.

F. Size low pressure ductwork using equal friction method at .08-inch WG loss/100-feet.

G. Size medium pressure ductwork using velocity method or static regain. Maximum velocity shall not exceed 2000 FPM.

H. Prepare load calculations in accordance with ASHRAE fundamentals, Trane or Carrier computer load programs. Submit calculations to Project Manager for review including design assumption.

I. Number of people as specified in program. Block load sizing based on 1 person/150 sq. ft.

J. Provide exhaust for the toilet rooms at the minimum rate of 10 air changes per hour. Provide provisions for accommodating exhaust of Printing Room at 10 air changes per hour. Exhaust electrical rooms and elevator equipment room to maintain maximum 95° F room temperature.

K. Select diffusers for NC-30 Office, NC35 Lobby/Public Areas with air distribution that will result in air velocities which do not exceed 50 FPM in the occupied zone.

L. Rooftop air conditioning units shall be sized to provide no less than 0.9 CFM/sq. ft. of net usable area. NO EXCEPTIONS. Net usable area shall be defined as gross area less enclosed stairwells, shafts, and elevations.

M. OBTAIN APPROVAL FROM STRUCTURAL ENGINEER, IN WRITING, FOR AC UNIT LOCATIONS, NO EXCEPTIONS.

N. OBTAIN FINAL EQUIPMENT MATRIX AND DESIGN CRITERIA FROM OWNER/PROJECT MANAGER IN WRITING PRIOR TO COMPLETING DESIGN, NO EXCEPTIONS.

O. Exhaust enclosed parking garage at 1.5 CFM/sq. ft. and as required by City of Portland building officials.

1.8 GENERAL REQUIREMENTS

A. Examine all existing conditions at building site.

B. Review contract documents and technical specifications for extent of new work to be provided.

C. Provide and pay for all licenses, fees and inspections.

D. Install equipment and materials to provide required access for servicing and maintenance. Coordinate the final location of concealed equipment and devices requiring access with final location of required access panels and doors. Allow ample space for removal of all parts that require replacement or servicing. This work shall include furnishing and installing all access doors required for mechanical access.

E. Install mechanical equipment to facilitate maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.

F. Coordinate the installation of mechanical materials and equipment above ceilings with suspension system, light fixtures, and other installations.

1.9 MINOR DEVIATIONS

A. The Contractor shall carefully review and study the structural and architectural conditions affecting all of his work, and it is the specific intention of this section that all such work imposed on this section by structural and architectural conditions of the Contract shall be borne by this section at no extra cost to the Owner. The Contractor shall study the operational requirements of each system, and shall arrange his work accordingly, and shall furnish such fittings, offsets, valves, supports, accessories, as are required for the proper and efficient installation of all systems from the physical space available for use by this section. This requirement extends to the Contractor's coordination of this section's work with the "Electrical Work". Should cases arise where physical conflict occurs because of the absence of part or all of these section coordinations as a responsibility of the Contractor; the time delay, the labor and materials, and any other item of cost for time shall not be at a cost to the Owner, including demolition.

1.10 SHOP DRAWINGS AND SUBMITTALS

A. Refer to Division 1 for general requirements.

B. The Contractor shall submit Shop Drawings and manufacturer's certified Drawings to the Project Manager for approval.

C. The Contractor shall submit approved Shop Drawings and manufacturer's equipment cuts, of all equipment requiring connection by Division 16000, to the Electrical Contractor for final coordination of electrical requirements. Contractor shall bear all additional costs for failure to coordinate with Division 16000.

D. Submittals and Shop Drawings shall be submitted as a complete package bound in a 3-ring binder with tabs for each specification section. The submittals shall be converted into O & M Manuals at the completion of the project.

E. Itemized requirements are specified in each section below.

1.11 INSTRUCTION AND MAINTENANCE

A. Upon completion of the work, the Contractor shall submit to the Project Manager complete operating instructions, maintenance instructions, part lists, and all other bulletins and brochures pertinent to the operation and maintenance for equipment furnished and installed as specified in this section bound in a durable binder.

B. The Contractor shall be responsible for proper instruction of Owner's personnel for operation and maintenance of equipment, and apparatus installed as specified in this section. INCLUDE 8-HOUR INSTRUCTION PERIOD FOR ROOFTOP AIR CONDITIONING UNITS AND 40-HOUR INSTRUCTION PERIOD FOR CONTROL SYSTEM.

C. The manual shall be indexed to correspond to these specification sections.

D. The manual shall include reproducible copies of Shop Drawings, fabrication drawings and as-built drawings, prepared to facilitate the actual installation of ductwork and piping. Drawings shall indicate location of all concealed valves, controllers, dampers and other apparatus.

E. The manual shall include all tabulations required under "Adjusting and Balancing: and "Testing", and as otherwise required.

F. Submit to the Project Manager a special lubrication chart for equipment requiring lubrication listing each item of equipment, proper lubricant, and dates lubricated, and a lubrication schedule. Lubricate each piece of equipment in the presence of Owner's operators and make a record thereof. The Contractor is responsible for proper instruction of Owner's personnel for operation and maintenance of all material, equipment, and apparatus provided. Instruct Owner's personnel once upon completion and once after completion, all within the guarantee period. Each instruction period shall be interpreted to mean 4 hours time. Instruction on major items such as air conditioning units and temperature control, shall be accomplished by a representative of the manufacturer of the respective equipment.

1.12 "AS-BUILT" DRAWINGS

A. Before commencing installation, obtain at cost an extra set of prints from Project Manager, marked "As-Built". Keep this set of Drawings at the job site at all times, and use it for no other purpose but to mark on it all the changes and revisions to the Contract Drawings resulting from coordination with other trades. At the completion of the project, obtain a clean set of current design drawings on sepia mylars from the Project Manager at cost and transfer the revisions to these mylars in a neat and orderly fashion.

B. Upon completion of Contract, return the set of "As-Built" drawings to the Project Manager for review and approval.

C. Refer also to Division 1 for full scope of requirements.

1.13 CLEANING AND CLOSING

A. All work shall be inspected, tested, and approved before being concealed or placed in operation.

B. Upon completion of the work, all equipment installed as specified in this section, and all areas where work was performed, shall be cleaned to provide operating conditions satisfactory to the Engineer.

1.14 EXAMINATION OF SITE

A. Examine the site prior to the submission of Proposal, and be fully cognizant of all conditions under which the work is to be performed.

1.15 DAMAGE AND RESTORATION

A. During construction and until expiration of the guarantee period, the Contractor shall be responsible for all damage to the premises due to poor workmanship, faulty material or equipment.

1.16 CUTTING AND PATCHING

A. The Contractor shall be responsible for all cutting and patching required for proper installation of the material and equipment.

1.17 SUBMITTALS

A. Refer to each section of these specifications for specific submittal requirement. Submittals shall be prepared as a complete package and six sets submitted in a durable 3-ring binder. Provide division tabs referencing each section of the

specifications. Partial submittals of equipment and materials will be rejected. Submit approved copies of submittals with electrical connections to the electrical contractor for coordination of voltages, sizes, connection points, starters and disconnects.

1.18 DELIVERY, STORAGE AND HANDLING

A. Deliver products to project properly identified with names, model numbers, types, grades, compliance labels, and similar information needed for distinct identifications; adequately packaged and protected to prevent damage during shipment, storage, and handling.

B. Store equipment and materials in an environmentally controlled area at the site, unless off-site storage is authorized in writing. Protect stored equipment and materials from damage.

C. Coordinate deliveries of mechanical materials and equipment to minimize construction site congestion. Limit each shipment of materials and equipment to the items and quantities needed for the smooth and efficient flow of installations.

1.19 START-UP SERVICE

A. Prior to start-up, be assured that systems are ready, including checking the following: Proper equipment rotation, proper wiring, auxiliary connections, lubrication, venting, controls, and installed and properly set relief and safety valves.

B. Provide services of factory trained technicians for start-up of Air Conditioning Unit, temperature controls, etc. Certify in writing compliance with this paragraph, stating names of personnel involved and the date work was performed.

C. Refer to other Division 15 Sections for additional requirements.

1.20 WARRANTIES

A. Refer to the General Conditions for procedures and submittal requirements for warranties. Refer to individual equipment specifications for warranty requirements.

B. Provide complete warranty information for each item, to include product or equipment, and date of beginning of warranty or bond; duration of warranty or bond; and names, addresses, and telephone numbers and procedures for filing a claim and obtaining warranty services.

1.21 TESTING

A. Refer to other Division 15 Mechanical sections for specific requirements.

1.22 GUARANTEE

A. The Contractor shall guarantee all work, material and equipment to be free from defect for a period of eighteen months from the date Notice of Completion has been filed, and the Owner has accepted the building. The final guarantee shall include any and all damage to equipment or property due to faulty equipment and materials.

END OF SECTION

BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 APPLICABLE REQUIREMENTS

A. Section 15010 - Mechanical General is applicable.

1.2 SCOPE

A. All work to be furnished and installed under this Section shall comply with all the requirements of Division 15, Section 15010, Mechanical General.

1.3 MATERIALS AND EQUIPMENT

A. Furnish and install all new material, equipment, and apparatus hereinafter specified unless specifically noted otherwise. All material, equipment, and apparatus shall be identified by the manufacturer's name, nameplate, and pertinent data.

B. All materials, equipment, and apparatus are mentioned as standards unless noted otherwise. THE WORDS "OR APPROVED EQUAL" SHALL BE CONSIDERED TO BE SUBSEQUENT TO ALL MANUFACTURER'S NAMES USED HEREIN, UNLESS SPECIFICALLY NOTED THAT SUBSTITUTES ARE NOT ALLOWED.

PART 2 - PRODUCTS

2.1 ELECTRICAL

All work shall comply with the requirements specified in Division 16.

2.2 STANDARD PIPE AND FITTING CLASSES

A. General: Pipe classes listed in pipe and fitting schedule are general classes most frequently used. All classes listed are not necessarily required for this project. Of classes listed, only those specifically called for under other sections of this Division shall be provided. Special classes of piping required under other sections. Standards to be latest revisions. Pressure rating 150 lb.

B. Pipe and Fittings

1. Class A

a. Pipe: ASTM A53 or A120 Schedule 40 black steel.

b. Fittings: ANSI B16.3, 150 lb. malleable iron; ANSI B16.9, steel buttweld.

c. Joints: 1-1/2" and smaller, ANSI B2.1 threads; 2" and larger, ANSI B16.25 buttweld.

2. Class B

a. Pipe: ANSI A21.6 service weight cast iron, hub and spigot, bituminous coated.

b. Fittings: ANSI A21.10 hub and spigot.

c. Joints: Lead and oakum caulked.

3. Class C

a. Pipe: ANSI A21.6 service weight cast iron, hub and spigot, bituminous coated.

b. Fittings: ANSI A21.10 hub and spigot.

c. Joints: Neoprene gaskets.

4. Class D

a. Pipe: ANSI A21.6 no-hub cast iron, bituminous coated.

b. Fittings: ANSI A21.10, no-hub.

c. Joints: Neoprene sleeve, stainless steel shield conforming to CISPI 301 and ASTM C564.

5. Class E

a. Pipe: ASTM B88, Type L, hard drawn copper water tube.

b. Pipe, Below Ground: ASTM B88 Type L soft drawn copper water tube. No joints below ground.

c. Fittings: ANSI B16.22, wrought copper, solder joint.

6. Class F

a. Pipe: ASTM B306, DWV class, copper tube.

b. Fittings: ANSI B16.29 wrought copper.

7. Class T

a. Pipe: ASTM D1785-76 Schedule 40 PVC.

b. Fittings: ASTM D2466-78 socket joints.

c. Joints: Solvent weld with solvent cement and primer.

8. Class U

a. Pipe: ASTM D2751-80 ABS sewer pipe.

b. Fittings: ASTM D2751-80 ABS hub and spigot and socket fittings.

c. Joints: Solvent weld with solvent cement ASTM Standard D2235-80.

9. Class W

a. Pipe: Polyethylene, Grade 23, Type II, ASTM 2513, plain ends, heat fused joints.

b. Finish: Orange.

10. Class Y

a. Pipe: AWWA Class 900 PVC. Blue finish.

b. Fittings: Ductile iron, mechanical joint, AWWA C110.

c. Thrust Blocks: 2,000 psi concrete, NFPA No. 24.

d. Field Wrap: 2" 20 mil vinyl pipe wrap 50% overlap (fittings only).

C. System Types, Provide the Following:

1. Storm Drain, Rainwater Leader, Sanitary Sewer, Waste and Vent - Underground: Class B or C.

2. Domestic Water - Above Ground: Class E.

3. Interior RWL, Waste and Vent - Above Ground: Class C or D.

4. Natural Gas - Above Ground: Class A. (All joints welded in ceiling plenum.)

5. Equipment Drains: Class F.

6. Fire Protection: Refer to Section 15500.

2.3 VALVES

A. Product Data: Submit manufacturer's technical product data, including installation instructions for each type of valve. Include pressure drop curve or chart for each type and size of valve. Submit valve schedule showing manufacturer's figure number, size, location, and valve features for each required valve.

B. Shop Drawings: Submit manufacturer's assembly-type (exploded view) shop drawings for each type of valve, indicating dimensions, weights, materials, and methods of assembly of components.

C. Maintenance Data: Submit maintenance data and spare parts lists for each type of valve. Include this data, product data, and shop drawings in Maintenance Manual; in accordance with requirements of Division 15010.

D. Valve Identification: Provide valves with manufacturer's name (or trademark) and pressure rating clearly marked on the valve body.

E. Standards: In addition to the referenced sections, valves shall comply with the following Standards:

1. MSS-25: "Standard Marking System for Valves, Fittings, Flanges and Unions."

2. ANSI B16.10: "Face-to-Face and End-to-End Dimensions of Ferrous Valves."

F. Provide factory-fabricated valves recommended by manufacturer for use in service indicated. Provide valves of types and pressure ratings indicated; provide proper selection as determined by installer to comply with installation requirements. Provide end connections which properly mate with pipe, tube, and equipment connections. Where more than one type is indicated, selection is installer's option.

G. Sizes: Unless otherwise indicated, provide valves of same size as upstream pipe size.

H. Operators: Provide handwheels, fastened to valve stem, for valves other than quarter-turn. Provide lever handle for quarter-turn valves, other than plug valves. Provide one wrench for every 10 plug valves, and one in each size. PROVIDE EXTENDED STEMS ON ALL VALVES INSTALLED IN INSULATED LINES.

I. Valve Features

1. General: Provide valves with features indicated and, where not otherwise indicated, provide proper valve features. Comply with ASME B31.9 for building services piping, and ASME B31.1 for power piping.

2. Bypass: Comply with MSS SP-45, and except as otherwise indicated, provide manufacturer's standard bypass piping and valving.

3. Drain: Comply with MSS SP-45, and provide threaded pipe plugs.

4. Flanged: Valve flanges complying with ANSI B16.1 (cast iron), ANSI B16.5 (steel), or ANSI B16.24 (bronze).

5. Threaded: Valve ends complying with ANSI B2.1.

6. Solder-Joint: Valve ends complying with ANSI B16.18.

7. Flangeless: Valve bodies manufactured to fit between flanges complying with ANSI B16.1 (cast iron), ANSI B16.5 (steel), or ANSI B16.24 (bronze).

J. Gate Valves

1. Soldered End, 2" and Smaller: MSS SP-80, Class 125, ASTM B62 cast bronze composition body, bonnet and solid disc, copper-silicon non-rising stem, brass packing gland, teflon impregnated packing and malleable iron hand-wheel.

2. Flanged End, 2-1/2" and Larger: MSS SP-70, Class 125, ASTM A126 Grade B cast iron body, bolted bonnet and disc, bronze trim, copper silicon non-rising stem, bronze packing gland, teflon impregnated packing and malleable iron hand-wheel.

3. MFG: Hammond, Lunkenheimer, Nibco or Stockham.

K. Drain Valves

1. Soldered Ends, ASSE 1005, Class 125, bronze body, screw-in bonnet, rising stem, composition disc, 3/4" hose outlet.

2. MFG: Hammond, Lunkenheimer, Nibco or Stockham.

L. Plug Valves

1. Welded ends, MSS SP-78, 200 psi, lubricated plug type, semi-steel body, loose, wrench operated, straight way pattern round port, combination button head fitting and lubricant screw, teflon seal and discs.

2. MFG: Homestead, Nordstrom or Resun.

M. Ball Valves

1. Soldered Ends, 2" and Smaller: ANSI B16.34, 400 psi, ASTM B16 brass 3-piece body, reinforced teflon seats and seals, conventional port, blow out proof brass stem, stainless steel ball, and extended solder cups. Provide extended stems when insulation is to be used.

2. MFG: Apollo, Hammond, Milwaukee, Stockham or Watts.

N. Butterfly Valves

1. Lug Type, 2-1/2" and Larger: MSS SP-67, ductile iron body, ASTM A-395, nickel plated ductile iron disc, EPT sleeve and o-rings, lever operated. Provide extended stems when insulation is to be used.

2. MFG: Hammond, Nibco, Stockham or Watts.

O. Check Valves

1. Soldered Ends, 2" and Smaller: Class 125, ASTM B62 cast bronze body and screwed cap, horizontal swing type, renewable bronze disc.

2. Flanged Ends, 2-1/2" and Larger: Non-slam design, Class 250, A-126 Grade B cast iron body, twin bronze flappers, stainless steel trim.

3. MFG: Hammond, Lunkenheimer, Nibco or Stockham.

P. Backflow Preventers

1. Reduced pressure principle assembly consisting of shutoff ball valves in inlet and outlet and strainer on inlet. Assemblies shall include test cocks and pressure-differential relief valve located between 2 positive seating check valves and shall comply with requirements of ASSE Standard 1013.

2. MFG: Hersey, Febco, Watts or Wilkins.

Q. Pressure Regulating Valves

1. Single seated, direct operated type; having bronze body with integral strainer, and complying with requirements of ASSE Standard 1003. Select proper size for maximum flow rate and inlet and outlet pressure indicated.

2. MFG: Cash-Acme, Bailey, Watts or Wilkins.

R. Fire Protection: Refer to Section 15500.

2.4 PIPING SPECIALTIES

A. Provide factory-fabricated piping specialties recommended by manufacturer for use in service indicated. Provide piping specialties of types and pressure ratings indicated for each service, or provide proper selection to comply with installation requirements. Provide sizes as indicated, and connections, which properly mate with pipe, tube, and equipment connections. Where more than one type is indicated, selection is installer's option.

B. Pipe Escutcheon: Provide pipe escutcheons as specified herein with inside diameter closely fitting pipe outside diameter, or outside of pipe insulation where pipe is insulated. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls, or ceilings; and pipe sleeve extension, if any. Furnish pipe escutcheons with nickel or chrome finish for occupied areas, prime zinc base paint finish for unoccupied areas.

1. Pipe Escutcheons for Moist Areas: For waterproof floors, and areas where water and condensation can be expected to accumulate, provide

stainless steel, cast brass or sheet brass escutcheons, solid or split hinged.

2. Pipe Escutcheons for Dry Areas: Provide stainless steel escutcheons, solid or split hinged.

C. Low Pressure Y-Type Pipeline Strainers: Provide strainers full line size of connecting piping, with ends matching piping system materials. Select strainers for 125 psi working pressure, with Type 304 stainless steel screens, with 3/64" perforations at 233 per square inch.

1. Threaded Ends, 2" and Smaller: Cast-iron body, screwed screen retainer with centered blowdown fitted with pipe plug.

2. Flanged Ends, 2-1/2" and Larger: Cast-iron body, bolted screen retainer with off-center blowdown fitted with pipe plug.

D. Unions: Unions shall be of type specified in following schedule:

1. Black Steel: Sizes: 2" and smaller. Union: 250 lb. screwed malleable iron, ground joint, brass to iron seat.

2. Galvanized Steel: Sizes: 2" and smaller. Union 250 lb. screwed galvanized malleable iron, ground joint, brass to iron seat.

3. Screwed Black or Galvanized: Sizes: 2-1/2" and larger. Union: 150 lb. cast iron screwed flanged, flat faced, full faced gasket.

4. Copper or Brass Pipe or Tubing: Sizes: 2" and smaller. Union: 150 lb. cast bronze or copper, ground joint, non-ferrous seat with soldered ends.

5. Screwed Copper or Brass Pipe: Sizes: 2" and smaller. Union: 150 lb. cast brass, ground joint, brass to brass seat, with threaded ends.

6. Copper or Brass Pipe or Tubing: Sizes: 2-1/2" and larger. Union: Two (2) 150 lb. cast bronze flanges.

7. Manufacturer: Watts, EPCO, Muellor or Stanley G. Flagg.

E. Flanges

1. Provide flanges at flanged connections to equipment, tanks and valves. Faces of flanges being connected shall be alike in all cases. Connection of raised-face flange to flat-faced flange not permitted.

2. Use ASTM A307, Grade B, bolts and nuts for cast iron flanges and ASTM A193 for steel flanges. Regular square head unfinished bolts with heavy semi-finished hex nuts ASTM A194. Cadmium plated where exposed to weather. Rating: 150 lb. or 300 lb. in high pressure portions.

3. Type of pipe and corresponding flanges as follows:

   a. Screwed Black or Galvanized Steel Pipelines: 125 lb. black cast iron screwed flange, flat faces.

   b. Welded Steel Pipe, Except in Steam Lines Above 75 psi: 150 lb. black forges steel welding flanges, 1/16" raised fact ASTM A181 Grade I. Use flat face when connected to flat faced companion flange.

   c. Welded Steel Pipe in Steam Lines Above 75 Psi: 300 lb. black forged steel welding flanges, 1/16" raised face ASTM A181 Grade I. Use flat face when connected to flat-faced companion flange.

F. Pipe Sleeves

1. Sheet Metal: Fabricate from galvanized sheet metal; round tube closed with snaplock joint, welded spiral seams, or welded longitudinal joint. Fabricate from the following gauges: 3" and smaller, 20 gauge; 4" to 6", 16 gauge; over 6", 14 gauge.

2. Steel Pipe: Fabricate from Schedule 40 galvanized steel pipe; remove burrs.

3. Iron Pipe: Fabricate from cast iron or ductile-iron pipe; remove burrs.

G. Sleeve Seals

1. Underground: For sleeves passing through exterior or foundation walls, provide mechanical link seal assembly.

2. Aboveground: For sleeves passing through walls or floors provide a non-toxic 3-hour rated fire resistant silicone foam sealant with a Flame Spread Rating of 20. Sealant to be tested and approved under UL 263, ASTM E119, and NFPA 251 Standards.

3. Local Approvals: All seals to be provided shall be in accordance with the regulations of all governing agencies of the City of Portland and the Fire Marshal's Office.

2.5 EXPANSION COMPENSATORS (SEISMIC JOINT)

A. Expansion products to conform to the standards of the Expansion Joint Manufacturer's Association. Provide expansion joints where piping passes across building seismic joint.

B. Packless Expansion Joints: Provide packless expansion joints where indicated for piping systems, with materials and pressure/temperature ratings selected by installer to suit intended service. Select packless expansion joints to provide 200% absorption capacity of piping expansion between anchors.

C. Expansion Joints for Grooved Piping: For piping systems fabricated from grooved pipe and couplings, use one of the following methods for expansion compensation:

1. Combination Couplings and Nipples: Provide expansion joints constructed of grooved short pipe nipples and couplings, designed by manufacturer to suit intended service. Provide removable ties to hold joint compressed or expanded during piping fabrication, depending on application. Select couplings and gasket materials to match balance of piping system.

2. Slip-Type Expansion Joints: Provide slip-type expansion joints constructed of carbon steel pipe and couplings, designed by manufacturer to suit intended service. Select couplings and gasket material to match balance of piping system.

D. Pipe Alignment Guides: Provide pipe alignment guides on both sides of expansion joints, and elsewhere as indicated. Construct with 4 finger spider traveling inside a guiding sleeve, with provision for anchoring to building substrate.

2.6 SUPPORTS AND ANCHORS

A. General: Comply with applicable codes pertaining to product materials and installation of supports and anchors, including, but not limited to, the following:

1. Uniform Building Code.

2. UL and FM Compliance: Provide products which are UL listed and FM approved.

3. MSS Standard Compliance: Manufacturer's Standardization Society (MSS).

4. SMACNA: "Guidelines for Seismic Restraints of Mechanical and Plumbing Systems."

5. NFPA: Pamphlet number 13 and 14 for fire protection systems.

B. Provide supports for piping, suitable for grading, alignment, and movement due to expansion. Locate supports within 2' of each change in direction of piping. Provide at least three supports for each expansion loop. Select all pipe supports with minimum safety factor of 5 based on ultimate tensile strength of material. Horizontal supports shall consist of upper attachment, threaded hanger rod(s) with turnbuckles and lower attachment. Vertical supports as hereinafter specified or as indicated. Refer to "VIBRATION ISOLATION" article for expansion of piping and earthquake restraint attachments.

C. Manufacturer: Grinnell Corp. (ITT), Michigan, Allied, Patterson and Carpenter, or approved equal. Submit manufacturer's literature for hangers.

D. Coordination: Coordinate location of hangers with light fixtures as shown on reflected ceiling plans. Only hangers designed specifically for support of piping will be used. Piping shall not be supported from ductwork, duct supports, or other piping. Hanger rods shall not penetrate ductwork.

E. Supplementary Steel: Provide all necessary supplementary steel for support or attachment of hangers and pipe and duct supports in shafts and between building structural members. Steel shall be painted with one coat of rust-inhibiting primer. The supplementary steel shall be structural grade steel or unistrut members.

F. Seismic Restraints: Provide anchors, guides, and bracing as indicated to prevent lateral movement due to seismic forces of 1G, and as required by State and Local codes. Refer to SMACNA "Seismic Restraint Guide" for details.

2.7 VIBRATION CONTROL

A. Manufacturer: Subject to compliance with requirements, provide vibration control products of the following:

1. Provide Caldyn Type QSK Vibration Isolators with integral seismic restraints.

2.8 FLEXIBLE PIPE CONNECTORS

A. Copper Piping: Provide bronze hose covered with bronze wire braid with copper tube ends or bronze flanged ends, braze-welded to hose.

B. Steel Piping: Provide stainless steel hose covered with stainless steel wire braid with NPT steel nipples or 150 psi ANSI flanges, welded to hose.

C. Cast Iron Connectors: Provide neoprene or EDPM construction consisting of multiple plies of nylon tire cord fabric and elastomer molded and cured in hydraulic rubber presses. Provide straight or elbow connector as indicated, rated at 125 psi at 220° F (140° C).

2.9 IDENTIFICATION MARKERS

A. Mechanical Identification Materials: Provide products of categories and types required for each application as referenced in other Division 15 sections. Where more than single type is specified for application, selection is installer's option, but provide single selection for each product category.

B. Plastic Pipe Markers

1. Snap-On Type: Provide pre-printed, semi-rigid snap-on, color coded pipe markers, complying with ANSI A13.1.

2. Pressure Sensitive Type: Provide pre-printed, permanent adhesive, color coded, pressure sensitive vinyl pipe markers, complying with ANSI A13.1. Secure both ends of markers with color coded adhesive vinyl tape.

3. Insulation: Furnish 1" thick molded fiberglass insulation with jacket for each plastic pipe marker to be installed on uninsulated pipes subjected

to fluid temperatures of 125° F (52° C) or greater. Cut length to extend 2" beyond each end of plastic pipe marker.

4. Arrows: Print each pipe marker with arrows indicating direction of flow, either integrally with piping system service lettering (to accommodate both directions), or as separate unit of plastic.

C. Valve Tags

1. Brass Valve Tags: Provide 1-1/2" diameter 19-gauge polished brass valve tags with stamp-engraved piping system abbreviation in 1/4" high letters and sequenced valve numbers 1/2" high, and with 5/32" hole for fastener. Fill tag engraving with black enamel.

D. Valve Schedule Frames: For each page of valve schedule, provide glazed display frame, with screws for removable mounting on masonry walls. Provide frames of finished hardwood or extruded aluminum, with SSB-grade sheet of glass.

E. Plastic Equipment Signs

1. Provide plastic laminate sign, ANSI A.13 color coded with engraved white core lettering.

2. Nomenclature: Provide equipment tags utilized on Contractor's "Design Build" Drawings.

F. MFG: Brady or Seton.

2.10 ACCESS PANELS AND ACCESS DOORS

A. Provide all access doors and panels to serve equipment under this work including those which must be installed in finished architectural surfaces.

B. Included under this work is the responsibility for verifying the exact location and type of each unit required to serve equipment under this work and in the proper sequence to keep in tune with construction and with prior approval of the Architect.

2.11 VIBRATION AND DYNAMIC BALANCING

A. Vibration tolerances shall be as specified by the "International Research and Development Corporation", Worthington, Ohio, measured by the displacement, peak to peak, as follows:

1. All Fans: Below severity chart labeled "FAIR", maximum velocity of 0.0785 in/sec, peak.

2. Pump and Electric Motors: Below severity chart labeled "SLIGHTLY ROUGH", maximum vibration velocity of 0.157 in/sec, peak.

3. Compressors: Same as pumps.

B. Correction shall be made to all equipment which exceeds vibration tolerances specified above. Final vibration levels shall be reported as described above.

PART 3 - EXECUTION

3.1 GENERAL

A. Workmanship shall be performed by journeymen mechanics and shall result in an installation consistent with the best practices of trades.

B. Install work uniform, level and plumb, in relationship to lines of building. Do not install any diagonal, or otherwise irregular work unless so indicated on Drawings or approved by Architect.

3.2 MANUFACTURERS DIRECTIONS

A. Follow manufacturers' directions and recommendations in all cases where the manufacturers of articles used on this Contract furnish directions covering points not shown on the Drawings or covered in these Specifications.

3.3 SAFETY PRECAUTIONS

A. It is intended within the scope of this work, during construction and until final acceptance that, under the direct responsibility and supervision of the Contractor, strict attention be given to all matters pertaining to public safety and to safety of the construction workers and complementing personnel. This shall apply continuously during course of construction; not just to normal working hours.

3.4 INSTALLATION

A. Coordinate the work between the various Mechanical Sections and with the work specified under other Divisions of the work or contracts toward rapid completion of the entire project. If any cooperative work must be altered due to lack of proper supervision or failure to make proper provisions in time, then the work hereunder shall include all expenses of such changes as are

necessary in the work under other contracts, and such changes shall be directly supervised by and made to the satisfaction of the Engineer. Also coordinate ceiling work with the General Contractor, and his subcontractors in locating ceiling air outlets, etc.

The cooperative work not included in the Mechanical Division related to the general construction work is as follows:

1. All formed concrete work.

2. Framed openings in masonry and other Architectural and Structural elements.

3. Wood grounds and nailing strips in masonry and concrete.

B. Inspect all material, equipment, and apparatus upon delivery and do not install any that may be subject to rejection as a result of damage or other defects. Provide tarps and visqueen cover to protect equipment delivered to the site.

C. Provide means of access to all valves, dampers, controllers, operable devices, and other apparatus which may require adjustment or servicing.

D. Verify in field exact size, location, invert, and clearances regarding all existing material, equipment and apparatus, and advise the Architect of any discrepancies between that indicated on the Drawings and that existing in the field prior to any installation related thereto.

E. Ductwork: Install ducts to best suit field conditions and cooperate with other trades. Do not penetrate Structural members without consent of Architect. Check with Structural drawings prior to locating any penetrations. Ducts shall be constructed in accordance with the latest edition of the ASHRAE Guide, NFPA pamphlets, Sheet Metal and Air Conditioning Contractors' National Association, Inc., Duct Manual, and as scheduled on the Drawings.

1. Provide 16-gauge metal sleeve with 1" clearance and pack space around ducts through walls tight with fiberglass, and seal with Johns Manville Duxseal. For exposed ducts through walls, provide flat, sheet metal escutcheon to conceal fiberglass and wall opening.

2. Extend supply ducts 1' beyond connection to supply diffusers to form cushion head.

F. Grilles, Registers and Diffusers: Install all outlets flush, squared, tightly sealed, and entirely covering sheet metal ductwork and gaskets.

G. Ductwork Specialties: Install fire dampers in accordance with NFPA Standards, requirements of the State Fire Marshal, and applicable codes. Provide fire dampers in all penetrations and fire separations, and as otherwise required. Ensure that fire dampers are installed in the open position in the locations indicated.

1. Install turning vanes in all mitered elbows in all ducts, so that tips are parallel with the sides of the ducts. Tips of acoustical turning vanes on outside radius shall be flush with acoustical lining.

2. Provide flexible connections to completely isolate fans from direct contact with all sheet metal work.

3. Provide access panels or doors, as required, for access to valves, controllers, fire dampers.

H. Hangers and Supports: Securely fasten all piping and ductwork to the building construction by means of hangers, supports, guides, anchors, and sway braces to maintain pipe alignment, to prevent sagging, and to prevent noise and excessive strain on piping and ductwork due to movement under operating conditions.

1. Adequately mount and anchor all material and equipment as required. Include lateral bracing as required to prevent horizontal, seismic movement.

2. Do not support piping or ductwork from pumps, fans or any other pieces of equipment.

3. Refer to Section 3.12 for further details.

I. Other

1. Fans: Align fans, motors, and drives. Install fans to render bearings accessible for lubrication without dismantling fans or ducts. Provide extended bearing oilers as required. Mount all fans on vibration isolators as specified.

2. Filters: Ensure that all filters are clean at completion of installation. Interpret this as meaning new clean disposable or replaceable media filters, as specified. Provide manometer at each filter bank.

3. Flues, Stacks and Breeching: Provide flues, stacks and breeching on all gas-fired equipment as required, in accordance with the latest applicable building codes.

4. Insulation: Properly and neatly apply insulation on all material and equipment and apparatus, as specified, including all fittings. Apply insulation over clean, dry surfaces, with adjoining sections firmly butted together and canvas smoothly pasted over. When vapor barriers are specified, install continuous overall external surfaces of the entire system.

3.5 ELECTRICAL REQUIREMENTS

A. Provide Where Applicable:

1. Mechanical Contractor to provide the following:

a. Motors.

b. Low voltage and electronic control devices.

c. Low voltage transformers.

d. Low voltage conduit wire as well as connecting devices.

e. Conduit and wire for electronic devices, except for line voltage wiring.

f. All electrical work under items a. through e. above, shall be performed by an electrical contractor or by the control manufacturer, but to be provided for and coordinated under this work. In addition, all the controls to be supervised and subsequently approved in writing by the control manufacturer.

2. Mechanical Contractor to furnish the following to the Electrical Contractor where applicable:

a. Motor starters (except those part of MCC).

b. Line voltage control equipment, enclosing switches (except disconnects), time switches, transformers, relays, etc. (except those part of MCC).

B. Under Division 16 the following to be provided:

1. Furnish and install line voltage wire and conduit system.

2. Install equipment furnished under Division 15.

a. Line voltage control equipment under paragraph A.2.b.

C. Motors and Motor Control Equipment: Conform to the standards of the NEMA. Equip motors with magnetic or manual line starters with overload protection. Motor starters and line voltage controls shall be installed under Electrical Section but located and coordinated as required under this Section of the work. Starters shall be combination type with non-fusible disconnect switches. All single phase fractional horsepower motors shall have built-in overload protection.

3.6 PIPING INSTALLATION

A. General: Install pipes and pipe fittings in accordance with recognized industry practices which will achieve permanently leakproof piping systems, capable of performing each indicated service without piping failure. Install each run with minimum joints or couplings, but with adequate and accessible unions for disassembly and maintenance/replacement of valves and equipment. Reduce sizes (where indicated) by use of reducing fittings. Align piping accurately at connections, within 1/16" misalignment tolerance. Comply with ANSI B31 Code for Pressure Piping.

B. Locate piping runs, except as otherwise indicated, vertically and horizontally (pitched to drain) and avoid diagonal runs wherever possible. Orient horizontal runs parallel with walls and column lines. Hold piping close to walls, overhead construction, and other structural and permanent-enclosure elements of building. Limit clearance to 1/2" where furring is shown for enclosure or concealment of piping, but allow for insulation thickness, if any. Where possible, locate insulated piping for 1" clearance outside insulation. Whenever possible in finished and occupied spaces, conceal piping from view, by locating in column enclosures, in hollow wall construction, or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as indicated.

C. Electrical Equipment Spaces: Do not run piping through transformer vaults and other electrical or electronic equipment spaces and enclosures.

3.7 PIPING SYSTEM JOINTS

A. General: Provide joints of type indicated in each piping system. Provide joint samples for approval by Engineer. The approved samples to be kept at job site.

B. Thread pipe in accordance with ANSI B2.1. Cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside diameter. Apply pipe joint compound, or pipe joint tape (Teflon) where recommended by pipe/fitting manufacturer, on male threads at each joint and tighten joint to leave not more than 3 threads exposed.

C. Solder copper tube-and-fitting joints with tin-antimony alloy, 95-5% solder where indicated, in accordance with AWS 5.8 and recognized industry practice. Cut tube ends squarely, ream to full inside diameter, and clean outside of tube ends and inside of fittings. Apply solder flux to joint areas of both tubes and fittings. Insert tube full depth into fitting, and solder in manner which will draw solder full depth and circumference of joint. Wipe excess solder from joint before it hardens. Piping 2-1/2" and larger shall be flanged. Tin-lead 50-50% solder is not to be present at job site.

D. Weld pipe joints in accordance with recognized industry practice and as follows:

1. Weld pipe joints only when ambient temperature is above 0° F (-18° C).

2. Bevel pipe ends at a 37.5° angle where possible, smooth rough cuts, and clean to remove slag, metal particles, and dirt.

3. Use pipe clamps or tack-weld joints with 1" long welds, 4 welds for pipe sizes to 10", 8 welds for pipe sizes 12" to 20".

4. Build up welds with stringer-bead pass, followed by hot pass, followed by cover or filler pass. Eliminate valleys at center and at edges of each weld. Weld by procedures which will ensure elimination of unsound or unfused metal, cracks, oxidation, blow-holes, and non-metallic inclusions.

5. Do not weld out piping system imperfections by tack-welding procedures. Refabricate to comply with requirements.

6. At Installer's option, install forged branch-connection fittings whenever branch pipe is indicated, or install regular T-fitting.

E. Flanged Joints: Match flanges within piping system, and at connections with valves and equipment. Clean flange faces and install gaskets. Tighten bolts to provide uniform compression of gaskets.

F. Cast-Iron Joints: Comply with coupling manufacturer's Cast Iron Soil Pipe Institute Standards and installation instructions.

G. Cleaning, Flushing, Inspecting

1. General: Clean exterior surfaces of installed piping systems of superfluous materials, and prepare for application of specified coatings (if any). Flush out piping systems with clean water before proceeding with required tests. Inspect each run of each system for completion of joints, supports, and accessory items. Inspect pressure piping in accordance with procedures of ASME B31.

2. Disinfect water mains and water service piping in accordance with AWWA C 601.

3.8 VALVES

A. General: Except as otherwise indicated, comply with the following requirements.

1. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided as necessary.

2. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane without prior written approval. Install valve drains with hose-end adapter for each valve that must be installed with stem below horizontal plane.

B. Insulation: Where insulation is indicated, install extended-stem valves, arranged in proper manner to receive insulation.

3.9 PIPE SPECIALTIES

A. Pipe Escutcheons: Install pipe escutcheons on each pipe penetration through floors, wall, partitions, and ceilings where penetration is exposed to view; and on exterior of building. Secure escutcheon to pipe or insulation so escutcheon covers penetration hole, and is flush with adjoining surface.

B. Dielectric Unions: Install at each piping joint between ferrous and non-ferrous piping. Comply with manufacturer's installation instructions.

C. Pipe Sleeves: Install pipe sleeves of types indicated where piping passes through walls, floors, ceilings, roofs. Do not install sleeves through structural members of work, except as detailed on drawings, or as reviewed by Architect. Install sleeves accurately centered on pipe runs. Size sleeves so that piping

and insulation (if any) will have free movement in sleeve, including allowance for thermal expansion; but not less than 2 pipe sizes larger than piping run. Where insulation includes vapor-barrier jacket, provide sleeve with sufficient clearance for installation. Install length of sleeve equal to thickness of construction penetrated, and finish flush to surface; except floor sleeves. Extend floor sleeves 1/4" above level floor finish, and 3/4" above floor finish sloped to drain. Provide temporary support of sleeves during placement of concrete and other work around sleeves, and provide temporary closure to prevent concrete and other materials from entering sleeves.

1. Install sheet metal sleeves at interior partitions and ceilings other than suspended ceilings.

2. Install iron pipe sleeves at exterior penetrations, both above and below grade.

3. Install steel pipe or plastic pipe sleeves except as otherwise indicated.

D. Mechanical Sleeve Seals: Loosely assemble rubber links around pipe with bolts and pressure plates located under each bolt head and nut. Push into sleeve and center. Tighten bolts until links have expanded to form a watertight seal.

E. Fire Barrier Penetration Seals: Fill entire opening with sealing compound. Adhere to manufacturer's installation instructions.

3.10 SUPPORTS AND HANGERS

A. Proceed with installation of hangers, supports, and anchors only after required building structural work has been completed in areas where the work is to be installed. Correct inadequacies including, but not limited to, proper placement of inserts, anchors, and other building structural attachments.

B. Prior to installation of hangers, supports, anchors, and associated work, installer shall meet at project site with Contractor, installer of each component of associated work, inspection and testing agency representatives, (if any), installers of other work with requirements specified.

C. Installation of Building Attachments: Install building attachments at required locations within concrete or on structural steel for proper piping support. Install additional building attachments where support is required for additional concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes is direction of piping. Install concrete inserts before concrete is placed. Fasten insert securely to forms. Where concrete with compressive

strength less than 2500 psi is indicated, install reinforcing bars through opening at top of inserts.

D. Install hangers, supports, clamps, and attachments to support piping properly from building structure. Arrange for grouping of parallel runs of horizontal piping to be supported together on trapeze type hangers where possible. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Do not use wire or perforated metal to support piping, and do not support piping from other piping.

E. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories. Except as otherwise indicated for exposed continuous pipe runs, install hangers and supports of same type and style as installed for adjacent similar piping.

F. Support sprinkler piping independently of other piping.

G. Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated, or by other recognized industry methods.

H. Provisions for Movement

1. Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

2. Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connecting equipment.

3. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes, and so that maximum pipe deflections allowed by ANSI B31 are not exceeded.

4. Insulated Piping: Comply with the following installation requirements:

a. Clamps: Attach clamps, including spacers, (if any), to piping with clamps projecting through insulation. Do not exceed pipe stresses allowed by ANSI B31.

b. Shields: Where low compressive strength insulation or vapor barriers are indicated on cold or chilled water piping, install coated protective shields.

c. Saddles: Where insulation without vapor barrier is indicated install protection saddles.

I. Installation of Anchors

1. Install anchors at proper locations to prevent stresses from exceeding those permitted by ANSI B31, and to prevent transfer of loading and stresses to connected equipment.

2. Fabricate and install anchor by welding steel shapes, plates and bars to piping and to structure. Comply with ANSI B31 and with AWS standards.

3. Where expansion compensators are indicated, install anchors in accordance with expansion unit manufacturer's written instructions, to limit movement of piping and forces to maximums recommended by manufacturer for each unit.

4. Anchor Spacings: Where not otherwise indicated, install anchors at ends of principal pipe runs, at intermediate points in pipe runs between expansion loops and bends. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.

J. Equipment Supports

1. Concrete housekeeping bases will be provided as work of Division 3. Furnish to Contractor scaled layouts of all required bases, with dimensions of bases, and location to column center lines. Furnish templates, anchor bolts, and accessories necessary for base construction.

2. Provide structural steel stands to support equipment not floor mounted or hung from structure. Construct of structural steel members or steel pipe and fittings. Provide factory-fabricated tank saddles for tanks mounted on steel stands.

3. Furnish roof equipment supports to Contractor for installation as part of work of Division 7; not work of this section.

K. Seismic Restraints: Provide anchors, guides, and bracing as necessary to prevent lateral movement due to seismic forces of 1.5G and as required by State and Local codes. Refer to SMACNA "Seismic Restraint Guide" for details. PROVIDE SEISMIC RESTRAINT OF PIPING, DUCTWORK AND EQUIPMENT. RETAIN SERVICES OF A STRUCTURAL ENGINEER TO REVIEW AND APPROVE DETAIL. INCLUDE THIS WORK IN YOUR BID.

L. Adjusting

1. Hanger Adjustment: Adjust hangers so as to distribute loads equally on attachments.

2. Support Adjustment: Provide grout under supports so as to bring piping and equipment to proper level and elevations.

3. Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

3.11 IDENTIFICATION MARKERS

A. General: Where identification is to be applied to surfaces which require insulation, painting, or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

B. Piping System Identification

1. Install pipe markers on each system indicated to receive identification, and include arrows to show normal direction of flow.

2. Locate pipe markers as follows:

a. Near each valve and control device.

b. Near each branch, excluding short take-offs for fixtures and terminal units; mark each pipe at branch, where there could be question of flow pattern.

c. Near locations where pipes pass through walls or floors/ceilings, or enter non-accessible enclosures.

d. At access doors, manholes, and similar access points which permit view of concealed piping.

e. Near major equipment items and other points of origination and termination.

f. Spaced horizontally at maximum spacing of 20' along each piping run, with minimum of 1 in each room. Vertically spaced at each story transversed.

C. Mechanical Equipment Identification: Locate engraved plastic laminate signs on or near each major item of mechanical equipment and each operational device. Provide signs for the following:

1. Rooftop air conditioning units.

2. Fan powered boxes and VAV terminal units.

3. Exhaust fans.

3.12 VIBRATION CONTROL ISOLATORS (INCLUDES PACKAGED EQUIPMENT)

A. Comply with minimum static deflections recommended by ASHRAE, for selection and application of vibration isolation materials and units as indicated.

B. Manufacturer's Recommendations: Except as otherwise indicated, comply with manufacturer's recommendations for selection and application of vibration isolation materials and units.

C. Except as otherwise indicated, comply with manufacturer's instructions for installation and load application to vibration control materials and units. Adjust to ensure that units have equal deflection, do not bottom out under loading, and are not short-circuited by other contacts or bearing points. Remove space blocks and similar devices intended for temporary support during installation.

D. Install units between substrate and equipment as required for secure operation and to prevent displacement by normal forces, and as indicated.

E. Adjust leveling devices as required to distribute loading uniformly onto isolators. Shim units as required where substrate is not level.

F. Upon completion of vibration control work, prepare report showing measured equipment deflections for each major item of equipment as indicated.

G. Clean each vibration control unit, and verify that each is working freely, and that there is no dirt or debris in immediate vicinity of unit that could possibly short-circuit unit isolation.

3.13 PAINTING

A. Finished painting is specified under Section 09900: Painting.

B. All exposed work under Division 15 shall receive either a factory finish or a field prime coat finish, except:

1. Exposed copper piping.

2. Aluminum jacketed outdoor insulated piping.

3.14 EXCAVATION AND BACKFILL

A. Trench excavations shall be true to line and grade. Remove all rock protruding at sides and bottom of trenches. Minimum trench width shall be 16". Pipe crown shall not be less than 24" below the finished ground surface for metallic pipe and 30" for non-metallic pipe, unless otherwise indicated on the Drawings or otherwise directed by the Architect. Dispose of all surplus excavation material and seepage water as directed by the Architect.

B. Backfill material from the bottom of the trench to a level 6" above the pipe crown shall be unwashed sand, dampened but not puddled, and subsequently compacted. The remainder of the backfill shall be 3/4" minus gravel, dampened and tamped in 6" layers by air hammers to 95 percent compaction in accordance with ASTM D-1557-58T. Replace to their original condition all turf, plants, concrete, asphalt, or other improvements which constituted landscaping, traffic areas, or otherwise improved areas which become disturbed by trenching. In graded and undeveloped areas, in addition to backfill specified above, backfill trenches with crown 8" above the surrounding surface.

3.15 TESTING - GENERAL

A. Provide all tests specified hereinafter and as otherwise required. Provide all test equipment, including test pumps, gages, instruments, and other equipment required. Test all rotational equipment for proper direction of rotation. Upon completion of testing, certify to the Architect, in writing, that the specified tests have been performed and that the installation complies with the specified requirements.

B. Piping: Remove from the system, during testing, all equipment which would be damaged by test pressure. Replace removed equipment when testing has been accomplished. The systems may be tested in sections as the work progresses; however, any previously tested portion shall become a part of any latter test of a composite system. Correct leaks by remaking joints with new material.

C. Test time will be accrued only while full test pressure is on the system. Unless indicated otherwise. "Tolerance" shall be no pressure drop, except that due to temperature change in a 24-hour period. Inspect and test all work prior to burying or concealing.

System	Test Medium	Test Pressure	Tolerance
Domestic Water	Water	150 psig	None
Soil and Waste	Water	Top of Vent	No leaks - 24 hours
Vent	Water	Top of Vent	No leaks
Storm	Water	Top of Drain	No leaks
Automatic Fire Sprinkler	Water	200 psig	None
Natural Gas	Air	60 psig	None

D. Valves: Test all valve bonnets for tightness. Test operate all valves at least once from closed-to-open-to-closed position while valve is under test pressure. Test all automatic valves, including solenoid valves, and temperature and pressure relief valves, safety valves, and temperature and pressure relief valves not less than three (3) times.

E. Piping Specialties: Test all thermometers, pressure gages, and water meters for accurate indication; automatic water feeders, air vents, trap primers, and vacuum breakers for proper performance. Test all air vent points to ensure that all air has been vented.

F. Ductwork: Test all air quantities as specified in Section "Adjusting and Balancing". Pressure tests per SMACNA.

G. Registers and Diffusers: Test for proper operation of manually operated control feature. Test all air quantities as specified in Section "Adjusting and Balancing".

H. Ductwork Specialties: Test all operable ductwork specialties for proper operation. Check all fire dampers to ensure that they are 100 percent open.

I. Plumbing Fixtures and Trim: Test all fixtures for proper operation of trim. Operate all flush valves at least two times to ensure proper performance. Assure that fixtures are complete and ready for use.

J. Temperature Control: Test all control functions to assure that all systems are controlling as specified or as otherwise necessary and that all controls are adjusted to maintain proper room temperatures. The manufacturer's representative shall perform all tests. Temperature control contractor shall include 40 hours of instruction and programming during building commissioning phase.

END OF SECTION

INSULATION

PART 1 - GENERAL

1.1 Section 15010 - Mechanical General is applicable.

1.2 SCOPE

All work to be furnished and installed under this section shall comply with all the requirements of Division 1, and shall include but not necessarily be limited to the following:

A. Domestic hot and cold water supply and return piping.

B. Supply and return air ductwork.

C. Rainwater leaders.

D. Equipment as noted.

E. Acoustical duct lining as shown on Drawings.

F. Horizontal runs of funnel drains, floor drains, floor sinks receiving cold condensate from cooling coils, cold boxes, ice machines and drinking fountains.

G. Handicapped lavatory P-traps.

1.3 RELATED WORK IN OTHER SECTIONS

A. Basic Materials and Methods: Section 15050.

B. Plumbing: Section 15400.

C. HVAC: Section 15600.

1.4 APPROVALS

A. All materials shall be fire retardant, tested by an independent testing laboratory and approved by County and State of Oregon building codes.

B. All materials shall comply with Oregon State Energy Code requirements.

C. All duct covering, duct lining and equipment insulation and pipe insulation located in active (air-handling) plenums shall have a maximum Flame Spread Rating of 25 and a maximum Smoke Developed Rating of 50. Pipe insulation located in mechanical equipment rooms and other exposed areas and concealed pipe insulation located in non-active plenums shall have a maximum Flame Spread Rating of 25 and a maximum Smoke Developed Rating of 150.

These ratings are per test method ASTM E-84 and are to be composite ratings (jacket, insulation and adhesive). Ratings are to be shown on the products or on their carton labels or they may be verified by a report from an independent testing laboratory.

PART 2 - PRODUCTS

2.1 PIPE INSULATION

A. Domestic Hot Water Supply and Return Piping; Owens-Corning Fiberglas, heavy density, k-equals 0.23 at 75 degrees F, sectional pipe insulation, with factory supplied all service jacket ASJ-SSL canvas jacket with longitudinal and end laps. Insulation shall be continuous without pipe hangers penetrating insulation. Insulate all fittings and valves same as above with Zeston fiberglass PVC insulation fittings. Thickness shall be in accordance with State Energy Code, but no less than 1-inch thick for pipe 2 inches and smaller and 1-1/2 inch thick for pipes 2-1/2 inches and larger.

B. Domestic Cold Water Piping: Same as hot water pipe except that the insulation thickness is to be 1/2" for all sizes with a continuous vapor barrier.

C. Rainwater Leaders and Overflow Lines (Horizontal Runs): Commercial Grade FRK insulation, fiberglass, 1 PCF, 1-1/2 inch thick, K equals 0.23 at 75°F, with 0.02 inch aluminum foil vapor barrier cover secured with wires 18 inches on center. All seams shall be sealed with adhesive. Drain sumps secured with adhesive and flange ring.

D. Horizontal runs installed above grade and above ceiling or exposed from funnel drains, floor drains, floor sinks receiving drips from cooling coils, cold boxes, ice machines, water stations, refrigerators, ice chests, walk-in coolers and similar cold drips: Same as domestic cold water.

E. Exterior Piping: Exposed piping subject to freezing shall be heat taped with Chromalox self-limiting heat tape, insulated same as domestic cold water and covered with 0.16" aluminum jacket secured with bands 12" on center. Seam shall be on bottom of pipe and caulked. Coordinate connection of heat tape with Division 16.

F. Handicapped Lavatories: Provide prefabricated trap insulation kits for handicapped P-traps. Insulate exposed domestic hot water supply.

2.2 INSULATION FOR FITTINGS, VALVES AND FLANGES

A. Hot Pipes: Zeston fittings.

B. Cold Pipes: Use Zeston premolded PVC fitting covers with joints sealed with vapor barrier or Zeston Z tape.

2.3 DUCT INSULATION

A. Owens-Corning Fiberglas, as noted. Johns-Manville, or approved equal.

B. Where ducts are internally lined, exterior insulation is not required. Duct dimensions on drawings are inside, net free area sizes; increase metal sizes as required to allow for thickness of duct liner. Apply, fasten, all insulation in strict conformance with manufacturer's published recommendations.

C. All Supply and Return Ducts on the Discharge Side of All Supply Fans for a Distance as Indicated on Drawings: Internal, flexible mat-faced duct liner, fiberglass, 2 PCF, 1-inch thick, k-equals 0.24 at 75 degrees F, coated on air stream side with black neoprene. In addition to the above required locations, this insulation is applicable wherever so indicated on the Drawings or in the "Installation" paragraph on the section of the Specifications. Coat edge of insulation with adhesive. Refer to Section 15600 for additional requirements.

D. All Sheet Metal Supply Ducts: External, commercial grade FRK insulation, fiberglass, 1 PCF, 1-1/2" thick, k-equals 0.23 at 75 degrees F, with 0.02" aluminum foil vapor barrier cover.

2.4 PAINTING

A. Painting of all exposed insulation shall be in accordance with Section 15050. Painting is required on all insulation of exposed pipes and equipment. Exposed shall be all piping visible and not concealed in or behind walls or ceilings. INCLUDE THIS WORK IN YOUR BID.

PART 3 - EXECUTION

3.1 CLEARANCES

A. Plan piping layout with contractors of other sections apart to permit installation of insulation and air movement over surfaces.

3.2 PIPE INSULATION

A. Apply over clean dry surfaces, with the pipe at approximately room temperature. Adjoining sections of insulation shall be butted firmly together and the longitudinal seam of the jacket sealed with a vapor barrier lap. Longitudinal seam shall be located on the bottom half of the pipe. Ends of pipe insulation on cold pipes shall be sealed off with vapor seal adhesive at all fittings, flanges, and valves. Valves, or other fittings which project out from pipe, shall have oversize sleeve of sectional insulation fitted over standard size insulation with 2" overlap and exposed ends of insulation coated with white mastic, as above. Hot pipes, valves, fittings, and flange insulation do not require a vapor barrier, only full coverage. Factory jacket flaps may be stapled.

3.3 SUPPORTS

A. Support all insulated piping with hard sections of insulation at the point of support. Install sheet metal saddles between the insulation and the clevis of hangers.

3.4 NAMEPLATES

A. Do not insulate nameplates, access plates, ASME stamps and similar identification tags. Bevel insulation around all nameplates.

3.5 FITTINGS

A. Flanges, Unions, Valves and Fittings: For fittings and valves, segments shall be cut or nested. The segments of the insulation shall be placed and joined with adhesive. After the segments are in place, a vapor barrier coating shall be applied as specified. Where unions, flanges and valves are indicated not to be insulated, the covering shall be terminated neatly. The beveled ends shall receive a vapor barrier coating, as applicable.

3.6 HANGERS, SLEEVES AND ANCHORS

A. The insulation shall be continuous through pipe hangers and pipe sleeves. At hangers pipe shall be protected by a 360 insert of high density, 10 psi, waterproof calcium silicate, encased in a 360 metal shield. Insert to be same thickness as adjoining pipe insulation. Shield length and minimum sheet metal gauges as scheduled below. Insulation shall be vapor sealed.

PIPE SIZE	SHIELD LENGTH	MIN. GAUGE
1/2" - 1-1/2"	4"	26
2" - 6"	6"	20

3.7 SLEEVES AND WALL CHASES

A. At sleeves where caulking is required, pipe shall be protected by a 360 insert of high density, 100 psi, waterproofed calcium silicate, encased in a 360 shield. Insert to be same thickness as adjoining pipe insulation. Minimum sheet metal shield gauge shall be as scheduled in this section. On interior walls shield shall extend 2 inches beyond the wall on either side and shall be secured on each end by a band. On floor penetrations, shield shall extend from a point below the backup material to a point 10 inches above the floor with one band at the floor and one not more than one inch from end of shield. On both wall and floor penetrations insulation shall extend one inch beyond the shield on either end. Where plumbing pipes are located in wall chases and space does not permit installation of sectional insulation, when approved by the Project Manager pipes may have insulation omitted, provided chases are packed full of mineral fiber or Rock Wool.

3.8 ANCHORS FOR INSULATION

A. Where anchors or pins are welded to ducts, plenums or casings, use a welding procedure which will not distort sheet metal or burn through or mar interior finish of duct, plenum or casings but which will develop full strength of anchor. Attach anchors to inside surface of concrete curb under air conditioning units with epoxy, liberally applied. Anchor and pin sizes and diameters shall be as recommended by manufacturer for type and thickness of insulation specified.

3.9 DUCTS AND PLENUMS

A. Clean and dry surfaces before installing insulation.

B. Butt joints of insulation together with vapor barrier overlap to obtain full coverage. Do not compress the insulation.

C. Staple all flaps.

D. For rectangular ducts 20" or larger in width the flexible insulation shall be secured to the bottom of the duct by adhesive applied in 6" square dabs on 24" centers in each direction.

E. Repair breaks, and perforations to full thickness flush with adjoining surface with new sections.

F. Acoustical lining breaks and tears shall be repaired prior to final installation. Contractor shall keep additional stick pins and adhesive on site for such repairs. Coat leading edge of all acoustical lining with adhesive. ACOUSTICAL LINING WHICH IS WATER SOAKED OR TORN SHALL BE REMOVED AND REPLACED.

3.10 ELECTRIC HEAT TAPE

A. Secure electric heat tape to piping per manufacturer's recommendations. Terminate wiring in weatherproof J-box. Coordinate connection with Division 16.

3.11 SUBMITTALS

A. Prior to construction submit for approval the following materials:

1. Pipe insulation for:

   a. Domestic cold water
   b. Domestic hot water
   c. Rainwater leaders and overflow drains
   d. Drains from drinking fountains and floor sink.
   e. Handicapped lavatory P-traps.

2. Duct insulation

   a. Supply ducts
   b. Return ducts

3. Acoustical duct and plenum lining. Submit sample for approval.

4. Pipe elbows.

5. Insulation saddles.

6. Specialties such as taping material, stick pins, metal bands.

7. Heat tape.

END OF SECTION

PLUMBING

PART 1 - GENERAL

1.1 APPLICABLE REQUIREMENTS

A. Section 15010 - Mechanical General.

B. Section 15050 - Basic Materials and Methods.

C. Section 15250 - Insulation.

D. Secton 15440 - Plumbing Fixtures.

E. Section 15458 - Plumbing Equipment.

1.2 SCOPE

A. The work includes providing new plumbing systems, complete, as indicated on the drawings, and in accordance with rules and regulations of all governing agencies and all requirements of this Section of the Specifications.

B. Work includes but is not limited to the following:

1. Domestic Water System.

2. Interior Waste and Vent System.

3. Interior Rainwater System.

4. Sanitary and Storm Sewer Systems.

5. Equipment.

1.3 TEMPORARY WATER SERVICE

A. As directed by the General Contractor, the plumber shall provide a temporary metered water service and temporary water risers with hose bibbs installed at each level as the building proceeds upwards to the roof. Coordinate with Section 01500, paragraph 1.4 for exact requirements.

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials and equipment under this Division of the Specifications shall be new, of best grade and as listed in printed catalogs of the manufacturer.

B. All manufactured materials shall be delivered and stored in their original containers. Equipment shall be clearly marked or stamped with the manufacturer's name and rating.

C. The following products to be included as part of this work but specified under Section 15050 Basic Materials and Methods:

1. Piping.
2. Valves.
3. Hangers and supports.
4. Escutcheon plates, flashings, and sleeves.
5. Identification markers and signs.
6. Anchors, alignment guides and requirements.
7. Excavation and backfill.
8. Pressure and temperature gages.
9. Access Panels.

D. Plumbing Fixtures: Refer to Section 15450.

E. Plumbing Equipment: Refer to Section 15458.

2.2 CLEANOUTS

A. Cleanout Plugs: Bronze, countersunk head, gasket seal.

B. Floor Cleanouts: Cast-iron body and frame, flange with flashing clamp, adjustable cast-iron top with scored non-skid finish, caulk inside or no-hub.

1. Finished Floor: Jay R. Smith series 4026-F-C or Wade series W-6010-26-118 or Zurn ZN-1400-2-C.

2. Carpeted Areas: Jay R. Smith series 4026-F-C-Y or Wade series W-6010-26-118 or ZN-1400-14-C.

3. Tiled Areas: Jay R. Smith series 4166-F-C or Wade series W-6010-26-118-TS or Zurn ZN-1400-6-C.

4. Unfinished Areas: Jay R. Smith series 4226-FC, Wade series W-6010-Z-26 or Zurn ZN-1400-2-C.

C. Cleanout Tee: Cast iron cleanout tee with countersunk brass plug and smooth stainless steel cover.

1. MFG: Jay R. Smith series 4531, Wade series W-8460-R or Zurn Z-1445-1.

2.3 ROOF FLASHING

A. Flashing: Sheet lead, 3 lbs. per sq. ft.

B. Vent Pipes: Pre-fabricated flashing assembly, 4 lb. lead flashing, 10" skirt, steel boot, caulk type, hood with Allen head vandal proof screws.

1. MFG: Stoneman series 1300-7.

2.4 WATER HAMMER ARRESTORS

A. Bellows Type: Stainless steel casing and bellows, nitrogen charged, 250 psi rated, tested and certified per PDI WH-201.

1. MFG: Jay R. Smith series 5000, Wade series W5-100, or Zurn series Z-1700.

B. Piston Type: Hard drawn copper construction, mirror finished internal surfaces; machine finished brass piston, air charged, 250 psi rated, tested and certified per PDI WH-201.

1. MFG: Watts series 15, Sioux Chief series 650, or Precision Plumbing Products.

2.5 WALL HYDRANTS AND HOSE BIBBS

A. Anti-contamination Hose Bibbs, HB-1: Interior, bronze body construction, polished chrome plated finish, renewable composition disc, wheel handle, 1/2" NPT inlet, 3/4" threaded hose end, vacuum breaker/backflow preventer, solder joint, ANSI 1011.

1. MFG: Woodford series 24P.

B. Anti-Contamination Wall Hydrant, WH-1: Exterior, box-type, freezeproof, cast-bronze construction, chrome plated finish, loose key, bronze casing, length to suit wall thickness, vacuum breaker/backflow preventer, 3/4" inlet, 3/4" threaded hose end, solder joint.

1. MFG: Woodford series B65C, Jay R. Smith or Wade.

C. Roof Hydrant, RH-1: Exterior, freezeproof, post type, 1" brass pipe outer casing, brass casing head; 1/8" drain top; drain to nearest floor drain or mop sink, 3/4" vacuum breaker/backflow preventer hose end. Provide additional support and brace solid to structure.

1. MFG: Woodford series Y30 with 34 HD.

2.6 VALVES: DOMESTIC WATER

A. General: Refer to Section 15050 for details.

B. Shut-Off, 2" and Smaller: Ball valve.

C. Shut-Off, 2-1/2" and Larger: Lug wafer butterfly valve.

D. Check Valve: Swing type.

E. Underground: Gate AWWA gate valve.

F. Backflow Preventer:

1. Domestic Water Service: Double check valve type.

2. Equipment: Reduce pressure type.

2.7 VALVES: NATURAL GAS

A. General: Refer to Section 15050 for details.

B. Shut-off Valve: Lubricated plug valve.

C. Shut-off: 1-1/2" or Smaller: AGA approved ball valve.

2.8 DRAINS

A. General: Provide drains of size as indicated on drawings and type, including features, as specified herein.

B. Area Drain, AD-1 - Outdoor Plaza on Roof Deck: Enamel coated cast iron body and flashing collar, 8" square bar grate, inside caulk or no-hub joint. Polished bronze top shall be furnished for finished areas.

1. MFG: Jay R. Smith series 2110-S-Y, Wade series W-1310-4, or Zurn series ZB-611.

C. Area Drain, AD-2 - Parking Garage: Enamel coated cast iron body with flashing collar, sediment bucket, 12" diameter tractor grate inside caulk or no-hub joint.

1. MFG: Jay R. Smith series 2142(Y), Wade series 1210-13-27, or Zurn Z-541.

D. Floor Drain, FD-1 - Finished Areas: Enamel coated cast iron body with flange, integral reversible clamping collar, seepage openings, adjustable 5" square satin nickel bronze strainer, trap primer connection, bottom outlet, caulk inside or Ty-Seal joint.

1. MFG: Jay R. Smith series 2010-B-P, Wade series W-1100-C, or Zurn series ZN-415-SB.

E. Floor Drain, FD-2 - Mechanical Rooms: Enamel coated cast iron body with flange, clamping collar, seepage openings, 8-1/2" diameter cast iron bar strainer, trap primer, bottom outlet, caulk inside or Ty-Seal joint. Note: Provide deep seal traps on floor drains in supply and return air plenums and all floor drains installed in Penthouse.

1. MFG: Jay R. Smith 2110-P(Y), Wade Series W-1310-6-K(TY), or Zurn Z-550-P.

F. Floor Sink, FS-1: Enamel coated cast iron rectangular body with seepage flange, acid resistant interior surfaces, aluminum dome strainer, 6" x 12" full recessed aluminum grate, bottom outlet, caulk inside, Ty-Seal, or no-hub joints. Provide trap primer as indicated on plans.

1. MFG: Jay R. Smith series 3320-Y-15, Wade series W-9240-24, or Zurn series ZN-1845-12.

G. Roof Drain, RD-1: Enamel coated cast iron body with flange, flashing ring with gravel stop, 10-7/8" polyethylene mushroom domes, under deck clamp, extension, sump receiver, caulk inside or no-hub joint, and expansion compensator.

1. MFG: Jay R. Smith series 1010-CE-R(Y), Wade series 3000-52-53-DR-NH(IC) or Zurn series Z-100-ERC. For IRMA roof areas use Wade Series 3000-DFS-D, Jay R. Smith or Zurn. For terrace areas use Wade Series 3100-1-53-DFS, Jay R. Smith or Zurn.

H. Overflow Roof Drain, OFD-1: Enamel coated cast iron body with flange, flashing ring with gravel stop, polyethylene dome, underdeck clamp, extension, sump receiver, standpipe collar, caulk inside or no-hub joint, and expansion compensator.

1. MFG: Jay R. Smith series 1080-CER(Y), Wade series W3000-D-52-53-DF-NH(IC) or Zurn Z-2100-89-ERC. For IRMA roof areas use Wade Series 3000-DFS, Jay R. Smith or Zurn. For terrace areas use Wade Series 3100-1-53-DFS, Jay R. Smith or Zurn.

I. Hub Drain: Open bell of pipe with 2" x 4", 4" x 8", or 4" x 10" increaser or as indicated.

J. Downspout Fitting, DSN-1: Cast bronze body construction and flange, nickel bronze finish, threaded outlet.

1. MFG: Jay R. Smith series 1770-NB, Wade series 3940 or Zurn series Z-199.

2.9 TRAP PRIMER

A. Cast bronze construction, vacuum breaker, 1/2" sweat solder connection. Install in accessible location.

1. MFG: Jay R. Smith 2699-1, Wade W-2400-CS, or Zurn 1022.

PART 3 - EXECUTION

3.1 GENERAL

A. This system to be installed by an experienced firm regularly engaged in the installation of plumbing systems as specified by the requirements of the Specifications.

B. Install all items specified in this section of the Specification under the full purview of local and State governing agencies.

C. For additional provisions regarding this work, refer to Section 15050, Mechanical General Requirements.

D. Connections to other equipment included in other sections of this specification.

1. Drains for sprinkler/standpipe system.

2. Drains for HVAC equipment.

E. Connections from building utilities shall extend 5'-0" from the building for connection to utilities as shown on the civil engineer's plans.

3.2 TESTING AND DISINFECTING - PLUMBING SYSTEMS

A. General: The Contractor to perform all field tests and provide all labor, equipment, and incidentals required for the tests. Owner to witness all field tests and conduct all field inspections. The Contractor to give the Owner ample notice of the dates and times scheduled for tests. Any deficiencies to be completely retested at no additional cost.

1. Inspection: Inspection to continue during installation and testing. Perform a final inspection of the equipment prior to installation to determine conformity to the type, class, grade, size, capacity, and other characteristics specified herein or indicated. Correct or replace all rejected equipment prior to installation.

2. Water Distribution Piping Test: Before fixtures are set, subject the entire hot and cold piping system to a hydrostatic pressure test of 150 pounds per square inch with water for not less than 8 hours in order to permit inspection of all joints with no evidence of leakage. Where a portion of the water distribution piping is to be concealed before completion, test this portion separately as specified for the entire system.

3. Sanitary, Waste, Storm, Rainwater, and Vent Piping Test: Before the installation of any fixtures or drains, cap the ends of the system and fill all lines with water to the roof level and allow to stand for at least 30 minutes without leakage. Make tests within building with piping exposed. If the system is tested in sections, tightly plug each opening, except the highest opening of the section under test, and fill each

section with water and test with at least a 10' head of water. Test underground piping before backfilling with at least a 10' head of water.

4. Sanitary Drainage, Vent, Storm, Rainwater and Fixture System Final Test: Give sanitary, drainage vent, and fixture systems an in-service test after complete installation. After all fixtures are installed, test the entire vent and sewer system and prove gas and water tight. Final test shall be with air. Before proceeding with test, fill all traps with water. Close all stacks and line openings during test, for a minimum period of 24 hours. If test reveals leakage of air at any point, repair and retest the system.

5. Natural Gas Testing

   a. Inspection, testing and purging to be in accordance with NFPA 54, Part 4.1, 1985 Edition.

   b. Certification results to be approved in writing by Northwest Natural Gas Company.

6. Disinfection of Water Distribution System: After pressure tests have been made, thoroughly flush the entire domestic water distribution system with water until all entrained dirt and mud have been removed, and sterilize by chlorinating material. The chlorinating material shall be liquid chlorine. The chlorinating materials shall provide a dosage of not less than 50 parts per million and shall be introduced into the system or part thereof in an approved manner. Retain the treated water in the pipe for 24 hours, or, fill the system or part thereof with a water-chlorine solution containing at least 200 parts per million of chlorine and allow to stand for three hours. Open and close all valves in the system being disinfected three times during the contact period. Then flush the system with clean potable water until the residual chlorine is reduced to less than 1.0 ppm. During the flushing period open and close all valves and faucets three times. From at least three divergent points in the system, take samples of water in properly sterilized containers for bacterial examination. Repeat the disinfecting until tests indicate that satisfactory bacteriological results have been obtained.

   a. Taking of samples shall be witnessed by Project Manager or Owner's representative. Samples are to be taken and tested by an independent analytical testing laboratory. Written reports shall be supplied to Project Manager for approval.

3.3 OPERATION TESTING AND CERTIFICATION - PLUMBING SYSTEMS

A. Upon completion and disinfection, and prior to acceptance of the installation, the Contractor to subject the plumbing system to operating tests to demonstrate satisfactory, functional, and operating efficiency. Such operating tests to include the following information in a report with conclusions as to the adequacy of the system.

1. Time, date, and duration of tests.

2. Water pressures at most remote location.

3. Operation of all valves and hydrants.

4. Operation of all floor drains by flooding with water.

5. Quality of domestic water.

6. Pressure of gas lines.

7. Read all indicating instruments at half-hour intervals unless otherwise directed. Supply four copies of the test report to the Owner.

3.4 CLEANING EQUIPMENT AND MATERIALS

A. In addition to the requirements of Section 15010, provide for the safety and good condition of all materials and equipment until final acceptance by the Owner. Protect all materials and equipment from damage. Provide adequate and proper storage facilities during the progress of the work. Special care to be taken to provide protection for bearings, open connections, pipe coils, pumps, compressors, and similar equipment.

B. All piping, finished surfaces, and equipment to have all grease, adhesive labels, and foreign materials removed.

C. All piping to be drained and flushed to remove grease and foreign matter. Pressure regulating assemblies, traps, flush valves, and similar items shall be thoroughly cleaned. Remove and thoroughly clean and reinstall all liquid strainer screens after the system has been in operation for ten days.

D. When connections are to be made to existing systems, the Contractor is to do all cleaning and purging of the existing systems required to restore them to the condition existing prior to the start of work.

3.5 OPERATION MANUALS, START-UP SERVICE, WARRANTIES, ACCEPTANCE AND GUARANTEES

A. General: Refer to Section 15010 for details.

3.6 LAYOUT DRAWINGS

A. Prior to the start of installation, submit to the Project Manager for approval, Layout Drawings to scale, coordinated with all building systems, and lists of materials, fixtures, and equipment to be incorporated in the work. The Layout Drawings shall consist of plans and sections, with elevations and sections to show clearly the locations and size of major items of equipment and piping as listed below, clearances for maintenance withdrawals of removable components. The general arrangement of the systems to be installed, coordination with other work, and all requirements for installation shall be met.

3.7 SUBMITTALS

A. Prior to construction, submit for approval the following materials and equipment:

1. Piping and fittings and designated use.
2. Piping specialties.
3. Floor drains, floor sinks.
4. Valves.
5. Access doors.
6. Plumbing fixtures.
7. Layout drawings.
8. Seismic Calculations and Details.

B. See Section 01300: Submittals.

END OF SECTION

PLUMBING FIXTURES

PART 1 - GENERAL

1.1 APPLICABLE REQUIREMENTS

A. Section 15010 - Mechanical General.

B. Section 15400 - Plumbing Piping.

1.2 SCOPE

This Section specifies plumbing fixtures and trim.

1.3 RELATED SECTIONS

Separate grab bars and toilet accessories not an integral part of plumbing fixtures are specified in Division 10.

1.4 SUBMITTALS

A. Product Data: Submit Product Data and installation instructions for each fixture, faucet, specialties, accessories, and trim specified; clearly indicate rated capacities of selected models of water coolers.

B. Shop Drawings: Submit rough-in drawings. Detail dimensions, rough-in requirements, required clearances, and methods of assembly of components and anchorages. Coordinate requirements with Architectural Woodwork shop drawings specified in Division 6 for fixtures installed in countertops and cabinets. Furnish templates for use in woodwork shop.

C. Wiring Diagrams: Submit manufacturer's electrical requirements and wiring diagrams for power supply to units. Clearly differentiate between portions of wiring that are factory installed and field installed portions.

D. Color Charts: Submit manufacturer's standard color charts for cabinet finishes and fixture colors.

E. Maintenance Data: Include data in Maintenance Manual specified in Division 1 and Section 15010.

1.5 CODES AND STANDARDS

A. ASHRAE Standard 18: "Method of Testing for Rating Drinking Water Coolers with Self-Contained Mechanical Refrigeration Systems."

B. ARI Standard 1010: "Drinking Fountains and Self-Contained Mechanically Refrigerated Drinking Water Coolers."

C. ANSI Standard A117.1: "Specifications for Making Buildings and Facilities Accessible To and Usable By Physically Handicapped People."

D. Public Law 90-480: "Architectural Barriers Act of 1968."

E. UL Standard 399: "Drinking-Water Coolers."

F. UPC: Chapter 9 - Plumbing Fixtures.

1.6 MAINTENANCE

A. Extra Stock

1. Furnish special wrenches and other devices necessary for servicing plumbing fixtures and trim to Owner with receipt in a quantity of one device for each 10 fixtures.

2. Furnish faucet repair kits complete with all necessary washers, springs, pins, retainers, packings, o-rings, sleeves, and seats in a quantity of 1 kit for each 40 faucets.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide fixture as specified. Acceptable manufacturers: American Standard, Briggs, Bradley, Crane, Eljer, Kohler, Universal Rundle or as indicated.

B. Provide faucet as specified. Acceptable manufacturers: Chicago, Delta, Powers, Symmons or as indicated.

C. Provide carrier as specified. Acceptable manufacturers: Josam, Jay R. Smith, Wade, or Zurn.

2.2 FIXTURE LISTING

WC-1 Water Closet

1. Fixture: American Standard 2477.016 "Afwall" wall mounted vitreous china siphon jet toilet 1-1/2" top spud, bolt caps, 3 gallon water flush, white color finish.

2. Seat: Beneake, Bemis or Olsonite solid black plastic elongated open front seat less cover, stainless steel check hinges.

3. Flush Valve: Sloan Royal 110-3YB, Delaney or Zurn, chrome color finish.

4. Carrier: Wade series W-310-AMI for horizontal and W-340-AMI for vertical installation, 4" side outlet, 2" vent outlet and flush valve support.

5. Mounting Height: 15" floor to rim.

WC-2 Water Closet - Barrier Free

1. Fixture: American Standard 2477.016 "Afwall" wall mounted vitreous china siphon jet toilet 1-1/2" top spud, bolt caps, 3 gallon water flush, white color finish.

2. Seat: Beneake, Bemis or Olsonite solid black plastic elongated open front seat less cover, stainless steel check hinges.

3. Flush Valve: Sloan Royal 110-3YB, Delaney or Zurn, chrome finish.

4. Carrier: Wade Series W-310-AMI for horizontal and W-340-AMI for vertical installation, 4" side outlet, 2" vent outlet, high rough and flush valve support.

5. Mounting Height: 19" floor to top of seat maximum.

UR-1 Urinal

1. Fixture: American Standard 6540.017 "All Brook", wall mounted vitreous china siphon jet urinal, 1-1/4" top spud, 2" outlet, wall hanger, one gallon water flush, white color finish.

2. Flush Valve: Sloan Royal 180-YB, Delaney or Zurn, chrome finish.

3. Carrier: Bearing plate and flush valve support, Wade W-400-AMI-M36 fixture support, with 1x3 steel uprights min.

4. Mounting Height: UR-1 - 24" floor to lip.

PLUMBING FIXTURES

L-1 Lavatory - Barrier Free

1. Fixture: American Standard 0476.028 "Aqualyn", 20" x 17" countertop vitreous china oval lavatory drilled for centerset fitting, white color finish. Provide additional punched hole for soap dispenser.

2. Faucet: American Standard 2000.101 "CERAMIX", 4" centers. Provide Chicago E26, 0.75 GPM aerator fittings, chrome finish.

3. Drain: Brass Craft, Chicago, or McQuire, 1-1/4" perforated grid strainer with offset tailpiece, chrome finish.

4. P-Trap: Brass Craft, Chicago, or McQuire, 1-1/4" x 1-1/2" adjustable 17 gauge p-trap with cleanout; escutcheon plate.

5. Supplies: Brass Craft, Chicago, or McQuire, 1/2" x 3/8" flexible type supplies with loose-key stops and escutcheon plates.

6. Mounting Height: Refer to architectural elevations for details.

7. Note: Insulate with 1/2" thick covering P-trap and supplies, black matte finish, to meet barrier free requirements. Refer to insulation Section 15180 for details.

8. Soap Dispenser: American Standard 4503.029, chrome finish.

S-2 Sink - Mop

1. Fixture: Stern Williams CRS-2200, "Crescent" 28" x 28" x 12" terrazzo floor set receptor; cast brass drain with stainless steel strainer and tailpiece; 20 gauge stainless steel rim guard.

2. Faucet: Chicago 897; wall mounted combination fitting with vacuum breaker, wall brace, threaded hose outlet and integral stops.

3. Sealant: Caulk edges of basin with silicone sealant.

EWC-1 Electric Water Cooler - Barrier Free

1. Fixture: Haws Series HWCF8RF, lead-free unit, front panel grille.

2. Trap: 1-1/4" x 1-1/2" cast brass adjustable p-trap.

3. Supply: 1/2" x 3/8" supply with stop.

4. Carrier: Wade fixture support with 1" x 3" steel uprights, min.

5. Electrical: 380 watt, 4.7 amps; plug-in, 3-wire cord, 120 volt.

6. Finish: Satin stainless steel.

7. Mounting Height: 35-1/2" floor to top of bubbler orifice.

8. MFG: Haws.

PART 3 - EXECUTION

3.1 GENERAL

A. Verify all dimensions by field measurements. Verify that all plumbing fixtures may be installed in accordance with pertinent codes and regulations, the original design, and the referenced standards.

B. Examine rough-in for potable water and waste piping systems to verify actual locations of piping connections prior to installing fixtures.

C. Examine walls, floors and cabinets for suitable conditions where fixtures are to be installed.

D. Install plumbing fixtures level and plumb, in accordance with fixture manufacturer's written instructions, rough-in drawings, and pertinent codes and regulations, the original design, and the referenced standards.

E. Comply with the installation requirements of UPC, 1985 Edition, with respect to plumbing fixtures for the physically handicapped.

F. Fasten plumbing fixtures securely to supports or building structure. Secure supplies behind or within wall construction to provide rigid installation.

G. Install a stop valve in an accessible location in the water connection to each fixture.

H. Install escutcheons at each wall, floor, and ceiling penetration in exposed finished locations and within cabinets and millwork.

I. Seal fixtures to walls and floors using silicone sealant as specified in Section 07900. Match sealant color to fixture color.

J. Test fixtures to demonstrate proper operation upon completion of installation and after units are water pressurized. Replace malfunctioning units, then retest.

K. Inspect each installed unit for damage. Replace damaged fixtures.

L. Adjust water pressure at drinking fountains, faucets, shower valves, and flush valves to provide proper flow stream.

M. Replace washers of leaking or dripping faucets and stops.

N. Clean fixtures, trim, and strainers using manufacturer's recommended cleaning methods and materials.

O. Provide protective visqueen covering for installed fixtures, water coolers and trim.

3.2 SUBMITTALS

A. Prior to construction, submit for approval the following materials and equipment:

1. Plumbing fixtures.

2. Carriers.

3. Drinking fountains.

4. Plumbing fixture trims.

3.3 OPERATION MANUALS, START-UP SERVICE, WARRANTIES, ACCEPTANCE AND GUARANTEES

A. General: Refer to Section 15010 for details.

END OF SECTION

PLUMBING EQUIPMENT

PART 1 - GENERAL

1.1 APPLICABLE REQUIREMENTS

A. Section 15010 - Mechanical General

B. Section 15050 - Basic Materials and Methods

1.2 SCOPE

A. Extent of work required by this Section is indicated on drawings and schedules and by requirements of this section. Equipment to be provided under this section as follows:

1. Water Heaters

2. Domestic Hot Water Recirculating Pumps

B. Electrical Work: Refer to Division 15050 for requirements.

C. Electrical Work: Provide the following wiring as work of this section, in accordance with requirements of Division 16.

1. Provide factory-mounted and factory-wired controls and electrical devices as specified in this section.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data including rated capacities and efficiencies of selected model clearly indicated, operating weights, furnished specialties and accessories, and installation and start-up instructions.

B. Shop Drawings: Submit manufacturer's assembly type shop drawings indicating dimensions, required clearances, and methods of assembly of components.

C. Wiring Diagrams: Submit manufacturer's electrical requirements for electrical power supply wiring. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring required for final installation. Differentiate between portions of wiring that are factory installed and portions that are to be field installed.

D. Maintenance Data: Submit maintenance data and parts lists for each type and size of water heater, control, and accessory, including "trouble-shooting" maintenance guide. Include this data, product data, shop drawings, and wiring diagrams in maintenance manual, in accordance with requirements of Division 1.

E. Certificates: Submit appropriate Certificates of Shop Inspection and Data Report as required by provisions of ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 HOT WATER HEATER - GAS

A. The heater shall be a glass-lined dura-power supreme commercial gas water heater as manufactured by A.O. Smith Corporation.

B. Heater should be rated at capacities indicated on contract documents and constructed in accordance with ASME code shall bear appropriate symbol and listed with the National Board as required. Heater shall be listed with Underwriters' Laboratories and approved by National Sanitation Foundation.

C. All internal surfaces of the tank shall be glass-lined with an alkaline borosilicate composition that has been fused-to-steel by firing at a temperature of 1600° F. Tank shall be cathodically protected with adequate extruded magnesium anode. The entire vessel is to be enclosed in a round steel enclosure with baked enamel finish.

D. Control compartment to be hinged and shall house 120 volt control circuit transformer, transformer fusing, magnetic contactor(s), immersion style operating thermostat(s), element fusing per NEC, and commercial grade incoloy sheathed flange mounted elements with pre-wired thermal leads. Temperature controls include limiting switch which will require resetting manually in the event the temperature reaches 190° F.

E. Foam insulation (R-16) shall exceed latest requirements of ASHRAE (currently 90A-1980) for heat loss efficiency.

F. Heater shall include ASME T & P relief valve and drain valve.

G. Warranty: 3 years, professional start-up to be included.

H. Acceptable Equals: A. O. Smith, Bradford-White, Lochinvar or State.

2.2 RELIEF VALVES

A. Relief Valve: Watts vacuum relief valve, bronze body, silicone disc, threaded ends, installed on C.W. supply line only, refer to H.W. Heater Detail on contract drawings.

B. Temperature and Pressure Relief Valve: Watts, bronze body construction, thermostat and test lever, temperature relief set at 210° F, and pressure relief set at 125 psi, pipe relief to nearest floor sink.

2.3 HOT WATER RECIRCULATING PUMPS

A. Pump shall be maintenance free, in-line, single stage, wet rotor type with the pump mounted directly to the pump chamber. Refer to equipment schedules on drawings for capacities.

B. Pump chamber shall be bronze construction rated at 145 PSI, WWP. Impeller, inlet cone, rotor can and rotor cladding shall be stainless steel. Motor shall be aluminum oxide ceramic.

C. Circulator shall run continuously with an on-off switch provided by Electrical Contractor.

D. Manufacturer: Grundfos UP, Bell & Gossett or Thrush.

PART 3 - EXECUTION

3.1 GENERAL

A. Examine areas and conditions under which equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Install equipment in accordance with manufacturer's installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.

C. Orient so controls and devices needing service and maintenance have adequate access.

D. Connect water piping to units with shutoff valves and unions as indicated.

E. Anchor bolt water heater to slab and provide steel band for seismic restraint.

F. Provide angle iron or unistrut support brackets for support of hot water recirculation pumps.

G. Start-Up: Start-up, test, and adjust equipment in accordance with manufacturer's start-up instructions. Check and calibrate controls. Start-up to be by authorized manufacturer's representative or agent.

3.2 OPERATION MANUALS, START-UP SERVICE, WARRANTIES, ACCEPTANCE AND GUARANTEES

A. General: Refer to Section 15010 for details.

END OF SECTION

FIRE PROTECTION SYSTEMS

PART 1 - GENERAL

1.1 APPLICABLE REQUIREMENTS

A. Section 15010 - Mechanical General.

B. Section 15050 - Basic Materials and Methods.

1.2 SCOPE

A. The work includes the design and installation of a complete and fully operable automatic sprinkler and standpipe system in accordance with rules, regulations and standards as required by the following governing agencies.

1. City of Portland, Oregon.

2. Governing Fire Marshal's Office.

B. Work to be in accordance with the following:

1. Uniform Building Code, 1990 Edition.

2. NFPA Standards, 1985 Edition.

No. 13 - Sprinkler Systems
No. 14 - Standpipes & Hose Systems
No. 24 - Private Fire Service Mains

3. Factory Mutual.

4. Underwriters Laboratories, Inc.

C. Work includes but is not limited to the following:

1. Office: Automatic Wet Type Sprinkler System.

2. Standpipes: Dry-type.

3. Parking Garage: Dry system including air compressor.

1.3 SUBMITTALS

A. Product Data: Submit six copies of manufacturer's technical data and installation instructions for fire protection materials and products.

B. Shop Drawings: Prepare scaled layout drawings for fire protection pipe and fittings including, but not necessarily limited to, pipe and tube sizes, locations, and elevations and slopes of horizontal runs, wall and floor penetrations, and connections. Indicate interface and spatial relationship between piping and proximate equipment.

C. Approval Drawings: Submit shop drawings to Agency having jurisdiction for approval. Submit six approved copies, bearing stamp and/or signature of governing Fire Marshal to Owner's representative for review and approval.

D. Approval Calculations: Prepare hydraulic calculations of fire protection systems. Submit to governing Fire Marshal for approval. Submit six approved copies, bearing stamp, and/or signature of Agency having jurisdiction to Owner's representative for review and approval.

E. Certificate of Installation: Submit certificate upon completion of fire protection piping work which indicates that work has been tested in accordance with NFPA 13, and also that system is operational, complete, and has no defects.

F. Maintenance Data: Submit maintenance data and parts lists for fire protection materials and products. Include this data, product data, shop drawings, approval drawings, approval calculation, certificate of installation, and record drawings in maintenance manual; in accordance with requirements of the General Conditions.

1.4 DESIGN DESCRIPTION

A. This section of the specification combined with any of the contract drawings are intended as a guide to establish a basis of design for the systems required.

B. Contractor shall examine the existing building layout and install a completely hydraulically sized sprinkler system for all areas. Existing piping may be used where possible. All sprinkler heads and valves shall be replaced. NO EXCEPTIONS. Space shall be provided for any valving and equipment to be used. System shall start with connection to existing service and extend throughout the building.

C. The building shall be served with a wet type sprinkler system split into two zones - one per floor. Risers shall be located in a separate sprinkler closet with sprinkler valves on each floor.

D. All areas shall be sprinklered as the construction progresses, including accessible pipe chases, elevator pits, etc.

E. Install dry-type standpipe risers in each of the stairwells with fire department valves on each floor level. Valves shall be housed in cabinets.

F. Provide a dry system to the parking garage. Provide a maintenance air compressor.

G. All electrical devices used for this system shall be compatible with the fire alarm system, refer to Division 16.

1.5 HYDRAULIC DESIGN

A. Office Levels: Light Hazard.

B. Parking Garage: Ordinary Hazard Group II.

B. Head spacing shall not exceed the limits described in NFPA Pamphlet No. 13.

PART 2 - PRODUCTS

2.1 GENERAL

A. All products to be commercial grade, new and of the manufacturer's latest design model.

B. All products to be UL listed and/or FM approved, no exceptions.

C. All products to be delivered and stored in original containers. Containers shall be clearly marked or stamped with manufacturer's name and rating. Piping shall be covered and protected at all times.

D. The following items to be included but specified under Section 15050 Mechanical - General Requirements.

1. Hangers and supports.

2. Escutcheons plates, flashings and sleeves.

3. Access panel and doors.

4. Identification markers and signs.

5. Expansion compensators and flexible connectors.

6. Anchors, alignment guides, and restraints.

7. Excavation and backfill.

2.2 PIPE AND FITTINGS - ABOVE GROUND

A. Piping 2-1/2" and Smaller: Schedule 40 black steel, ASTM-135 or ASTM A-53 stamped on pipe; Class 150 threaded malleable iron fittings or roll-grooved fittings.

B. Piping 3" and Larger: Schedule 10 lightwall steel pipe, ASTM-135 stamped on pipe with roll-grooved fittings.

C. Mechanical Couplings: Victaulic grooved couplings style 07, 75 or 77.

1. Acceptable Equals: Grvlok or Gustin Bacon.

D. Mechanical Tees: Victaulic style 920. Victaulic style 921 mechanical tees are not acceptable.

1. Acceptable Equals: Grvlok or Gustin Bacon.

2.3 PIPE AND FITTINGS - UNDERGROUND

A. Class 52 ductile iron pipe and fittings, mechanical joint fittings. Piping to be encased with 8 mil polyethylene tube or sheet. Fittings to be double field wrapped with 2" wide, 20 mil vinyl tape, 50% overlap.

B. Provide 2000 PSI concrete thrust blocks at all fittings.

2.4 FIRE DEPARTMENT CONNECTIONS

A. Siamese Connection: Wall mounted; semi-recessed, with individual clapper valves, plugs and chains. Escutcheon plate to be lettered "AUTO SPRINKLER AND DRY STANDPIPE". Unit shall be polished chrome finish, mounted 36" above finished grade. Coordinate location with Fire Marshal.

B. MFG: Croker, Elkhart, Powhatten Brass or Potter-Roemer.

2.5 VALVING (2-1/2" OR LARGER)

A. Control Valve: Lug type wafer valve with tamper switch, ductile iron body, nickel plated ductile iron disc, stainless steel stem and Buna-N seat, 175 PSI WOG min.

B. Control Valve: OS&Y rising stem type gate valve, cast iron body and bonnet, bronze stem, seat and disc, flanged ends, 175 PSI WOG min. Provide with tamper switch.

C. Check Valve: Swing check type with cast iron body, bolted cap and disc, flanged ends, 175 PSI WOG min.

D. MFG: Stockham, Mueller or Kennedy.

2.6 VALVING (2" OR SMALLER)

A. Control Valve: OS&Y rising stem type gate valve bronze body, bonnet and disc, copper alloy stem, threaded ends, 175 PSI WOG min. Provide with tamper switch.

B. Check Valve: Swing check type with bronze body, cap and disc, threaded ends, 175 PSI WOG min.

C. Drip Valve: 3/4", cast brass automatic ball drip type, threaded ends, 175 PSI WOG min.

D. Sight Glass: 1", cast brass body, threaded ends, two glass plates mounted on either side of threaded ends, 175 PSI WOG min.

E. MFG: Stockham, Mueller, Reliable or Elkhart.

2.7 TAMPER SWITCHES

A. Switch shall be mounted so as not to interfere with normal operation of the valve and be adjusted to operate when handle of valve has traveled more than one-fifth the distance of its normal operating position. Electrical Contractor shall provide conduit from switch to fire alarm panel.

B. Housing shall be of aluminum, acid-treated, primed and finished in baked red enamel. Removal of housing shall cause switch to operate. Inside shall be a single pole, double throw micro switch with connection for electrical conduit.

C. Install on all control valves.

D. MFG: Potter Electric, Notifier or Ellenco.

2.8 WATER FLOW ALARM - VANE TYPE

A. Indicator shall be for either vertical or horizontal installation. Indicator shall not be installed in a fitting that changes direction of water flow and shall have a sensitivity setting to signal any flow of water that equals or exceeds the discharge from one sprinkler head. Provide retarding device to prevent false alarms from line surges.

B. Whenever a water flow alarm is installed in the piping system, an approved floor control valve shall be provided upstream of the alarm indicator. In addition, a drain is required downstream of the alarm indicator.

C. Each water flow alarm shall be wired to a Fire System. All wiring and conduits as required will be provided under Division 16. An alarm will automatically activate the local fire alarm system.

D. MFG: Potter Electric, Notifier or Ellenco.

2.9 WET ALARM CHECK VALVE

A. Alarm Gong: 10" diameter electric bell, 115 volt wired to flow alarm in ground floor sprinkler closet.

B. MFG: Grinnell, Reliable or Viking.

2.10 SPRINKLER HEADS - GENERAL

A. Sprinkler heads shall be regular automatic closed-type heads of ordinary degree temperature rating except that sprinkler heads installed in the vicinity of heating equipment or in special occupancy areas shall be of the temperature rating as described in NFPA No. 13.

B. The Contractor shall furnish spare heads. The heads shall be packed in a suitable container and shall be representative of, and in proportion to, the number of each type and temperature rating head installed. In addition to the spare heads, the contractor shall furnish not less than two special sprinkler head wrenches.

C. Sprinkler Price Adjustment: The price proposal for the complete sprinkler system shall be accompanied with a unit price for each head added to or deleted from the sprinkler system due to revision in the contract drawings.

2.11 SPRINKLER HEADS AND ESCUTCHEONS

A. Sprinkler heads installed shall be upright or pendant, as conditions require, and shall be of the following type and finish for the areas designated. Sprinklers shall be small frame type, center bulb capsule and 1/2" orifice.

Building Area	Type of Sprinkler Head	Sprinkler Finish	Escutch. Finish	Temp. Deg.
Unfinished, Garage & Mechanical & Electrical Rooms &	Upright Viking Model "M" Micromatic	Brass	None	155° F
Unimproved Office Space	Recessed Pendant, Viking Model "M" Micromatic	Chrome	White	155° F
Entrance & Elevator Lobbies	Concealed Pendant Viking Model "A"	Chrome	Navajo White	135° F
Soffit	Sidewall Viking Model "M" Micromatic	Chrome	White Polyester	155° F

B. Submit samples of each head for approval.

C. MFG: Firematic, Grinnell, Reliable or Viking.

PART 3 - EXECUTION

3.1 GENERAL

A. This system to be installed by an experienced firm regularly engaged in the installation of automatic sprinkler system as specified by the requirements of the Specifications.

3.2 PERFORMANCE OF WORK

A. Examine areas and conditions under which materials are to be installed. Layout the system to suit the different types of construction and equipment as indicated on the drawings and in accordance with NFPA Pamphlet No. 13, 14, and 24.

B. Work to start immediately after authorization has been given to proceed so that the overall progress of the construction is not delayed.

C. Coordinate with other trades as necessary to properly interface components of the sprinkler system.

D. Follow manufacturer's directions and recommendations in all cases where the manufacturers of articles used on this Contract furnish directions covering points not shown on the drawings or covered in these Specifications.

E. The omission from the drawings or Specifications of any details of construction, installation, materials, or essential specialties shall not relieve the Contractor from furnishing the same in place for a complete system.

F. Furnish 3 sets of drawings, calculations, and equipment submittals to Fire Marshal and Factory Mutual Representative. APPROVAL OF FACTORY MUTUAL REPRESENTATIVE IS REQUIRED.

3.3 TEMPORARY FIRE PROTECTION

A. Provide all temporary valving, piping, siamese connections and other components as directed by the Fire Marshal's office during all phases of construction.

3.4 INSTALLATION - GENERAL

A. Fire protection system shall be installed in accordance with the approved Drawings. The finished ceiling is not to be erected until all fire protection piping has been installed, tested, and inspected. Sprinkler heads located in the electrical equipment, elevator, or similar rooms shall be furnished with deflectors to prevent water spray on equipment.

B. The arrangement of all pipes shall conform to all architectural requirements and field conditions, shall be as straight and direct as possible, forming right angles or parallel lines with building walls and other pipes, and shall be neatly spaced. Offsets will be permitted only where required to permit the pipes to follow the walls. Standard fittings shall be used for offsets. All risers shall be erected plumb and true, shall be parallel with the walls and other pipes, and shall be neatly spaced. All work shall be coordinated with HVAC, Plumbing,

Electrical and Structural work in order to avoid interference and unnecessary cutting of floors or walls. All underground or concealed work shall be before the construction is closed up.

C. Sprinkler heads in all finished areas are to be installed on a true axis line in both directions, with maximum deviation from the axis line of 1/2 inch plus or minus and shall be plus or minus 1" within center of tile. At the completion of the installation, if any heads are found to exceed the above mentioned tolerance, they shall be removed and reinstalled.

D. No pipes or other apparatus shall be installed so as to interfere in any way with full swing of doors.

E. The arrangement, positions, and connections of pipes, drains, valves, etc., shall be as required by NFPA Pamphlet #13 for all areas to be sprinklered. However, the right is reserved by the Project Manager to change the location of any item to accommodate conditions which may arise during progress of the work, without additional compensation for such changes provided that no additional heads are required prior to the installation of the work.

F. Where required, piping shall be installed concealed in building construction, or through steel beams, to obtain adequate head room.

G. All pipe throughout the job shall be reamed smooth before being installed. Pipe shall not be split, bent, flattened, or otherwise injured either before or during installation.

H. Provide protective pans under pipes passing over high voltage electrical bus duct or switchgear equipment. The pan shall be constructed of 12 gauge black iron with a 6 inch lip, the corners being welded to make the pans watertight. Each pan shall be given three coats of Rust-Oleum paint and shall be supported by pipe hangers. The pan shall drain clear of the bus duct or switchgear.

I All pipe interiors shall be thoroughly cleaned of foreign matter before installation, and shall be kept clean during installation by plugging or other approved means. Piping shall be covered with visqueen during storage at site. Piping showing signs of rusting will be removed from project site and replaced.

J. Field Connections: Any modifications to system required by field conditions, physical equipment changes or compliance with code regulations shall be made promptly without cost to Owner.

K. Interference: No piping or sprinkler devices shall interfere with the operations of any door, window or mechanical and electrical systems. No part of this system shall visibly be installed in the physical parameter of any window.

L. Prohibited Fittings: U-bolt Mechanical T, Roustabout, Hooker style fittings, plain end, fit, snap-joint, field drilling or welding of any main or branch lines, and any device specifically prohibited by the local governing agencies.

M. Threaded Pipe: Threads shall be clean cut, standard and tapered. Threads shall be made up using flaked graphite and lubricating oil or a piping compound applied to the male threads only.

N. Grooved Pipe: Installation shall be as prescribed in the Victaulic Piping Manual only. "The VICHOLE Cutting Tool" is the only acceptable method to be used to cut holes in sprinkler or fire main piping when utilizing mechanical style fittings. Holes in the piping are to be made in the fabrication shop, not at the job site. Contractor shall provide at the project site a sample of each type of coupling (threaded, standard grooved coupling and mechanical type), showing complete assembly with pipe connections. Couplings will not be installed until samples are approved by the Project Manager. Project Manager's approval does not eliminate the Contractor's final approval by the Field Marshal's office.

O. Conform to all requirements of Section 15050 Mechanical - General Requirements.

P. Elevator Pits: Provide sprinkler heads in elevator pits per elevator code. Provide control valve with tamper switch to each pit and shaft area. Coordinate with Division 16 Fire Alarm System.

Q. Drain Lines: Route sprinkler system drains and test valves to janitors sinks or exterior location. NO EXTRAS FOR SPRINKLER DRAIN LINES.

R. Piping Protection: Protect sprinkler piping during construction with visqueen and tarps. Piping found unprotected on site will be removed and replaced.

S. Coordinate piping drops with fan powered box electrical access panel code clearance. Relocate piping which blocks clearance at no expense to owner.

3.5 IDENTIFICATION

A. In addition to the requirements of Section 15050, provide pipe markers every 20 feet, once in every room, and at each building level traversed, minimum.

B. Equipment such as siamese connections, valves, drains, pumps, alarm gongs, etc., to be provided with signs that identify type of equipment and service.

3.6 AS-BUILT RECORD DRAWINGS AND CERTIFICATION

A. As-built Record Drawings are to be kept up-to-date and the Master Copy kept at the job site. Prior to final acceptance of work being approved, these drawings are to be turned over to the Owner's Representative for approval.

B. Written certification from the insuring agents, and authorities having jurisdiction that the tests were satisfactory, to be part of the acceptance required under Paragraph 1.3.

C. After installation is complete and tests satisfactorily approved, deliver test certificates and approval by the local Fire Authorities and the FMA to the Project Manager. Final acceptance of sprinkler/standpipe system by Owner or Owner's representative shall be contingent upon receipt of certificate and approval from authorities having jurisdiction and for the delivery of final As-Built Drawings.

3.7 START-UP SERVICE, OPERATING AND MAINTENANCE MANUAL, WARRANTIES, ACCEPTANCE AND GUARANTEES

A. General: Refer to Section 15010 for details.

END OF SECTION

HEATING, VENTILATING & AIR CONDITIONING

PART 1 - GENERAL

1.1 Section 15010 - Mechanical General is applicable.

1.2 SCOPE

A. All work to be furnished and installed under this Section shall include but not necessarily be limited to the following:

1. Packaged rooftop variable air volume air conditioning units.
2. Variable air volume and fan powered box terminal units.
3. Air distribution, fans, ducts, registers and ductwork accessories.
4. Equipment isolation.
5. High efficiency motors for equipment of this Section.
6. Electrical equipment and wiring integral with equipment and control panels of this Section, as specified.
7. Motor starters, only as specifically called for.
8. Painting of work of this Section, including identification painting and marking.
9. Identification of heating and cooling work.
10. Testing of heating and cooling work.
11. Instruction of Owner's personnel for maintenance of systems.
12. Layout drawings.

1.3 RELATED WORK IN OTHER SECTIONS

A. Painting - Division 9.

B. Insulation - Section 15180.

C. Balancing - Section 15620.

D. Automatic Temperature Control - Section 15900.

E. Electrical - Division 16.

PART 2 - PRODUCTS

2.1 DUCTWORK

A. General: Construct all ducts and plenum of gauges, and with joints, bracing, reinforcing, and other construction details in accordance with the latest ASHRAE Guide and Data Book, and SMACNA Duct Manual, 1985 Issue, unless specified otherwise, and comply with requirements of NFPA Pamphlet No. 90A. Construct ductwork of United States Steel, Kaiser or equal, galvanized sheet metal, or aluminum and stainless steel in special systems as shown below. Diagonally crossbreak all panels on ducts 30-inches wide and larger, or bead using automatic bead machine with beads at 12-inches on center or less. Duct dimensions indicated on Drawings are net, inside, clear dimensions. For internally lined ducts, add lining thickness to determine metal duct dimensions.

B. Construction: Construct ducts as low, medium or high pressure per latest ASHRAE Guide and Data Book and/or SMACNA Duct Manual as follows:

1. Medium Pressure Supply and Return Ductwork in Risers: 2" to 3" wg.

2. Supply Ductwork Up to VAV Boxes: 1.5" to 2.5" wg.

3. All Supply Ductwork Downstream of VAV Boxes: 0.5" to 1" wg.

4. All Return Air Ductwork: -0.5" to -1.5" wg.

5. All Exhaust Air Ductwork: -0.5" to -1.5" wg.

C. Round Ductwork (Acoustically Lined): United Sheet Metal K-27 where acoustically lined or "Uni-Seal" spiral lockseam or equal by Metco.

D. Round Ductwork (Single Wall): United Sheet Metal "Uni-Seal" spiral lockseam or equal by Metco.

E. Oval Ductwork (Acoustically Lined): United Sheet Metal K-27 where acoustically lined with metal liner double wall ductwork, or equal by Metco.

F. Rectangular Ductwork: Ductwork upstream of terminal boxes, exhaust ductwork and return ductwork galvanized sheet metal in accordance with SMACNA and as specified above.

G. Joints - Rectangular Ducts

1. Low and Medium Pressure: Drive slip joints or standard seams as scheduled. Seal all transverse seams and longitudinal joints on all supply, exhaust and return air ducts with Arabol and canvas, or hardcast.

2. High Pressure: Per SMACNA manual.

H. Joints - Round

1. Exposed Ductwork: Sheet metal screws and hardcast.

2. Concealed Ductwork: Sheet metal screws, Arabol and canvas, or hardcast.

Maximum allowable leakage is 0.5% of the air flow. Install per manufacturer's recommendations.

I. Main Duct Run-Outs: The supply ductwork from the connection at the shaft riser and for first 15 feet shall be 16 gauge galvanized sheet metal reinforced with galvanized steel angle frame, 1" thick acoustical liner, and steel angles at 30-inches on center. Provide access doors and reinforce around doors with galvanized steel angle. Joints shall be Ductmate sealed Arabol and canvas. THIS REQUIREMENT IS CRITICAL FOR PROPER ACOUSTICAL ATTENUATION AND WILL BE ENFORCED.

J. Elbows and Transitions

1. Construct radius elbows with inside radius not less than duct width.

2. Use square elbows in all cases where exposed, unless otherwise indicated, and in lieu of radius elbows where required to facilitate installation. All square elbows shall have turning vanes.

3. Round Elbows: 5-gore all welded construction. Assemble per manufacturer's recommendations.

4. Construct transitions with minimum slope of 1 to 5 ratio.

K. Flexible Ducts: G I Industries ABL-181 acoustical round insulated with compression fittings at both ends. Lengths: 3.5' and 5.0' Genflex, Thermaflex or approved equal. Flexible duct shall be capable of maintaining smooth shape without sagging twist turns.

L. Where it is necessary to use 2-piece mitered elbows, they shall have turning vanes in accordance with the following schedule:

Diameter	Number of Vanes
3" through 9" (75 through 225 mm)	2
10" through 14" (250 through 350 mm)	3
15" through 19" (375 through 475 mm)	4
20" and over (500 mm and over)	5

1. Leading edge of vanes shall be hemmed with a 1/2" (13 mm) foldback.

2. Turning vanes in ducts over 24" (600 mm) shall be reinforced by rods or sectional construction to limit unsupported length to 24" (600 mm).

3. Vanes shall be a minimum of 20 gauge (0.912 mm).

M. Reduction of divided flow fittings shall be a conical-spun section in the thirty six common reductions in sizes 4" (100 mm) through 22" (550 mm).

N. Galvanized areas that have been damaged by welding shall be coated with corrosion resistant protection equal to Rustoleum Galvanoleum #1226.

O. Pipe to pipe joints in diameters to 50" (1 250 mm) shall be by use of sleeve couplings reinforced by rolled beads.

P. Fitting to pipe joints in diameters to 50" shall be by slip-fit of projecting collar of the fitting into pipe.

Q. Insertion length of sleeve coupling and fitting collar shall be 2" for diameters through 9", and 4" for diameters 10" through 50".

R. Round duct joints in diameters through 50" shall be assembled and sealed as follows:

1. Approved sealer shall be applied to the male end of coupling and fittings. After the joint is slipped together, sheet metal screws shall be placed 1/2" from joint bead for mechanical strength at 6" on center. Sealer shall be applied to outside of joint, extending one inch on each side of joint bead and covering the screw heads.

   A 3" wide band of gauze shall be imbedded in sealer and wrapped around the connection with enough layers to prevent separation of the connections. Apply a final coat of sealer as necessary to completely cover the gauze and extending one inch on each side of gauze.

2. Duct sealer shall be specifically formulated for sealing field joints in high pressure systems. Samples of sealer and gauze and the specification data shall be submitted to Project Manager for approval.

S. Installed duct system shall be pressurized to a test pressure of 4" WC. Air leakage at test pressure shall be measured by a calibrated orifice type of flow meter.

Total allowable leakage of system shall not exceed 1/2 of 1% of the air handling capacity of system. If system is tested in sections, leakage rates shall be added to give the performance of the whole system. Leakage concentrated at one point may result in objectionable noise even if the system passes the leakage rate criteria.

This noise source shall be corrected to the satisfaction of the Project Manager.

2.2 DUCTWORK SPECIALTIES

A. Volume and Splitter Dampers: Galvanized sheet metal with Ventfabrics Inc., Ventlok operating hardware. For accessible dampers, provide No. 620, 635, or 637 dial regulators, No. 635 or 637 square end bearing, and No. 635 spring end bearing, as applicable. For inaccessible dampers, provide No. 666 concealed damper regulator with bearings as above. For medium and high pressure ducts, provide No. 635 Hi/Vel dial regulator and No. 609 Hi/Vel end bearing for accessible dampers. Concealed ceiling damper in gypsumboar shall have Young #303.

B. Multi-louver Volume Dampers: Titus AG-35-B, opposed blade, Anemostat, or equal.

C. Extraction Dampers: Titus AG-45 with No. 3 operator, Anemostat, or equal.

D. Fire Dampers: Ruskin, Air Balance, Inc., Fire/Seal, Wonder Metal, or equal, UL labeled and in conformance with NFPA 90A. All dampers to be out of airstream, Type B or C. Provide duct and ceiling access panels as required.

E. Turning Vanes: Turning vanes shall be single vane with trailing edge in accordance with ASHRAE 1981 Fundamentals Handbook 33.32 3-8.

F. Flexible Connections: Q Industries, Consolidated Kinetics; Elgen "Silent Duct", Type SDA, Ventfabrics, or equal.

G. Bird Screens: No. 14 gauge, 1/2-inch, galvanized wire mesh, set in a galvanized steel frame, screw set.

H. Access Panels: Reinforced, galvanized sheet metal with airtight gaskets. Provide hinges and Ventfabrics, Inc. Ventlok latches, Milcor, or equal, as follows:

1. Duct Access Panels for Hand Entry Only: No. 90 sash type latch.

2. Duct and Plenum Access Doors for Body Entry: No. 310 latch, operable from both sides of door.

3. Minimum size of access panels is 12"x12".

I. Backdraft Dampers: Shall be counterweight type complete with frame, end bearings, counterbalance assembly, blades, linkage, etc. Pacific Air Products Model PRD-100AL, Ruskin Model CBS-7 or approved equal.

2.3 GRILLES, REGISTERS, AND DIFFUSERS

A. Titus, Barber Colman, MetalAire or Krueger, except as noted otherwise, sizes, capacities and pattern as shown on the Drawings. Install all outlets flush, squared, tie-sealed, and entirely covering sheet metal ductwork and gaskets. Thread sheet metal mounting screws tightly into sheet metal. All frames to fit ceiling type. Provide dropped face register is tegular ceiling installation. Verify with Architectural Drawing. Manufacturer's representative shall carefully review architectural and mechanical drawings and ensure register selections will provide proper air distribution at NC 30 or less. Register not providing proper distribution or excessive noise at scheduled air flow shall be replaced by manufacturer at no additional expense to the Owner.

1. CSD-1 (Ceiling Supply Diffuser #1 - Toilet Room): Krueger Model 1100 perforated face diffuser with pattern control, round to square duct adapter, and white factory finish. Provide opposed blade damper in gypboard ceiling installations.

2. CSD-2 (Ceiling Supply Diffuser #2 - Building Lobby): Titus TMS louver face register, round to square adapter, and white factory finish. Provide opposed blade damper in gypboard ceiling installation.

3. CLD-1 (Ceiling Linear Diffuser #1 - Building Perimeter): Titus Model ML 39 2-slot linear diffuser with pattern control vanes factory prime finish. Fabricate lined sheet metal boot in accordance with manufacturer's recommendations for air flows indicated.

4. CER-1 (Ceiling Exhaust Register #1 - Toilet Rooms): Krueger 1100 series perforated face register. Provide opposed blade damper in hard ceilinged areas.

5. WSR-1 (Wall Supply Register #1 - Building Core): Titus Model RL with adjustable front and rear blades.

2.4 VARIABLE VOLUME ZONE BOXES

A. Furnish and install variable volume zone boxes of the sizes and capacities shown on the Drawings, Titus ESV-3000, or approved equal by Trane or Enviro-Tec.

B. The control assemblies shall be pressure independent and shall be able to be reset to any air flow between zero and maximum scheduled CFM. The differential static pressure of the basic assembly shall not exceed 0.25 inch W.G. for all sizes with inlet velocities of 2,000 FPM or less.

C. The air valve shall be die cast aluminum; damper shafts shall operate in rustproof Delrin or equal, self-lubricating bearings, or a 16 gauge damper with continuous steel rod end bearings and minimum of 2 set bolts. The air valve shall seat against durable gaskets and not exceed a 2% leakage rate per Air Diffusion Council Standards.

D. The control device shall be designed to maintain constant flow regardless of inlet flow deflection. Duct inlets at 90 degrees or less to the control device shall not alter the maximum or minimum factory setting by more than 10%. The assembly shall incorporate an amplified non-directional flow sensor.

E. The control devices and actuators shall be provided by the controls contractor under Section 15900 and shall be factory installed, calibrated and tested. NO EXCEPTIONS.

F. The assemblies shall be contained in a welded 26-gauge galvanized steel box internally lined with 1-inch, 1-1/2 pound insulation complying with NFPA 90A and UL-181 standards.

G. Provide factory sound attenuators or fabricate and install 5-foot lined sheet metal discharge duct with 1" thick acoustical lining on all VAV boxes. First outlet shall be 10-feet downstream of air valve.

2.5 FAN POWERED BOXES

A. Furnish and install fan powered boxes of the sizes and capacities shown on the Drawings, Titus or approved equal by Trane, Envirotec or Anemostat.

B. Casing: 26-gauge galvanized steel with rectangular discharge with slip and drive type connection. One piece aluminum backdraft damper provided on

fan discharge. Damper factory set and aligned for precise seal. Leak rate 2% at 0.5 WG.

C. Insulation: Interior surface of casing acoustically and thermally lined with 1-inch thick, 1-1/2 lb. density glass fiber insulation, with high density facing. Insulation is UL listed and meets NFPA 90A requirements.

D. Air Valve: Cylindrical die cast aluminum air flow control device with integral actuator, or a 16-gauge damper with continuous steel rod, end bearing, minimum of 2 set bolt (torqued to required pressure) and blade seals. Valve tapered to fit standard round flexible duct diameters. Normally open sequencing for reverse acting thermostat. Leak rate 4% at 2 WG.

Integral flow ring taps, calibration chart for flow measurement, ± 10% accuracy regardless of inlet condition.

E. Fan: Fan style galvanized steel wheel. Housing is 18-gauge steel and fanboard is 16-gauge steel. Motor is permanent split capacitor type, direct drive, variable frequency drive. Motor temperature rise design criteria less than 50 degrees C on all speeds. Provide inlet acoustical attenuator on fan inlet, filter and filter frame. PROVIDE VARIABLE SPEED CONTROL ON FANS. THREE-SPEED SWITCH NOT ACCEPTABLE.

F. Disconnect Switch: Provide factory mounted fused disconnect switch with interlocking door handle on terminal box door.

G. Dust Cover: Integral control panel shall be gasketed for tight seal. Provide code required clearance in front of control panel during installation. COORDINATE CODE CLEARANCE WITH OTHER TRADES.

H. Electric Duct Heater: Electric duct heater shall be factory installed and wired complete with all controls including high-limit and air flow safety switch. Coils 4 KW to 8 KW shall be two stage, 8 KW and larger shall be three stage. Coordinate voltage with electrical contractor. Contactors on heaters shall not be audible in the occupied area. PROVIDE MERCURY CONTACTORS FOR DUCT HEATERS. MAGNETIC CONTACTORS ALTERNATE SUBMITTAL PROPOSALS WILL NOT BE ACCEPTED.

I. VAV Control: The control devices and actuators shall be furnished by Section 15900 and factory mounted, and wired and tested. NO EXCEPTIONS. The actuator shall be electronic. The regulator shall be thermostatically reset with velocity controller which provides constant delivery air control within ± 10% accuracy regardless of inlet condition. The velocity signal is input to the volume regulator which will automatically adjust valve position to compensate for either increase or decrease in duct pressure. Adjustable set points

provided to set maximum and minimum cfm. Integral flow ring taps and calibration chart shall be provided on unit.

2.6 AIR FILTERS

A. General: FARR 30/30 filters or equal by Cambridge or American Air Filter.

B. Efficiency: Minimum efficiencies of 30-35% shall be in accordance with the ASHRAE Standard 52-76 atmospheric dust test method. Filters shall be UL Class 2 listed.

C. Start-Up: No fan shall be operated unless filters as specified are installed. During construction protect all return air openings with blankets of 2-inch thick fiberglass filters.

D. Air Filter Gauge: Install a weatherproof Dwyer filter gauge, range 0-2 inches W.G., complete with static pressure tips and tubing on all rooftop air conditioning units, and elevator equipment room air conditioning units.

2.7 ROOF MOUNTED EXHAUST FANS

A. Pace, Cook, or approved equal. Ventilator housing shall be of heavy gauge spun aluminum construction and shall be weatherproof, incorporating an integral weather shield. VENTILATORS SHALL BE MOUNTED ON SONOTROL ACOUSTICAL CURBS WITH INTEGRAL BACKDRAFT DAMPERS. NO EXCEPTIONS. EXTERNAL STATIC PRESSURE DOES NOT INCLUDE PRESSURE DROP THROUGH SOUND CURB.

B. Fan wheels shall be centrifugal design that have been statically and dynamically balanced. Tip speed, RPM, and motor horsepower shall not exceed listing in manufacturer's catalog for unit specified. Power roof ventilators, gravity ventilators, and prefabricated curbs where required shall be the product of the same manufacturer. Provide integral backdraft dampers in all curbs.

C. Fans shall have integral factory formed base fabricated to the dimensions shown on the Drawings. Housings shall be provided with wiring channel and are to be of the direct discharge design. Motor and fan assembly shall be on spring isolator vibration mounts. Fans shall have capacity, speeds and motor sizes as scheduled on Drawings.

D. Each fan shall be equipped with factory mounted disconnect switch and motor with internal overload protection.

E. Wiring shall be installed up through and inside roof curb. Coordinate with Division 16.

2.8 SOUND TRAPS

A. General: Provide 5' sound traps at return opening into return air shaft. Sound traps shall be IAC ES or equal. Air pressure drop shall not exceed 0.15" wg at 1,000 fpm face velocity. Sound traps shall comply with all requirements of the acoustical specifications stated herein. A representative shall test in accordance with the procedure specified in order to demonstrate such compliance.

B. Material Description: Sound traps or duct silencers used to control (attenuate) noise generated by fans or other system components which would otherwise be transmitted by the ductwork.

Outer casings and internal perforated sheet metal shall not be less than 22-gauge galvanized sheet metal and shall comply with high velocity ductwork recommendations of the current ASHRAE Guide.

Acoustical fill material shall be inorganic glass fiber, not less than 4 lb./cu. ft. density, and shall be packed behind partitions under not less than 10% compression so as to eliminate voids caused by settling. The material shall be protected by one layer of fiberglass cloth behind the perforated metal.

Airtight construction shall be used and shall be leakproof when subjected to a differential pressure of 8-inches of water gauge between the outside and inside of the trap.

C. Applicable Standards: All measurements shall be made in accordance with Air Diffusion Council Test Code No. 1062RI, ASHRAE Standard 36-62 and SHRAE Standard 36B-63.

D. Test Conditions: The unit to be tested shall be the same type and size as one of those specified in the schedule, but not less than 24x24 inches.

1. Insertion Loss: The acoustical performance of the sound traps shall meet or exceed the values of the scheduled sound traps and shall be determined by the Dynamic Net Insertion Loss method utilizing air flow through the attenuator at the face velocities indicated on the schedule. The test method shall be conducted in a manner to eliminate effects such as end reflection, directivity, flanking transmission, standing waves, etc. Final acceptance of the test method shall be at the discretion of the Project Manager.

2. Self Noise: At the time the insertion loss measurements of Paragraph 1, are conducted, the self noise of the sound trap shall be measured by turning off the sound source and measuring the noise generated by the sound trap alone.

3. Static Pressure Drop: The unit shall be installed in a duct of the same inside dimensions as the unit. Measurements shall be made in the duct at a point not less than 6 feet upstream or 12 feet downstream from the unit. The data shall be obtained using pressure traverses to assume uniform readings within 10% of the duct centerline pressure valve.

E. Acoustical Specifications

The minimum dynamic insertion loss, the maximum self noise sound power level and the maximum static pressure drop shall be in accordance with the tabulated values in the schedule, when tested at the face velocity and static pressure specified.

F. Submittal

The results of the tests shall be certified by the testing agency and submitted to the Project Manager for approval. The submittal shall include a complete description of the test conditions and measurement procedures.

2.9 ACOUSTICAL ABSORPTION/THERMAL DUCT LINER

A. General: Mansville Linacoustic or equivalent in accordance with the following schedule:

1. Equipment Curb and Shaft Return Air: 2" Linacoustic HP.

2. Main Supply Risers in Shaft: 2" Linacoustic HP.

3. Ductwork Run-Outs From Shaft: 1" Linacoustic HP.

4. Downstream of Terminal Units: 1" Standard Linacoustic.

B. Facing and Backing Material Requirements: Facing material is to be a woven fabric made from spun glass fiber yarns and coated with a flexible high polymer vinyl resin.

1. The weight of the coated fabric shall be 4.75-5.50 oz. per square yard.

2. The coated fabric shall not curl, become stiff or crack on bending after exposure to gasoline and hydraulic oil. Test Requirements: Two 4" x

4" samples soaked for 5 min. in each fluid; air dry at 70F for 2.0 hours, 180 fold and top roll with a 10 lb roller.

3. The tensile strength of the coated fabric shall be minimum of 60 pounds.

4. Exposure of the coated fabric to 500F for 60 seconds shall not produce visible weakening or disintegration of the base fabric. In addition, the material shall meet the flame resistance requirements of ASTM E-162.

C. Fiberglass Requirements: The uncured fiberglass batt material must be contour molded and capable of conforming, after cure, to the following:

1. Thickness: 0.9-1.1 inches

2. Density: 1.5 - 2.0 lbs/cu. ft. ASTM D 1822

3. Permeability: 40-80 Ray 1/1.0 inch thickness

4. The facing shall be chemically bonded to the fiberglass batt during the molding process. The bond strength when tested for facing adhesion shall remove the top layer of cured fiberglass batt.

D. Fiberglass Absorber with Fabric Facing on Noise Source Side: The facing material is to be extended over the entire surface on the noise source side of the fiberglass batt.

E. Sound Absorption Coefficient, Min. Per ASTM C 432-66

Req.(Hz)	125	250	500	1000	2000	4000
Absorp. Coeff.	.22	.38	.70	.71	.51	.28

Noise Reduction Coefficient 0.60 (Rounded to nearest .05)

F. Thermal conductivity Requirements: The fiberglass absorber shall withstand continuous operating temperatures up to 400 F and shall have the following thermal conductivity characteristics:

	Mean Temperature, Degrees F		
Thermal Conductivity Btu/hr.sq.ft. (°F/in)	150 .26	300 .36	400 .51

2.10 VIBRATION ISOLATION

A. All equipment subject to noise-producing vibrations shall be mounted on vibration eliminators as indicated on Drawings, or as required, and shall be subject to approval by the Project Manager.

B. Isolators: For rotating equipment and associated apparatus unless otherwise indicated, shall be designed and provided in accordance with the following.

C. Earthquake Motion Restrained Spring Mounts: Earthquake motion restrained spring mounts shall incorporate a single spring vibration isolator built into a welded steel mount assembly designed and engineered to limit movement of supported equipment during an earthquake without degrading the vibration isolation of the spring during normal equipment operating conditions.

The mounts shall incorporate a welded steel angle and plate motion limit assembly and steel spring isolator, engineered as a system to accept a force in any direction equal to a minimum of 1.3 times the rated load capacity of the spring isolator without yield or failure, and shall limit movement of the point of level bolt connection to supported equipment to 0.75-inch in any direction, relative to any fixed point on the mount assembly, while subjected to the minimum force specified. The motion limit assembly shall be welded to a steel base plate having a 1-inch thick compressed fiberglass noise stop pad, drilled and tapped load plate and leveling bolt assembly shall be positioned by weld studs on the base plate, and shall carry all normal equipment operation loads.

D. Spring and Fiberglass Hangers: Shall be combination spring and fiberglass hangers to provide the ultimate in control of both high and low frequency noise and vibration generated by suspended equipment, piping and ductwork.

Heavy duty hangers are a unique combination of a permanently resilient fiberglass noise stop pad, in series with high deflection stabile steel spring for vibration isolations springs are designed to allow 50% overload capacity and are housed in a welded steel bracket designed to carry a five times overload, without failure, and to allow up to 15 degrees rod misalignment without metal contact or other short circuit.

E. Spring isolators, hangers, inertia bases mounted outside, exposed to weather shall have finishes and/or be made of metals resistant to corrosion and weather elements. Refer to Drawings and to equipment mounted on roofs and other outside areas.

F. Manufacturers: Mason, Amber, Booth or approved equal.

2.11 ELECTRICAL ROOM EXHAUST FANS

A. All fans, where indicated on the Drawings, shall be Pace or equal. Fans shall have acoustically insulated housings. Air deliveries and zone levels shall be as indicated on the Drawings and all fans shall bear the AMCA Certified Ratings Seal and the UL Label. Manufacturer shall submit vibration amplitudes and magnetic motor hum levels as decibels. Integral backdraft damper shall be totally chatterproof with no metal to metal contact. Fan shall have true centrifugal wheel or wheels with inlet perpendicular to or remote from inlet grille. Terminal box shall be provided on the housing with J-box. Entire fan, motor and wheel assembly shall be easily removable without disturbing the housing. Motor speeds shall not exceed 1050 RPM and all fan motors shall be suitably grounded and mounted on rubber-in-shear vibration isolators. Grille shall not be provided. Provide access panel for easy inspection of electrical connections inside the cabinet.

2.12 ROOFTOP HVAC UNITS

A. General: McQuay, Carrier, Trane or Mammoth. Furnish and install roof top HVAC unit specifically designed for outdoor roof top installation on a full roof curb. Unit shall be completely factory assembled and tested, piped, internally wired, fully charged with R-22, compressor oil and shipped in one piece, with direct expansion cooling only. Filters, outside air system, return air system, optional nonfused disconnect switches and all operating and safety controls shall be factory installed and factory run tested. Cooling capacity rated in accordance with ARI Standard 360. Units shall be provided with UL approval.

B. Casing: The frame and unit base shall be 12-gauge galvanized steel. The unit base shall overhang the roof curb for water runoff and shall have a formed recess that seats on roof curb basket to provide a positive weathertight seal.

Exterior panels shall be constructed of 17-gauge galvanized steel. Access doors downstream of the supply air fan section shall include 20-gauge galvanized steel door liners. Side access doors shall seal to vinyl, dual durometer gasketing. Captivate all insulation edges in sheet metal.

Exterior surfaces shall be phosphatized and coated with baked-on light green enamel. (Match existing units on campus.) Side panels shall have stainless steel hinges with flush mounted single lever latching mechanisms shall provide access to each cabinet section from both sides of the unit. Condensing unit section access doors shall have Southco type quick turn latches.

Unit shall be completely insulated with 1" thick neoprene coated glass fiber secured to side, top and end panels with adhesive and mechanical fasteners. Lifting brackets with lifting holes shall be provided on the unit base to accept cable or chain hooks.

C. Condensing Section: Compressors shall be heavy duty, reciprocating, semi-hermetic type with reversible, positive displacement oil pump, suction and discharge line service valves, crankcase heater and inherent solid state thermal overload protection. Each compressor shall have its own completely independent refrigeration circuit including sight glass, filter-drier, manual shutoff valve and spring-type high pressure relief valve. Compressors shall be isolated on neoprene impregnated fiberglass kinetic blocks. Compressor capacity reduction shall be accomplished with 6-stage cylinder unloading, and hot gas bypass.

The condensing unit section shall be open on the sides and bottom to assure complete access to and air flow through the coils. Condenser coils shall be provided with an additional circuit for a minimum of 15 degrees of subcooling. Suction lines shall be insulated along entire length.

Condenser fans shall be direct drive, propeller type designed for low tip speed and vertical air discharge. Fan blades shall be constructed of steel and riveted to an Iridite dipped steel center hub.

Condenser fan motors shall be heavy duty, inherently protected, three phase non-reversing type with permanently lubricated ball bearings and integral rain shield.

D. Cooling Coil Section: Evaporator coils shall be multi-row type fabricated from 5/8" O.D. seamless copper tubing mechanically bonded to rippled and corrugated aluminum fins. Coils shall be factory leak tested at 315 psig under water. The evaporator coil circuitings shall be fed with an adjustable thermal expansion valve (one per refrigerant circuit) with an external equalizer. The evaporator coil shall be circuited for a combination row/face split. Coils shall have a maximum of 12 fins per inch and face velocity limits of 550 fpm for 12 fins, 600 for 10 fins, and 650 for 8 fins per inch.

A mastic coated primary drain pan shall be provided with the cooling coil and extend beyond the leaving side of the coil and underneath the cooling coil connections. The drain pan shall be connected to a threaded drain connection extended through the unit base. Units shall be provided with a secondary mastic coated drain pan connected to the primary drain pan.

E. Electrical: Each unit shall be wired and tested at the factory before shipment. Wiring shall comply with NEC requirements and shall conform with all applicable UL standards. All wiring shall be number coded per the electrical wiring diagrams. All wiring outside control panels shall be in conduit or raceways. All electrical components shall be labeled according to the electrical diagram. Each unit shall have a 115 volt control circuit transformer, system service disconnect switch, and control circuit fuse.

The supply and return air fan, compressor and condenser fan motor branch circuits shall be individually fused. Contactors and inherent thermal overload protection shall be furnished for each compressor and condenser fan motor. The supply and return air fan motors shall have contactors and external overload protection. Main control panel shall be of weatherproof construction with a dead-front cover over the main power circuit controls.

A terminal block shall be provided for the main power connection and a terminal board shall be provided for the low voltage control wiring. Knockouts shall be provided in the bottom of the main control panel for field wiring entrance. A separate keylocked control panel shall house all controls for the condensing section.

Electrical disconnect provided by Division 16. Coordinate installation location to ensure access panels are not blocked.

F. Gas Heat: Heat exchanger shall be suitable for use with gas or oil burners, and shall allow for future field conversion. The heat exchanger shall have a welded 430 stainless steel cylindrical combustion chamber and a 430 stainless steel header. Secondary heat exchanger surface shall be of corrosion resistant aluminized steel or stainless steel tubing. A carbon steel heat exchanger surface shall not be acceptable. The heat exchanger design shall permit each section to freely expand and contract at its own rate, including each individual secondary tube.

There shall be no baffles within the heat exchanger design except secondary surface tubing turbulators. There shall be no gasketed plates, bulkheads, or ports between the inside of the heat exchanger and the supply air stream. Cleanout of the heat exchanger and turbulators shall be accomplished without removing casing panels or passing soot through the supply air passages. A

flame observation port shall be provided opposite the burner. The head exchanger shall have a condensate drain.

The burner shall be forced draft type. The burner controls and valves shall be housed within the integral burner vestibule. The burner, controls and valves shall be housed within the integral burner vestibule. The vestibule door shall be hinged at the top and equipped with steel retainer rod to hold the door open for service. The burner shall be fire tested and adjusted at the factory. Final adjustments shall be made in the field at initial start-up by a qualified service organization.

Gas burners shall be U.L. listed, forced draft type, complete with flame supervision, integral prepurge timing, combustion air providing switch, intermittent pilot with spark ignition, and a complete gas train. The gas train shall include the main gas valve, main pressure regulator, main shut-off cock, pilot gas valve, pilot pressure regulator, pilot cock, and electronic flame supervision with 4-second time response.

G. Supply Fan Section: Supply fans shall be double width, airfoil type, discharging into a sound attenuating plenum. All fans shall be statically and dynamically balanced for quiet operation. The airfoil fan wheel shall be Class II type and fabricated from aluminum with the fan blades continuously welded to the back plate and end rim. Units shall have solid steel fan shafts mounted in heavy duty 200,000 hour relubricative ball bearings.

Fan motors shall be heavy-duty, 1800 RPM, open drip-proof type with relubricative ball bearings. The motor shall have a variable pitch sheave 1.15 drive service factor and an adjustable base for proper alignment and belt tension adjustment. The entire fan assembly shall be completely isolated from the unit bulkhead with 2" deflection spring isolators with integral seismic restraint.

H. Filter Section: The filter section shall be supplied complete with galvanized steel filter racks as an integral part of the unit. Filters shall be accessible from both sides of the unit. The filter section shall be provided with panel filters. Panel filters shall be 2-inch thick throwaway glass fiber, 35 percent efficient pleated, type mounted in a galvanized steel filter frame. The panel filter section shall be designed for face velocities not to exceed 335 fpm.

I. Return Air Section: Return fans shall be of double width airfoil type. All fans shall be statically and dynamically balanced for quiet operation.

The airfoil fan wheel shall be Class II type and fabricated from aluminum with the fan blades continuously welded to the back plate and end rim. Units shall have solid steel fan shafts mounted in heavy duty 200,000 hour relubricable ball bearings.

Fan motors shall be heavy duty, 1800 rpm, open drip-proof type with relubricable ball bearings. The motor shall have a variable pitch sheave and an adjustable base for proper alignment and belt tension adjustment. The entire fan assembly shall be completely isolated from the unit bulkhead with 2" deflection spring isolators with integral seismic restraint.

J. Outside Air Section: The outside and return air section shall be designed to form a plenum. Outside air arrangement shall be 0 to 100 percent and control shall consist of outside, return air and exhaust air dampers, adjustable potentiometer, damper motor, and an adjustable enthalpy control mounted in the outside air stream. Outside and return air dampers shall be low leak, gasketed type with leakage rate of less than 1% at one inch pressure. The adjustable potentiometer shall control the minimum outside air damper position for fresh air requirements and shall be installed inside the unit with controls for remote adjustment by BMS. A dry bulb controller shall be provided to sense the dry bulb temperature of the outside air for use in cooling. The damper motor shall be of the modulating spring return type.

K. Refrigeration Controls: Each compressor circuit shall include a liquid line solenoid valve, oil pressure switch, high pressure switch, low pressure switch, compressor control circuit switch and pumpdown switch. Each refrigeration circuit shall have at least one condenser fan controlled from an ambient thermostat for positive head pressure control. An ambient thermostat shall prevent the refrigeration system from operating below 50 F. PROVIDE ALTERNATOR TO ALTERNATE LEAD COMPRESSOR START.

L. Temperature Controls: Units shall be provided with solid state discharge air temperature control systems with contacts for resetting by Section 15900. All temperature control system components shall be completely factory wired and tested.

M. Roof Curb: A prefabricated 12-gauge galvanized steel mounting curb designed and manufactured by the unit manufacturer shall be provided for field assembly on the roof decking prior to unit shipment. The roof curb shall be a perimeter type with complete perimeter support of the air handling section and rail support of the condensing unit section. The curb shall be a maximum of 16" high and include a nominal 2" x 4" wood nailer strip. Gasketing shall be

provided for field mounting between the unit base and roof curb. The roof curb shall be approved by the National Roofing Contractors Association. ANCHOR BOLT OR WELD EQUIPMENT CURB TO CONCRETE EQUIPMENT CURB.

N. Variable Air Volume: A fully factory mounted variable air volume control system shall be provided on each unit.

Units with supply and return air fans shall include a solid state VANETROL Electronic Pressure Controller shall control the position of the supply and return fan inlet vanes from the static pressure control signals. Provide a diagnostic readout of sensed pressure, setpoint pressure and vane position.

A manual reset pressure switch shall be factory mounted in the unit discharge air stream to shut down the supply and return air fans on an excessive build-up of pressure on units with airfoil wheels and inlet vanes. BUILDING STATIC PRESSURE SHALL BE CONTROLLED TO 0.02" WG $\pm$ 0.01" WG.

O. Hot Gas Bypass: Hot gas bypass control shall be factory installed on one compressor circuit to provide capacity control by artificially loading the evaporator. Hot gas bypass control includes a solenoid valve, hot gas bypass piping, and a hot gas bypass valve. The hot gas bypass valve shall be sized to modulate the full load.

PART 3 - EXECUTION

3.1 DUCTWORK

A. General: Construct all ducts and plenums of gauges, and with joints, bracing, reinforcing, and other construction details in accordance with the latest ASHRAE Guide and Data Book, and SMACNA 1985 Manual, and unless herein specified otherwise, and comply with requirements of NFPA Pamphlet No. 90A.

B. Construct ductwork of United States Steel, Kaiser, or equal galvanized sheet metal.

C. Diagonally crossbreak all panels on ducts 30-inches wide and smaller.

D. Duct dimensions indicated on Drawings are net, inside, clear, dimensions. For internally lined ducts, add lining thickness to determine duct dimensions.

3.2 SEISMIC REQUIREMENTS

A. All HVAC equipment and machinery shall be anchored to withstand forces generated by earthquake motions. As a minimum, equipment and equipment frames shall be designed to withstand a force of 100% of the weight of the equipment and frame acting at its center of gravity. Anchorage of the equipment and/or frame to the structure shall be for a force of 100% gravity also acting at the center of gravity.

B. Piping and ductwork shall be seismically braced per SMACNA Manual.

C. Retain services of a structural engineer for preparation of any necessary seismic support calculations.

D. Weld rooftop air conditioning unit equipment curbs to metal inbeds in a concrete curbs. Secure units to equipment curbs per manufacturer's recommendations.

3.3 SUBMITTALS

A. Prior to construction submit for approval the following materials and equipment:

1. Ductwork.

2. Duct specialties.

B. Fire dampers.

C. Grilles, registers and diffusers.

D. Fans.

E. Rooftop air conditioning VAV air conditioning units.

F. Air Filters.

G. Vibration isolation.

H. Testing equipment.

1. Air systems

I. Thermometers and gauges.

J. Split system air conditioning units.

K. Layout drawings.

3.4 LAYOUT DRAWINGS

A. Prior to the start of installation, submit to the Project Manager for approval, layout drawings to scale, coordinate with all building systems, and lists of materials, fixtures, and equipment to be incorporated in the work. The layout drawings shall consist of plans and sections, with elevations and sections to show clearly the locations and size of major items of equipment, ductwork and piping as listed below, and clearances for maintenance withdrawals of removable components. The general arrangement of the systems to be installed, coordination with other work, and all requirements for installation shall be met. Layout drawings shall show all ducts, fans, air outlets, reheating coils, piping, electrical light fixtures, major electrical runs, cable trays, and bus ducts. Minimum scale of layout drawings shall be 1/8-inch to the foot for floor plans and 1/2-inch to the foot for mechanical rooms. Show volume damper access locations at hard ceiling areas for coordination and review. INCLUDE SECTIONS THROUGH ROOFTOP AIR CONDITIONING UNITS SHOWING DUCTWORK, SOUND TRAPS, AND SHAFT. PROVIDE DIMENSIONED LOCATIONS OF BLOCKOUT OPENINGS IN STRUCTURE. THIS IS A REQUIREMENT. OBTAIN WRITTEN APPROVAL FOR STRUCTURAL OPENINGS.

END OF SECTION

TESTING AND BALANCING

PART 1 - GENERAL

1.1 Section 15010 - Mechanical General is applicable.

1.2 SCOPE

A. All work to be furnished and installed under this section shall include but not necessarily be limited to the testing and balancing of the following:

1. Air distribution, fans, branch ducts, air outlets.

2. Instruction of Owner's personnel for future balancing of systems.

3. Testing of Automatic temperature control system.

4. Balancing reports.

1.3 WORK RELATED IN OTHER SECTIONS

A. Section 15050: Basic Materials and Methods.

B. Section 15600: HVAC.

C. Section 15900: Controls and Instrumentation.

PART 2 - PRODUCTS

2.1 TESTING AND BALANCING

A. Testing and balancing of air distribution and hydronic systems shall be performed by an independent test and balance agency, that specializes in and whose business is limited to testing and balancing of air conditioning systems. Qualified firms include
Northwest Engineering. Other interested firms should submit qualifications for evaluation.

1. The air balance agency shall provide proof of having successfully completed at least five projects of similar size and scope and shall be a fully certified member of the Associated Air Balance Council.

2. All work by this agency shall be done under the direct supervision of a qualified heating and ventilating engineer employed by them.

3. All instruments used by this agency shall be accurately calibrated and maintained in good working order.

4. Test and balance agency shall include an extended warranty of 90 days, after completion of each phase of the test and balance work, during which time the engineer may request readjustment of the system to comply with comfort or sound conditions.

B. Testing and balancing agency, as part of its contract, shall act as authorized inspection agency responsible to Consulting Engineer and Owner, and shall during the test and balance list all items where installed incorrectly, requiring correction, or which have not been installed in accordance with contract Drawings and/or Specifications, pertaining to air distribution, cooling and heating systems.

C. The testing and balancing agency shall provide with his bid a performance guarantee covering all phases of the work as herein specified.

D. The air conditioning contractor shall cooperate with the selected test and balance agency in the following manner:

1. Provide sufficient time before final completion dates so that tests and balancing can be accomplished.

2. Provide immediate labor and tools to make corrections when required without undue delay. Install balancing dampers as required by test and balance agency.

3. The contractor shall put all heating, ventilating and air conditioning systems and equipment into full operation and shall continue the operation of the same during each working day of testing and balancing.

4. Testing and balancing agency shall be kept informed of any major changes made to the system during construction, and shall be provided with a complete set of As-Built Drawings.

E. Prior to proceeding to test and balance the mechanical system, perform the following:

1. Set up typical test office, and adjust registers and airflows to specified levels. Conduct smoke test on perimeter diffusers to determine airflow patterns and optimum vane position of linear diffusers for best performance. Test shall be conducted in presence of Glumac & Associates and Owner's Representative.

2. After approval of diffuser vane positions, adjust all vanes for proper airflow.

3. Verify all filters are clean, including fan powered box filters.

4. Verify proper operation of rooftop air conditioning units, and automation controls.

F. Air System Test and Balance Procedure

The air balance agency shall perform the following tests, and balance each system in accordance with the following requirements:

1. Test and adjust supply and return fan blower RPM to design requirements with all terminal units open.

2. Replace adjustable sheave with fixed sheave.

3. Test and record motor full load amperes.

4. Make Pitot Tube traverse of main supply ducts and obtain design CFM at fans.

5. Test and record system pressures, suction and discharge.

6. Test and adjust system for design recirculated air, CFM.

7. Test and adjust system for design CFM outside air.

8. Test and record entering air temperatures.

9. Test and record leaving air temperatures.

10. Adjust all main supply and return air ducts to proper design CFM.

11. Adjust all terminal units to proper design CFM, heating and cooling, including interior terminal units. Adjust interior boxes to operate with 0.5" WG pressure to accommodate T.I. low pressure ductwork.

12. Adjust heating fan speed control to obtain proper heating airflows. Verify proper operation of duct heater. Measure electrical heating KW and compare to specified heat.

13. Test and adjust each diffuser, grille, and register to within 10% of design requirements. Re-adjust main fans and terminal units as necessary.

14. Balance 50 CFM of conditioned air to toilet room transfer grilles.

15. Each grille, diffuser and register shall be identified as to location and area.

16. Size, type and manufacturer of VAV boxes, diffusers, grilles, registers and all tested equipment shall be identified and listed. Manufacturer's ratings on all equipment shall be used to make required calculations.

17. Readings and tests of diffusers, grilles and registers shall include required FPM velocity and test resultant velocity, required CFM and test resultant CFM after adjustment.

18. In cooperation with the control manufacturer's representative, check setting adjustments of automatically operated dampers to operate as specified, indicated, and/or noted. Testing agency shall check all controls requiring adjustment by control installers. Room thermostats shall be checked for cooling and heating response. Test all alarm functions of EMS. Assist Controls Contractor with locating static pressure sensors.

19. All diffusers, grilles and registers shall be adjusted to minimize drafts in all areas.

20. As part of the work of this contract, the HVAC contractor shall make any changes in the pulleys, belts and dampers or the addition of dampers required for correct balance as recommended by air balance agency, at no additional cost to Owner.

21. After air balancing is completed and RPM determined, Balancing Contractor shall provide fixed pitch pulleys.

22. All mixing boxes, VAV air valves, control dampers, smoke dampers and similar devices which operate at 100% shut off shall be tested for leakage.

23. In cooperation with the control system contractor, test each and every control point in the system for proper function and annunciation. INCLUDE CHECK-OFF LIST IN BALANCING REPORT.

24. In cooperation with rooftop air conditioning unit manufacturer and control contractor, adjust supply and return/relief fans to obtain proper building pressure. Test in full return mode and 100% outside air mode. Adjust position of dampers as necessary. Balancing contractor is responsible for obtaining proper building pressure.

2.2 TEST HOLES

A. Duct Test Holes shall be provided in ducts and plenums where directed or necessary for the pitot tubes for taking air measurements and to balance the air systems. Test holes shall be provided with an approved removable plug or seal. At each location where ducts or plenums are insulated, test holes shall be provided with an approved extension with plug fitting.

PART 3 - EXECUTION

3.1 Prior to submittal of proposal advise the Project Manager of any deficiencies on plans such as lack of balancing valves, duct dampers, etc. Air balance contractor shall pay all cost for additional balancing dampers not requested.

3.2 Balancing Contractor shall report all deficiencies in control system, air valve leakage, damper leakage, mixing box leakage, thermostat malfunction, excessive noise in the HVAC system, and other deficiencies. Submit preliminary balancing reports to resolve problems prior to occupancy.

3.3 Balancing contractor shall visit the project during construction and advise of any installation problems which will not allow the system to be balanced as specified.

3.4 Prior to commencing work, meet with Glumac & Associates to discuss balancing procedures and methodology.

END OF SECTION

CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section 15050 applies to work of this Section.

B. Work shall include furnishing equipment, labor and materials required to install a building control system, complete as shown and specified.

1.2 SCOPE

A. All work to be furnished and installed under this Section shall comply with all the requirements of Division 1, and shall include but not necessarily be limited to the following:

1. Submit shop drawings of the entire control system components fully coordinated with major equipment suppliers' requirements. Provide proposed programming logic sequences of control functions on each system.

2. Installation of control components other than valves, dampers and sensing wells as required for a complete and workable system.

3. This Contractor shall furnish, install and coordinate the interlock and control wiring as specified and/or required for a complete and workable control system.

4. Furnishing automatic control dampers as indicated on Drawings to Sheet Metal Contractor for installation.

5. Complete validation and adjustment of specified control system through period of testing and Owner acceptance.

6. Owner training on operation of the control system.

7. One year warranty on workmanship and materials.

8. Interlocking of electrical systems and motors as shown on Drawings, except where specifically shown on electrical drawings.

1.3 QUALITY ASSURANCE

A. The control work shall be provided by a single company with specialists in the type of work required, so that only one supplier is responsible for all control work for the project.

B. Prior to substantial completion, the controls contractor must demonstrate that the system is operating per the Specifications, and final adjustments have been made as approved.

C. The controls bidder may be required to meet with the General Contractor, Consultants, and Owner and his representatives at a Post-Bid conference to discuss his bid and to present his control system proposal for the project.

D. Provide coordination with other contractors or subcontractors for work required by other trades for work accomplishment.

E. Approved manufacturers include Allerton, Barrington, Landis Gyr Powers, Robert Shaw, Johnson, Trane, Carrier and Honeywell.

1.4 SUBMITTALS

A. Shop Drawings: Provide schematic-type Drawings as follows: These drawings are to be diagrammatic and are not to show any more offsets, bends, or crossing lines than absolutely necessary.

1. In diagrams, show complete piping or ductwork system schematics with both electrical and pneumatic control devices,tubing and wiring indicated.

2. In a separate diagram, provide a complete electrical/pneumatic control schematic with all devices and connections identified. Indicate function and setpoint.

3. In separate Drawings, provide control panel and graphic drawings.

4. In booklet form, provide catalog data on all control device types, including control operation description, technical parameters, and connection identifications.

B. Shop drawings to include:

1. Detailed pneumatic and electric connections to all control devices.

2. All control devices shall be completely identified with manufacturer's type, number, and functional description.

3. All temperature, pressure, spring range, and differential settings at the devices.

4. Normal positions of all devices identified so as to explain the device and system function.

5. Complete sequence of operation containing all information necessary for clarity and understanding of device function and system sequence of operation.

6. All electric and pneumatic connections of the control system to equipment furnished by others shown complete to terminal points specifically identified with manufacturer's terminal designation.

7. Pressure reducing station of control air.

8. All control tubing, wire, and conduit shall be uniquely identified in the field and on the Drawings with a logical numbering system.

9. Detail of ceiling mounted stats.

C. Operating and Maintenance Data

1. Provide a complete set of control Shop Drawings with as-built and operating changes.

2. Provide Operating and Maintenance Data on all equipment requiring periodic or incidental services or adjustment.

D. Instruction of Owner Personnel

1. Complete instructions, both verbal and written, of the control systems shall be provided to the Owner's Operating Engineer by the Control Project Manager or an approved instructor upon project completion.

2. Field Superintendent shall locate all control components for Operating Engineer.

3. Provide minimum of four 4-hour instruction periods scheduled and as approved.

E. Startup: Implement a logical step-by-step start-up and check-out of the control system. Start-up shall be considered complete after the entire system is operating properly.

1.5 RELATED WORK IN OTHER SECTIONS

A. Sources of 120 volt electrical power for control system components furnished by electrical section, in close proximity of control panels.

2.0 PRODUCTS

2.1 TYPE OF CONTROL SYSTEMS

A. General

1. Base price shall include full DDC system.

2. Provide supplementary electric, electronic or pneumatic devices as required. All valve and damper actuators shall be pneumatic.

3. Provide all equipment, installation, and accessories as required, but not necessarily specified, to accomplish the operations as described.

4. Provide air gauges at main and branch connections of all instruments, except room thermostat; with one main air gauge only required at groups of instruments. Provide sufficient gauges so that the input and output pressures of each device may be determined at or near its location.

5. All tubing shall be labeled, with numbers shown on control drawings.

6. Gauges shall be shown on control diagram.

B. Positioning Devices: Provide positive positioning devices on all outside exhaust, and return air dampers and where sequencing cannot be accomplished by standard spring ranges, and where controller does not sense changes resulting from action of controlled device.

C. Controls and Power Wiring

1. Provide all low and line voltage control wiring not shown on electrical drawings or specifically excluded below.

2. The Contractor shall furnish and install all electric conduit and wiring which is necessary for the control of manual or automatic start-stop of any equipment included in this Section of the Specifications. Included in this work are all thermostat leads, remote control wiring if not in path of power to motors in "starting" and "stopping" control circuit defined in Electrical, all interlock wiring AC or HV unit control power source to control circuit and the conduit, wire, junctions or pneumatic tubing for these purposes.

3. All wiring shall be in thin wall or galvanized steel conduit in exposed areas. Conduit and wire installation shall conform to all applicable codes.

4. Provide Type THHN conductors of not less than l8 gage stranded. No two wires of the same color shall be in one conduit, unless all wires of the same color are tagged at both ends and any splice points.

5. Control voltage shall not exceed l20 volts.

6. All l20 volt wiring shall be a minimum of l4 gage stranded, THHN insulation and properly protected against over current.

7. Conduit Sizing: Minimum size conduit shall be 3/4" except 1/2" may be used where a maximum of four wires are going from a local J box to a single device, such as a flow switch. Conduits shall be sized for 25% future capacity and all conduits larger than l" shall have a nylon pull string installed with the wire to accommodate pulling future wires.

8. No splices will be allowed except at junction boxes and control centers.

9. This Section does not cover power wiring to any electric drive motor, or integrally mounted combination power and control panel, or connection to small pumps, thermostats, speed switches, or other devices furnished under this Section.

10. This Contractor shall install and wire the duct smoke detectors provided by Division 16.

2.2 CONTROL DEVICES

A. General: The major components of the control system shall conform to the following requirements. Provide additional components as required for the complete control system.

B. DDC Electronic Thermostat

1. Electronic thermostat with accessible adjustment. Set-point range shall be programmed at host and can be locally adjusted from low to high parameter set-points.

C. Flow Indication: Differential pressure switches.

D. Bypass Timer: Spring wound type without manual "ON" position. 1/2-hour to ll-hour range.

E. Time Delay Relays: P&B knob adjustable, 0-20 min. plug-in type, or equal.

F. Transformers: Transformers selected and sized for appropriate VA capacity, installed and fused according to applicable Codes. Provide wiring to nearest suitable power source as required.

G. DDC Sensors

1. All sensing inputs shall be provided via industry standard signals. Temperatures, humidities, differential pressure signals, and all other signal inputs shall be one of the following types:

0 - 20 mA
4 - 20 mA
0 - 5 VDC
0 - l2 VDC

2. All signal inputs shall be compatible with the controllers, used and with the requirement for readout of variables as specified.

3. All temperature sensors to be solid state electronic utilizing an RTD sensor. Sensors shall provide a linear resistance change per degree temperature change. Wall sensors to be housed in tamperproof enclosures. Duct sensors to be electronically identical, housing suitable for the application. Metal guards shall be provided as shown on Drawings.

H. Static Pressure and Velocity Controllers: Static pressure controller shall be of either the diaphragm, or rigid element bellows, electronic type.

2.3 CONTROL PANELS

A. Provide prewired steel local control panels in each electrical room for rooftop air conditioning units, lighting controls, and terminal unit controls for mounting switches, pilot lights, relays, thermostats, etc., as required. Refer to Division 16 details for locations of control panels.

B. Control panels shall have hinged door and locking handle.

2.4 DDC SYSTEM EQUIPMENT

A. General

1. The DDC System shall consist of stand-alone DDC controllers, a Local Area Network (LAN) and a Central Operators Terminal (COT).

2. Each air handling unit shall be controlled from it's own stand-alone controller and be totally programmed as described in the sequence of operation. This programming is to include the Energy Management and Facility Management functions as herein specified.

3. Each standalone controller (LCM) shall be a modular multitasking l6 bit microprocessor based direct digital controller with adequate Eprom, EEprom, and RAM memory. Each controller shall be standalone and fully programmed to perform all control functions as specified.

   Systems utilizing controllers that operate in a default mode only as a standalone will not be acceptable. The controllers must mantain all software programs as defined herein specified under software functions.

   The controllers shall be strategically located at data concentration points and shall monitor specific analog and digital inputs, process the data received, and produce analog or digital outputs to control the systems specified. Each controller shall be capable of performing all specified control functions independently.

4. A LAN shall connect the Local Control Modules together for reporting to the Central Operators Terminal.

5. Any system requiring a Host computer to perform the control functions of the stand-alone controllers such as DDC control, EMS functions or Facility Management functions will not be accepted.

B. Global Control Module (GCM)

1. Hardware

a. The GCM shall be a l6 bit microprocessor-based Facilities Control System (FCS) with Direct Digital Control (DDC) capabilities.

b. The GCM shall be equipped with full alphanumeric keypad and four lines of twenty character LCD display.

c. The GCM shall be equipped with two RS-232 serial communication ports for connection to host computer, printer, modem or terminal.

d. The GCM shall be equipped with two RS-485 ports for communication with Local Control Modules and Microzone controllers.

e. The GCM shall be equipped with a 2400 baud auto answer/auto dial modem.

f. The hardware shall be UL-9l6 listed and meet FCC Class A requirements.

2. Software

a. The software shall be modular in design and programming shall be accomplished by assembly of functional software blocks.

b. Standard software features of the GCM shall include DDC, Energy Management, Math, Logic and Facilities Management functions. The software shall provide for communicating with up to 3l Global Control Satellite modules which provide input and output hardware for use by the GCM.

c. DDC functions shall, at a minimum include the following:

l) Setpoint Reset
2) PID Loop
3) Ramp
4) Sequencers
5) High/Low Selector

d. Energy Management Functions shall include the following:

1) Temperature Compensated Duty Cycling
2) Optimum Start/Stop
3) Electric Demand Limiting
4) Weekly and Calendar Scheduling
5) Enthalpy Changeover

e. Math and Logic Functions shall include the following:

1) Add, Subtract, Multiply and Divide
2) Square Root
3) Pulse Count Conversion
4) Sensor Curve Fitting
5) AND, OR, XOR, NAND, NOR and Invert logic functions

f. Facilities Management Functions shall include the following:

1) Analog High/Low Alarms
2) Discrete Alarms
3) Trend Log Reporting
4) Maintenance Time Reminders

C. Global Control Satellite (GCS)

1. The GCS shall provide hardware for 16 universal input/output points and 2 pulse contact inputs. These points shall be software configurable for analog input, analog output, discrete input and discrete output.

2. Analog inputs shall be user selectable and accept the following signals:

a. 0 - 12 VDC - user selectable range.
b. 4 - 20 mA.
c. Thermistors - 10k and 30k ohms.
d. Resistance inputs - 50 to 10,000 ohms.
e. Analog outputs shall be 0 - 12 VDC with user selectable output range. Output accuracy shall be +/- 15 MVDC.

3. Discrete inputs and pulse inputs shall accept dry contact closure.

4. GCS shall be used in conjunction with the GCM for control of the existing campus.

5. The hardware shall be UL-916 listed and meet FCC Class A requirements.

D. Local Control Module (LCM)

1. Hardware

a. The LCM shall be a l6 bit microprocessor-based, standalone Facilities Control System with Direct Digital Control (DDC) capabilities.

b. The LCM shall be equipped with a functional keypad and two lines of twenty character LCD display.

c. The LCM shall be equipped with one RS-485 port for communication with the Global Control Module.

d. The LCS shall provide hardware for l6 universal input/output points and 2 pulse contact inputs. These points shall be software configurable for analog input, analog output, discrete input and discrete output.

e. Analog inputs shall be user selectable and accept the following signals:

l) 0 - l2 VDC - user selectable range
2) 4 - 20 Ma
3) Thermistors - l0k and 30k ohms
4) Resistance inputs - 50 to l0,000 ohms

f. Analog outputs shall be 0 - l2 VDC with user selectable output range. Output accuracy shall be +/- l5 MVDC.

g. LCM firmware shall consist primarily of EEPROM and EPROM. RAM firmware is only acceptable for time clock functions.

h. LCM shall be programmable from either the COT, RS232 port or LCD display.

i. Discrete inputs and pulse inputs shall accept dry contact closure.

j. The hardware shall be UL-9l6 listed and meet FCC Class A requirements.

k. Air handling system shall be controlled by LCM's.

2. LCM Software

a. The software shall be modular in design and programming shall be accomplished by assembly of functional software blocks.

b. Standard software features of the LCM shall include DDC, Energy Management, Math, Logic, HVAC and Facilities Management functions. The software shall provide for communicating with a Global Control Module. These software programs shall all be resident to the LCM.

c. DDC functions shall, at a minimum, include the following:

1) Setpoint Reset
2) PID Loop
3) Ramp
4) Sequencers
5) High/Low Selector

d. Energy Management Functions shall include the following:

1) Temperature Compensated Duty Cycling
2) Optimum Start/Stop
3) Electric Demand Limiting
4) Weekly and Calendar Scheduling
5) Enthalpy Changeover

e. Math and Logic Functions shall include the following:

1) Add, Subtract, Multiply and Divide
2) Square Root
3) Pulse Count Conversion
4) Sensor Curve Fitting
5) AND, OR, XOR, NAND, NOR and Invert logic functions

Programs shall be provided as required to meet the sequence of operation as specified.

All programming defining the functions to be performed by the standalone controller, including but not limited to, application programs and point database, shall be protected from loss due to power failure

for a minimum of six months. Non-volatile memory is required for these functions. Systems not providing non-volatile memory shall not be accepted.

Standalone controllers not capable of performing the above listed software programs without the host computer will not be acceptable. Programs must be maintained regardless of communication with the host computer.

E. Microzone (MZ) Controllers

1. Hardware

a. The MZ shall be a 16 bit microprocessor-based standalone Direct Digital Controller.

b. The MZ shall be equipped with one RS-485 port for communication with the GCM.

c. The MZ shall provide hardware for 20 total points consisting of 8 universal inputs, 8 digital outputs, and 4 analog outputs.

d. Analog inputs shall be user selectable and accept the following signals:

1) 0 - 12 VDC - user selectable range.
2) 4 - 20 ma
3) Thermistors - 10 K and 30 K ohms
4) Resistance inputs - 50 to 10,000 ohms

e. Analog outputs shall be 4 - 20 ma or 0 - 20 ma selectable output range.

f. MZ firmware shall consist primarily of EEPROM and EPROM.

g. MZ shall be programmable from either the COT or an optional hand held programmer's terminal.

h. Discrete inputs and pulse inputs shall accept dry contact closure.

i. The hardware shall be UL-916 listed and meet FCC Class A requirements.

2. MZ Software

a. The software shall be modular in design and programming shall be accomplished by assembly of functional software blocks.

b. Standard software features of the MZ shall include DDC, Math, Logic and HVAC functions. The software shall provide for communicating with a Global Control Module. These software programs shall all be resident to the MZ.

c. DDC, math, logic and HVAC functions shall be identical to those specified for the LCM.

F. Programs shall be provided as required to meet the sequence of operation as specified. All programming shall be done utilizing a library of pretested application software blocks.

All programming defining the functions to be performed by the standalone controller, including but not limited to, application programs and point database, shall be protected from loss due to power failure for a minimum of six months. Non-volatile memory is required for these functions. Systems not providing non-volatile memory shall not be accepted.

Standalone controllers not capable of performing the above listed software programs without the host computer will not be acceptable. Programs must be maintained regardless of communication with the host computer.

2.5 Central Operator's Terminal (COT)

A. The COT shall consist of a Host computer, VGA monitor, wide carriage printer and applicable software as specified herein.

B. The host computer shall be a 33 Mhz, 386 machine with a minimum of 64k caching, 4 MByte RAM, or equivalent based upon a truly multi-tasking operating system, performing multiple tasks simultaneously. The host computer shall be provided with multi-tasking operating system software such as Unix, RSX llM, or QNX. Operating systems which provide only foreground/background operation, or are based on personal computer DOS, or concurrent DOS, are unacceptable and will be rejected.

The host computer shall operate at a minimum system processor speed of 20 Megahertz, and shall include and utilize at least 2.5 Megabytes of RAM.

The host computer shall include as a minimum, a 1.2 Megabyte operational floppy drive, and shall operate as a standard from a 40 Megabyte hard disk drive. Hard disk drive shall have 26 millisecond access time performance.

The host computer shall include an optical mouse system in conjunction with each colorgraphic terminal as the primary operator interface method. Each colorgraphic terminal shall also have a full keyboard with at least 12 Function keys. Either mouse or keyboard shall be able to be utilized interchangeably for operator interface.

C. The host computer shall support all peripherals as specified. Peripherals shall include a serial printer and an auto answer/auto dial modem.

D. Locate system host computer as instructed by the Owner. The system host computer shall be capable of communicating with the other buildings on the Nike World Campus via a hardwire connection. This hardwire connection shall be furnished by the Owner through their campus-wide telephone system.

The Control Contractor shall provide all interface devices required to communicate with Nike's existing DDC controllers.

E. Host Computer Software: Since the primary operating software is resident to the standalone controllers, the primary purpose of the host computer and software is enhanced man-machine interfacing, enhanced reporting, and centralized monitoring and control. Host software programs shall include as a minimum:

1. Colorgraphic Operator Interface: Each colorgraphic terminal shall be driven by software allowing the operator to access any system information via a "system penetration" method. System penetration shall allow the operator to begin at an entire site plan colorgraphic display and progressively select portions of the site plan to be chosen for closer inspection or selection of a more detailed colorgraphic display of a desired system information without being required to enter any commands via the keyboard.

2. Accessible System Information: Available for display or modification in any specific colorgraphic display shall include, but not be limited to:

   - the real-time value display of any connected point in the system
   - the alarm status condition of any desired system alarm point
   - any software parameter such as setpoints for control sequences, minimum position adjustments, or throttling ranges

3. Centralized Scheduling and Modification: The colorgraphic terminal shall support operator access to the global Scheduling Screens which allow the operator to review and modify any or all schedules as desired. The centralized Scheduling function shall allow modification of equipment and lighting operating schedules, modification of facility holiday schedules, and when desired allow assignment of temporary schedules for designated portions of the facility or specific equipment.

4. Optimum Start Control: The host software shall provide operator access to Optimum Start parameters for any designated items or equipment or commonly scheduled systems of equipment. Optimum Start programs shall be self-learning and shall adapt the algorithm parameters to the optimum values for each applied zone. Optimum start/stop shall, at a minimum, provide separate control outputs for heating, cooling, fan and ventilation control sub-systems to maximize energy efficiency.

5. Trend Reports: The host software shall support logging and historical accumulation of trended data from the entire facility, or multiple sites as required and shall include the capacity for acquiring trend data from at least 100 sites.

   The host software shall provide capacity to store to disk a directory of at least 150 trend logs. Such trend logs can be accessed from the directory by the operator at any time for analysis of selected sets of the trended data, display onto the screen, or hard copy documentation.

6. Third Party Software Packages: The host software shall provide the capacity to run specific third party software packages for word processing, spreadsheets, or database management programs. Use of third party software shall not suspend operation of background tasks of multi-tasking operating system, such as alarm logging, and report generation.

7. Graphic Chart Plotting and Bar Graph Software: Provide software which will enable the operator to command X-Y graphic plots of specific energy history data, or accumulated real-time system information. Software shall in addition, provide bar charts of energy usage information, such as charts of daily peak demand, etc. All graphic plots and bar charts shall be screen printable onto a dot-matrix printer, or onto multi-pen plotter where available.

8. Standalone Controller Database Archiving: The host software shall provide capability to upload global control functions being performed by the network of controllers and the individual database and

application programming resident in each controller in the facility, or on remote sites. Uploaded programs shall be retained on hard disk for system backup. Programs may be modified using Editor functions, and downloaded to individual controllers as desired. Downloading of databases shall not interrupt alarm reporting functions, or other multi-tasked functions which are ongoing.

2.6 CONTROL SEQUENCES

A. General: The control sequences specified below are to be achieved by means of the customized software utilizing direct digital controls and pneumatic actuation. Base price shall be for DDC controls for rooftop equipment and monitoring, and pneumatic control of terminal units. Alternate price shall be for full DDC system including terminal units.

B. VARIABLE AIR VOLUME (VAV) TERMINAL UNITS

1. The VAV terminal units shall be individually controlled by a DDC/VAV controller which shall be supplied by the BMS contractor and furnished to the terminal unit supplier. The cost to mount, calibrate and test the controller and actuator shall be coordinated prior to bid day.

   Sensor installation to terminal unit and communications wiring to BMS to be provided under this section.

   Refer to specification Section 15600 Terminal Units for requirements.

   Power wiring to all scheduled VAV boxes shall be provided by the controls contractor.

2. The BMS shall perform the following VAV terminal unit control strategies and provide the points as listed on the DDC/VAV point list and the specified monitoring and diagnostics.

   a. Grouping: The BMS shall be able to group VAV boxes via keyboard commands. These groups shall make it possible for the operator to send a common command to all boxes in a group to operate in the same mode. BMS shall also compile on a group basis, the following:

      1) Minimum group temperature.

      2) Maximum group temperature.

3) Average group temperature.

4) Current airflow through boxes in group (total).

b. Setpoint Control: The BMS shall edit the zone space temperature setpoint of each VAV box. The zone temperature setpoint shall be operator adjustable. Individual zone setpoint and control logic shall reside at the zone level, and not be dependent upon the BMS for control. In the event of communication loss, the box will continue to control to current setpoints.

c. Cooling Damper Control: The BMS shall control the cooling air valve to a fully open, fully closed, maximum CFM, or minimum CFM position based on operator commands. The operator shall also have the capability to adjust the maximum and minimum airflow limits of the air valve through the BMS.

d. Operating Mode: The BMS shall place the box in either the occupied or unoccupied mode based on an operator adjustable time schedule. Separate heating and cooling setpoints shall be enterable for each mode through the BMS. Other modes available for special applications shall include full open, full closed, maximum flow, and minimum flow.

e. Control Offset: The BMS shall be capable of offsetting the cooling or heating setpoints of one or more groups of boxes by an operator adjustable amount. This capability will allow for automatic zone setpoint changes based on system requirements, such as demand limiting.

f. Automatic Recalibrations: The system shall automatically recalibrate its airflow sensing and air valve position measurement system at system start-up and on a scheduled basis.

g. Remote Setpoint Adjustment: The BMS zone temperature setpoint programmed in software shall be capable of being manually overridden by a remote adjustment at the temperature sensor. This manual readjustment feature may be disabled through the BMS, if desired.

i. Portable Interface Device: The VAV box shall be capable of communicating with a hand held portable operator's terminal. This portable terminal shall give the operator the capability to interrogate and edit DDC/VAV box parameters.

j. Terminal Unit Status Reports: For each terminal unit, the BMS shall provide an operating status summary of all unit sensed values (zone temperature, CFM, etc.), setpoints, and modes.

k. Terminal Unit Group Report: For each group of VAV terminal units, the BMS shall report the group mode, heating and cooling airflow, average zone temperature, minimum zone temperature, and maximum zone temperature. The report shall also display for each terminal unit in the group the present temperature control setpoints and the current zone temperature.

3. Terminal Box Diagnostics

a. If zone temperature sensor input fails above its high range, unit shall control at its maximum CFM setpoint. If sensor input fails below its low range, unit shall control it its minimum CFM setpoint.

b. In both cases, all heat outputs shall be disabled. A diagnostic message shall be displayed upon operator inquiry.

c. If flow measuring system fails, unit shall automatically convert to a pressure dependent, damper position-based algorithm. Diagnostic message shall be displayed upon operator inquiry.

d. If zone temperature setpoint potentiometer on zone sensor fails, unit shall automatically control to 74°F. Diagnostic message shall be displayed upon operator inquiry.

e. If communications are lost, controller shall continue to operate in the current mode of operation. All setpoints shall be retained in nonvolatile memory. If communications are not restored within 15 minutes, unit shall automatically initiate a reset-calibrate.

4. Shutoff VAV Terminals: On a rise in space temperature, the unit will modulate to provide maximum CFM. As space temperature decreases, the box will modulate down to its minimum CFM.

5. Parallel Fan Powered Units: As the space temperature rises above the cooling setpoint, the terminal unit shall modulate to is maximum CFM. As the space temperature falls below cooling setpoint, the terminal unit shall modulate to 20% of the maximum cooling CFM. Upon a continued drop in temperature, the parallel fan will be energized, and the cooling valve will modulate the minimum position.

Upon a further decrease in space temperature, the terminal unit will modulate to heating minimum CFM. Electric heating shall stage on with a 1° interval per stage.

Unoccupied Cycle: During the unoccupied cycle, the air valve on the terminal unit shall drive closed. When the room setpoint rises above 90° F, the lead rooftop air conditioning unit shall start and the cooling valve shall modulate open to maintain 80° F. when the room temperature drops below 50°F, the rooftop air conditioning unit shall start in heating mode and the cooling valve modulate open to maintain 60°F.

C. Large Rooftop Air Conditioning Unit

1. The Building Management System shall perform the following rooftop unit control strategies and provide the points as listed on the points list, and the specified monitoring and diagnostics.

   a. Occupied Mode: When the rooftop unit is turned ON by the BMS during normal occupied hours, all rooftop unit functions will be enabled. Variable air volume will operate in the cooling mode. The rooftop unit defaults to this mode whenever communication with the BMS is lost.

      Variable air volume boxes will control to their occupied or unoccupied setpoints, depending on the schedule of the zone.

   b. Normal Operation: When in occupied mode, as described above, dedicated rooftop unit controls shall operate economizer and stages of cooling to maintain supply air temperature setpoint (VAV units), or economizer and stages of heating and cooling to maintain space temperature setpoint (constant volume units). Setpoints may be reset through the BMS by the operator. Motorized inlet guide vanes shall modulate to maintain static pressure setpoint in supply air ductwork (VAV units only).

   c. Start-up Mode: When the large rooftop unit is turned ON by the BMS for optimal start, heating or cooling is provided as required. On variable air volume units, the BMS holds the rooftop unit in the heating mode until the zone temperature is greater than the user entered occupied heating setpoint. The outside air dampers remain closed unless economizing, until the occupied time of the zone.

Heat Source at VAV Box: In morning warmup mode and night setback mode, exterior VAV boxes shall control to occupied heating setpoint while interior boxes open to maximum CFM setpoint. when morning warmup setpoint is reached, interior and exterior boxes shall control to occupied setpoints.

d. Coastdown Mode: When the unit is turned "OFF" by the BMS for optimal stop, the supply fan remains on, and the outdoor air damper remains open for ventilation. VAV box cooling setpoints shall be automatically raised by an operator defined amount to allow space temperature to drift upward in a controlled fashion. The reduced cooling requirement shall unload the rooftop unit.

e. Nighttime Free-Cool Purge Mode: An economizer-only cooling cycle shall be provided during unoccupied hours when outdoor air conditions are suitable and the zone requires cooling.

f. Demand Limit Mode: Under conditions of high electrical demand, VAV box cooling setpoints shall automatically be raised by an operator defined amount. The reduced cooling requirement unloads the rooftop unit. Temperature limits are provided to ensure occupant comfort.

g. Night Setback Temperature Control: During unoccupied hours, the large rooftop unit shall be controlled by the BMS to maintain user defined unoccupied heating and cooling setpoints. The outdoor air damper remains closed during night setback operation (unless economizing).

h. Outdoor Air Ventilation Control: The use of outdoor air for ventilation shall be provided only during scheduled hours of occupancy and during periods of timed override. Use of the economizer overrides any outdoor air ventilation control.

i. Low Ambient Compressor Lockout: Compressor operation shall be disabled below a user defined outdoor air temperature.

j. Timed Override: When a timed override is initiated by the user, the rooftop unit will return to its normal occupied mode for a user determined period of time. When the timed override period has ended, the unit shall automatically shut down. The BMS shall monitor and store the override time for each timed override input for documentation of after-hours operation.

VAV boxes in the effected zone shall control to their occupied setpoints while the unit is in timed override operation. Other VAV boxes shall remain closed.

k. Emergency Shutdown: The unit will shut down in response to a contact closure supplied by Division 16. Wire from contact closure to air conditioning unit contacts to shut down unit and close all dampers.

l. Unit Status Report: For each rooftop unit, the BMS shall provide an operating status summary of all sensed values (zone temperature, discharge temperature, etc.) setpoints and modes.

m. Diagnostics/Protection: The BMS system shall be able to alarm from all sensed points from the rooftop units and diagnostic alarms sensed by the unit controller. Alarm limits shall be designated for all sensed points.

D. System Point List

1. The contractor shall provide all sensors and controllers to provide the system monitoring and controls for each system point in accordance with the "Systems Point List" as follows:

SYSTEM POINT LIST

Point	Type Point
ROOFTOP AC UNITS	
Discharge Air Temp	Analog input
Mixed Air Temp	Analog input
Oustide Air Temp	Analog input
Supply Fan Status	Digital input
Return Fan Status	Digital input
Compressor(s) Status	Digital input
Filter Status	Digital input
Discharge duct static pressure	Analog input
Duct static pressure	Analog input
Supply Fan Auto/off	Digital output
Return Fan Auto/off	Digital output
Discharge Air Temperature Reset	Analog output
Heating Auto/Off	Digital output
Cooling Auto/Off	Digital output
Discharge Air High/Low Limit Alarm	Alarm
Mixed Air High/Low Limit Alarm	Alarm
Filter Alarm	Alarm
VAV BOX POINTS	
(Typical of each VAV box.)	
Space temperature	Analog input
Box CFM (Box pressure sensor)	Analog output
Box damper	Analog output

COMMENTS: The following information for each box is capable of being input or is accessible through the system: Box size (inches), supply air temperature from AC unit supplying box, Maximum CFM allowed, Minimum CFM allowed, Calibration factor for box, set point for zone box/sensor, cooling setpoint offset, demand setpoint offset, unoccupied setpoint, maximum after hours use, current air flow in CFM.

FPB CONTROL POINTS	
(Typical of each FPB.)	
Space temperature sensor	Analog input
Box CFM (box pressure sensor)	Analog input
Box damper	Analog output
Heating coil	
(See schedule for stages.)	Digital output
Fan Start/stop	Digital output

COMMENTS: The following information for each box shall be accessible through the system: Box size (inches), supply air temperature from AC unit supplying box, Maximum CFM allowed, Minimum CFM allowed, Calibration factor for box, set point for zone box/sensor, cooling setpoint offset, heating setpoint offset, demand setpoint offset, unoccupied cooling setpoint, unoccupied heating setpoint, maximum after hours use, fan start CFM, current air flow in CFM.

EF - (TOILET EXHAUST FAN)

Start/Stop	Digital output
Run indication	Digital input

EF - (ELECTRICAL & ELEVATOR EQUIPMENT ROOMS)

Fan Start/Stop	Digital output
Space Temperature Sensor	Analog output

COMMENTS: The exhaust fans shall start and stop to satisfy the room setpoint temperature. Fans shall have timed controlled to provide minimum 10 minutes on and 2 minutes off. Provide high temperature alarm if temperature exceeds 105° F.

LIGHTING CONTROLS

Start/Stop	Digital output
Override	Analog output

COMMENTS: Division 16 provides low voltage lighting control panels for lighting controls. Control Contractor shall provide 4-wire from EMS panel to each of the low voltage relay panels (connection by Division 16). During off-hours, the EMS shall provide a 20-second signal to sweep lighting. An override signal will be provided if off-hour HVAC has been requested.

3.0 EXECUTION

3.1 INSTALLATION

A. Room Thermostats and Room Sensors: Mount at height of 5' for wall mounted thermostats. Provide insulating back on thermostats mounted on exterior walls. Provide guards where indicated. Suspend ceiling mounted stats where shown, centering in acoustical panels.

B. Local Control and Central Control Panels: Control devices shall be wired without splices to terminal strips and identified by color coding or wire markers. Locate local panels as approved.

C. Identification: Provide engraved nameplates identifying all switches, lights and starters, and each control device where the control function is not readily apparent. Nameplates shall comply with Section 15050. Provide Dynamo label inside of each thermostat cover.

D. Outside Air: A single outside air sensor for all systems is acceptable.

E. Electrical

1. Control voltage shall be limited to a maximum of 120 volts.

2. Where a relay coil or pilot light is connected to the load side of a motor starter to energize with motor operation, the external control circuit shall be properly fused with the fuse block located in the respective starter enclosure.

3. Where relays are used to control single phase motors directly, the contacts of these relays shall be rated for not less than the horsepower rating of the largest motor switched by the relay.

4. The control contractor shall study the Mechanical and Electrical Drawings and Specifications and provide wiring relating to the control system not otherwise specified.

5. Install and wire duct smoke detectors.

3.2 START-UP AND TRAINING

A. Controls Contractor shall provide a minimum of 80 hours instruction, training and debugging to ensure the system is fully operational. In conjunction with the Controls Contractor, test each and every control point.

END OF SECTION

ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.01 SCOPE

A. This Section specifies unique and specific minimum requirements generally applicable throughout this Division of work. At the same time, the Architectural requirements are interfaced with Division 16 requirements. The GENERAL CONDITIONS and GENERAL REQUIREMENTS, Division 1 of the Specifications, govern work under Division 16.

B. This Section applies to all work under this Division 16, and to other Divisions' work where referenced to the "electrical requirements", "Division 16", etc. When any other Division 16 Sections or parts thereof, are copied for use by subcontractors, suppliers, etc., this Section shall also be copied and attached thereto.

C. Provide all labor, materials, tools, instructions, data, directories, test results, reports, spare parts, equipment and services required to construct and install the complete electrical systems in accordance with the Contract Documents.

D. This is a "short form" specification. Words such as "the Contractor shall", "the unit shall be", etc., have been deliberately omitted in the interest of clarity and brevity. These words are understood by the Contractor to be included in the intent and meaning of the Contract Documents and their absence shall not be cause for extra claims.

1.02 DESCRIPTION OF WORK

A. Work to accommodate underground utility power and telephone service and the Owner's telephone/data facilities.

B. Electric service and distribution system for 480Y/277V and 208Y/120V. Provisions for utility company revenue metering. Distribution equipment, panelboards, feeders, dry-type transformers, etc.

C. Pay all electric utility fees and charges associated with installation of service for this project.

D. Concealed wiring and recessed outlets with flush wiring devices unless otherwise indicated.

E. Lighting for all areas, including all switches, ballasts, lamps, etc.

F. Connections for utilization equipment as indicated.

G. Fire Detection and Alarm System.

H. Special Systems and Work as indicated.

I. Automatic lighting controls including low voltage relays and contactors.

J. Motor starters, except as indicated under Work Excluded.

K. Telephone/data terminal backboards, receptacles, outlets, power connections, conduits and sleeves as indicated, for Owner-provided telephone and data processing systems.

L. Master building grounding electrode and grounding electrode riser. Grounding of electrical apparatus and utilization equipment.

M. Security system with CCTV and card key access control.

1.03 WORK EXCLUDED

A. Telephone and data processing systems cable or equipment and installation of such, except as indicated.

B. Utility service transformer(s), except pay any associated fees or charges as required.

C. Motor starters and/or controls indicated to be an integral part of the equipment furnished under other Divisions of work or other Contracts; such as certain package HVAC equipment, etc.

D. Control wiring for mechanical equipment except automatic lighting controls, interface wiring, empty conduits, power outlets, etc., specifically indicated.

E. Elevator equipment and controllers and wiring thereof, except single point power supply connections and/or other provisions specifically indicated.

F. Panelboards, distribution equipment, feeders, transformers, raceways, equipment, wiring, etc., indicated to be existing.

1.04 UTILIZATION EQUIPMENT CHARACTERISTICS

A. Unless specifically indicated otherwise, motors rated 1/3 HP and less are to be suitable for nominal supply of 120 volts or 277 volts; all motors 1/2 HP and over are to be suitable for nominal supply of 480 volts, 3 phase.

1.05 REQUIREMENTS OF REGULATORY AGENCIES

Conform with the latest rules of the National Board of Fire Underwriters' Code, regulations of the Fire Marshal, and applicable local and state codes, as interpreted by the authority having jurisdiction.

1.06 DEFINITIONS

The following apply to portions of the Contract Documents pertaining to Division 16 work:

A. "Provide" means "furnish and install".

B. "Indicated" means "indicated in the Contract Documents".

1.07 EXISTING CONDITIONS

Visit the job site prior to bid to gain familiarity with existing conditions which may affect execution of the work. Information relative to existing conditions is approximate, based upon drawings prepared by others and limited field observations.

1.08 DEMOLITION

Remove all existing raceway and open cable wiring not to be reused which is exposed and which is concealed above accessible ceilings.

PART 2 - PRODUCTS

2.01 GENERAL

A. Provide products third party (UL) listed or labeled for location and use, wherever such a listing or labeling service is normally provided unless items are specifically exempted.

B. Except as otherwise indicated provide new electrical products, free of defects and harmful deterioration at the time of installation. Scratched, marred, rusty, or deformed materials are prohibited.

PART 3 - EXECUTION

3.01 CUTTING AND PATCHING

Comply with applicable provisions of other Divisions of work. Do not cut framing, walls, floors, decks and other members intended to withstand stress, except with the Structural Engineer's written authorization.

3.02 OBSERVATIONS AND TESTS

A. Test all wiring and connections for continuity, proper phase sequence, and grounds before energizing any fixtures or equipment.

3.03 CONTRACT CLOSEOUT

A. Electrical systems will be considered substantially complete only if they are fully operational. Test and demonstrate the entire system to assure that all portions are functional according to the design intent.

B. Instruct the Owner's staff thoroughly in the operation of apparatus and controls.

C. Submit Record Drawings and Operating and Maintenance Manuals.

END OF SECTION

PART 2 - PRODUCTS

2.01 RACEWAYS

A. Comply with applicable NEMA and ANSI Standards and Federal Specifications pertaining to metallic and non-metallic conduit, duct, tubing and fittings.

B. Metal Raceway

1. Electrical Metallic Tubing (EMT): Hot-dip galvanized steel with overall zinc coating, and special interior lubricant coating; 4" maximum size.

2. Galvanized Rigid Conduit (GRC): Threaded type hot-dip galvanized steel with overall zinc coating; all threads galvanized after cutting and protected by color coded end caps.

3. Intermediate Metal Conduit (IMC): Hot dip galvanized steel with overall zinc coating; all threads galvanized after cutting and protected by color coded end caps.

4. Flexible Metal Conduit (FMC): Hot-dip galvanized heavy wall steel with zinc coating; 1/2" minimum size.

5. Liquid-tight Flexible Metal Conduit (LFMC): Single strip, flexible, continuous, interlocked, and double-wrapped steel, galvanized inside and out; coated with liquid-tight jacket of PVC; smooth-wall internal wiring channel; 1/2" minimum size.

C. Non-metallic Raceway: Rigid non-metallic conduit (RNC) Schedule 40 heavy wall PVC.

D. EMT Fittings: Steel except elbow and offset connectors with cadmium plated malleable iron bodies are acceptable. Gland compression or set-screw type; connectors with insulating bushing (or pre-insulated).

E. GRC & IMC Fittings: Plated malleable iron, threaded screw-on type.

F. FMC Fittings: Screw clamp type, plated malleable iron; insulated throat.

G. LFMC Fittings: Liquidtight compression type, plated malleable iron or steel; insulated throat.

H. RNC Fittings: Schedule 40 heavy wall PVC.

I. Nipples: Insulated throat, or all thread conduit with locknuts and insulated bushings.

J. Metal Conduit Bodies: Zinc plated malleable iron; threaded conduit entrances; with removable covers, neoprene gasket and corrosion resistant screws.

K. Plastic Conduit Bodies: Similar to metal except PVC.

L. Raceway Sleeves: Heavy wall steel or cast iron pipe, coated malleable iron bodies, core-bit drilled, or precast concrete.

M. Hydrostatic Seals: Pressure rated by the manufacturer in feet of water or equivalent psig for the maximum potential hydrostatic head.

N. Accessories: Hangers, clamps, rollers, straps, fasteners, brackets, transition adaptor couplings, protective caps and plugs, expansion and deflection fittings, complying with manufacturer's published product information and designed and constructed by manufacturer for use in the applications.

2.02 CABLE TRAY

A. General: Trapeze supported steel tray for power limited circuit cables.

B. Design Load: 50 pounds per linear foot when supported on 12' centers.

C. Supports: Threaded rods 12' maximum on center; earthquake braces 60' maximum on center to preclude lateral movement.

D. Cable Protection: All edges rounded and smooth.

2.03 SURFACE METAL RACEWAY

A. General: Two-piece metal raceway construction of lengths indicated; factory applied gray, semi-gloss finish suitable for field painting.

B. Outlets: Provide device brackets or device covers with specified wiring devices and plates unless otherwise indicated.

C. Fittings and Accessories: Wire clips 30" O.C., couplings, supporting clips, cover clips, ground clamps, blank end fittings, elbows, tees, corner couplings and adaptors as required and to comply with the manufacturer's recommendations.

2.04 SURFACE MULTI-OUTLET ASSEMBLY

Two piece metal construction nominal 1-1/4" wide x 3/4" deep with three-wire, 15A, 120V receptacles. Couplings, supporting clips, cover clips, ground clamps, blank end fittings elbows, tees, corner couplings and adaptors as required and to comply with the manufacturer's recommendations.

A. Manufacturer: Wiremold, Walker.

2.05 CONDUCTORS

A. General: Circular soft drawn copper, solid or stranded, 12AWG, 8AWG and larger to be stranded.

B. Building Wire: Single Conductor 600V THHN/THWN type insulated conductors.

C. Control Circuits: 18AWG minimum, 90°C rated TFN, RFH-2, RFHH-2, or RFHH-3.

D. Aluminum: Prohibited.

C. Metal Covered Cable: Solid, 18AWG and 16AWG TFN and 14AWG to 10AWG THHN or XHHW conductors enclosed in an interlocking armor sheath formed of galvanized steel; 600V types MC and AC.

D. Non-Metallic Sheath (NM) Cable: Prohibited.

E. Direct Burial: Prohibited.

F. Power Limited Circuit Cable: Overall jacketed, color coded stranded 20AWG minimum conductors.

2.06 CONNECTORS AND LUGS

A. Screw Terminal Lugs: Compression tool applied, insulated, flanged or locking fork.

B. Crimp Splice Connectors: Compression tool applied, with 600V heat shrink insulation.

C. Crimp Lug: Compression tool applied for bolted connection.

D. Mechanical Lugs: Set screw, clamp type for 2AWG and larger.

2.07 PULL & JUNCTION BOXES

A. Interior and Exterior Above Grade: Galvanized sheet steel with welded seams or cast metal, with screw-on cover; types, shapes and sizes to suit respective location and application; corrosion resistant hardware; gray baked enamel finish.

B. Exterior in Earth: Nonmetallic gasketed with stainless steel inserts, two stainless steel cover bolts, and suitable cover logo.

2.08 FLOOR OUTLETS

A. Flush Floor Outlets: Rough-in boxes, dual level fully adjustable before and after concrete pour, stamped steel except cast iron in slab on grade; round floor opening.

1. Covers: Heavy gauge aluminum.

2. Duplex Receptacles: Aluminum dual flap covers.

3. Carpet Flanges: Clear lexan plastic.

B. Pedestal Service Fittings: Four-piece heavy gauge aluminum.

C. Poke-Through Fittings: Fire stop rated with pedestals as above.

2.09 CABINETS

Arrangement and sizes as required, with backboards for spare and future apparatus, terminals and wiring. Suitable for location and use, lockable, and rain and dust tight.

2.10 OUTLET BOXES

A. Interior Concealed: One piece, pressed steel, knockout type with zinc or cadmium coating; no smaller than 4" octagonal, 1-1/2" deep.

B. Recessed Box, One or Two Devices: Minimum 4" square box, 1-1/2" or more deep, with single or two-gang raised covers.

C. Recessed Box, Three or More Devices: One piece gang box with raised device cover; one gang minimum per device.

D. Interior Dry Location Surface Boxes: As above with raised device covers.

E. Exterior Surface Boxes: Cast metal threaded hub style with gasketed covers.

2.11 WIRING DEVICES

A. General: Color as selected.

B. Switches: Heavy duty AC, quiet, 20 ampere, 120-277 volt.

C. Duplex Receptacles: 15/20 ampere NEMA 5-20R, smooth nylon face.

D. G.F.I. Duplex Receptacles: As above except 15-ampere NEMA 5-15R with 5±1mA trip, test and reset buttons.

E. Special Purpose Receptacles: Specification Grade.

F. Flush Device Plates: Entirely smooth nylon, except for special purpose type 302/304 non-magnetic stainless steel.

G. Weatherproof Receptacle Covers: Listed for wet locations with or without barrel type utilization plug inserted in wiring device.

2.12 CONTROL UNITS

Heavy duty control units, oil-tight with double break silver switch contacts, for general application such as magnetic starters, lighting contactors, etc.

2.13 PHOTOELECTRIC CONTROL

Weatherproof, 2000W rated, adjustable light level selector, and fail safe ON; Tork 2100 Series, Precision, Paragon.

2.14 CONTACTORS AND RELAYS

A. General: Type, voltage, poles, amperage, required short circuit withstand rating, quantity, etc., as required.

B. Control Relays: Rated 3600VA make, 360VA break, 120VAC minimum, and not less than 125% of connected load; enclosed contacts appropriately configured to perform the required function.

C. Multi-Pole Lighting Contactors: Electrically held, double-break silver-cadmium-oxide convertible contacts rated 20A for tungsten and ballast lighting loads.

2.15 MANUAL STARTERS

Enclosed full voltage non-reversing types consisting of a manually operated switch equipped with trip-free thermal overload relay(s) of one-piece construction; starter inoperative if any thermal unit is removed.

2.16 MAGNETIC STARTERS

Enclosed full voltage non-reversing (FVNR) units in accordance with NEMA standards, sizes and horsepower ratings, NEMA Size 0 minimum; sizes greater than the minimum required by NEMA horsepower rating where indicated; rated 600VAC except 240VAC permitted for single phase starters where applicable.

2.17 DISCONNECTS

Individually enclosed disconnect switches (safety switches), heavy duty (600VAC) and general duty (240VAC), fusible and non-fused as required.

2.18 FUSES

600V or less; non renewable type with dual elements; current limiting, and time delay. 1-600A: NEMA Class RK1 or RK5 rejection type as required. 601-6000A: NEMA Class L.

2.19 CIRCUIT BREAKERS

A. General: Molded case, 15-2500A at 120, 240, 277, 480 and 600VAC; suitable for mounting and operating in any position.

B. Operating Mechanism: Overcenter, trip-free, toggle type handle with quick-make, quick break action.

C. Trip Mechanism: Individual permanent thermal and magnetic trip elements in each pole, except variable magnetic trip elements with a single continuous adjustment 3X to 10X for 100A and larger; two and three pole, common trip; operating handle to assume a center position when tripped; test button on cover; calibrated for 40°C ambient.

D. Connections: Supply (line side) at either end; mechanical wire lugs and bolted to bus; removable lugs for breakers over 100A.

E. Short Circuit Interrupting Ratings: Equal to, or greater than, available fault current; not less than the following RMS symmetrical minimums for the indicated trip settings.

1. Up to 100A, less than 250VAC: 10,000A.

2. Up to 100A, 250-600VAC: 14,000A.

3. Over 100A: 22,000A.

F. Series Connected Ratings: Listed configurations and ratings with load side breakers of breaker/breaker and fuse/breaker combinations conforming to the indicated short circuit ratings.

G. Ground-Fault Circuit Interrupters (GFI): 120VAC, 5ma sensitivity; single pole 20A GFI breaker.

H. Magnetic Only: For motor protection, instantaneous trip adjustment which simultaneously sets the magnetic trip level of each individual pole, continuously through a 3X to 10X trip range.

I. Accessories: Shunt trip, auxiliary switches, handle lock on devices, mechanical interlocks, key interlocks, unit mounting bases, NEMA enclosures, etc., as required; shunt trip operators to be continuous duty rated or have coil clearing contacts.

J. Manufacturer: Siemens-ITE, Cutler-Hammer, Square D, General Electric, or approved substitute.

2.20 SUPPORTS

As required for each installation, suitable for location and use in accordance with the manufacturer's recommendations, and; capable of sustaining not less than four (4) times the ultimate weight or other force which the work will be subjected to under normal conditions. All materials including bolts, straps, screws, etc., to be inherently corrosion-resistant or protected by corrosion-resistant materials. Mounting backboards: 3/4" fire retardant treated plywood, exposed surfaces covered with two coats light gray fire retardant sealant/primer.

2.21 FIRE STOPS

UL classified hourly fire-rating equal to, or greater than, the assembly penetrated; prevents the passage cold smoke, toxic fumes and water, before and after exposure to flame.

2.22 IDENTIFICATION

A. Subgrade Marking Tape: Detectable (tracer) type, 3" x 5.5 mil minimum overall thickness with 0.5 mil minimum solid aluminum foil core, inert

polyethylene plastic imprinted with manufacturer's standard legend which most accurately identifies the type of line. Safety Red for Class 1 control, power distribution, and transmission lines; Safety Alert Orange for telephone, communications and television lines.

B. Wire Markers: Vinyl-cloth self-adhesive wrap-around type, either pre-numbered plastic coated or write-on type with clear plastic self-adhesive cover flap.

C. Engraved Signs: Melamine plastic, black with white core, 1/16" thick, engraved with Helvetica Letter style, 3/16" minimum all capitals, unless otherwise indicated; drilled or punched for self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.

D. Dymo Type Labels: Prohibited.

E. Legend Plates: For control and pilot devices, manufacturer's standard engraved metallic plates, with enamel filled letters.

F. Device Plate Engraving: Helvetica Letter style, minimum 5/32" high, all capitals, approved contrast color enamel filled.

G. Device Plate Circuit Numbers: Self-adhesive Kroy Type 12 point Helvetica medium font, black on clear tape; spray sealed prior to application to plate.

PART 3 - EXECUTION

3.01 RACEWAYS

A. General

1. Required: Install a continuous circular raceway (conduit) system for all wiring between outlets, equipment and apparatus unless specifically indicated otherwise.

2. Location: Concealed in or under floor or grade in walls, and in or over ceilings.

3. Size: 1/2" minimum for power and lighting except 3/4" minimum in or under slab and for homeruns and 1" minimum for runs extending beyond the building under grade. For power and lighting branch circuits, install the code minimum size for Type THW conductors of the same gauge and quantity as those installed. For signal, communications

and control size as required, 3/4" minimum; a maximum of three data and/or telephone outlets may be "daisy" chained with 1" between them and 1-1/4" stubbed out to accessible location. Refer to details.

4. Conduit Only: Install a 14AWG galvanized iron or steel fishwire or 90 lb. test nylon line in all conduits in which permanent wiring is not installed; secure at each end. Only data and/or telephone conduits of less than 10' length are excepted. Install interior data and/or telephone so that the stub is directed toward the cable tray system; terminate with bushed connector.

5. Conduit Bodies: Prohibited for service and feeders except straight through permitted for feeders.

6. Bends: Conform to code.

7. Routing: Except under slab or grade, install conduit parallel with or at right angles to the lines of the building.

8. Membrane Penetrations: Install watertight fitting, pitch pocket, flange, or membrane clamping ring to provide watertight seals for all conduits piercing building exterior walls, roofs or other waterproof membranes above grade.

9. Hydrostatic Seals: Install on all exterior undergrade conduits and sleeves which terminate indoors; seal both outside and channel.

10. Construction Joints: Install expansion/deflection couplings where conduits pass through building expansion and earthquake joints; where accessible, pull boxes on both sides of the joint connected with slack flexible conduit may be installed in lieu of coupling.

11. Fire Stops: Install approved fire stops where conduits and sleeves pass through fire rated walls, floors or ceilings; seal all floor penetrations watertight.

12. Stub Outs: Keep all temporary conduit openings closed by means of manufactured plugs or caps; seal, mark, install permanent metal plug or cap, and record location of all conduit stub outs for future continuation.

13. Dissimilar Metal Joints: Apply lubricant/sealer.

14. RNC: Prohibited above slab on grade and above exterior grade.

15. Sleeves and Chases: Install all necessary sleeves, openings and chases where wiring or empty conduits must pass through floors, ceilings, and walls; close openings and seal around conduits and cables as required. Seal all floor penetrations watertight.

B. Conduit Underground

1. General: Install RNC only beneath the building or grade.

2. Minimum Size: 1", except 3/4" minimum under building floor slab.

3. Elbows: Long radius (NEC Table 346-10 Conductors with Lead Sheath).

4. Metals: Where ferrous metal conduit, boxes and fittings are required to be installed in direct contact with the earth, use only materials with corrosion resistant exterior coating.

5. Couplings and Connections: Seal watertight.

6. Minimum Depth: Unless otherwise indicated, install 24" below finish grade, or greater where required by Code and/or special conditions at the site. See trench detail.

C. Exposed Conduit: Permitted in Elevator Machine Rooms and Electrical Rooms. Follow the structural lines of the building; hold conduits tight to structure unless otherwise required and offset raceway at panels, outlets, switches, junction boxes, etc.

D. Metal Conduit

1. EMT: Install only in interior, dry applications not subject to physical damage, and where not otherwise prohibited.

2. GRC & IMC Required: Unless otherwise indicated, install only GRC or IMC for any exposed work below 6'; also in wet, damp, and/or hazardous locations.; and for service entrance conduits above ground.

3. FMC: Install for connections subject to movement and vibration, except where LFMC is required.

4. LFMC: Install for motor connections, and other connections subject to movement and vibration, and subject to one or more of the following conditions:

a. Exterior location.

b. Moist or humid atmosphere where condensate can be expected to accumulate.

c. Corrosive atmosphere.

d. Water spray.

e. Dripping oil, grease or water.

5. Electrical Continuity: Install conduits continuous from outlet to outlet and from outlets to cabinets, pull or junction boxes; terminate runs so that each metallic system is electrically continuous throughout.

6. Bonding Jumpers: Install on all loosely coupled metal raceways.

7. Supports: Support from ductwork, other piping or their supports is prohibited.

3.02 SPECIAL RACEWAY SYSTEMS

A. Cable Tray:

1. General: Install standard lengths where possible; avoid unnecessary cutting or drilling and conform to the manufacturer's recommended installation practices.

2. Cables: Install power limited circuit cables for telephone, data, fire alarm, low voltage switching, HVAC control, etc., in tray where available. Coordinate placement of cable for various systems so as to avoid conflict and electrical interference between system.

3. Wall Penetrations: Coordinate with framer and sheet rock trades to provide rectangular finished opening to match tray to box connector opening. Install tray to box connector to frame opening and fasten securely to wall framing to stabilize tray termination.

4. Location: Suspend tray so top of rails are 3" minimum clear of fireproofing structural members.

3.03 CONDUCTORS

A. Install conductors and cable in concealed raceway for all circuits unless otherwise indicated.

B. Install metal covered cable only in concealed dry protected locations for single 20 ampere lighting and receptacle circuit branches and for up to three switch legs plus hot or neutral lighting circuit branches. Install "through" wiring, and homeruns, and exposed work in raceway.

C. Where one-way isolated ground 120 volt computer power 20 amp branch circuit lengths exceed 60 feet, install 10AWG neutral. For all 120 volt 20 amp circuits over 100 feet circuit length, install all 10AWG. All exterior underground circuits 8AWG minimum unless otherwise noted.

D. Power limited circuit cables may be routed without raceway where run concealed in accessible or fishable spaces. Also may be run exposed above bottom of structural members in areas without ceilings. Keep 12" clear of power and lighting circuits. Where they cannot be run in cable tray system, support cables with bridle rings maximum 6' on center and clear of suspended ceilings. Use caddy clips with bridle rings and nylon tie wraps or equivalent. Route parallel to building lines. Install cable sleeves and fire stops as required.

E. Neatly form, train and tie conductors in panels and cabinets for power, control, signal, communications, etc.; use plastic ties.

F. Support and restrain power cables to remain in place under maximum available fault current conditions.

G. Install stranded conductors where flexible conduit is required.

H. Install cross linked polyethylene insulated hot and neutral conductors with dielectric constant of 3 on load side of ground fault circuit interrupters when one way circuit length exceeds 50'; 600V type XLP typical.

3.04 CONNECTORS AND INSULATION

A. Install joints or branch circuits only where such circuits must branch; splice conductors only at outlet boxes, junction boxes and splice boxes.

B. Excepting power limited circuits, join 10AWG or smaller only with insulated spring or crimp sleeve connectors; terminate in mechanical or crimp lugs.

C. Join power limited circuit conductors with insulated crimp sleeve connectors; terminate in screw terminal lugs.

D. Join 8AWG or larger with a crimp compression or mechanical compression connectors and insulate the joint equal to the insulation of the conductors; terminate in mechanical or crimp lugs unless otherwise indicated.

E. Crimp Required: Install only crimp connectors and crimp lugs for grounding electrode riser and for wet locations such as junction boxes below grade.

3.05 OUTLET BOXES

A. Use bar hangers and framing members to support and accurately locate outlet boxes in stud or furred partitions and ceilings. Use expansion shields for fastening to concrete or masonry. Install knockout seals in all unused knockout holes.

3.06 WIRING DEVICES

A. Where more than one wall switch and/or other strap mount devices are required at one location, gang under a common wall plate. More than six switches at one location, gang in two rows, one above the other.

B. Test all receptacles for correct polarity. Check all GFI receptacles for proper operation at 5ma ground fault.

C. Install blank covers on all unused outlets; such as, data, telephone, etc.

3.07 MOTOR STARTERS

Provide motor starters for all new motors as required. Label starters indicating equipment served and equipment project designation.

3.08 DISCONNECTS

Install a readily accessible disconnecting means for each motor and/or controller. Install fuses and identification.

3.09 IDENTIFICATION

A. Install detectable subgrade marking tape above all underground circuits approximately 9" to 12" below grade; use multiple tapes above groups of circuits, no less than one per 12" of group width.

B. Use wire markers or other approved identification at all locations where more than three circuits are present.

C. Attach engraved signs to all equipment indicating designation, voltage and where served from.

D. Provide panel and circuit number identification for each wiring device or group of wiring devices on common circuit.

3.10 SUPPORTS

A. Support all equipment and raceway installed under this Division from the building structure.

B. Install mounting backboards as substrate for wall mounting surface electrical equipment, and telephone terminal boards. Install necessary galvanized steel framing for supporting starters, control panels, panelboards, etc. where it is not feasible to wall mount such items.

C. At exterior locations, install only materials which are highly corrosion resistant.

3.11 ACCESSIBILITY

A. Install pull boxes, wireways and other items requiring inspection, repairing, removal or replacement, so as to be conveniently and accessibly located with reference to the finished building.

B. Install access panels for required access to pull boxes and other items; doors 18" x 18" minimum. Access panel installation to be performed by trades installing the accessed wall, ceiling or floor construction.

3.12 EQUIPMENT CONNECTIONS

A. Connect mechanical equipment and all other utilization equipment complete. Include all incidental wiring, materials, devices, and labor necessary for a finished working installation. Make motor rotations in the proper direction.

B. Verify location, electrical characteristics, and method for connecting each item of equipment prior to roughing in.

END OF SECTION

SERVICE AND DISTRIBUTION

PART 1 - GENERAL

1.01 SCOPE

Provide electric service and distribution system. Conform with Serving Utility Company requirements.

1.02 SUBMITTALS

Submit shop drawings for revenue meter sockets, distribution equipment, dry-type transformers, branch circuit panelboards, grounding materials, etc. Include electrical ratings, dimensions, mounting, material, required clearances, terminations, weight, temperature rise, wiring and connection diagrams, plan, front, side and rear elevations, sectional views, dimensioned raceway termination areas, buswork, circuit breaker frame, trip and short-circuit rating, accessories, and device nameplate data. Show the size, ampere rating, number of bars per phase and neutral in each bus run (horizontal and vertical), bus spacing, equipment ground bus, and bus material.

1.03 FEES

Pay all material and labor costs for electric service installation not furnished by the Serving Utility Company as part of their obligation for service to the project.

PART 2 - PRODUCTS

2.01 SERVICE EQUIPMENT

A. Provide equipment UL approved, and accepted by the code authority having jurisdiction, as suitable for use as service equipment. Where applicable conform to Serving Utility requirements.

B. Provide adequate space, CT bus links, landing pads, etc., in service equipment to accommodate utility revenue metering equipment.

2.02 DISTRIBUTION EQUIPMENT

A. Integrated Short Circuit Rating: Equal to, or greater than the RMS symmetrical available fault current (or IER) indicated, 22,000A minimum.

B. Enclosure Construction: Dead-front with front accessibility required; framework formed of code gauge steel, rigidly welded and bolted together to support all cover plates, bussing and component devices; hinged wireway front covers; NEMA 1 enclosure unless otherwise indicated.

C. Bussing

1. Cross-sectional Area: Conform to UL 891 for temperature rise.

2. Material: Plated copper or plated extruded aluminum, except provide copper ground bus.

3. Configuration: Three phase bus plus full neutral bus plus 25% rated equipment ground terminal bus (bar).

4. Insulation: For 480 VAC services, provide continuous insulation of each individual phase bus bar on the line side of main disconnect(s) equal to two layers of 105°C electrical tape; provide removable slip-on insulating covers or equivalent at joints for maintenance access to bolts. Or, provide continuously metal-barriered bus bars on line side. No exception.

D. Finish: All metal enclosure parts (including distribution panel tubs) completely painted using an electrodeposition process so that interior and exterior surfaces as well as bolted structural joints have a complete finish coat on and between them; manufacturer's standard color (gray) baked-on enamel.

E. Related Work: Comply with applicable provisions of Sections 16010 and 16100, particularly Connectors and Circuit Breakers; see also Grounding Materials.

F. Spaces: Provide 30% minimum to accommodate future breakers, completely bussed and otherwise equipped with necessary accessories.

G. Accessories: Provide current transformers, shunt trip operators, ground fault protective relays, control transformers and other accessories prewired at the factory, as required.

H. Manufacturers: Square-D, Siemens ITE, Westinghouse, Industrial Electric Manufacturing, General Electric, Cutler-Hammer, or approved substitute.

2.03 BRANCH CIRCUIT PANELBOARDS

A. General: Provide sequence phased, factory assembled, bolt-on circuit breaker branch circuit panelboards as indicated; similar to Square-D types NQOD and NEHB.

B. Integrated Short Circuit Rating: Equal to or greater than the RMS symmetrical available fault current (or IER) indicated 10,000A minimum up to 250 VAC and 14,000A minimum over 250 VAC; series ratings may be applied.

C. Bus: Copper or aluminum bar with suitable electroplating (tin) for connection to corrosion control; insulated equipment ground bar with removable jumper to enclosure.

D. Trim Doors: Flush lift latches and locks; two keys per panel furnished, three minimum; all panel locks to be keyed alike unless otherwise indicated.

E. Gutters: Minimum 5-inch side gutters and 6-inch top and bottom.

F. Identification

1. Individual circuit identification numbers adjacent to each breaker pole position.

2. Circuit identification cards mounted in frame(s) on the inside of panel doors.

3. Engraved Sign: On trim, above door, indicating project designation and voltage; such as, "PANEL 2H2NB", "208Y/120V".

G. Circuit Breakers: As required, 30% minimum spaces.

H. Finish: All metal structural and enclosure parts (tub and cover) completely painted using an electrodeposition process so that interior and exterior surfaces as well as bolted structural joints have a complete finish coat on and between them; manufacturer's standard color (gray) baked-on enamel unless otherwise indicated.

I. Related Work: Comply with applicable provisions of Sections 16010 and 16100, particularly Connectors and Circuit Breakers; see also Grounding Materials.

J. Manufacturers: Cutler-Hammer, Square D, Siemens-ITE, Westinghouse, General Electric, Industrial Electric Manufacturing or approved substitute.

2.04 DRY-TYPE TRANSFORMERS ($\leq$ 600V)

A. General: Sizes shown on the Drawings. Separate primary and secondary windings for each phase, unless otherwise indicated.

B. Primary Windings: Unless otherwise indicated, rated 480 volts, 60 cycles, 3 phase, three-wire delta with full capacity taps in each winding; 15 KVA and larger to have two 2-1/2% taps above rated voltage and two 2-1/2% taps below rated voltage.

C. Secondary Windings: Unless otherwise indicated, rated 208Y/120 volt, 3-phase, 4-wire, grounded.

D. Voltage Drop: 5% maximum at full load, 90% power factor.

E. Acoustical Noise Levels: Not to exceed NEMA Standard values.

F. Insulation Systems

1. Less Than 30 KVA: Epoxy encapsulated, Class F insulation, designed to operate at rated KVA with a temperature rise not exceeding 115°C over a 40°C ambient.

2. 30 KVA and Larger: Class H insulation, designed to operate at rated KVA with a temperature rise not exceeding 150°C over 40°C ambient unless specifically noted for operation at rated KVA with a temperature rise of 115°C over 40°C ambient (15% continuous overload capacity).

G. Isolation or Shielded Type: Provide electrostatic shield between primary and secondary windings for computer power.

H. Basic Impulse Level: 10 KV, all units.

I. Manufacturer: Westinghouse, General Electric, Square D, International Transformer Corp., Acme, or approved substitute.

2.05 SURGE ARRESTOR

A. General: Provide to protect against transients caused by lightning, induction, switching surges and EMP; for 480Y/277 volt RMS, 3 phase, grounded-wye, 50-60 Hz systems, Joslyn 1456-05.

B. Method of Operation: When a surge voltage exceeds the spark-over voltage of an arrester, the gas in the spark gap becomes intensively ionized and electrical conduction takes place. In a fraction of a micro-second, the arrester becomes a short circuit and remains so until the transient has been bypassed and the line voltage returns to normal. The unit will automatically restore itself to a nonconducting state without the necessity of replacing fuses or resetting a breaker.

C. Construction: Metal enclosure with insulated terminal board. Discharges are totally contained within the envelope. No external corona, arcing, or venting. Individual arrester modules can be replaced without disturbing the arrester installation.

D. Power Rating: Unlimited.

E. Sparkover Voltage: 532V RMS ±10%; 750V peak ±10%.

F. Impulse Sparkover Voltage: 1700V peak, at 10KV/μsec line to ground.

G. Nominal Discharge Voltage: 10 x 20 μsec wave with:

1. 5,000 amps = 1.5 KV
2. 10,000 amps = 1.8 KV
3. 40,000 amps = 2.8 KV
4. 65,000 amps = 3.5 KV

H. Minimum Life: 2500 hits of 10 KA 10 x 20 μsec waves and subsequent power-follow current.

I. Extreme Duty Discharge Capacity: 65,000 amps peak (10 x 20 μsec wave).

J. Power-Follow Characteristics: Self-restoring within 1/2 cycle.

K. Pilot Indicators: Extremely long life, one per phase, g-no go indication.

L. Alarm Output: Double pole, double throw form C, go-no go.

M. Power Consumption: Less than 10 watts.

N. Operating Temperature Range: -40°F to +160°F.

O. Operating Altitude: 12,000 feet maximum.

P. Manufacturer: Joslyn Electronic Systems, (805) 968-3551, Lightning Protection Corporation, (805) 967-4577, or approved substitute.

2.06 GROUNDING MATERIALS

A. General: Conductors, electrodes, bus and terminal bars shall be copper.

B. Conductors: Color identified green, stranded copper; TW insulation acceptable.

C. Connectors and Terminal Lugs: As specified except cast clamps for pipe bonding, and crimp connectors and exothermic weld (Cadweld) where indicated.

D. Terminal Bars and Bus: Drilled (and tapped) with indicated lugs and suitably plated for connection corrosion control.

E. Lug Bolts: 5/16" minimum for bolted connections of #6 and larger conductors.

F. Rods: Copperclad steel, 3/4" diameter by 10' long.

PART 3 - EXECUTION

3.01 DISTRIBUTION EQUIPMENT

Locate in rooms or spaces dedicated to such equipment. Coordinate with other Divisions of work. Mount plumb. Cover all openings. Cable conductors with plastic ties and support (brace) in accordance with manufacturer's instructions to withstand fault current. Identify all overcurrent devices and accessories. Tag conductors at termination.

3.02 PANELBOARDS

Mount plumb and adjust trim to be vertical, covering all openings; top of panelboard maximum 6'-6" above finished floor. Circuit identification cards typewritten, filled out clearly, to identify all outlets served. Cable and tree conductors in panels with plastic ties. Tag conductors at termination.

3.03 DRY-TYPE TRANSFORMERS

A. Mount on vibration isolators (Korfund) properly sized for load and connected with liquid-tight flexible conduit to prevent transmission of noise and vibration to the building.

B. Adjust actual secondary voltage in place and under load to as close to rated secondary voltage 120/208 volts as possible.

C. Label transformers with engraved signs indicating equipment served, designation and voltages.

D. Ground in accordance with the National Electric Code and as indicated.

3.04 GROUNDING

A. General: Ground all electrical systems and equipment in accordance with all applicable codes; comply with NEC Article 250.

B. Raceways

1. Install grounding bushings on all metal feeder and service conduit terminations and bond with minimum 10AWG conductor.

2. Install code size equipment ground conductor within any circuit with phase conductors 6AWG and larger; larger than code size where shown.

3. Install equipment grounding conductor in all non-metallic raceway.

C. Receptacles: Install a wired connection from panel to the ground terminal on all receptacles. Equipment ground and isolated ground conductors may be common to multiple receptacles and circuits but keep separate.

D. Motors: Connect the equipment ground conductor to the motor frame with a bolted crimp lug; use bronze or cadmium plated steel bolts, screws and washers.

E. Equipment: Where an equipment ground conductor is indicated or otherwise required, or branch circuit overcurrent protection is set at 60 amperes or higher, install bonding for motors above. Grounding lugs, where provided as standard manufacturer's items on equipment furnished, may be used.

F. Ground Conductors: Install 12AWG (minimum) stranded copper with green insulation, continuous from terminal to terminal without splice; install separately run grounding conductors in code size conduit unless otherwise indicated.

G. Isolated Ground Test: After completion of installation of all wiring devices, lift enclosure jumper and feeder ground at each computer power branch panel and test for continuity of isolated grounds to building ground (should be an open circuit). If continuity is indicated, lift each isolated ground conductor and test; correct faulty wiring.

END OF SECTION

LIGHTING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Provide new light fixtures and lamps as required.

B. Provide all materials, equipment and services to construct a complete and workable general lighting system.

C. Provide selected fixtures with electronic ballasts and dimming electronic ballasts.

1.02 SUBMITTALS

Submit fixture construction details and photometric data; indicate ballast type, lamp type and special lens or louver type. Submit each ballast type, lamp type and special lens and louver type.

PART 2 - PRODUCTS

2.01 FIXTURE CONSTRUCTION

A. General: Minimum 20-gauge steel with 18-gauge frames and end pieces.

B. Fluorescent Fixtures: Steel painted a final baked (white) enamel finish; minimum reflectance for housing interiors 88%.

C. Parabolic Reflectors: Specular aluminum finish, minimum 80% reflectance.

D. Trims: Suitable for mounting in each ceiling type where shown.

2.02 LENSES AND LOUVERS

A. Material: Injection molded or extruded 100% virgin acrylic.

B. Lenses: Average thickness of 0.115 inches minimum, and minimum unpenetrated thickness of 0.075 inches; patterns as scheduled.

C. Louvers: Semi-specular anodized aluminum.

D. Reflector Cones: Specular clear anodized.

2.03 MAGNETIC BALLASTS

A. Unless otherwise indicated, high power factor type, Class P internally thermally protected, lowest available (A) sound rating, bearing the CBM, BTL and UL labels; Universal, Jefferson, and Advance.

B. Rapid Start and Slimline Fluorescent: Energy saving magnetic type equal to Advance Mark III unless otherwise indicated.

C. High Intensity Discharge: Single-lamp, high power factor, regulator out-put type, suitable for 150°F interior application and -20°F outside unless otherwise indicated.

2.04 ELECTRONIC BALLASTS

A. General: Sinusoidal lamp drive voltage 25-30 KHZ, Class P, NEMA A sound rating or better, greater than 0.90 power factor; or approved substitute.

B. Brown-Out Protection: Maintain constant light output over input voltages of 75V to 145V for 120V rated and 180V to 320V for 277V rated.

C. AC Input Harmonics: Less than 5% total harmonic distortion, less than 3% third harmonic.

D. Current Crest Factor: Approximately 1.41, both line and lamp.

E. Dimming Range: 5% to 100% continuous.

F. Lamp Starting: Soft heating the filaments for approximately 500 milliseconds; 4 watts maximum starting filament power. Filament voltage increases with lamp dimming.

G. Safety Features: Short circuit protected; ballast permanently turned off in the event of lamp or fixture fault condition; less than 15° C case temperature rise over 40° C ambient.

H. Line Transient Withstand: Conform to IEEE587, Category A.

I. Warranty: Three-year ballast replacement by manufacturer.

2.05 ELECTRONIC DIMMING BALLASTS

A. General: Sinusoidal lamp drive voltage 25-30 KHZ, Class P, NEMA A sound rating or better, greater than 0.90 power factor; ETTA Industries, or approved substitute.

B. Brown-Out Protection: Maintain constant light output over input voltages of 75V to 145V for 120V rated and 180V to 320V for 277V rated.

C. AC Input Harmonics: Less than 5% total harmonic distortion, less than 3% third harmonic.

D. Current Crest Factor: Approximately 1.41, both line and lamp.

E. Dimming Range: 5% to 100% continuous.

F. Lamp Starting: Soft heating the filaments for approximately 500 milliseconds; 4 watts maximum starting filament power. Filament voltage increases with lamp dimming.

G. Safety Features: Short circuit protected; ballast permanently turned off in the event of lamp or fixture fault condition; less than 15° C case temperature rise over 40° C ambient; opto isolated low voltage control.

H. Line Transient Withstand: Conform to IEEE587, Category A.

I. Warranty: Three-year ballast replacement plus $10.00 replacement labor cost payment by manufacturer.

J. Slide Control: On/off switch and slide dimming control plus concealed low trim potentiometer; ETTA ED-SL-8 operates up to 8 ballasts and ETTA ED-SL-16 operates up to 16 ballasts.

K. Relay Module: Provides low voltage to slide control and a power relay for the on/off operation of the ballasts' power line; ETTA ED-RM-120 for 120V and ED-RM-277 for 277V.

2.05 LAMPS

A. Fluorescent: 3500° K triphosphor T8 and compact, unless otherwise indicated; Sylvania, Phillips or General Electric.

B. 120V Incandescent: Rated for 130V operation, of wattage and type indicated, inside frosted.

C. Low Voltage Incandescent: General Electric, Venture or approved substitute.

D. Metal-Halide: Phosphor coated suitable for the burning position required; Sylvania Super Metalarc 3K, Venture Super Pro-Arc 3200K, or approved substitute, unless otherwise indicated.

E. Mercury Vapor: Deluxe white unless otherwise indicated; Sylvania, Phillips, Venture or General Electric.

F. High Pressure Sodium: Coated or clear as scheduled and/or recommended by fixture manufacturer; Sylvania, Phillips, Venture or General Electric.

PART 3 - EXECUTION

3.01 GENERAL

A. Furnish and install all light fixtures indicated as new and connect to building wiring system.

B. Securely fasten fixtures to either slab, ceiling or wall. Recessed fluorescent fixtures in suspended ceiling shall be independently supported from building structure with minimum two #9 wires at diagonal corners and clipped to ceiling to grid for bracing. Install one support wire for each recessed can and lighting track segment.

C. Adjust all incandescent lamp sockets to match specified lamps and aim all adjustable fixtures as directed.

D. Provide lamps in all fixtures as indicated.

E. Install spacers between surface mounted fixtures and mounting surface where required by code.

END OF SECTION

FIRE ALARM SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Provide a complete stand-alone, non-coded, continuous ringing, supervised fire alarm system equal to Simplex 2001 Series.

B. Provide all wiring entirely supervised, consisting of 90°C insulated conductors in metal raceway system, or an approved power limited circuit cable assembly where permitted to be run open.

1.02 SUBMITTALS

A. Submit product literature on all major components, accessories and cable.

B. Submit shop drawings of system one-line riser diagram and reflected ceiling plans showing all initiating and indicating devices, junction and pull boxes, raceway sizes, conductor gauges and counts, door holder and closer interfaces, elevator interfaces, interface, annunciator panels, and all other auxiliary equipment. Submit complete wiring diagrams and connection diagrams.

C. Certification: Prior to substantial completion, submit certification by the authorized agent of the manufacturer of the major fire alarm system equipment that the system has been properly adjusted and tested and has been found to be complete and operating as required.

D. Operating and Maintenance Manuals: Submit information for testing, repair, trouble shooting, and recommended maintenance intervals. Wiring diagrams indicating internal wiring for each item of equipment and the interconnections with terminal identification.

1.03 QUALITY ASSURANCE

A. Comply with code requirements including NFPA 72A Local Protective Signaling Systems and NFPA 72E Automatic Fire Detectors.

B. Provide materials, appliances, equipment and devices tested and listed by UL or Factory Mutual Corporation.

C. The authorized agent of the manufacturer of the major equipment such as control panel, annunciator, and initiating devices is responsible for satisfactory total system operation and its certification.

1.04 PERMITS

Both electrical building permit and Fire Marshal fire alarm system permit are required.

1.05 SERVICE & GUARANTEE

Provide a factory trained and authorized service organization within 30 air miles of the job site. This organization must have five years' previous experience in servicing fire alarm, signaling systems, and associated equipment in the Portland area. Provide emergency service on a 24-hour basis; make such immediate repairs and routine service necessary to keep the system in operation throughout the period of the guarantee on a maximum four-hour response time to any call. The service organization must stock locally all required spare parts and materials. Upon request, submit a complete maintenance contract proposal, including fees covering service, parts and labor for a one-year period immediately following expiration of the guarantee period. The guarantee period will commence only upon receipt of written approval by the Fire Marshal and final acceptance of the entire system.

1.06 OPERATION

A. Actuation of any manual station, automatic detector, flow switch or other approved normally open contact alarm initiating device causes:

1. Actuation of fire alarm indicating devices in march time.

2. Illuminate appropriate zone lamp at lobby annunciator and control panel.

3. Signal to proprietary reporting system for alarm reporting to Fire Department and Owner. Separate signal outputs for water flow and general alarm.

4. Automatic release of all fire doors for control of smoke spread, except do not release on manual station initiation.

5. Automatic selective elevator return in case of elevator lobby detector.

B. Actuation of any valve tamper switch, circuit trouble, duct detector, or system trouble causes:

1. Actuation of audible and visual trouble signals at control panel.

2. Appropriate zone and/or auxiliary annunciator lamps at control panel to light to show AC power failure, system trouble, zone in trouble, duct detector actuation, valve tampers, etc.

3. Signal to proprietary reporting system for trouble reporting to Fire Department and Owner.

4. Automatic selective shutdown of air handling unit in the case of a duct detector. Provide dry contact wired to the unit for use by Division 15.

PART 2 - PRODUCTS

2.01 CONTROL PANEL

A. Provide switches, relays, LED indicator lamps, wiring, terminals, etc., as required for complete operation, supervision and control for entire system including, but not limited to, the following:

1. Green power ON light and lamp test switch.

2. Facilities to signal alarm(s) and trouble to campus proprietary system alarm disconnect switch which sends trouble signal.

3. Alarm indicating circuits as required at maximum 66% rated capacity, four (4) minimum.

4. Alarm (red) and trouble (yellow) lamp for each zone.

5. Trouble lamp, audible signal, silence switch and holding relay or logic.

6. DC power for operation of door holders, coiling door releases, smoke detectors, auxiliary relays, etc. *Provide auxiliary supplies as required. (AC power failure will not result in an alarm or door release.)

7. Self-charging nickel-cadmium battery backup for all system functions in accordance with code authority (Fire Marshal) requirements (operate 24 hours, then alarm for 10 minutes, minimum). Batteries to be monitored and initiate a trouble signal if disconnected or discharged more than 15%.

8. Zone modules, module provisions, relays, and accessories as indicated.

9. Surface-mounted cabinets to house all of the above.

2.02 FIRE ALARM TERMINAL CABINET

Surface-mounted, red, with identification.

2.03 ANNUNCIATOR PANEL

Backlighted deadfront with lamp test in recessed cabinet with shatter-proof lens, sized as required, including spare zones. Each annunciator 1-1/2" x 2" minimum with two lamps and with up to 45 characters of 18 point lettering. Annunciator backboxes to be 3-1/2 inches deep, sized for and furnished with barrier terminal strips for all external circuit terminations.

2.04 ALARM INDICATING DEVICES

Combination horn/strobe units, flush-mounted (except strobe lens), with prime gray or white finish; Wheelock EHS-D series. Field-painted to match wall surface.

2.05 ALARM INITIATING DEVICES

A. Manual Stations: Red, semi-recessed mounting, non-coded with reset lock keyed alike with Control Panel.

B. Heat Detectors

1. Fixed Temperature: 135°F or 194°F replaceable element as indicated with 25' x 25' listed spacing. Visible indication when heat element has operated.

2. Rate-of-Rise: Pneumatic, self-restoring rate-of-rise element plus 135°F fixed temperature element as above, with 50' x 50' listed spacing.

C. Smoke Detectors

1. General: Nominal 6-1/2" diameter for two-wire operation with alarm LED, remote LED capability, and 135°F fixed temperature element as above, unless otherwise indicated. Removal of detector head to initiate zone trouble signal; provide auxiliary contacts with four-wire operation where required.

2. Ionization: Dual chamber with 30' x 30' listed spacing.

3. Photoelectric: Pulsed infrared with 30'x 30' listed spacing.

4. Duct Detectors: Photoelectric type with alarm LED, with four-wire operation. Two sets SPDT 1A 120VAC resistive auxiliary alarm

contacts. Airtight, see-through cover on detector housing or external alarm LED. Sampling tube of not less than 75% duct width.

5. Remote Alarm Indicator: LED on single gang plate labeled "Alarm Indicator." Furnish with all smoke detectors to be installed where alarm LED is not visible from a readily accessible location.

2.06 MANUFACTURERS

Simplex Time Recorder, Co., FCI, Gamewell, Johnson Controls, Honeywell or approved substitute.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install in accordance with the manufacturer's instructions. Review proper installation of each type of device with manufacturer's agent. Install all wiring, raceway and outlet boxes required for erection of a complete system. Comply with applicable requirements of Section 16100. Install all circuits 90°C insulated conductors or power limited circuit cable in raceway; more than one circuit may be combined in common raceway except door holder circuits. In lieu of 90°C conductors in metal raceway, open power limited circuit cable may be installed; however, use is limited to single circuits (initiating or indicating loop or control) in dry, protected locations above suspended ceilings and within walls or partitions, and which do not pass between floors.

B. Remote Alarm Indicators: Install for all smoke detectors located where alarm LED on detector is not visible from readily accessible location, i.e., detectors above suspended ceilings, certain duct detectors, etc.

C. Sprinkler Bell: Wire Class I to operate 120V bell connected through main building flow switch(es); use individual Emergency branch circuit.

D. Water Flow and Valve Tamper Switches: Connect all fire protection sprinkler system switches. Provide annunciation by floor for each riser.

3.02 TESTS

A. Provide the service of a competent, factory-trained technician authorized by the manufacturer of the fire alarm equipment to technically supervise and participate during all of the adjustments and tests for the system.

B. When the system is complete and prior to the substantial completion, furnish testing equipment and perform the following tests:

1. Before energizing system, check for correct wiring connections and test for short circuits, ground faults, continuity, and insulation.

2. Test the insulation on all installed wiring by standard methods as recommended by the equipment manufacturer.

3. Open supervised circuits to see if the trouble signal actuates.

4. Ground supervised circuits and verify response of trouble signals.

5. Check installation, supervision, operation and sensitivity of smoke detectors as recommended by the manufacturer to ascertain that they will avoid false alarm signals yet provide the required automatic detection.

6. When any defects in the work are detected, make repairs and repeat the tests as required.

C. Instruct Metro personnel in system operation, minimum two four-hour sessions, one at time of substantial completion and second after 60 days of Metro occupancy. At the same time give instruction with respect to routine maintenance and testing of smoke detectors.

END OF SECTION

LV SWITCHING SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

Provide power limited low voltage switching system for control of 20A lighting, receptacle, motor and equipment circuits as indicated; equal to equipment and component devices as manufactured by General Electric (GE).

1.02 MANUFACTURERS

General Electric, Pass and Seymour, Enercon Data, or approved substitute.

Note: The approved manufacturers each utilize unique and different components and switching techniques to achieve the same end results.

PART 2 - PRODUCTS

2.01 COMPONENTS

A. Relays: Heavy-duty mechanical latching SPST rated 20A 125 VAC tungsten surge, 20A 277 VAC ballast, 1/2 HP 125 VAC and 1-1/2 HP 277 VAC, operation in ambients to 140° F; GE RR7.

B. Control Transformer: Suitable for Class 3 systems, rated 75 VA momentary and 40 VA continuous; 120 VAC or 277 VAC primary as required; GE RT1 or RT2.

C. 1/2-Wave Rectifier: Heavy-duty silicon type preassembled on terminal block, rated 7.5A continuous and 20A intermittent at 30 VAC; GE RA16.

D. Control Blocking Diodes: 1.5A 30 VAC; GE RA20.

E. Control Blocking Diode Assembly: 21 control blocking diodes with numbered terminal blocks; GE RCBD1.

F. Multiple Relay Energizer: Accepts maintained or momentary pulse signals for operation of multiple relays and isolates each relay to allow control by more than one multiple relay energizer or other switching device; GE RMS Series.

G. Relay Cabinet: Surface-mount, sized as required to house aforementioned control components, with metal barrier, terminal strips and cover; GE RB Series.

H. Low Voltage Conductors: 18AWG minimum, larger where otherwise indicated or required.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install control transformers and 1/2-wave rectifiers as required in cabinets to supply 125% of continuous connected control loads plus 100% of simultaneous momentary loads.

B. Install control components except remote switches in specified relay cabinet(s) adjacent to associated branch circuit panel(s). Use terminal strips in cabinets; other connectors not permitted.

C. Identify power circuit conductors to match branch circuit pole numbers and control circuit identification in accordance with Drawings.

D. Install pushbutton remote bypass control switches at locations as directed by Metro. Provide Metro-approved engraving of plates.

END OF SECTION

APPENDIX D.

Prevailing Wage Requirements

PREVAILING WAGE RATES

for

Public Works Contracts in Oregon

BOLI

Mary Wendy Roberts
Commissioner
Bureau of Labor and Industries

Effective July 1, 1991

BUREAU OF LABOR AND INDUSTRIES
Mary Roberts, Commissioner

July 1, 1991

This booklet contains the Prevailing Wage Rates for the building and construction trades in the State of Oregon. These rates are effective July 1, 1991. These rates have been amended in accordance with ORS 279.348 through ORS 279.365.

Prevailing Wage Rates are the minimum wages that must be paid to all workers employed in the construction, reconstruction, major renovation or painting of any public works. Copies of these rates must be incorporated into all bid specifications when the advertisement for a public works contract is issued. A provision that Prevailing Wage Rates be paid must also be put in the contract. The rates in effect at the time the bid specifications are first advertised are those that apply for the duration of the project, with one exception; if during the bidding process the Prevailing Wage Rates change, the public contracting agency has the option of amending the bid specifications to reflect such changes.

If you identify any errors in the rates published, please bring them to the attention of the Prevailing Wage Rate specialist in Portland (229-6655). If you have any questions about the manner in which the Prevailing Wage Rates are enforced, contact the Wage and Hour Division in Portland (229-5750).

Mary Wendy Roberts

MARY WENDY ROBERTS
Commissioner
Bureau of Labor and Industries

PORTLAND
1400 SW 5th Avenue
Portland, Oregon 97201

SALEM
3865 Wolverine St. NE; E-1
Salem, Oregon 97310

EUGENE
165 E. 7th Street, Suite 220
Eugene, Oregon 97401

MEDFORD
700 E. Main
Medford, Oregon 97504

COOS BAY
320 Central Ave., Suite 510
Coos Bay, Oregon 97420

BEND
1250 NE 3rd, Suite B105
Bend, Oregon 97701

PENDLETON
700 SE Emigrant, Suite 240
Pendleton, Oregon 97801

ANNOUNCEMENT

The Prevailing Wage Rates contained in this booklet generally reflect those rates determined for Oregon by the Secretary of Labor of the United States pursuant to the Davis-Bacon Act; certain changes have been made to better reflect prevailing practices in Oregon. Pursuant to ORS 279.348 to ORS 279.365, these rates have been adopted for use on public works contracts in Oregon. If you have specific questions regarding how rates are determined or if you would like a copy of this booklet, please contact:

Prevailing Wage Rate Analyst
Bureau of Labor and Industries
P.O. Box 800,
Portland, OR 97207-0800

(503)229-6655

The first copy is free. Additional copies are available for $2.00 each.

GENERAL INFORMATION

Information in this section and in the "Commonly Asked Questions" is meant to provide a convenient reference to Oregon's Prevailing Wage Rate Law. It is in no way a complete statement of the laws and rules.

If you have questions about the enforcement of Prevailing Wage Rates, please contact the Wage and Hour Division. Division offices may be reached at the following phone numbers:

Bend	388-6330
Eugene	686-7623
Medford	776-6201
Pendleton	276-7884
Portland	229-5750
Salem	378-3292

Apprentices and Trainees

Apprentices and trainees may be employed on public works. To qualify as an apprentice or trainee, the worker must be registered in a bonafide apprenticeship or training program of the U.S. Department of Labor, Bureau of Apprenticeship and Training (BAT) or with any State Apprenticeship and Training Agency recognized by BAT. For information call 229-6573. The apprentice or trainee is to receive all fringe benefits and a percentage of the journeyman's wage rate which is listed in this booklet. This rate may be different than the rate contained in the Apprenticeship Standards for the trade. The correct percentage shall be determined by the appropriate apprenticeship or training committee. All other workers must receive rates as published.

Zone Pay

In certain trades, the basic hourly rate of pay progressively increases based upon the distance between the job site and a designated landmark; this is commonly referred to as zone pay. To determine the hourly wage, find the correct zone based on the number of road miles the job site is from the closest designated city (based either on distance from city hall or from geographical center of the city, depending on the trade) and add the amount for that zone to the basic hourly rate. Zone pay, unlike travel pay, is the basic hourly wage upon which overtime is computed.

Bid Specifications

The specifications for every public works contract must include the current Prevailing Wage Rates in effect at the time the specifications are first advertised. A statement incorporating the existing rates by reference will not satisfy this requirement (ORS 279.352).

NOTE: If a public agency fails to include the Prevailing Wage Rates in the contract specifications or fails to include in the contract the provision that Prevailing Wage Rates must be paid, the liability for any unpaid prevailing wages could be exclusively that of the agency.

Fringe Benefits

Payments for fringe benefits are in addition to the basic hourly rate. Fringe benefits means the amount for:

a) medical or hospital care; pensions on retirement or death; compensation for injuries or illness resulting from an occupational activity, or insurance to provide any of the foregoing;
b) unemployment benefits, life insurance, disability and sickness insurance or accident insurance;
c) vacation and holiday pay;
d) defraying costs of apprenticeship or other similar programs; and
e) other such bona fide benefits.

NOTE: For the purpose of Prevailing Wage Rates, fringe benefits do not include any benefits which may be required by federal, state or local law (e.g. Workers' Compensation, Unemployment Insurance, etc.).

Fringe benefits may be paid to the worker in cash or to a third party administering a fringe benefit program. When an hourly rate in excess of the required prevailing base rate is paid, the amount by which the rate is exceeded may be credited toward payment of fringe benefits.

Overtime

Workers employed on a public works job for more than eight hours in a day or 40 hours in a week must be paid overtime for each additional hour so worked (ORS 279.334). Overtime is calculated at no less than one and one-half times the basic hourly rate as determined by the Commissioner of Labor (not including fringe benefits which are paid at the straight rate for every hour worked). In the computation of overtime, travel pay does not need to be included but zone pay differentials do.

Work performed on Saturday, Sunday or legal holidays must also be compensated at time and one-half. Legal holidays for purposes of Prevailing Wage Rates include the following: 1) New Year's Day on January 1; 2) Memorial Day on the last Monday in May; 3) Independence Day on July 4; 4) Labor Day on the first Monday in September; 5) Thanksgiving Day on the fourth Thursday in November; 6) Christmas Day on December 25.

NOTE: Contractors who are signatory to a collective bargaining agreement may be subject to different overtime requirements (ORS 279.334[3]).

Certification of Payroll

The law requires every contractor and subcontractor to file certain information on wages paid to each worker employed on a public works contract. This statement must completely and accurately reflect payroll records for the work week immediately preceding the submission. A contractor or subcontractor must complete and submit the certified statement contained on Form WH-38 as well as the information required on the weekly payroll side of the form. A copy of Form WH-38 and instructions for completing it are included in the back of this booklet; xeroxed copies may be used for filing.

The schedule for submitting payroll information is as follows: once within 15 days of the date the contractor or subcontractor first began work on the project and once before the final inspection of the project by the public contracting agency; in addition, for projects exceeding 90 days, submissions are to be made at 90 day intervals. Payroll information is to be filed with both the public contracting agency and the Wage and Hour Division, Bureau of Labor and Industries, P.O. Box 800, Portland, Oregon 97201-0800. The payroll information must be kept by the contractor and or subcontractor for three years.

COMMONLY ASKED QUESTIONS

1) What are "Prevailing Wage Rates?"

A prevailing wage rate is the minimum wage, including fringe benefits to be paid workers employed on contracts for public works. Different rates are established for specific trades and specific geographical areas.

2) Who must be paid "Prevailing Wage Rates?"

All employees of a contractor or subcontractor engaged on a public works project when the total price of the project is $10,000 or more must receive at least the Prevailing Wage Rate (PWR) for time worked on the project, unless otherwise exempt.

Supervisory and office/clerical employees are not required to be paid the PWR. A person who owns and operates his/her own truck on construction projects (Owner/Operator) is not required to be paid the PWR.

3) What about contracts when Federal funds are used?

When more than $2,000 of federal funds are involved, the contract is usually subject to the provisions of the Davis-Bacon Act, not Oregon statutes. Further information may be obtained from the U.S. Department of Labor, Wage and Hour Division, Portland, Oregon (326-3057). However, in the event that federal funds are involved, but the contract is not regulated under Davis-Bacon, Oregon's Prevailing Wage Rates Statutes may apply (ORS 279.348 - 279.365).

4) I don't have a pension fund. How do I calculate fringe benefits?

Workers must receive at a minimum the sum of the basic hourly rate plus all fringe benefits for each hour worked on a public works contract. Fringe benefits may be paid either to a third party trust account or in cash directly to the worker.

5) My employees receive health benefits. Do I get credit for the health benefit when I prepare my payroll on a public works project?

Yes. Any expenditures an employer makes for bona fide employee benefits can be charged against the fringe benefit payments designated in the Prevailing Wage Rate Booklet. To learn how to compute the correct hourly charge, call the Wage and Hour Division (229-5750).

6) What if the employees are not paid on an hourly basis?

All workers must receive at least the basic hourly rate of wage and fringe benefits for each hour worked on the project. If an employee is paid other than on an hourly basis, the equivalent hourly rate (for both wages and fringe benefits) must still be at least equal to the rates published.

7) How do I classify workers?

Virtually all of the job classifications/trades normally used in the construction industry are represented by the job classifications used in this PWR publication. These classification titles should be used according to common practice. Try to fit your workers into existing classifications. If you have questions about how to classify workers, contact the Wage and Hour Division at 229-5750 in Portland or at one of the offices listed on page 1 of this booklet.

Laborers who do basic work requiring no specific skills, training, or knowledge are generally classified as Group 1 Laborers.

(Note that Landscapers are classified as Laborers, and Ornamental Ironworkers are classified as Ironworkers.)

8) When are new rates determined? How long are they effective?

Prevailing Wage Rates are determined once each year by the Commissioner of the Bureau of Labor and Industries. The Commissioner may amend the rates at any time. The rates are usually amended at least once each year. The rates in effect at the time the bid specifications are first advertised are those that apply for the duration of the contract, with one exception. If during the bidding process the prevailing wage rate changes, the public contracting agency (not the contractor) has the option of amending the bid specifications to reflect such change.

9) How do I post Prevailing Wage Rates?

Every contractor or subcontractor employing workers on a public works project is required to post the applicable Prevailing Wage Rates in a conspicuous and accessible place in or about the work-site. Rates need to be posted for the duration of the job. Contractors and subcontractors who intentionally fail to post the PWR can be made ineligible to receive any public works contract for up to three years.

10) What can I do about a contractor who is not complying with Oregon's PWR law?

File a complaint with the nearest office of the Oregon Bureau of Labor and Industries or contact the Wage and Hour Division, Bureau of Labor and Industries, 1400 S.W. 5th Avenue, Portland, Oregon 97201 (229-5750). Other Bureau offices are located in Bend (388-6330), Coos Bay (269-4575), Eugene (686-7623), Medford (776-6013), Pendleton (276-7884) and Salem (378-3292). You may also complain to the contracting agency, which has the contractual authority to pay PWR claims directly to a contractor's or subcontractor's workers (ORS 279.314).

11) What happens to contractors who do not comply with PWR statutes?

Contractors and subcontractors who pay less than the Prevailing Wage Rates may be liable to the workers affected for the amount found due plus an equal amount as liquidated damages (ORS 279.356). Contracting agencies also have the contractual authority to withhold payments due or to be due to the contractor or subcontractor in order to pay the unpaid prevailing wages directly to the worker (ORS 279.314).

Contractors and subcontractors who intentionally refuse to pay the Prevailing Wage Rate to workers employed on public works or to post the PWR on the job site may be determined to be ineligible to receive any public works contracts for a period of up to three years (ORS 279.361). Workers employed by the contractor or subcontractors have a right of action against the surety of the prime contractor for any unpaid prevailing wages.

A list is kept of all contractors, subcontractors, and other persons ineligible to receive public works contracts and subcontracts. When a contractor or subcontractor is a corporation, the individual officers and agents of the corporation can be debarred, in addition to the corporation. As a result, individuals who intentionally fail to pay or post the PWR are prevented from simply moving from one corporation to another.

12) How much do I pay apprentices?

To qualify as an apprentice, the worker must be registered in a bona fide apprenticeship program of the U.S. Department of Labor, Bureau of Apprenticeship and Training (BAT) or with any State Apprenticeship Agency recognized by BAT. For information call 229-6573. The apprentice is to receive all fringe benefits and a percentage of the journeyman's wage rate as listed in this booklet. This rate may be different than the rate contained in the Apprenticeship Standards for the trade. The correct percentage shall be determined by the appropriate apprenticeship committee. All other workers receive rates as published.

13) What records must I keep? For how long?

Contractors and subcontractors are required to keep records necessary for determining if Prevailing Wage Rates were paid. These records must include the Payroll and Certified Statement Form (WH-38) as well as the following: The name and address of each employee; the work classification(s) of each employee; the rate(s) of wages and fringe benefits paid to each employee; the rate(s) of fringe benefit payments made in lieu of those required to be provided to each employee; total daily and weekly compensation paid to each employee; daily and weekly hours worked by each employee; apprenticeship and training agreements; any payroll and other such records pertaining to the employment of employees upon a public works contract.

These need to be kept for a period of three (3) years from the completion of the public work contract. Records relating to public works contracts must be maintained separately from records relating to private projects/ contracts.

14) What forms are public agencies required to file with the Bureau of Labor and Industries?

Public agencies are required to prepare and file with the Commissioner of the Bureau of Labor and Industries a list of every public improvement that the agency intends to fund during the subsequent budget period (ORS 279.023[2]). If, after the original filing, the agency plans additional public improvements, a revised list is to be submitted (OAR 839-16-008[2]).

The "Notice of Award of Public Works Contract" is to be filed with the Wage and Hour Division within 30 days of the date when a contract is awarded which requires the payment of Prevailing Wage Rates (i.e., is regulated under ORS 279.348 to 279.365).

Copies of the "Planned Public Improvement Summary" (Form No. WH-118), the "Capital Improvement Project Cost Comparison Estimate" (WH-119), and the "Notice of Award of Public Works Contract" (WH-81) can be found at the back of this booklet.

15) Does a contracting agency have any power to enforce payment of Prevailing Wage Rates on its public works projects?

Yes. According to ORS 279.314, all public contracts for work or services must contain a clause or condition permitting the contracting agency to pay a worker's past due wage claim, charging the payment against funds due or to become due to the contractor.



NOTE

There have been several changes in addition to the usual wage and fringe benefit up-dates in the section which follows. We have attempted to make them more noticeable by printing them in **bold type**. You will find such changes under the following trades.

CARPENTERS

This is the only trade which still has a less than 100% wage rate. Note that the conditions under which the lower rate may be used have been simplified and the dollar amount which separates the two rates has been reduced to $750 thousand. Carpenters have added a Group 7 Marine Piledriver to their wage rates. In addition the Carpenters have changed their zone differentials by both changing the rates and by adding a zone 6.

LABORERS

Laborers no longer have a less than 100% wage rate. The Hazardous Waste Removal Differential note has been rewritten to emphasize that it applies only to Federally Designated Hazardous Waste sites. A footnote has been added to the Group 3 classification of "Pipe Layer of all Types" to clarify that Laborers do this type of work on public thoroughfares only.

POWER EQUIPMENT OPERATORS

The Hazardous Waste Removal Differential note has been rewritten to emphasize that it applies only to Federally Designated Hazardous Waste sites.

TRUCK DRIVERS

The Hazardous Waste Removal Differential note has been rewritten to emphasize that it applies only to Federally Designated Hazardous Waste sites. The number of groups has been cut from 14 to 6 and there have been many changes in the description of the work done by the various groups.

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

ASBESTOS WORKERS

Installation of insulation on mechanical systems*

Journeyman Asbestos Worker

o Projects in buildings which are not used for manufacturing, manufacturing services or similar processes (Offices, schools, laboratories, etc.)	18.10	4.83
o Projects in buildings which are used for manufacturing, manufacturing services and similar processes (water treatment plants, electrical generating plants, road maintenance shops, etc.)	19.45	4.83

Removal of insulation on mechanical systems* which are not going to be scrapped.**

o Hazardous Materials Handler Mechanic (in any type of project regardless of value)	12.71	2.70

* Mechanical systems include pipes, boilers, ducts, flues, breechings, etc.

** The removal of all insulation materials from mechanical systems is exclusively the work of Asbestos Workers, unless the mechanical systems are going to be scrapped. It does not matter whether the insulation materials contain asbestos. Laborers do all removal of insulation materials on mechanical systems to be scrapped and any non mechanical (walls, ceilings, floors, beams, etc.) insulation. They also do loading of any insulation materials that have already been removed, bagged and tagged, as well as cleanup at the removal site and all work done at the disposal site. Laborers performing asbestos removal are classified as Group 3 laborers.

BOILERMAKERS

o Erection and repair of storage tanks, tower tanks, standpipes, swimming pools and reservoirs.	20.58	5.37
o All other work	21.79	5.37

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

BRICKLAYERS/STONEMASONS

Area 1 (add $0.75 per hour to Fringe for Refractory repair work.)	19.78	4.60
Area 2	18.00	4.37

Area 1

Baker	Hood River	Polk	Wallowa
Clackamas	Malheur (a)	Sherman	Wasco (b)
Clatsop	Marion	Tillamook	Washington
Columbia	Morrow	Umatilla	Yamhill
Gilliam	Multnomah	Union	

Area 2

Benton	Douglas	Josephine	Linn
Crook	Grant	Klamath	Malheur (c)
Coos	Harney	Lake	Wasco (d)
Curry	Jackson	Lane	Wheeler
Deschutes	Jefferson	Lincoln	

a) North half
b) North of the City of Maupin
c) South half
d) Including the City of Maupin and South thereof

CARPENTERS

Under the following circumstances a rate lower than the basic hourly rate may be used for carpenters:

The lower rate applies to all public works projects of less than $750 thousand involving construction, reconstruction, major renovation or painting. In determining the $750 thousand figure, do include the cost of all surfacing and paving, but do not include the cost of underground utilities (i.e., the amount of the contract dedicated to facilities for electricity, water, gas, sewerage including storm water, and communications) which are five feet or more outside of and away from any building, bridge or dock which is a part of the project, and are subordinate and incidental to the major purpose of the project.

NOTE: In determining whether or not the lower rates are applicable, consider the total project cost, and not the cost of any individual contract (or schedule) within that project.

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

CARPENTERS (See above for explanation of when the lower rates may be used)

	LESS THAN 100%	100%	
Zone 1 (Base Rate):			
o Group 1	16.19	19.17	4.12
o Group 2	16.31	19.32	4.12
o Group 3	16.64	19.67	4.12
o Group 4	16.76	19.82	4.12
o Group 5	16.67	19.67	4.12
o Group 6	16.75	19.82	4.12
o Group 7	**17.17**	**20.17**	**4.12**

Zone Differential for Carpenters (Add to Zone 1 Rate)

Zone 2	**.85**
Zone 3	**1.25**
Zone 4	**1.70**
Zone 5	**2.00**
Zone 6	**3.00**

Zone 1: Projects within 30 miles of City Hall in the Cities listed below.
Zone 2: More than 30 miles but less than 40 miles.
Zone 3: More than 40 miles but less than 50 miles.
Zone 4: More than 50 miles but less than 60 miles.
Zone 5: More than 60 miles but less than 70 miles.
Zone 6: More than 70 miles.

Reference cities for Group 1, 2, 3 and 4 Carpenters

Albany	Eugene	Longview	Portland
Astoria	Goldendale	Madras	Port Orford
Baker	Grants Pass	Medford	Reedsport
Bend	Hermiston	McMinnville	Roseburg
Brookings	Hood River	Newport	Salem
Burns	Klamath Falls	Oregon City	The Dalles
Coos Bay	LaGrande	Ontario	Tillamook
Corvallis	Lakeview	Pendleton	

Zones for Groups 5, 6 and 7 Carpenters are determined by the distance between the project site and either 1) the worker's residence or 2) City Hall of a reference city for the appropriate group shown below, whichever is closer.

Reference Cities for Groups 5, 6 and 7

Astoria	Eugene	Newport	Salem
Bend	Klamath Falls	Portland	The Dalles
North Bend	Medford	Roseburg	

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

CARPENTERS (Continued)

Group 1

Auto. Nailing Machine
Carpenters
Form Stripper
Manhole Builders
Non-irritating Ins.
Cabinet & Shelving Installers (wood or steel)

Group 2

Floor Layers & Finishers
Stationary Power Saw Operators
Wall & Ceiling Insulators
Irritating Insulation

Group 3

Millwrights
Machine Erectors
Machinists

Group 4

Certified Welders

Group 5

Bridge, Dock & Wharf Builders
Piledrivermen

Group 6

Boom Men

Group 7

Marine Piledriver

CEMENT MASONS

Zone 1 (Base Rate):		
o Group 1	17.14	5.77
o Group 2	17.48	5.77
o Group 3	17.48	5.77
o Group 4	17.83	5.77

Group 1 Cement Masons, hand chipping and patching grouting, end pointing, screed setting, plugging, filling bolt holes, dry packing, setting curb forms, planks, stakes, lines and grades.

Group 2 Composition Workers (includes installation of epoxy & other resinous toppings), and Power Machine Operators.

Group 3 Cement masons working on suspended, swinging and/or hanging scaffold.

Group 4 Cement Masons performing work of both Group 2 and Group 3 at the same time.

Zone Differential for Cement Masons (Add to Zone 1 Rate)

Zone 2	.65
Zone 3	1.15
Zone 4	1.70
Zone 5	2.75

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

CEMENT MASONS (continued)

Zone 1: Projects within 30 miles of City Hall in the cities listed below.
Zone 2: More than 30 miles but less than 40 miles.
Zone 3: More than 40 miles but less than 50 miles.
Zone 4: More than 50 miles but less than 80 miles.
Zone 5: More than 80 miles.

Cities

Bend	Corvallis	Coos Bay	Roseburg	Eugene
Pasco	The Dalles	Medford	Longview	K. Falls
Salem	Pendleton	Astoria	Portland	Newport

DIVERS & DIVERS' TENDERS

o Divers	48.04	4.12
o Divers' Tenders	21.23	4.12

Depth Pay and Enclosure Pay are added to the Divers' Basic Hourly Rate to obtain the Total Hourly Rate for the diver.

BASIC HOURLY RATE	+	HOURLY DEPTH PAY	+	HOURLY ENCLOSURE PAY	=	DIVERS' TOTAL HOURLY PAY

o Divers' Depth Pay

Depth of Dive	Hourly Depth Pay
50-100 ft	([total ft- 50] x $1.00)/hr.
100-150 ft	$ 50 + ([total ft-100] x $1.50)/hr.
150-200 ft	$125 + ([total ft-150] x $2.00)/hr.

o Divers' Enclosure Pay(working without vertical escape)

Distance Travelled In the Enclosure	Hourly Enclosure Pay
5 - 50 ft	$ .50/hr
50 - 100 ft	$ .63/hr
100 - 150 ft	$ 2.13/hr
150 - 200 ft	$ 4.63/hr
200 - 300 ft	$ 4.63 + ([total ft-200]x $.05)/hr
300 - 450 ft	$ 9.63 + ([total ft-300]x $.10)/hr
450 - 600 ft	$24.63 + ([total ft-450]x $.20)/hr

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

DREDGING

Zone 1 (Base Rate):		
o Leverman-Hydraulic	20.07	5.42
o Leverman-Dipper	20.88	5.42
o Asst. Engineer (including: Watch Engineer, Welder, Mechanic, Machinist)	19.45	5.42
o Tenderman (Boatman, Attending Dredge Plan); Fireman	18.98	5.42
o Assistant Mate (Deckhand); Oiler	18.58	5.42

Zone Differential for Dredging
(Add to Zone 1 Rate)

Zone 2	1.50
Zone 3	1.90
Zone 4	2.40
Zone 5	3.00

Zone 1: Center of job site not more than 15 miles from the City Hall of Portland
Zone 2: More than 15 miles but not more than 30
Zone 3: More than 30 miles but not more than 50
Zone 4: More than 50 miles but not more than 70
Zone 5: More than 70 miles.

DRYWALL/WETWALL

o Drywall (Accoustical and Drywall Applicator)	18.05	4.87
o Wetwall (Lather)	16.80	6.12

ELECTRICIANS

Area 1:		
o Electricians	18.15	3.40
o Cable Splicers	19.97	3.50
Area 2:		
o Electricians	20.71	5.63
o Cable Splicers	21.75	5.66
Area 3:	18.35	5.60
Area 4:	20.75	3.82
Area 5:		
o Electricians	21.35	5.74
o Cable Splicers	22.10	5.76
Area 6:		
o Electricians	18.72	5.26
o Cable Splicers	20.59	5.32

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

ELECTRICIANS (continued)

Area 1	Area 2	Area 2(cont)	Area 3
Malheur	Baker	Umatilla	Coos
	Gilliam	Union	Curry
	Grant	Wallowa	Lincoln
	Morrow	Wheeler	Douglas (a)
			Lane (a)

Area 4	Area 5	Area 6
Benton	Clackamas	Harney
Crook	Clatsop	Jackson
Deschutes	Columbia	Josephine
Jefferson	Hood River	Klamath
Lane (b)	Multnomah	Lake
Linn	Sherman	Douglas (b)
Marion	Tillamook	
Polk	Wasco	
Yamhill(c)	Washington	
	Yamhill (d)	

a) Those portions lying west of a line North and South from the NE corner of Coos County to the SE corner of Lincoln County
b) That portion lying east of a line running North and South from the NE corner of Coos County to the SE corner of Lincoln County
c) South half
d) North half

ELEVATOR CONSTRUCTORS

Area 1		
o Mechanic	19.34	5.68 + a
o Helper	13.54	5.68 + a
o Probationary Helper	9.67	-
Area 2		
o Mechanic	21.74	5.68 + a
o Helper	15.22	5.68 + a
o Probationary Helper	10.87	-

a) Plus 8% of basic hourly rate for employees with more than 5 years of service; 6% of basic hourly rate for 6 months to 5 years of service.

Area 1	Area 2
Umatilla	All
Wallowa	Remaining
Union	Counties
Baker	

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

GLAZIERS

Area 1	19.50	3.70
(Add $1.00 to base rate if safety belt is required by State safety regulations) (Add $4.00 to base rate for work done from a non-motorized single-man bosun chair)		
Area 2	13.76	1.37
(Add $0.50 to base rate if working at over 35 feet of free fall in height)		

Area 1	Area 2
All Counties except Malheur	Malheur

HIGHWAY AND PARKING STRIPERS

	18.40	2.00

IRONWORKERS

o Structural, Reinforcing, Ornamental, Riggers, Fence Erectors, Signal Men	19.56	6.86

LABORERS

Zone 1 (Base Rate):		
o Group 1	14.62	5.12
o Group 2	14.97	5.12
o Group 3	15.27	5.12
o Group 4	15.52	5.12
o Group 5	13.03	5.12
o Group 6	9.78	5.12

Note: A Hazardous Waste Removal Differential must be added to the base rate if work is performed inside the boundary of a Federally Designated Hazardous Waste Site. A Group 1 base rate is used for General Laborer on such a site. For further information on this, call the Prevailing Wage Rate Coordinator at 229-6655.

Zone Differential for Laborers
(Add to Zone 1 Rate)

Zone 2	.65
Zone 3	1.15
Zone 4	1.70
Zone 5	2.75

Zone 1: Projects within 30 miles of City Hall in the Cities listed below.
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Zone 4: More than 50 miles but less than 80 miles.
Zone 5: More than 80 miles.

CEMENT MASONS (continued)

Zone 1: Projects within 30 miles of City Hall in the cities listed below.
Zone 2: More than 30 miles but less than 40 miles.
Zone 3: More than 40 miles but less than 50 miles.
Zone 4: More than 50 miles but less than 80 miles.
Zone 5: More than 80 miles.

Cities

Bend	Corvallis	Coos Bay	Roseburg	Eugene
Pasco	The Dalles	Medford	Longview	K. Falls
Salem	Pendleton	Astoria	Portland	Newport

DIVERS & DIVERS' TENDERS

o Divers	48.04	4.12
o Divers' Tenders	21.23	4.12

Depth Pay and Enclosure Pay are added to the Divers' Basic Hourly Rate to obtain the Total Hourly Rate for the diver.

BASIC HOURLY RATE	+	HOURLY DEPTH PAY	+	HOURLY ENCLOSURE PAY	=	DIVERS' TOTAL HOURLY PAY

o Divers' Depth Pay

Depth of Dive	Hourly Depth Pay
50-100 ft	([total ft- 50] x $1.00)/hr.
100-150 ft	$ 50 + ([total ft-100] x $1.50)/hr.
150-200 ft	$125 + ([total ft-150] x $2.00)/hr.

o Divers' Enclosure Pay(working without vertical escape)

Distance Travelled In the Enclosure	Hourly Enclosure Pay
5 - 50 ft	$ .50/hr
50 - 100 ft	$ .63/hr
100 - 150 ft	$ 2.13/hr
150 - 200 ft	$ 4.63/hr
200 - 300 ft	$ 4.63 + ([total ft-200]x $.05)/hr
300 - 450 ft	$ 9.63 + ([total ft-300]x $.10)/hr
450 - 600 ft	$24.63 + ([total ft-450]x $.20)/hr

DREDGING

Zone 1 (Base Rate):		
o Leverman-Hydraulic	20.07	5.42
o Leverman-Dipper	20.88	5.42
o Asst. Engineer (including: Watch Engineer, Welder, Mechanic, Machinist)	19.45	5.42
o Tenderman (Boatman, Attending Dredge Plan); Fireman	18.98	5.42
o Assistant Mate (Deckhand); Oiler	18.58	5.42

Zone Differential for Dredging
(Add to Zone 1 Rate)

Zone 2	1.50
Zone 3	1.90
Zone 4	2.40
Zone 5	3.00

Zone 1: Center of job site not more than 15 miles from the City Hall of Portland
Zone 2: More than 15 miles but not more than 30
Zone 3: More than 30 miles but not more than 50
Zone 4: More than 50 miles but not more than 70
Zone 5: More than 70 miles.

DRYWALL/WETWALL

o Drywall (Accoustical and Drywall Applicator)	18.05	4.87
o Wetwall (Lather)	16.80	6.12

ELECTRICIANS

Area 1:		
o Electricians	18.15	3.40
o Cable Splicers	19.97	3.50
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o Electricians	20.71	5.63
o Cable Splicers	21.75	5.66
Area 3:	18.35	5.60
Area 4:	20.75	3.82
Area 5:		
o Electricians	21.35	5.74
o Cable Splicers	22.10	5.76
Area 6:		
o Electricians	18.72	5.26
o Cable Splicers	20.59	5.32

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

ELECTRICIANS (continued)

Area 1	Area 2	Area 2(cont)	Area 3
Malheur	Baker	Umatilla	Coos
	Gilliam	Union	Curry
	Grant	Wallowa	Lincoln
	Morrow	Wheeler	Douglas (a)
			Lane (a)

Area 4	Area 5	Area 6
Benton	Clackamas	Harney
Crook	Clatsop	Jackson
Deschutes	Columbia	Josephine
Jefferson	Hood River	Klamath
Lane (b)	Multnomah	Lake
Linn	Sherman	Douglas (b)
Marion	Tillamook	
Polk	Wasco	
Yamhill(c)	Washington	
	Yamhill (d)	

a) Those portions lying west of a line North and South from the NE corner of Coos County to the SE corner of Lincoln County
b) That portion lying east of a line running North and South from the NE corner of Coos County to the SE corner of Lincoln County
c) South half
d) North half

ELEVATOR CONSTRUCTORS

Area 1		
o Mechanic	19.34	5.68 + a
o Helper	13.54	5.68 + a
o Probationary Helper	9.67	-
Area 2		
o Mechanic	21.74	5.68 + a
o Helper	15.22	5.68 + a
o Probationary Helper	10.87	-

a) Plus 8% of basic hourly rate for employees with more than 5 years of service; 6% of basic hourly rate for 6 months to 5 years of service.

Area 1	Area 2
Umatilla	All
Wallowa	Remaining
Union	Counties
Baker	

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

GLAZIERS

Area 1	19.50	3.70
(Add $1.00 to base rate if safety belt is required by State safety regulations) (Add $4.00 to base rate for work done from a non-motorized single-man bosun chair)		
Area 2	13.76	1.37
(Add $0.50 to base rate if working at over 35 feet of free fall in height)		

Area 1	Area 2
All Counties except Malheur	Malheur

HIGHWAY AND PARKING STRIPERS

	18.40	2.00

IRONWORKERS

o Structural, Reinforcing, Ornamental, Riggers, Fence Erectors, Signal Men	19.56	6.86

LABORERS

Zone 1 (Base Rate):		
o Group 1	14.62	5.12
o Group 2	14.97	5.12
o Group 3	15.27	5.12
o Group 4	15.52	5.12
o Group 5	13.03	5.12
o Group 6	9.78	5.12

Note: A Hazardous Waste Removal Differential must be added to the base rate if work is performed inside the boundary of a Federally Designated Hazardous Waste Site. A Group 1 base rate is used for General Laborer on such a site. For further information on this, call the Prevailing Wage Rate Coordinator at 229-6655.

Zone Differential for Laborers
(Add to Zone 1 Rate)

Zone 2	.65
Zone 3	1.15
Zone 4	1.70
Zone 5	2.75

Zone 1: Projects within 30 miles of City Hall in the Cities listed below.
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Zone 3: More than 40 miles but less than 50 miles.
Zone 4: More than 50 miles but less than 80 miles.
Zone 5: More than 80 miles.

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

MARBLE SETTERS (Includes Granite)

Area 1	20.78	4.60

Area 1

Baker	Hood River	Sherman	Wallowa
Clackamas	Malheur (a)	Tillamook	Wasco (b)
Clatsop	Morrow	Union	Washington
Columbia	Multnomah	Umatilla	Yamhill (a)
Gilliam			

a) North half b) North of the City of Maupin

PAINTERS & DRYWALL TAPERS

Area 1		
o Painters & Drywall Tapers	12.25	1.78
Area 2		
o Brush	15.00	1.99
o Spray, sandblasting, other pressure blasting over 3000 psi, and steam cleaning.	15.50	1.99
o Drywall Tapers	19.90	3.05

Area 1	Area 2
Malheur County	Remaining Counties

PLASTERERS

Area 1	18.58	4.02
Area 2		
o Nozzleman	20.43	4.06
o Swinging scaffold	19.43	4.06
o all other work	18.93	4.06

Area 1	Area 1(cont)	Area 1(cont)	Area 2
Benton	Deschutes	Lincoln (b)	All
Coos	Harney	Linn (b)	remaining
Crook	Jefferson	Wasco (b)	counties
Curry	Klamath (a)	Wheeler (b)	
Douglas	Lane		

a) Northern one-third b) South half

PLUMBERS & STEAMFITTERS/PIPEFITTERS

Area 1 (Both)	20.23	5.15
Area 2 (Both)	22.35	5.65
Area 3 (Both)	20.40	5.10

PLUMBERS & STEAMFITTERS/PIPEFITTERS (cont)

Area 1	Area 2	Area 3
Baker	Grant (b)	All remaining counties
Harney (a)	Morrow	
Malheur	Umatilla	
	Wallowa	
	Union	

a) Except Northwest Portion
b) Except Southwest Corner

POWER EQUIPMENT OPERATORS

Zone 1 (Base Rate):		
o Group 1	19.60	5.67
o Group 2	19.25	5.67
o Group 3	18.65	5.67
o Group 4	18.25	5.67
o Group 5	17.75	5.67
o Group 6	17.05	5.67

Note: A Hazardous Waste Removal Differential must be added to the base rate if work is performed inside the boundary of a Federally Designated Hazardous Waste Site. For further information on this, call the Prevailing Wage Rate Coordinator at 229-6655.

ZONE RATES AND DESCRIPTIONS
(Add to Zone 1 Rate)

Zone 2	.65
Zone 3	1.15
Zone 4	1.70
Zone 5	2.75

Zone 1: Projects within 30 miles of City Hall in the Cities listed below.
Zone 2: More than 30 miles but less than 40 miles.
Zone 3: More than 40 miles but less than 50 miles.
Zone 4: More than 50 miles but less than 80 miles.
Zone 5: More than 80 miles.

Reference Cities

Albany	Eugene	Longview	Portland
Astoria	Goldendale	Madras	PortOrford
Baker	Grants Pass	Medford	Reedsport
Bend	Hermiston	McMinnville	Roseburg
Brookings	Hood River	Newport	Salem
Burns	Klamath Falls	Oregon City	The Dalles
Coos Bay	LaGrande	Ontario	Tillamook
Corvallis	Lakeview	Pendleton	

POWER EQUIPMENT OPERATORS (continued)

GROUP CLASSIFICATIONS

ASPHALT

6 Plant Oiler
6 Plant Fireman
6 Pugmill Operator (any type)
6 Truck mounted asphalt spreader, with screed
4 Screed Operator
5 Extrusion Machine Operator
2 Asphalt Plant Operator (any type)
4 Asphalt Paver Operator
5 Roller Operator (any asphalt mix)
4 Diesel-Electric Engineer, Plant
5 Asphalt Burner and Reconditioner Operator (anytype),84
4 Roto-Mill, pavement profiler operator, under 6 foot lateral cut
5 Roto-Mill, pavement profiler, ground man
2 Roto-Mill, pavement profiler operator, 6 foot lateral cut and over

BLADE

6 Blade Operator, pulled type
4 Blade Operator
4 Blade Operator, Finish
4 Blade Operator, externally controlled by electronic, mechanical hydraulic means
4 Blade Operator, multi-engine
2 Auto Grader or "Trimmer" Operator

BULLDOZERS

4 Bulldozer Operator
4 Drill Cat Operator
4 Side-Boom Operator
2 Tandem bulldozer operator (quadnine and similar type, D-11)
4 Bulldozer Operator, twin engine (TC 12 and similar type, D-10)
4 Cable-Plow Operator (any type)

CLEARING

4 Log Skidder Operator
4 Chipper Operator
4 Incinerator Operator
4 Stump Splitter Operator

POWER EQUIPMENT OPERATORS
(GROUP CLASSIFICATIONS continued)

COMPRESSORS

6 Compressor Operator (any power), under 1,250 cu. ft. total capacity
5 Compressor Operator (any power), over 1,250 cu. ft. capacity

COMPACTORS - Self-Propelled

5 Compactor Operator, including vibratory
5 Wagner Patcor Operator or similar type (without blade)
4 Compactor Operator, with blade
4 Compactor Operator, multi-engine

CONCRETE

6 Plant Oiler
6 Assistant Conveyor Operator
6 Conveyor Operator
6 Mixer Box Operator (C.T.B., dry batch, etc.)
6 Cement Hog Operator
6 Concrete Saw Operator
6 Concrete Curing Machine Operator (riding type)
6 Wire Mat or Brooming Machine Operator
5 Combination Mixer and Compressor Operator, gunite work
5 Concrete Batch Plant Quality Control Operator
5 Beltcrete Operator
5 Pumpcrete Operator (any type)
5 Pavement Grinder and/or Grooving Machine Operator (riding type)
4 Mixer Mobile Operator
5 Cement Pump Operator, Fuller-Kenyon and similar
5 Concrete Pump Operator
5 Grouting Machine Operator
4 Screed Operator
4 Concrete Cooling Machine Operator
5 Concrete Mixer Operator, single drum, any capacity
2 Batch Plant and/or Wet Mix Operator, 1 and 2 drum
1 Batch Plant and/or Wet Mix Operator, 3 units or more
5 Cast in place pipe laying machine
5 Maginnis Internal Full Slab Vibrator Operator
5 Concrete Finishing Machine Operator, Clary, Johnson, Bidwell, Burgess bridge deck or similar type
5 Curb Machine Operator, Mechanical Berm, Curb and/or Curb and Gutter
5 Concrete Joint Machine Operator
5 Concrete Planer Operator
5 Tower Mobile Operator
5 Power Jumbo Operator setting slip forms etc., in tunnels

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

MARBLE SETTERS (Includes Granite)

Area 1	20.78	4.60

Area 1

Baker	Hood River	Sherman	Wallowa
Clackamas	Malheur (a)	Tillamook	Wasco (b)
Clatsop	Morrow	Union	Washington
Columbia	Multnomah	Umatilla	Yamhill (a)
Gilliam			

a) North half b) North of the City of Maupin

PAINTERS & DRYWALL TAPERS

Area 1		
o Painters & Drywall Tapers	12.25	1.78
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Area 1	Area 2
Malheur County	Remaining Counties

PLASTERERS

Area 1	18.58	4.02
Area 2		
o Nozzleman	20.43	4.06
o Swinging scaffold	19.43	4.06
o all other work	18.93	4.06

Area 1	Area 1(cont)	Area 1(cont)	Area 2
Benton	Deschutes	Lincoln (b)	All
Coos	Harney	Linn (b)	remaining
Crook	Jefferson	Wasco (b)	counties
Curry	Klamath (a)	Wheeler (b)	
Douglas	Lane		

a) Northern one-third b) South half

PLUMBERS & STEAMFITTERS/PIPEFITTERS

Area 1 (Both)	20.23	5.15
Area 2 (Both)	22.35	5.65
Area 3 (Both)	20.40	5.10

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

PLUMBERS & STEAMFITTERS/PIPEFITTERS (cont)

Area 1	Area 2	Area 3
Baker	Grant (b)	All remaining counties
Harney (a)	Morrow	
Malheur	Umatilla	
	Wallowa	
	Union	

a) Except Northwest Portion
b) Except Southwest Corner

POWER EQUIPMENT OPERATORS

Zone 1 (Base Rate):		
o Group 1	19.60	5.67
o Group 2	19.25	5.67
o Group 3	18.65	5.67
o Group 4	18.25	5.67
o Group 5	17.75	5.67
o Group 6	17.05	5.67

Note: A Hazardous Waste Removal Differential must be added to the base rate if work is performed inside the boundary of a Federally Designated Hazardous Waste Site. For further information on this, call the Prevailing Wage Rate Coordinator at 229-6655.

ZONE RATES AND DESCRIPTIONS
(Add to Zone 1 Rate)

Zone 2	.65
Zone 3	1.15
Zone 4	1.70
Zone 5	2.75

Zone 1: Projects within 30 miles of City Hall in the Cities listed below.
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Zone 3: More than 40 miles but less than 50 miles.
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POWER EQUIPMENT OPERATORS (continued)

GROUP CLASSIFICATIONS

ASPHALT

6 Plant Oiler
6 Plant Fireman
6 Pugmill Operator (any type)
6 Truck mounted asphalt spreader, with screed
4 Screed Operator
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4 Asphalt Paver Operator
5 Roller Operator (any asphalt mix)
4 Diesel-Electric Engineer, Plant
5 Asphalt Burner and Reconditioner Operator (anytype),84
4 Roto-Mill, pavement profiler operator, under 6 foot lateral cut
5 Roto-Mill, pavement profiler, ground man
2 Roto-Mill, pavement profiler operator, 6 foot lateral cut and over

BLADE

6 Blade Operator, pulled type
4 Blade Operator
4 Blade Operator, Finish
4 Blade Operator, externally controlled by electronic, mechanical hydraulic means
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4 Bulldozer Operator, twin engine (TC 12 and similar type, D-10)
4 Cable-Plow Operator (any type)

CLEARING

4 Log Skidder Operator
4 Chipper Operator
4 Incinerator Operator
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POWER EQUIPMENT OPERATORS
(GROUP CLASSIFICATIONS continued)

COMPRESSORS

6 Compressor Operator (any power), under 1,250 cu. ft. total capacity
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6 Cement Hog Operator
6 Concrete Saw Operator
6 Concrete Curing Machine Operator (riding type)
6 Wire Mat or Brooming Machine Operator
5 Combination Mixer and Compressor Operator, gunite work
5 Concrete Batch Plant Quality Control Operator
5 Beltcrete Operator
5 Pumpcrete Operator (any type)
5 Pavement Grinder and/or Grooving Machine Operator (riding type)
4 Mixer Mobile Operator
5 Cement Pump Operator, Fuller-Kenyon and similar
5 Concrete Pump Operator
5 Grouting Machine Operator
4 Screed Operator
4 Concrete Cooling Machine Operator
5 Concrete Mixer Operator, single drum, any capacity
2 Batch Plant and/or Wet Mix Operator, 1 and 2 drum
1 Batch Plant and/or Wet Mix Operator, 3 units or more
5 Cast in place pipe laying machine
5 Maginnis Internal Full Slab Vibrator Operator
5 Concrete Finishing Machine Operator, Clary, Johnson, Bidwell, Burgess bridge deck or similar type
5 Curb Machine Operator, Mechanical Berm, Curb and/or Curb and Gutter
5 Concrete Joint Machine Operator
5 Concrete Planer Operator
5 Tower Mobile Operator
5 Power Jumbo Operator setting slip forms etc., in tunnels

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

POWER EQUIPMENT OPERATORS
(GROUP CLASSIFICATIONS continued)

REPAIRMEN, Heavy Duty

	6	Parts Man (Tool Room)
	6	H.D. Repairman Tender
	6	Welder's Tender
	4	Diesel-Electric Engineer (Plant or Floating)
	4	Bolt Threading Machine Operator
	4	Drill Doctor (Bit Grinder)
	4	H.D. Mechanic
	4	H.D. Welder
	4	Machine Tool Operator
	4	Combination H.D. Mechanic-Welder, when dispatched and/or when required to do both
	4	Welder - Certified, when dispatched and/or required

RUBBER-TIRED SCRAPERS

	4	Rubber-tired Scraper Operator, single engine, single scraper
	4	Self-loading, paddle wheel, auger type under 15 cu. yd.
	4	Rubber-tired Scraper Operator, twin engine
	4	Rubber-tired Scraper Operator, with push-pull attachments
	3	Rubber-tired Scraper Operator with tandem scrapers
	2	Rubber-tired Scraper Operator, with tandem scrapers, multi-engine
	4	Self-loading, paddle wheel, auger type 15 cu. yd. and over, single engine
	3	Self-loading, paddle wheel, auger type, finish and/or 2 or more units

SHOVEL, DRAGLINE, CLAMSHELL, BACKHOE, SKOOPER, ETC., OPERATOR

	6	Oiler
	6	Grade Oiler (required to check grade)
	6	Grade Checker
	6	Fireman
	4	Diesel-Electric Engineer
	4	Stationary Drag Scraper Operator
	4	Shovel, Dragline, Clamshell, Hoe etc., Operator under 3 cu. yd.
	4	Grade-all Operator
	2	Shovel, Dragline, Clamshell, Hoe etc., Operator 3 cu. yd. and over

SIGNALMAN

	6	Bell Boy, phones, etc., Operator
	6	Helicopter Radioman (ground)

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

POWER EQUIPMENT OPERATORS
(GROUP CLASSIFICATIONS continued)

SURFACING (BASE) MATERIAL

	6	Roller Operator, grading of base rock (not asphalt)
	5	Roller Operator, Oiling, C.T.B.
	6	Tamping Machine Operator, mechanical, self-propelled
	6	Hydrographic Seeder Machine Operator, straw, pulp or seed
	5	Rock Spreaders, self-propelled
	5	Pulva-mixer or similar types
	4	Blade Mounted Spreaders, Ulrich and similar types
	5	Chip Spreading Machine Operator
	5	Lime Spreading Operator

SWEEPERS

	6	Broom Operator, self-propelled
	5	Sweeper Operator (Wayne type) self-propelled

TRACTOR - RUBBER TIRED

	5	Tractor Operator, rubber-tired, 50 H.P. Flywheel and under
	4	Tractor Operator, rubber -tired, over 50 H.P. Flywheel
	4	Tractor Operator, with boom attachment
	4	Rubber-tired Dozers and Pushers (Michigan, Cat, Hough type)

TRENCHING MACHINE

	6	Oiler
	6	Grade Oiler (required to check grade)
	5	Trenching Machine Operator, maximum digging capacity 3 ft. depth
	4	Trenching Machine Operator, maximum digging capacity over 3 ft. depth
	4	Back Filling Machine Operator
	2	Wheel Excavator
	2	Canal Trimmer
	2	Band Wagon (in conjunction with wheel excavator)

TUNNEL

	4	Mucking Machine Operator
	6	Conveyor Operator (any type)
	4	Shield Operator
	6	Air Filtration Equipment Operator

WELDING MACHINES

	6	Welding Machine Operator

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

POWER EQUIPMENT OPERATORS
(GROUP CLASSIFICATIONS continued)

UNDERWATER EQUIPMENT

2	Underwater Equipment Operator, remote or otherwise, when used in construction work		

ROOFERS

Area 1:			
	o Roofers	17.14	4.30
	o Handling coal tar pitch	18.85	4.30
Area 2:			
	o Roofers (Add $2.00 per hour to Fringe for work with irritable Bituminous material.)	15.79	4.48
Area 3:			
	o Roofers (Add $1.50 per hour to Fringe for work with irritable Bituminous material.)	13.46	2.05
Area 4:			
	o Roofers (Add $2.00 per hour to Fringe for work with irritable Bituminous materials)	15.00	3.85
Area 5:			
	o Roofers (Add $3.00 per hour to Fringe for work with irritable Bituminous materials)	16.10	3.55

Area 1	Area 1(cont)	Area 2	Area 2(cont)
Baker	Multnomah	Benton	Klamath
Clackamas	Sherman	Coos	Lake
Clatsop	Tillamook	Crook	Lane
Columbia	Wasco	Curry	Lincoln
Jefferson	Washington	Deschutes	Linn
Gilliam	Wheeler	Douglas	Marion
Grant		Harney	Polk
Hood River		Jackson	Yamhill
		Josephine	

Area 3	Area 4	Area 5
Malheur	Umatilla	Morrow
	Union	
	Wallowa	

SHEETMETAL WORKERS

Area 1 (Add $0.75 to base rate for work performed on any swinging platform, swinging chair, or swinging ladder)	18.55	5.63
Area 2 (Add $1.75 to base rate for work performed whenever it is possible for worker to fall 30 feet or more) (Add $1.75 to base rate for work performed in an area where epoxy resins or other injurious chemicals are being applied)	17.41	4.28
Area 3 (Add $1.00 to base rate for work where it is necessary to wear a chemically activated face mask) (Add $1.00 to base rate for work where employee is required to wear a fresh air mask due to nuclear related work) (Add $.45 to base rate for work on a swinging stage, swinging scaffold or bosun chair in excess of 30 feet above the ground)	19.75	5.07
Area 4	17.34	3.79

Area 1

Benton	Gilliam	Linn	Tillamook
Clackamas	Grant	Marion	Wasco
Clatsop	Harney	Multnomah	Washington
Columbia	Hood River	Polk	Wheeler
Crook	Jefferson	Sherman	Yamhill
Deschutes	Lincoln		

Area 2	Area 3	Area 4	Area 4 (cont)
Baker	Morrow	Coos	Josephine
Malheur	Umatilla	Curry	Klamath
	Union	Douglas	Lake
	Wallowa	Jackson	Lane

SOFT FLOOR LAYERS

Area 1	15.98	4.00 + a
Area 2	13.66	1.19

a) plus 4% of basic hourly rate for employees with less than one year of service, 6% for those with more than one year.

POWER EQUIPMENT OPERATORS
(GROUP CLASSIFICATIONS continued)

REPAIRMEN, Heavy Duty

6	Parts Man (Tool Room)
6	H.D. Repairman Tender
6	Welder's Tender
4	Diesel-Electric Engineer (Plant or Floating)
4	Bolt Threading Machine Operator
4	Drill Doctor (Bit Grinder)
4	H.D. Mechanic
4	H.D. Welder
4	Machine Tool Operator
4	Combination H.D. Mechanic-Welder, when dispatched and/or when required to do both
4	Welder - Certified, when dispatched and/or required

RUBBER-TIRED SCRAPERS

4	Rubber-tired Scraper Operator, single engine, single scraper
4	Self-loading, paddle wheel, auger type under 15 cu. yd.
4	Rubber-tired Scraper Operator, twin engine
4	Rubber-tired Scraper Operator, with push-pull attachments
3	Rubber-tired Scraper Operator with tandem scrapers
2	Rubber-tired Scraper Operator, with tandem scrapers, multi-engine
4	Self-loading, paddle wheel, auger type 15 cu. yd. and over, single engine
3	Self-loading, paddle wheel, auger type, finish and/or 2 or more units

SHOVEL, DRAGLINE, CLAMSHELL, BACKHOE, SKOOPER, ETC., OPERATOR

6	Oiler
6	Grade Oiler (required to check grade)
6	Grade Checker
6	Fireman
4	Diesel-Electric Engineer
4	Stationary Drag Scraper Operator
4	Shovel, Dragline, Clamshell, Hoe etc., Operator under 3 cu. yd.
4	Grade-all Operator
2	Shovel, Dragline, Clamshell, Hoe etc., Operator 3 cu. yd. and over

SIGNALMAN

6	Bell Boy, phones, etc., Operator
6	Helicopter Radioman (ground)

TRADES | BASIC HOURLY RATE | FRINGE BENEFITS

POWER EQUIPMENT OPERATORS
(GROUP CLASSIFICATIONS continued)

SURFACING (BASE) MATERIAL

6	Roller Operator, grading of base rock (not asphalt)
5	Roller Operator, Oiling, C.T.B.
6	Tamping Machine Operator, mechanical, self-propelled
6	Hydrographic Seeder Machine Operator, straw, pulp or seed
5	Rock Spreaders, self-propelled
5	Pulva-mixer or similar types
4	Blade Mounted Spreaders, Ulrich and similar types
5	Chip Spreading Machine Operator
5	Lime Spreading Operator

SWEEPERS

6	Broom Operator, self-propelled
5	Sweeper Operator (Wayne type) self-propelled

TRACTOR - RUBBER TIRED

5	Tractor Operator, rubber-tired, 50 H.P. Flywheel and under
4	Tractor Operator, rubber -tired, over 50 H.P. Flywheel
4	Tractor Operator, with boom attachment
4	Rubber-tired Dozers and Pushers (Michigan, Cat, Hough type)

TRENCHING MACHINE

6	Oiler
6	Grade Oiler (required to check grade)
5	Trenching Machine Operator, maximum digging capacity 3 ft. depth
4	Trenching Machine Operator, maximum digging capacity over 3 ft. depth
4	Back Filling Machine Operator
2	Wheel Excavator
2	Canal Trimmer
2	Band Wagon (in conjunction with wheel excavator)

TUNNEL

4	Mucking Machine Operator
6	Conveyor Operator (any type)
4	Shield Operator
6	Air Filtration Equipment Operator

WELDING MACHINES

6	Welding Machine Operator

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

POWER EQUIPMENT OPERATORS
(GROUP CLASSIFICATIONS continued)

UNDERWATER EQUIPMENT

2	Underwater Equipment Operator, remote or otherwise, when used in construction work		

ROOFERS

Area 1:		
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o Handling coal tar pitch	18.85	4.30
Area 2:		
o Roofers (Add $2.00 per hour to Fringe for work with irritable Bituminous material.)	15.79	4.48
Area 3:		
o Roofers (Add $1.50 per hour to Fringe for work with irritable Bituminous material.)	13.46	2.05
Area 4:		
o Roofers (Add $2.00 per hour to Fringe for work with irritable Bituminous materials)	15.00	3.85
Area 5:		
o Roofers (Add $3.00 per hour to Fringe for work with irritable Bituminous materials)	16.10	3.55

Area 1	Area 1(cont)	Area 2	Area 2(cont)
Baker	Multnomah	Benton	Klamath
Clackamas	Sherman	Coos	Lake
Clatsop	Tillamook	Crook	Lane
Columbia	Wasco	Curry	Lincoln
Jefferson	Washington	Deschutes	Linn
Gilliam	Wheeler	Douglas	Marion
Grant		Harney	Polk
Hood River		Jackson	Yamhill
		Josephine	

Area 3	Area 4	Area 5
Malheur	Umatilla	Morrow
	Union	
	Wallowa	

SHEETMETAL WORKERS

Area 1 (Add $0.75 to base rate for work performed on any swinging platform, swinging chair, or swinging ladder)	18.55	5.63
Area 2 (Add $1.75 to base rate for work performed whenever it is possible for worker to fall 30 feet or more) (Add $1.75 to base rate for work performed in an area where epoxy resins or other injurious chemicals are being applied)	17.41	4.28
Area 3 (Add $1.00 to base rate for work where it is necessary to wear a chemically activated face mask) (Add $1.00 to base rate for work where employee is required to wear a fresh air mask due to nuclear related work) (Add $.45 to base rate for work on a swinging stage, swinging scaffold or bosun chair in excess of 30 feet above the ground)	19.75	5.07
Area 4	17.34	3.79

Area 1

Benton	Gilliam	Linn	Tillamook
Clackamas	Grant	Marion	Wasco
Clatsop	Harney	Multnomah	Washington
Columbia	Hood River	Polk	Wheeler
Crook	Jefferson	Sherman	Yamhill
Deschutes	Lincoln		

Area 2	Area 3	Area 4	Area 4 (cont)
Baker	Morrow	Coos	Josephine
Malheur	Umatilla	Curry	Klamath
	Union	Douglas	Lake
	Wallowa	Jackson	Lane

SOFT FLOOR LAYERS

Area 1	15.98	4.00 + a
Area 2	13.66	1.19

a) plus 4% of basic hourly rate for employees with less than one year of service, 6% for those with more than one year.

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

SOFT FLOOR LAYERS(continued)

Area 1 - All counties except Malheur County
Area 2 - Malheur County

SPRINKLER FITTERS	20.90	4.83

TENDERS TO MASON TRADES

o Tenders for Bricklayers, Tile Setters, Marble Setters and Terrazzo Workers; Topping for Cement Finishers and Morter Mixers.

15.99 4.12

(Add $0.50 to base rate for refractory work)
(Add to base rate an amount equal to that received for safety belt requirements or other unusual job conditions by the mechanic this worker is tending)

TENDERS TO PLASTERERS	15.50	4.12

TILE SETTERS

Area 1	17.60	4.20

(Add $.50 to base rate if safety belt required by State safety regulations or work involves epoxy, furnane, alkor, acetylene, black grouting and/or steam cleaning.)

Area 2	18.00	4.37

(Add $.24 to base rate if safety belt required by State safety regulations; $.20 if work involves epoxy, furnane, alkor, acetylene, black grouting, and/or steam cleaning.)

Area 1	Area 1(cont)	Area 2	Area 2(cont)
Baker	Polk	Benton	Josephine
Clackamas	Sherman	Coos	Klamath
Clatsop	Tillamook	Crook	Lake
Columbia	Umatilla	Curry	Lane
Gilliam	Union	Deschutes	Lincoln
Hood River	Wallowa	Douglas	Linn
Malheur(a)	Wasco (b)	Grant	Malheur (c)
Marion	Washington	Harney	Wasco (d)
Morrow	Yamhill	Jackson	Wheeler
Multnomah		Jefferson	

a) North half
b) North of Maupin
c) South half
d) Maupin and south thereof

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

TILE & TERRAZZO FINISHERS

Area 1	13.54	2.85

(Add $.50 to base rate if safety belt required by State safety regulations or work involves epoxy, furnane, alkor, acetylene, black grouting and/or steam cleaning.)

Area 1

Baker	Hood River	Sherman	Wallowa
Clackamas	Malheur (a)	Tillamook	Wasco (b)
Clatsop	Morrow	Umatilla	Washington
Columbia	Multnomah	Union	Yamhill (a)
Gilliam			

a) North Half
b) North of Maupin

TRUCK DRIVERS

Zone 1 (Base Rate):		
o Group 1	16.73	5.50
o Group 2	16.85	5.50
o Group 3	16.98	5.50
o Group 4	17.23	5.50
o Group 5	17.45	5.50
o Group 6	17.60	5.50
o Group 7	17.88	5.50

Note: A Hazardous Waste Removal Differential must be added to the base rate if work is performed inside the boundary of a Federally Designated Hazardous Waste Site. For further information on this, call the Prevailing Wage Rate Coordinator at 229-6655.

Zone Differential for Truck Drivers
(Add to Zone 1 Rate)

Zone 2	.65
Zone 3	1.15
Zone 4	1.70
Zone 5	2.75

Zone 1: Projects within 30 miles of City Hall in the Cities listed below.
Zone 2: More than 30 miles but less than 40 miles.
Zone 3: More than 40 miles but less than 50 miles.
Zone 4: More than 50 miles but less than 80 miles.
Zone 5: More than 80 miles.

TRUCK DRIVERS (continued)

Reference Cities

Albany	Eugene	Longview	Portland
Astoria	Goldendale	Madras	Port Orford
Baker	Grants Pass	Medford	Reedsport
Bend	Hermiston	McMinnville	Roseburg
Brookings	Hood River	Newport	Salem
Burns	Klamath Falls	Oregon City	The Dalles
Coos Bay	LaGrande	Ontario	Tillamook
Corvallis	Lakeview	Pendleton	

Work	Group
A-Frame or Hydra-lift Truck w/load bearing surface	1
Battery Rebuilder	1
Bus or Man-Haul Driver	1
Concrete Buggies (Power operated)	1
Drivers and Helpers handling sacked cement--add 15¢ per hour	
Dump Trucks, Side, End and Bottom Dumps, including Semi-Trucks and trains or combinations thereof:	
Up to and inc. 10 cu. yds	1
Over 10 cu. yds. and inc. 30 cu. yds	3
Over 30 cu. yds. and inc. 50 cu. yds	4
Over 50 cu. yds. and inc. 60 cu. yds	5
Over 60 cu. yds. and inc. 80 cu. yds	6
Over 80 cu. yds. and inc. 100 cu. yds	7
Dumpsters or Similar Equipment--all sizes	2
Flaherty Spreader Driver or Leverman	2
Lift Jitneys, Fork Lifts--all sizes--used in loading, unloading & transporting material on job site	1
Loader and/or Leverman on Concrete Dry Batch Plant, manually operated	1
Low Bed Equipment, Flat Bed Semi-Truck and Trailer or Doubles transporting equipment or wet or dry materials	2
Lubrication Man, Fuel Truck Driver, Driver, Tireman, Wash Rack, Steam Cleaner or combination	1

TRUCK DRIVERS (Continued)

Work	Group
Lumber Carrier, Driver-Straddle Carrier--used in loading, unloading and transportation of material on job site	2
Oil Distributor Driver or Leverman	2
Pilot Car	1
Slurry Truck Driver or Leverman	1
Solo Flat Bed and Misc. Body Trucks--0-10 tons	1
Transit Mix and Wet or Dry Mix Trucks:	
5 cu. yds. and under	1
Over 5 cu. yds. and inc. 7 cu. yds	2
Over 7 cu. yds. and inc. 11 cu. yds	3
Over 11 cu. yds. and inc. 15 cu. yds.	4
Team Drivers	1
Tireman, full-time basis	1
Truck Helper	1
Truck Mechanic--Welder--Body Repairman	3
Truck Mechanic Helper	1
Water Wagons (Rated Capacity) up to:	
3000 gallons	1
3000 to 5000 gallons	2
5000 to 10,000 gallons	3
10,000 to 15,000 gallons	4
Winch Truck--takes classification of truck on which winch is mounted	

WELDERS; RIGGERS

Receive rate for craft performing operation to which welding and rigging are incidental.

Bureau of Labor Industries
Wage and Hour Division

PAYROLL

Payroll and Certified Statement
Form - For Use When Complying
with ORS 279.354

NAME OF CONTRACTOR ☐ OR SUBCONTRACTOR ☐	ADDRESS Phone: ( )			
FOR WEEK ENDING	CONTRACTING AGENCY Phone ( )	PROJECT AND LOCATION	PROJECT OR CONTRACT NO.	DATE CONTRACT SPECIFICATIONS FIRST ADVERTISED FOR BID

(1) NAME, ADDRESS, AND SOCIAL SECURITY NUMBER OF EMPLOYEE	(2) W/H EX-EMP-TIONS	(3) WORK CLASSIFICATION (include group number if applicable)	OT or ST	(4) DAY AND DATE HOURS WORKED EACH DAY	(5) TOTAL HOURS	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS FICA	FEDERAL WITH-HOLDING TAX	STATE WITH-HOLDING TAX	OTHER	TOTAL DEDUC-TIONS	(9) NET WAGE PAID FOR WEEK
			O										
			S										
			O										
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CERTIFIED STATEMENT

I _____ , _____
(Name of signatory party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by

_____ on the _____
(Contractor, Subcontractor or Surety) (Building or work)

_____ ; that during the payroll period commencing on the _____day

of _____, 19____, and ending the _____day of _____, 19____,
all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on

behalf of said _____
(Contractor, Subcontractor or Surety)
from the full weekly wages earned by any person, and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as specified in ORS 652.610, and described below:

_____

_____

_____

_____

_____

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for workers contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each worker conform with work performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recongnized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Depertment of Labor.

FORM WH-38 (Rev 6/91)

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS OR PROGRAMS:
In addition to the basic hourly wage rates paid to each worker listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate progams for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH:
Each worker listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in Section 4(c) below.

(c) EXCEPTIONS:

EXCEPTION (CRAFT)	EXPLANATION
REMARKS	

I have read this certified statement, know the contents thereof and it is true to my knowledge.

NAME AND TITLE	SIGNATURE

☐ Contractor ☐ Subcontractor ☐ Surety

File this form with the contracting agency and send a true copy to the Bureau of Labor and Industries, Wage and Hour Division, P.O. Box 800, Portland, OR 97207-0800.

BUREAU OF LABOR AND INDUSTRIES - WAGE AND HOUR DIVISION

INSTRUCTIONS FOR COMPLETING PAYROLL AND CERTIFIED STATEMENT FORM, WH-38
(Rev 6/91)

General: This form meets needs resulting from the 1983 amendments to the Prevailing Wage Rate Law. Under this amended law, the contractor is required to pay not less than fringe benefits as predetermined by the Bureau of Labor and Industries, in addition to payment of not less than the predetermined rates. The contractor's obligation to pay fringe benefits may be met either by payment of the benefits to the various plans, funds, or programs or by making these payments to the employees as cash in lieu of fringe benefits.

This form provides for the contractor's showing of the payroll and all monies paid to the employees, whether as basic rates or as cash in lieu of fringe benefits and provides for the contractor's representation in the certified statement that he/she is paying other benefits required by the contract and not paid as cash in lieu of fringe benefits. Detailed instructions concerning the preparation of the form follow:

Fill in all boxes at the top of the form. Be sure to enter the date the contract was first advertised for bid by the contracting agency. This date should appear on the bid documents.

Column 1 - Name, Address, and Social Security number of Employee: The employee's full name must be shown on each payroll submitted. The employee's address must also be shown on the first payroll submitted. The address need not be shown on subsequent payrolls unless the address changes. Although not required. space is available in the name and address section so that Social Security numbers can be listed.

Column 2 - Withholding Exemptions: This column is merely inserted for the employer's convenience and is not a requirement.

Column 3 - Work Classifications: List classification descriptive of work actually performed by employees. Include group number when appropriate. Consult classifications and minimum wage schedule set forth in contract specifications. If additional classifications are deemed necessary, see Contracting Officer or Agency representative. Employee may be shown as having worked in more than one classification provided accurate breakdown of hours so worked is maintained and shown on submitted payroll by use of separate line entries.

Column 4 - Hours worked: Enter as overtime hours all hours worked in excess of 8 hours per day, all hours worked on Saturday and Sunday and hours worked on legal holidays as defined in ORS 279.334.

Column 5 - Total: Self-explanatory.

Column 6 - Rate of Pay, including Fringe Benefits: In the rate of pay box, list actual hourly rate paid the employee for straight time worked plus any cash in lieu of fringe benefits paid to the employee. When recording the straight time hourly rate, any cash paid in lieu of fringe benefits may be shown separately from the basic rate, thus $12.50/2.35. This is of assistance in correctly computing overtime. See "Fringe Benefits" below. Payment of not less than time and one half the basic or regular rate paid is required for overtime under ORS 279.334. In addition to paying not less than the predetermined rate for the classification in which the employee works, the contractor shall pay to approved plans, funds, or programs or shall pay as cash in lieu of fringe benefits, amounts predetermined as fringe benefits in the wage decision made part of the contract. See "FRINGE BENEFITS" below.

FRINGE BENEFITS -- Contractors who pay all required fringe benefits: A contractor who pays fringe benefits to approved plans, funds, or programs in amounts not less than were determined in the applicable wage decision of the Commissioner of the Bureau of Labor and Industries shall continue to show on the payroll the basic cash hourly rate and overtime rate paid to employees. Such a contractor shall check paragraph 4(a) of the Certified Statement to indicate that he/she is also paying to approved plans, funds, or programs not less than the amount predetermined as fringe benefits for each craft. Any exceptions shall be noted in Section 4(c).

Contractors who pay no fringe benefits: A contractor who pays no fringe benefits shall pay to the employee, and insert in column (6) of the payroll, an amount not less than the predetermined rate for each classification plus the amount of fringe benefits determined for each classification in the applicable wage decision. Inasmuch as it is not necessary to pay time and a half on cash paid in lieu of fringe benefits, the overtime rate shall be not less than the sum of the basic predetermined rate, plus the half time premium on basic or regular rate, plus the required cash in lieu of fringe benefits at the straight time rate. In addition, the contractor shall check paragraph 4(b) of the Certified Statement to indicate that he/she is paying fringe benefits in cash directly to employees. Any exceptions shall be noted in Sections 4(c).

Use of section 4(c), Exceptions

Any contractor who is making payment to approved plans, funds, or programs in amounts less than the wage determination required is obliged to pay the deficiency directly to the employees as cash in lieu of fringe benefits. Any exceptions to Section 4(a) or 4(b), whichever the contractor may check, shall be entered in Section 4(c). Enter in the Exception column the craft, and enter in the Explanation column the hourly amount paid the employee as cash in lieu of fringe benefits and the hourly amount paid to plans, funds, or programs as fringe benefits. The contractor shall pay, and shall show that he/she is paying to each such employee for all hours (unless otherwise provided by applicable determination) worked on the project an amount not less than the predetermined rate plus cash in lieu of fringe benefits as shown in Section 4(c). The rate paid and amount of cash paid in lieu of fringe benefits per hour should be entered in column 6 on the payroll. See paragraph on "Contractors who pay no fringe benefits" for computation of overtime rate.

Column 7 - Gross Amount Earned: Enter gross amount earned on this project. If part of the employees' wage was earned on projects other than the project described on this payroll, enter in column 7 first the amount earned on the project and then the gross amount earned on all projects, thus $63.00/120.00.

Column 8 - Deductions: Four columns are provided for showing deductions made. If more than four deductions should be involved, use first 3 columns; show the balance of deductions under "Other" column; show actual total under "Total Deductions" column; and in an attachment to the payroll describe the deductions contained in the "Other" column. All deductions must be in accordance with the provisions of ORS 652.610. If the employee worked on other jobs in addition to this project, show actual deductions from gross wage, but indicate that deductions are based on gross wages.

Column 9 - Net Wages Paid for Week: Self-explanatory

Certified Statement Required by ORS 279.354: While this form need not be notarized, the Certified Statement is subject to the penalties provided by ORS 279.990. Accordingly, the party signing this required statement should have knowledge of the facts represented as true.

Space has been provided between items (1) and (2) of the Statement for describing any deductions made. If all deductions made are adequately described in the "Deductions" column above, state "See Deductions column in this payroll." See paragraph entitled "FRINGE BENEFITS" above for instructions concerning filling out paragraph 4 of the Statement.

PLANNED PUBLIC IMPROVEMENT SUMMARY

FISCAL YEAR_____ - _____ _____ PAGE_____OF_____

(Name of State or Local Government Agency)

Project Number	Project Name	Project Type	Project Location	Estimated Project Cost	Agency or Contract Work

ORS 279.023 generally states that not less than 30 days prior to adoption of its budget for the subsequent budget period, each public agency shall prepare and file with the Commissioner of the Bureau of Labor and Industries a list of every public improvement known to that agency that the agency plans to fund in the budget period... If the agency decides to use its own equipment and personnel for constructing projects estimated to cost more than $50,000, the agency shall show that the decision conforms to the policy of the State of Oregon that public agencies shall make every effort to construct public improvements at the least cost to the public agency, and the public agency shall cause to be kept and preserved a full, true and accurate account of the costs of performing the work including all engineering and administrative expenses and a reasonable estimate of the cost, including investment cost, of the equipment used. NOTE: This Improvement Summary together with the project estimate and least cost determination constitutes a public record available in the usual manner for public review or copying. Mail a copy of this public improvement summary to: Wage and Hour Division, P.O. Box 800, Portland, Oregon 97207-0800.

FORM WH - 118 (Rev 6/91)

CAPITAL IMPROVEMENT PROJECT COST COMPARISON ESTIMATE

_____

(Name of State or Local Government Agency)

DEPARTMENT: PROJECT NAME: FUND:
PROPOSED YEAR: PROJECT NUMBER:
PROJECT DESCRIPTION:

Rough Quantity Estimate	Units	Work Class Description	Agency Force Estimate		Agency Contract Estimate	
			Unit Cost	Total Cost	Unit Cost	Total Cost
Estimated Construction Period _____				$		$

_____ determines that (Agency Forces)(Contractor) can perform this work at the least cost.

(Name of Agency) (cross out one)

FORM WH - 119 (Rev 6/91)

_____

(Agency Official)

NOTICE OF AWARD OF PUBLIC WORKS CONTRACTS
(For use by Public agency in Complying with ORS 279.363)

1. PRIME CONTRACTOR

Name _____

Address _____

City, State, Zip _____

Phone Number _____

2. CONTRACTING AGENCY

Name _____

Address _____

City, State, Zip _____

Phone Number _____

Submit this completed notice to:
Wage and Hour Division,
Prevailing Wage Section,
P.O. Box 800
Portland, Oregon 97207-0800

FORM WH-81 (Rev. 1/91)

3. CONTRACT INFORMATION

A. Contract Name and Number:

_____

B. Location of Work: _____

C. County: _____

D. Amount of the Award: $ _____

E. Source of Funds: (i.e. 100% Federal Funds; 50/50 Federal, State; 100% local)

_____

F. Date Contract Awarded: _____

G. Date Contract Specifications Advertised for Bid:

_____

NOTICE OF AWARD OF PUBLIC WORKS CONTRACTS
(For use by Public agency in Complying with ORS 279.363)

1. PRIME CONTRACTOR

Name ZAK CONSTRUCTION COMPANY

Address 1234 N.W. Camille Street

City, State, Zip Alexandra, OR 97201

Phone Number (503) 122-4567

2. CONTRACTING AGENCY

Name LOPEZ IRRIGATION DISTRICT

Address 1234 N.W. Shannon Court

City, State, Zip Jamestown, OR 97201

Phone Number (503) 987-6543

Submit this completed notice to:
Wage and Hour Division,
Prevailing Wage Section,
P.O. Box 800
Portland, Oregon 97207-0800

FORM WH-81 (Rev. 1/91)

3. CONTRACT INFORMATION

A. Contract Name and Number:

Dam Repair 100-H

B. Location of Work: Becca, Oregon

C. County: Malheur

D. Amount of the Award: $ 25,000

E. Source of Funds: (i.e. 100% Federal Funds; 50/50 Federal, State; 100% local)

100% State

F. Date Contract Awarded: July 16, 1991

G. Date Contract Specifications Advertised for Bid:

July 2, 1991

SAMPLE

BUREAU OF LABOR AND INDUSTRIES
P.O. BOX 800
PORTLAND, OREGON 97207-0800

ADDRESS CORRECTION REQUESTED

BULK RATE
U.S. Postage
PAID
Portland, Oregon
Permit No. 0458

Metro
Attn: Amha Hazen
2000 SW 1st
Portland, OR 97201

BUREAU OF LABOR AND INDUSTRIES

MARY WENDY ROBERTS
Commissioner

1400 SW 5th AVENUE
PORTLAND, OREGON 97201-5511

BULK RATE

U.S. Postage
PAID
Portland, Oregon

Permit No. 0701

Metropolitan Services District
Attn: Larry Shapiro
2000 SW 1st Avenue
Portland, OR 97201-5398

IMPORTANT NOTICE CONCERNING
PREVAILING WAGE RATES

AN AMENDMENT TO THE JULY 1, 1991
PREVAILING WAGE RATES FOR PUBLIC WORKS CONTRACTS IN OREGON

EFFECTIVE AUGUST 1, 1991

There have been changes in the Prevailing Wage Rates of 6 different trades since the most recent PWR Booklet was published on July 1, 1991. In addition, it has been pointed out to us that there are three errors in that booklet, and we are using this opportunity to correct those errors.

On page 8 in the first column under **CARPENTERS**, Group 3 and 4 Carpenters were assigned the same zone differential reference cities as Groups 1 and 2. Group 3 and 4 Carpenters should have their own list of reference cities as shown on the back of this sheet. Please note this correction in your booklet.

On page 12, at the top of the first column, under **LABORERS**, a footnote says; "**f) public thoroughfare only.**" This is incorrect and the entire footnote f) should be deleted. Please make this change in your booklet:

~~f) Public thoroughfare only~~

On page 19 in the second column, under **TRUCK DRIVERS**, the basic hourly rate for Group 7 should be 17.80. Please make this change in your booklet:

~~17.88~~ change to 17.80

These corrections and updates for BRICKLAYERS/STONEMASONS Area 2, ELECTRICIANS Area 2, ELEVATOR CONSTRUCTORS Area 2, PLASTERERS Area 1, ROOFERS Area 4 and Area 5, and SHEETMETAL WORKERS Area 4, are shown on the back of this sheet. For the sake of brevity, we have not included all of the explanatory information that is found in the regular booklet. Be sure to read the relevant parts of the July 1991 Booklet to make sure you understand this amendment. If you have any questions, call the PWR Coordinator at 229-6655 in Portland.

ALL RATES IN THE JULY 1991 BOOKLET WHICH ARE NOT AMENDED REMAIN IN FORCE.

LARRY SMITH

THE JULY 1, 1991 PREVAILING WAGE RATE PUBLICATION IS AMENDED AS FOLLOWS, EFFECTIVE AUGUST 1, 1991:

TRADES	BASIC HOURLY RATE	FRINGE BENEFITS

BRICKLAYERS/STONEMASONS

Area 2	**19.00**	4.37
(add $0.75 per hour to Fringe for Refractory repair work.)		

CARPENTERS

Reference cities for Group 1 and 2 Carpenters

Albany	Eugene	Longview	Portland
Astoria	Goldendale	Madras	Port Orford
Baker	Grants Pass	Medford	Reedsport
Bend	Hermiston	McMinnville	Roseburg
Brookings	Hood River	Newport	Salem
Burns	Klamath Falls	Oregon City	The Dalles
Coos Bay	LaGrande	Ontario	Tillamook
Corvallis	Lakeview	Pendleton	

Zones for Groups **3, 4,** 5, 6 and 7 Carpenters are determined by the distance between the project site and either 1) the worker's residence or 2) City Hall of a reference city for the appropriate group shown below, whichever is closer.

Reference Cities for Group 3 and 4 Carpenters

Eugene	**Medford**	**Portland**	**Vancouver**
Longview	**North Bend**	**The Dalles**	

Reference Cities for Group 5, 6 and 7 Carpenters

Astoria	Eugene	Newport	Salem
Bend	Klamath Falls	Portland	The Dalles
North Bend	Medford	Roseburg	

ELECTRICIANS

Area 2:		
o Electricians	**21.21**	**6.25**
o Cable Splicers	**22.27**	**6.28**

ELEVATOR CONSTRUCTORS

Area 2		
o Mechanic	**21.79**	5.68 + a
o Helper	**15.25**	5.68 + a
o Probationary Helper	**10.90**	-

a) Plus 8% of basic hourly rate for employees with more than 5 years of service; 6% of basic hourly rate for 6 months to 5 years of service.

LABORERS

Group 3

Asbestos Removal	Power Saw Operators (d)
Asphalt Rakers	Pumpcrete Nozzleman
Bit Grinder	Sand Blasting (dry)
Concrete Saw Operator	**Pipe Layers of all Types**
Drill Doctor	Sewer Timberman

LABORERS Group 3(continued)

Drill Operators (a)	Track Liners (e)
Gunite Nozzleman	Tugger Operator
High Scalers, Strippers, Drillers(b)	Tunnel-Chuck Tenders, Nippers, Timberman
Laser Beam (c)	Vibrator (4" and larger)
Manhole Builder	Water Blaster
Powdermen	Welder

a) Air Tracks, Cat Drills, Wagon Drills, Rubber-mounted drills, and other similar types

b) Covers work in Swinging Stages, chairs or belts, under extreme conditions unusual to normal drilling, blasting, barring-down, or sloping and stripping

c) Pipe laying, applicable when employee assigned to move, set up, align Laser Beam.

d) Bucking and falling

e) Anchor Machines, Ballast Regulators, Multiple Tampers, Power Jacks

PLASTERERS

Area 1		
o Nozzleman	**19.93**	**4.02**
o Swinging scaffold	**19.43**	**4.02**
o all other work	**18.93**	**4.02**

ROOFERS

Area 4:		
o Roofers (Add $2.00 per hour to Fringe for work with irritable Bituminous materials)	**15.75**	3.85
Area 5:		
o Roofers (Add $3.00 per hour to Fringe for work with irritable Bituminous materials)	**16.65**	**3.85**

SHEETMETAL WORKERS

Area 4	**17.14**	**3.99**

TRUCK DRIVERS

Zone 1 (Base Rate):		
o Group 1	16.73	5.50
o Group 2	16.85	5.50
o Group 3	16.98	5.50
o Group 4	17.23	5.50
o Group 5	17.45	5.50
o Group 6	17.60	5.50
o Group 7	**17.80**	5.50

APPENDIX E.

All Employee Design Charrette Summary

ALL EMPLOYEE DESIGN CHARRETTE SUMMARY

On September 9, 1991, a charette (brainstorming session) concerning the new Metro headquarters building was held in the Metro Council Chamber for all Metro and MERC employees. Neil Saling began the meeting with a summary of the current status of the project. Employees were then encouraged to voice suggestions and concerns regarding the new building. Those thoughts are broken down into four categories--**image**, **space**, **issues**, and **goals and objectives**--and summarized below:

IMAGE

Concerns were raised about the plan for parking on the lower two floors of the building, visible openings to such, and a preference for encouraging use of mass transit. It is also vital that the livability of the neighborhood be maintained, if not enhanced, aided by a pleasant and safe pedestrian experience and streetscape.

Of importance to a number of employees was the maintenance of current Metro office standards and the re-use of office furniture and supplies.

SPACE

- Smoking Lounge
- Kitchenettes (one per floor)
- Wide shelf in each restroom
- Nursing room w/ fridge (in day care)
- Separate men's/women's showers
- Back-of-house shower room access
- Coat closets (near each department)
- Sufficient departmental storage
- Sufficient departmental library space
- Lobby display space (Metro store)
- Conference space (privacy)
- In-house training center
- Panel systems between offices
- Freight elevator
- Sufficient windows/atrium (skylights)
- Hot water taps (on coffee makers)
- Full length mirrors in restrooms
- Ice machine/ice maker in a fridge
- Assigned lockers in shower rooms
- Exercise room
- Delivery space (back-of-house/unloading)
- Microfilm archive
- Secure, covered bicycle parking
- High security (DP, Personnel, etc.)
- Bulletin and white boards in conf. rooms
- Safe building access for employees
- Escalators (in or out?)
- Recycling chutes to central bins (near freight elevator

There should be an area or areas where employees can make private telephone calls, and this should be somewhere other than in the employee break room. On the subject of privacy, there needs to be at least one private office space in each department that can be used for private discussions on an immediate basis; this should be in addition to pre-scheduled conference rooms accessible by several departments.

Regarding the Council Chamber and associated space, it was noted that it would be helpful for employees to have a work space--furnished with a PA system and/or closed-circuit TV--adjacent to the Council Chamber. This would enable staff to work on projects while waiting for a specific agenda item.

Another general concern was planning to minimize movement of people and offices when expansion occurs in the new building.

ISSUES

Employees are quite concerned and want sufficient windows and natural light in the building. Additionally, they would like windows to be open-able and treated to enhance solar gain but cut down on bright glare. It was suggested that the perimeter of the building be maintained as circulation, i.e. minimize or prohibit private offices on the perimeter.

Regarding transportation, employees desire expansion of Fareless Square and want to know if expansion would include the new headquarters building. Also, due to the increased number of employees and possibly decreased access to downtown meetings from the East side, expansion of the agency's fleet of cars should be considered.

Of importance to many is the safety and security of the new building, including well-lit, open pedestrian and bicycle/car parking areas. Employees would like to see zoned security within the building. For example, when Council and other public meetings occur, the Council Chamber might be open to the public while the rest of the building would be inaccessible. ID cards for employee access were also suggested.

Backup power for the building and/or parts thereof, especially if an ID card access system were in place. Better and adequate capacity of electrical wiring is a "must" according to Data Processing staff, for office expansion and an ever increasing number of computers.

Regarding panel systems or possible lack thereof, employees have concerns about noise levels within the office space, especially the noise levels of certain types of office equipment.

New upholstery and carpet often contain noxious gasses to which many people are sensitive. It is suggested that such new items be given time to "air out" prior to employee move-in.

GOALS AND OBJECTIVES

Basic to renovation of the building is the need to meet or exceed all code requirements, including seismic coding. Metro currently plans to exceed the required "2B" seismic code by renovating to a "3" code, but at least one employee would like to see the Metro headquarters building at a level "4" seismic code.

It is a goal of Metro to provide the best possible access and facilities for handicapped individuals within the new headquarters building.

All efforts should be made to encourage use of mass transit, and a "trans-token" idea was discussed. A trans-token would be given to each employee and might be worth $15, for example. This could be used toward a parking spot, bus pass or Max pass. Employees would be encouraged to use mass transit or put such tokens together for a parking spot and carpool to work.

A major goal for Metro is to do as much as possible with recycling. In this respect, ideas include a recycling room (preferably with chutes from other floors of the building) to be located near the freight elevator and loading dock. Another aspect of this goal is the efficient salvage and recycling of as many office materials and supplies as is possible from the current Metro Center.

It is vital to all employees that a growth plan is prepared that will cut down on the movement of people and offices.

All possible energy conservation within the new building is a priority.

A more efficient (and better working) HVAC system would be appreciated by all.