PROJECT MANUEL 4A NOISE MONITORING SYSTEMS 1978

SET NO. 36

PROJECT MANUAL

including

SPECIFICATIONS

for a

NOISE MONITORING SYSTEM

PORT OF SEATTLE

at

SEA-TAC INTERNATIONAL AIRPORT
Seattle, Washington 98188

Issued by

PORT OF SEATTLE COMMISSION
General Offices, Pier 66
Seattle, Washington
(Mailing Address: P.O. Box 1209, Seattle, WA 98111)

Prepared under Direction
of

VERNON L. LJUNGREN
Chief Engineer

JUNE 21, 1978

POS 22645

C-2144

SEA-TAC INTERNATIONAL AIRPORT

NOISE MONITORING SYSTEM

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ADVERTISEMENT FOR BIDS

SEA-TAC INTERNATIONAL AIRPORT

NOISE MONITORING SYSTEM

Sealed bids will be received by the Chief Engineer, Port of Seattle, at the Engineering Department bid counter, 2nd floor, Pier 66, Seattle, Washington, until 2:00 PM PDT, July 20, 1978, for a Noise Monitoring System at Sea-Tac International Airport.

The bids will then and there be publicly opened and read aloud. Any bids received after the time for opening cannot be considered.

Bid documents may be examined at the above-named office Monday through Friday between 8:00 a.m. and 12:00 Noon and 1:00 p.m. and 4:30 p.m., and may be obtained for bidding purposes upon deposit of $10.00 for each set.

Each bid must be accompanied by a cashier's check, money order or surety bid bond, in an amount of not less than ten percent (10%) of the total bid, made payable to the Port of Seattle. A performance and payment bond will be required with the contract.

Time limit for completion of the work is two hundred seventy (270) calendar days from the date of notice to proceed.

The Port reserves the right to reject any and all bids, to waive any informality, to accept any alternate bids and to make such award that it deems to be in its best interest and pursuant to the terms of the General Conditions.

The Port of Seattle is an Equal Opportunity Employer.

Dated at Seattle, Washington, this 21st day of June 1978.

AUTHORIZED BY THE
PORT COMMISSION OF THE PORT OF SEATTLE

for VERNON L. LJUNGREN
CHIEF ENGINEER, PORT OF SEATTLE

First Publication: June 21, 1978

Final Publication: July 5, 1978

POS 22647

PROPOSAL

Date

Port of Seattle Commission
General Offices, Pier 66
Seattle, Washington 98121

Gentlemen:

1. Bid: Having carefully examined the contract documents titled:

NOISE MONITORING SYSTEM

as well as the site of the project and conditions affecting the work, the undersigned proposes to furnish all the labor, materials, equipment superintendence, insurance and other accessories and services necessary to perform and complete all of the work required by and in strict accordance with the above documents and the implied intent thereof, for the following price:

A. BASIC SYSTEM

Bid Item No.	Quantity	Description	Amount (Figures)	Amount (Words)
1	Job	For furnishing, delivering and installing of all equipment, as required and in accordance with the specifications and other documents, a Noise Monitoring System	$_____	
2		For one (1) year, maintenance service contract for the Noise Monitoring System	$_____	
Base Total Bid Price			$_____	

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2. State Sales Tax: The above bid does not include State or Local retail sales tax.

3. Completion: The undersigned agrees to complete all of the work included in this contract within 270 calendar days after award of contract and notice to proceed.

4. Progress Payment Retention: The undersigned elects that, during the life of the contract, the money withheld from his progress payments be retained in either of the following, as indicated. Failure to so indicate shall be construed as approval of Item (a).

   (a) A fund with the Port _____ Initials

   or

   (b) An escrow with the Peoples National Bank of Washington _____ Initials

5. Proposed Major Subcontractors and Material-and-Equipment Suppliers:

   _____

   _____

   _____

6. Addenda: Receipt of addenda numbered through _____ is hereby acknowledged.

7. Legal Representation: In all legal matters relating to this contract, the undersigned will be represented by:

   _____

   _____

8. Bid Withdrawal: The above bid will not be withdrawn within 60 days after the actual date of the opening thereof.

Contractor _____

By _____
(Signature) (Title)

Address _____

_____

Phone No. _____ Zip Code _____

B. OPTION PRICE SCHEDULE

UNIT	DESCRIPTION	LOT SIZE	UNIT PRICE Figures	Words
Each	Adding/Deleting a RMS, including: - CPS Interface Modules - Weather Proof Enclosure for CIU (Section 16910)	1 to 7	$_____	
N/A	Lower Wind-Induced Noise Floor (Section 16910, 2.01 C)	8 RMS's	$_____	
N/A	Elimination of Signal Cable Installation and Wind Signal Interfaces (Sections 16920, 2.03 and 16930, 2.16) (credit)		$_____	
N/A	Hourly L_{eq} Option (Section 16940, 2.05)		$_____	
N/A	Day-Night SEL Threshold Option (Section 16940, 2.06)		$_____	
N/A	HNL Threshold-Controlled Accumulations (Section 16940, 2.10)		$_____	
N/A	Higher-Order Language Programming (Section 16940, 2.25)		$_____	

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SCHEDULE OF VALUES

Bidders are requested to complete the following schedule of values. This schedule will be used by the Port for accounting purposes only, and will not be used for adjustment purposes. The sum total of this schedule shall equal the amount of bid Item 1.

ITEM	ESTIMATED COST
RMS, each	$_____
Computer	$_____
Data cassette recorder	$_____
Display board	$_____
Keyboard terminal, line printer	$_____
2-channel Graphic Level Recorder	$_____
Software	$_____
Factory testing	$_____
On-site testing	$_____
Central Station hardware	$_____
System integration	$_____

MANUFACTURER'S EXPERIENCE RECORD

Number of airport noise monitoring systems by this bidder which are presently in operation

_____

Number of airport noise monitoring systems by this bidder which are presently under contract

_____

List name, address and telephone number of all purchasers of airport noise monitoring systems manufactured by the bidder; indicate whether "operational" or "under contract":

1. Name _____
   Address _____
   Person to Contact _____

2. Name _____
   Address _____
   Person to Contact _____

3. Name _____
   Address _____
   Person to Contact _____

4. Name _____
   Address _____
   Person to Contact _____

5. Name _____
   Address _____
   Person to Contact _____

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PROPOSED PROGRESS SCHEDULE

NOISE MONITORING SYSTEM

SEA-TAC INTERNATIONAL AIRPORT

ITEM (See Special Conditions, SC-08.3)	MONTHS AFTER NOTICE TO PROCEED											
	1	2	3	4	5	6	7	8	9	10	11	12

POS 22653

ATTENTION TO BIDDERS

The General Conditions have been revised. Each section, article or paragraph marked with an asterisk (*) indicates a revision. Because of the interrelation of the sections of the General Conditions you are advised to review the set in its entirety.

POS 22654

PORT OF SEATTLE

GENERAL CONDITIONS

PORT OF SEATTLE ENGINEERING DEPARTMENT

OFFICE OF THE
CHIEF ENGINEER

REVISED SEPTEMBER, 1977

POS 22655

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Section G-01
*Definitions and Terms

Whenever in the contract, the specifications and other contract documents the following abbreviations, words and terms or pronouns in place of them, are used, the meaning will be construed as follows:

G-01.1 Abbreviations

Whenever the following abbreviations are used in these specifications or on the plans, they are to be construed the same as the respective expressions represented:

A.A.N.	American Association of Nurserymen
A.A.R.	Association of American Railroads
A.A.S.H.O.	American Association of State Highway Officials
A.C.I.	American Concrete Institute
A.G.C.	Associated General Contractors of America
A.I.A.	American Institute of Architects
A.I.S.C.	American Institute of Steel Construction
A.I.S.I.	American Iron and Steel Institute
A.N.S.I.	American National Standards Institute
A.R.A.	American Railway Association
A.R.E.A.	American Railway Engineering Association
A.S.C.E.	American Society of Civil Engineers
A.S.H.R.A.E.	American Society of Heating, Refrigeration and Air Conditioning Engineers
A.S.L.A.	American Society of Landscape Architects
A.S.M.E.	American Society of Mechanical Engineers
A.S.T.M.	American Society for Testing and Materials
A.W.P.A.	American Wood Preservers' Association
A.W.S.	American Welding Society
A.W.W.A.	American Water Works Association
C.P.M.	Critical Path Method of Project Scheduling
C.R.S.I.	Concrete Reinforcing Steel Institute
F.A.A.	Federal Aviation Administration
F.H.W.A.	Federal Highway Administration
F.S.S.	Federal Specifications and Standards
I.E.E.E.	Institute of Electrical and Electronic Engineers
N.B.F.U.	National Board of Fire Underwriters
N.E.C.	National Electrical Code
N.E.M.A.	National Electrical Manufacturers Association
O.S.H.A.	Occupational Safety and Health Act
P.C.A.	Portland Cement Association
S.A.E.	Society Automotive Engineers
S.M.A.C.N.A.	Sheet Metal and Air Conditioning Contractors National Association, Inc.
U.B.C.	Uniform Building Code
U.L.	Underwriters' Laboratory
W.I.S.H.A.	Washington Industrial Safety and Health Act

G-01.2 Bid or Proposal

The offer of a bidder, in the prescribed form properly executed, to perform the contract.

G-01.3 Bidder

An individual, partnership, firm, corporation or joint venture, submitting a proposal.

*Revised 9/1/77
820/17/01

G-01.4 CPM/Cost Module

A cost breakdown of activities on the CPM project schedule. The cost of each activity is shown on the CPM with the total of these costs equaling the contract price.

G-01.5 Commission, Port of Seattle Commission

The elected body and the members thereof having authority over Port of Seattle matters as provided by law.

G-01.6 Chief Engineer

The Chief Executive Officer of the Engineering Department.

G-01.7 Contract Sum

The Contract Sum is stated in the Agreement and, including authorized adjustments thereto, is the total amount payable by the Port to the Contractor for the performance of the Work under the Contract Documents.

G-01.8 Contract Documents

The Contract Documents shall consist of; the plans, drawings, General Conditions, Special Conditions, specifications, addenda, change orders, agreement or contract, form of bond, insurance certificates and any other form that may be requested in the Special Conditions.

*G-01.9 Contract or Purchase Order

The written agreement between the Port and the contractor setting forth the obligations of the parties thereunder including but not limited to, the performance of the work, the furnishing of labor and materials, and the basis of payment.

G-01.10 Contract Bond

The approved form of security furnished by the Contractor and his surety as required by the contract.

G-01.11 Contractor

The individual, partnership, firm, corporation or joint venture, contracting with the Port for performance of prescribed work.

*G-01.12 Drawings

The graphic presentation of the Work, or parts thereof, which indicates the size, form, location, and arrangement of the various elements.

*G-01.13 Engineer

The chief executive officer of the Engineering Department and such agents as are authorized to act in his behalf.

*G-01.14 Fee

The monetary consideration included as a part of the cost for overall management and direction of a project, sometimes referred to as "profit."

G-01.15 Inspector

The Engineer's authorized representative assigned to make detailed inspections of contract performance.

G-01.16 Laboratory

The official laboratories of the Port of Seattle, including either private or public laboratories authorized by the Port to test work, soils and materials.

*G-01.17 Plans

The concept or mental formulation for the work of this project. The plans may be represented graphically by drawings, by the written word within the Project Manual, or both.

G-01.18 Port

The Port of Seattle or the Port of Seattle Commission.

*G-01.19 Project Manual

A book, usually bound, containing the bidding forms and the contract documents, either collectively or by reference, as of the day of first publication.

*G-01.20 Provide

The all-inclusive actions required to furnish, install, connect, adjust, test, and make ready for use or occupancy.

G-01.21 Resident Engineer

The authorized representative of the Chief Engineer, located on or near the job site and assigned immediate charge of the on-site engineering and administration of the construction project.

*G-01.22 Roadways

A general term denoting a route for purposes of vehicular travel, including the entire area within the right-of-way.

*G-01.23 Section

A section within these General Conditions or Technical Specifications which shall cover one complete subject or a basic unit of work; a single entity that generally describes a particular material or product and its installation.

G-01.24 Site

A general term denoting land, property, or interest therein, acquired for or devoted to Port purposes.

*G-01.25 Special Conditions

Additions and revisions to the general conditions applicable to an individual project.

G-01.26 Specifications

The compilation of provisions and requirements which govern the quality and performance of the Work.

G-01.27 State

The State of Washington.

G-01.28 Subcontractor

An individual, partnership, firm, corporation or joint venture, to which the Contractor sublets part of the contract.

G-01.29 Supplier

The individual, partnership, firm, corporation, or joint venture contracting with the Port to supply, provide, or furnish any material or equipment.

G-01.30 Surety

The sureties or surety company who engage to be responsible for the bidder's execution of the contract and contract bond, or is bound with the Contractor to insure performance of the contract, payment of all obligations pertaining to the work, and fulfillment of such other conditions as are specified in the contract and contract bond, or otherwise required by law.

*G-01.31 Technical Specifications

That portion of the Project Manual which describes the Work in Division 1 through Division 16 as listed in the Project Manual Table of Contents.

G-01.32 Titles (or Headings)

The titles or headings of the sections and subsections herein are intended for convenience of reference and shall not be considered as having any bearing on their interpretation.

G-01.33 Waterway

The area within federally-established boundaries restricted for shipping.

G-01.34 Work

Work shall mean the furnishing of all labor, materials, equipment and other incidentals necessary or convenient to the successful completion of the project and the carrying out of all the duties and obligations imposed by the contract.

*G-01.35 Working Drawings

Stress diagrams, shop drawings, erection plans, falsework plans, framework plans, cofferdam plans, bending diagrams for reinforcing steel, or other supplementary plans or similar data which the Contractor is required to submit to the Engineer for approval.

Section G-02
Bid Procedures and Conditions

G-02.1 Prequalification of Bidders

No prequalification requirements are imposed prior to submitting a bid; however, each bidder is advised that a written statement may be required prior to consideration of his bid, showing the experience of the bidder and the amount of capital and equipment he has available for performance of the proposed work.

*G-02.2 Plans and Specifications

A. Informational copies of plans and specifications will be placed on file in the offices of the Chief Engineer of the Port of Seattle and the chapter offices of the Associated General Contractors of America, Plan Bureau, and Central Area Contractors Association at Seattle.

B. Plans and specifications may be obtained from the Chief Engineer, Port of Seattle, Pier 66, Seattle, Washington, by payment of the amount set forth in the call for bids. Payment shall accompany a letter request for plans. If such fee is paid by check, it shall be payable to the Port of Seattle.

C. Plans and specifications, after award of contract, will be issued on the following basis:

(1) A maximum of ten sets of plans and accompanying specifications to the successful bidder without cost.

(2) One additional set of plans and accompanying specifications to each approved subcontractor without cost.

(3) Additional plans and accompanying specifications will be furnished the successful bidder or his approved sub-contractors for a charge of 35 cents per plan sheet and 5 cents per page of specification.

Orders amounting to less than $1.00 including mailing and handling will not be charged.

*G-02.3 Estimated Quantities

The estimated quantities shown in the proposal and the contract are estimates only, being given only as the basis for the comparison of bids, and the Port does not warrant, expressly or by implication, that the actual amount of work will correspond therewith. The right to increase or decrease the amount of any class or portion of the work, or to make changes in the work required as may be deemed necessary is reserved by the Port as provided elsewhere in these specifications. The basis of payment will be the actual quantities of work performed in accordance with the specifications.

*G-02.4 Examination of Plans, Specifications and Site of Work

A. The bidder will examine carefully the sites, including material sites, of the proposed work, the proposal, plans, special conditions, specifications, addenda, and contract therefor. The submission of a bid shall be conclusive evidence that the bidder represents and acknowledges that he has made such examinations and has investigated and is satisfied as to the conditions to be encountered, the character, quantity, quality, and scope of work, the quantities and qualities of materials to be supplied and equipment and labor to be used, and the requirements of the proposal, plans, special conditions, specifications and addenda for performance of the work in full.

B. The bidder must be familiar with all Federal, State and local laws, ordinances and regulations which in any manner might affect those engaged or employed in the work, the materials, equipment or procedures used in the work, or which in any other way would affect the conduct of the work. He is assumed to be familiar with such laws and regulations, and no plea of misunderstanding or ignorance of the law will be considered.

C. The bidder shall determine from careful examination of the contract documents and site of the Work, the methods, materials, labor and equipment required to perform the work in full and shall reflect the same in his bid prices. If in the performance of the work, methods, materials, labor or equipment are required beyond those anticipated by the bidder, he will not be entitled to additional compensation.

G-02.4 Examination of Plans, Specifications and Site of Work (continued)

*D. Where the Engineering Department has investigated the site of the proposed work, including investigation of possible subsurface conditions, such an investigation is made only for purpose of study and design. Bidders may inspect subsurface boring logs made by the Port in such investigations. Such inspections are deemed solely for the bidders' convenience and the Port assumes no responsibility whatsoever for the sufficiency or completeness of investigations made or interpretation thereof. Such records of borings are not part of the contract and there is no representation or warranty expressed or implied, that the conditions interpreted from investigations are correct, that different materials or materials in different proportions or moisture content than indicated will not be encountered or that unanticipated developments will not occur. The availability of such information from the Port shall not relieve the bidder or the Contractor of the duty to make his own examination and investigation as required in this section or of any other responsibility under the contract.

E. Where logs of test borings are included in the contract plans it is agreed that such logs do not constitute a part of the contract and are included only for the convenience of the bidder or Contractor and do not relieve him of his duties under this section or of any other responsibility under the contract.

*F. No information derived from inspection of records of investigation or compilation thereof made by the Port will in any way relieve the bidder or Contractor from risks or from properly performing his obligations under the contract.

G-02.5 Proposal Forms

*A. The proposal form will identify the project and state the location and description of the contemplated construction. Such form shall contain a statement of the item of work to be performed and materials to be furnished at unit bid prices, estimated quantities thereof, and spaces for unit prices, extensions thereof, and the total amount of the bid for unit price contracts. For lump sum contracts there shall be a space for the lump sum price. For either form there will be a space for the name of the firm, date of the bid, address of the bidder and the bidder's signature.

*B. The contract documents relating to the project referred to in the proposal shall be considered to be part of the proposal.

G-02.6 Preparation of Proposal

A. The bidder shall submit his proposal properly executed on the form furnished by the Port. No other form shall be considered unless expressly authorized prior to submission.

*B. For unit price proposals a price shall be submitted for each item of work, an extension thereof, and the total amount bid. Such prices shall be stated in clearly legible figures only and shall be in ink or typed.

C. For lump sum proposals the total contract lump sum price shall be submitted.

D. If business is conducted under a firm name, such name shall be inserted in the appropriate blank on the proposal form. Where dealing under an assumed name, a certified copy of Certificate of Assumed Name, as filed with the county clerk, shall accompany the proposal or be filed with the Port.

*E. If the bidder is a corporation, proposals shall be signed by the officer or officers or authorized representative having authority to sign such proposal. If a bidder is a partnership, the proposal shall be signed by an authorized member of the partnership. When the bidder is a joint venture, the proposal shall be signed by one or more representatives authorized to sign.

F. If the Port should so require, evidence of legal authority to sign shall accompany the proposal or be on file with the Port.

*G-02.7 Bid Bond

Each bid shall be accompanied by a deposit of cash, certified check, cashier's check, or surety bond, in an amount equal to at least ten percent (10%) of the total amount bid. Checks shall be payable to the Port of Seattle.

G-02.8 Delivery of Proposal

A. Each proposal shall be sealed in the envelope which has been clearly marked with the words "Bid Proposal By" followed by the name and address of the bidder, the Port-designated project number and name, the time and the date for the bid opening.

B. No bid proposal shall be considered which has not been filed with the Chief Engineer before the time fixed for the opening of bid proposals in the published call for bids.

G-02.9 Withdrawal or Revision of Proposal

A bidder may withdraw or revise his bid proposal after it has been deposited with the Chief Engineer provided that the request for withdrawal or revision is filed with the Chief Engineer in writing before the time set for opening proposals. The original proposal as modified in writing will be considered as the proposal submitted by the bidder.

G-02.10 Combination and Multiple Proposals

If the Port elects, proposals may be issued for projects in combination and/or separately, or a project may be set up for performance and bids by different methods, so that bids may be submitted either on the combination or on the different methods stated. The Port reserves the right to make awards on combination bids or separate bids by whichever method it deems to be the most advantageous to the Port. No combination bid other than those specifically set up in the proposal will be considered. If contracts are awarded for combinations of projects, separate contracts will be written for each individial project included in the combination.

A bidder who is bidding on more than one proposal at a single letting may attach to each of his proposal forms submitted at such letting one of the following:

"We prefer to receive an award of not more than (number) contracts for projects upon which we have submitted bids at this letting;" or

"We prefer to receive awards totaling not more than $..... for projects upon which we have submitted bids at this letting."

Any such attachment shall not render such proposal irregular. The Port, regardless of any such attachment, shall award each contract to whomever it deems the lowest responsible bidder but may consider such attachment in determining the responsibility of such bidder to perform each contract upon which he has attached such a provision.

G-02.11 Public Opening of Proposals

Proposals will be opened and read publicly at the time indicated in the call for bids unless the Port has continued the date of opening bids to a day certain, rejected any bid or bids, or has cancelled the call for bids. Bidders, their authorized agents, and other interested parties are invited to be present.

*G-02.12 Irregular Proposals

A proposal shall be considered irregular and may be rejected by the Port for any of the following reasons:

A. If the proposal form furnished or authorized is not used or is altered;

B. If the proposal form as completed contains any additions, deletions, unauthorized alternate bids, or conditions;

C. If the bidder adds any provisions reserving the right to reject or accept the award, or enter into the contract;

D. If the proposal or bid bond is not properly executed, or shows an incorrect amount;

E. If the proposal fails to include a unit price for every bid item;

F. If the Port, for good cause, deems the bid bond inadequate;

G. If the Port deems any of the unit prices to be excessively unbalanced either above or below the amount of a reasonable bid for the item of work to be performed to the potential detriment of the Port.

H. If bid is not based on American dollars.

G-02.13 Disqualification of Bidders

The Port in its discretion, may determine that a bidder is not responsible and reject his proposal for any of the following reasons:

A. More than one proposal on the same project from a bidder under the same or different names.

*B. Evidence of collusion with any other bidder or bidders. Participants in such collusion shall be disqualified from submitting bids on further work.

*C. Unsatisfactory performance record, judged from the standpoint of conduct of work, workmanship, or progress, as shown by past or current work.

D. Uncompleted work, whether for the Port or otherwise, which might hinder or prevent the prompt completion of the work bid upon.

E. Failure to pay or settle bills for labor or materials on former or current contracts.

F. If the bidder has previously defaulted in the performance of or failed to complete a written public contract, or has been convicted of a crime arising from a previous public contract.

G. Any other inability, financial or otherwise, to perform the work.

H. A bidder not authorized to do business in the State of Washington.

I. For any other reasons deemed proper.

*G-02.14 Pre-Award Information

Before a contract is awarded, the bidder being considered for award may be required to furnish a complete statement as to the origin, composition and manufacture of materials to be used in the construction of the work, together with samples, which samples may be subjected to tests to determine their quality and fitness for the work as provided under the contract.

G-02.15 Alternates to Proposal

At the time of bidding, any bidder having submitted a conforming proposal, may in addition submit as part of his proposal any alternates to that proposal which he considers to be in the interest of the Port. The Port may consider such alternates in evaluating proposals and shall be the sole judge as to whether or not such alternates are in its best interest.

Section G-03
Award and Execution of Contract

G-03.1 Consideration of Bids

A. When proposals are opened and read, they will be checked for mathematical accuracy with respect to the extensions of unit bid prices and the total price of the contract. If there is a discrepancy between the unit bid price and the extended amount on any bid item, the unit bid price shall control. The total of extensions, corrected where necessary, will be used as the amount of the bid for award purposes and will fix the amount of the contract bond.

*B. The right is reserved to accept a proposal of the lowest responsible bidder, an alternate proposal, to reject any or all bids, republish the call for bids, revise or cancel the work to be performed, or to do the work otherwise, if in the judgment of the Port Commission the best interest of the Port is served thereby.

*G-03.2 Award of Contract

Unless otherwise stated in the special conditions, the award of contract, if it be awarded, shall be made within 30 calendar days after the date of opening of bids to the lowest bidder deemed responsible by the Port Commission. The successful bidder will be notified, by a certified letter mailed to the address shown on his proposal, that his bid has been accepted and that he has been awarded the contract.

G-03.3 Execution of Contract

*A. The successful bidder shall sign the contract form furnished by the Commission and return it within ten (10) calendar days after the date of award.

B. No proposal is binding upon the Port until the contract is fully executed.

*C. The Contractor shall start the Work as directed in the "Notice to Proceed."

*D. Work performed within the project limits or Port-furnished sites prior to the execution of the contract and work performed outside such areas or material ordered prior to such execution shall be at the sole risk of the Contractor.

*G-03.4 Cancellation of Award

The Port reserves the right to cancel the award of any contract at any time before the execution of said contract by all parties without liability against the Port.

G-03.5 Contract Bond

*A. The successful bidder shall furnish a duly-executed bond upon a form furnished by the Port, within ten (10) calendar days following date of award, signed by an approved surety or sureties in the full amount of the Contract Sum conditioned upon the faithful performance of the contract by the Contractor within the time prescribed therein. Failure to provide such bond will result in cancellation of the award. The Port may, from time to time, require such surety or sureties to appear and qualify themselves upon the bond. If such surety or sureties shall refuse to qualify, or if the Port shall determine that such surety or sureties are insufficient to fulfill the terms and conditions of the bond, then the Port shall require the Contractor to furnish additional surety or sureties as may be necessary to fulfill the terms and conditions of the bond.

*B. If the Contract Sum is increased by change order or otherwise, Contractor agrees to provide the Port with such additional payment and performance bond as required to assure performance of any additional work and payment for the labor and materials incidental to such work. Any change order the total cost of which is less than 10% of the original penalty of the bond shall not require consent of surety.

G-03.6 Failure to Execute Contract

A. If the successful bidder fails to execute the contract and furnish satisfactory bond within ten (10) days from the date of award, exclusive of the day of award, or declares in writing his intent to not execute the contract, his deposit shall be forfeited to the Port and the Port Commission may award the contract to the second lowest responsible bidder. If the second lowest responsible bidder fails to enter into the contract and furnish bond within ten (10) days after award to him, forfeiture of his deposit shall also be made and the contract may be awarded to the third lowest responsible bidder, and in like manner until the contract and bond are executed by a responsible bidder to whom award is made, or further bid proposals are rejected or the number of bid proposals is exhausted.

B. If the contract is not executed or not provided within the time required, and there appears circumstances which the Port Commission deems to warrant an extension of time it may extend the time for execution of the contract or for furnishing bond for not to exceed ten (10) additional days.

*G-03.7 Return of Bid Bond and Deposits

As soon as bid prices have been compared, the Chief Engineer will return the bid bond and deposits accompanying such of the proposals as in his judgment would not be considered in making the award. All other bid bonds and deposits will be held until the contract and bond have been executed, after which all bid bonds and deposits, except such as have been forfeited, will be returned to the bidders whose proposals they accompanied.

Section G-04
Scope of the Work

G-04.1 Intent of Contract

The Contractor shall furnish all labor, materials, tools, equipment, transportation, supplies, and incidentals required to make each and every part of the work complete. All work and materials required to fully perform the work shall be considered as incidental and included in the contract bid prices.

*G-04.2 Coordination of Contract Documents

The contract documents are all essential parts of the contract and a requirement occurring in one is binding as though occurring in all. They are intended to be complementary and prescribe and provide for a complete work. Work or material that has been omitted from the description of the work but is required to complete the work shall be furnished by the Contractor as though it had been specifically stated.

In case of discrepancies, technical specifications shall govern over drawings, larger scale drawings shall govern over smaller scale drawings, and Special Conditions shall govern over General Conditions. Where appearing on drawings, computed dimensions shall govern over scaled dimensions.

In the event of conflict between Contract Documents and applicable laws, codes, ordinances, regulations or orders of any competent authority having jurisdiction over the work or any portion thereof, or in the event of any conflict between such applicable laws, codes, ordinances, regulations or orders, the most stringent requirements of any of the above shall govern and be considered as a part of this contract in order to afford the Port the maximum benefits thereof.

*G-04.3 Special Conditions

Conditions or work not covered by the specifications may be described in the special conditions and shall be performed by the Contractor in accordance therewith and in accordance with the specifications insofar as applicable, and all costs incurred in the performance thereof shall be included in contract bid prices. Work required by the special conditions for which a price is not provided shall be considered as incidental to the construction and all costs shall be included in the contract bid prices.

G-04.4 Changes

A. The Port reserves the right to make, at any time during the progress of the work, increases or decreases in quantities and alterations in the details of construction, including the deletion, or alteration of any portion of the work and the addition of any new item of work, as may be found to be necessary or desirable by the Engineer. Any such change will be set forth in a written change order, which order will specify, in addition to the work to be done, the basis of compensation for such work.

Where unit prices were included as part of the Contractor's bid proposal or established under an earlier change order to the contract and the work does not differ materially from that work, it shall be measured and paid for at the unit price subjectd to the following conditions:

(1) Whenever the quantity of any item required to be constructed is more than 80 percent or less than 120 percent of the quantity for which the unit price was established, payment will be made at the contract unit price for the quantity of work actually performed.

(2) If it is found that the quantity of any item will be less than 80 percent of the quantity for which the unit price was established, the Contractor may submit a written request for a revision in the basis for payment, accompanied by evidence to support the revision claimed. The claim will be considered only so far as it justifies an increased share of fixed expenses chargeable to that item.

(3) If it is found that the quantity of any item will be more than 120 percent of the quantity for which the unit price was established, either party to the contract may submit a written request for a revision in the basis of payment, subject to the following limitations:

(a) The request must be accompanied by evidence to support the revision requested.

(b) The contract price shall apply to all work performed up to, and including, 120 percent of the quantity for which the unit price was established.

(c) The revised price, if agreed upon, shall apply only to the quantity of work performed in excess of 120 percent of the quantity for which the unit price was established.

*B. If no unit price has been established for the work, then compensation shall be at a price agreed upon in advance. The Chief Engineer may require, prior to the approval of a change order, that the contractor submit his detailed price calculations substantiating the price requested for the change. The detailed price calculations shall indicate the estimated cost for all labor, material, equipment and subcontractor's quotations. The estimate shall also show as a separate item the allowance for markup, contingencies, overhead or contractor's fee, the total of which shall not exceed the applicable percentages allowed for force account work as defined in Section G-09.6A. Contractor's cost records pertaining to work performed for which the price has been agreed to in advance, shall not be subjected to the inspection and audit provisions of Section G-09.6E.

*C. If no price can be agreed upon in advance, the Chief Engineer may, by written change order, authorize the Contractor to proceed by Force Account as provided in Section G-09.6. Upon receipt of a change order approved by the Engineer, the Contractor shall proceed with the ordered work. When ordered to proceed by Force Account, the Contractor shall prosecute such work in the most efficient, economical and workmanlike manner consistent with the best interest of the Port of Seattle.

D. The Contractor shall obtain the consent of surety to any change order the amount of which exceeds 10% of the original penalty of the bond.

G-04.5 Procedure and Protest by the Contractor

A. The Contractor accepts the terms and conditions of the change order by endorsement thereon, or by failure to protest as provided in this section. Payment in accordance with the terms of the change order shall constitute full compensation including all labor, materials, equipment, overhead, damages, if any, and for any work changed and all work required to be performed under the change order. If the Contractor disagrees with any terms or conditions set forth in an approved change order, he shall give immediate oral notice of protest to the Engineer prior to performing the work and he shall submit a written protest to the Engineer within ten (10) calendar days of his receipt of such order. The protest shall state the points of disagreement and the applicable contract specifications, and an estimate of quantities and costs involved. When protest of an approved change order relates to compensation, the Contractor shall keep full and complete records of the costs of such work and shall permit the Port to have such access thereto as may be deemed necessary to assist in evaluating the protest.

B. Protest shall not relieve the Contractor from his obligation to proceed promptly with the work as ordered by the Engineer, and no consideration for adjustment will be given to work performed preceding his oral notice of protest to the Resident Engineer.

G-04.6 Changed Conditions

A. The Contractor shall notify the Resident Engineer promptly in writing of: (a) subsurface or latent physical conditions at the site differing materially from those indicated in the contract, or (b) unknown physical conditions of an unusual nature at the site differing materially from those ordinarily encountered and generally recognized as inherent in the work of the character provided for in the contract. If such notice is not given prior to the condition being materially disturbed, or such condition is disturbed before the Contractor is ordered by the Engineer to continue the work, the Contractor will be deemed to have waived extra compensation for any additional or different work and material required because of such conditions.

B. If the Engineer finds that changed conditions do exist and cause a material change either in the Contractor's costs or time required to perform the contract, the Engineer may make an equitable adjustment in the amount of compensation to be paid for the performance of the work involved, or the time required, by agreement with the Contractor. If the parties are unable to agree, the Engineer may pay for such work as provided in Section G-09.6 "Force Account" and allow such additional time of performance as he deems proper.

G-04.7 Progress Estimates and Payments

Progress estimates of work performed on any portion or portions of the work made by the Engineer or payments therefor, shall not be evidence of performance or an admission by the Port of any work or quantities shown thereon. Such estimates made during progress of the work are tentative and made for the purpose of determining pay quantities for partial payment only, and are subject to change at any time prior to final acceptance by the Chief Engineer. The Chief Engineer may make any changes in such estimates and in the final estimate as he deems to be proper.

G-04.8 Use of Buildings or Structures

If the Contractor desires to use or permit any building or structure on the site to remain during the performance of the contract, such use or existence will be at the discretion of the Engineer.

G-04.9 Use of Materials Found on the Project

A. Upon written approval of the Engineer, or as designated in the contract Documents, the Contractor may use on the project any stone, gravel, sand or other materials found in the required excavation, or any other material removed in performing the work, provided that such materials satisfy the requirements of the contract and are not required for other use under the contract or these specifications. In no event shall such use be permitted to the detriment of the Port.

B. The volume of any such excavation materials, shall be paid for at the unit price of the items for which they are used and, except top soil, shall be deducted from the quantities of excavation.

C. When directed by the Engineer, materials disturbed on the work and not used by the Contractor shall be neatly piled or otherwise distributed on the site in areas, and in a manner designated by the Engineer, and shall remain the property of the Port.

*G-04.10 Final Cleanup

Upon completion of the work and before final inspection, the Contractor shall clean the work sites, material sites, and all grounds occupied by him in connection with the work of all rubbish, surplus and discard materials, falsework, camp buildings, temporary structures, equipment and debris which accumulated during the work. All parts of the work shall be left in a neat and presentable condition. All extraneous over-sized rock from grading, surfacing, and paving operations shall be deposited in embankments or otherwise disposed of to the satisfaction of the Engineer. The Contractor shall not remove, warning, regulatory and guide signs prior to formal acceptance except as requested by the Engineer.

*G-04.11 Cleanup During Work

From time to time, or as may be ordered by the Engineer, the Contractor at his own expense shall clean up and remove all refuse and unused materials resulting from the work. Upon failure to do so within 24 hours after request by the Engineer, the work may be done by Port of Seattle and the cost thereof be charged to the Contractor and deducted from the contract price.

Section G-05
Control of Work

G-05.1 Authority of the Engineer

A. The work under the contract shall be done to the complete satisfaction of the Engineer. He shall have such authority as given to him by the contract and as stated in the specifications.

B. The Engineer will decide all questions which may arise as to the quality and acceptability of materials furnished and work performed and as to the rate of progress of the work, all questions which may arise as to the interpretation of the plans and specifications, all questions as to the acceptable fulfillment of the contract on the part of the Contractor, and as to compensation.

C. The Resident Engineer shall represent the Engineer on the project and shall have authority to enforce the terms and requirements of the contract.

*D. The Resident Engineer has authority to suspend, in whole or in part, at the Contractor's risk, the Work for the failure of the Contractor to carry out the contract, to carry out orders, or to correct conditions unsafe for the Work, workmen, or the general public; or for unsuitable weather or other conditions which he considers unsuitable for the prosecution of the work.

E. Nothing in this section or elsewhere in the contract shall be construed as requiring the Engineer, or any of his duly authorized representatives to direct or advise as to the method or manner of performing any work under the contract. No approval or advice as to the method or manner of performing or producing any materials to be furnished shall constitute a representation or warranty by the Port that the result of such method or manner will conform to the contract, relieve the Contractor of any of his risks or obligations under the contract, or create any liability to the Port because of such approval or advice.

G-05.2 Authority of Assistants and Inspectors

*A. The Resident Engineer may appoint assistants and inspectors to assist him in determining that work performed and materials furnished comply with contract requirements. Such assistants and inspectors shall have authority to reject defective work or material and suspend any work that is being done improperly, subject to the final decisions of the Engineer, or to exercise such additional authority as may be delegated to them by the Resident Engineer. An inspector or other assistant to the Resident Engineer is not authorized to approve or accept any work or materials or to issue instructions or advice contrary to the contract.

*B. In the performance of their work, assistants and inspectors may call to the attention of the Contractor any faulty work or materials or non-conformance of the terms of the contract; however, failure of the Resident Engineer or his assistants or inspectors to so inform the Contractor shall not constitute acceptance of such work or materials or approval of such non-conformance.

*C. Work done or material furnished which at any time is found not to conform with contract requirements shall be at the Contractor's risk and expense and shall furnish no basis for claim even though the inspector or other assistant purports to change the contract to provide for such work or material, to approve or accept such work or material or issue any instructions contrary to the contract.

G-05.3 Plans and Working Drawings

A. The contract plans consist of drawings that show such details as are necessary to give a comprehensive idea of the work. Any alterations affecting the requirements and information in the plans shall be in writing and approved by the Engineer.

B. The Engineer may furnish to the Contractor such additional plans and explanations, consistent with the purpose and intent of the original plans as the Engineer may deem necessary to detail and illustrate the work, and the Contractor shall conform his work to such plans and explanations.

C. The plans shall be supplemented by such working drawings prepared by the Contractor as are required for the prosecution of the work. These supplements shall include but not be limited to detailed shop drawings, erection plans, masonry layout diagrams and bending diagrams for reinforcing steel. Working drawings for cribs, cofferdams, falsework, centering and form work also may be required. Written approval of such supplemental plans by the Engineer must be obtained before any work in accordance with these plans is performed.

D. All drawings submitted to the Engineer for his approval shall be drawn on sheets each 22 inches wide by 36 inches long in overall dimensions or on small sheets that are multiples of 8-1/2 inches by 11 inches.

E. Approval of the Contractor's working drawings shall not relieve him of any responsibility for accuracy of dimensions and details, nor shall mutual agreement of dimensions or details, relieve the Contractor of responsibility for agreement and conformity of his working drawings with the contract, or constitute any acceptance by the Port of the correctness or adequacy of such drawings or that they will meet the requirements of the contract.

*F. Required working drawings and plans shall be submitted in final form by the Contractor thirty (30) days in advance of their need to permit detailed review by the Port and/or other specified reviewing agencies, taking into account the possibility of rejections, revisions and resubmittals. The Port shall complete its review and approve or reject submittals within 20 calendar days of receipt. Delays to work by reason of lack of approvals of supplemental drawings and plans are deemed a risk to the Contractor and shall not be the basis for claims for additional compensation or time. Drawings marked "subject to change" will not be reviewed or approved. The Port will withhold approval of drawings that depend on other drawings not yet submitted.

*G. The Contractor shall keep, at the job site, one set of drawings and the approved working drawings and brochures or other submittal data. The drawings shall be marked up to truly reflect "as-built" conditions and given to the Engineer after completion of the work and prior to final inspection. The location of all existing or new underground piping valves and utilities, as located during work, shall be clearly marked with hubs. The actual field location dimensions and coordinates shall be incorporated on the "as-built" drawings. The "as-built" drawings shall be updated on a weekly basis. Satisfactory maintenance of up-to-date "as-built" drawings will be a requirement for approval of progress payments. After the completion of the work and before requesting final inspection, the "as-builts" shall be given to the Engineer.

*H. The bid price(s) shall include all costs of furnishing all working drawings required by the Engineer, and maintaining them in an "as-built" condition. No additional compensation will be made therefor.

G-05.4 Conformity with Plans, Stakes and Deviations Therefrom

A. The Contractor's work shall be governed by such lines, grades and cross sections as may be given by the Engineer in laying out and staking the work.

B. All work performed shall be in conformance with the lines, grades and data and dimensions shown on the plans or as staked by the Engineer. Where specific tolerances are stated in the plans, special provisions or standard specifications, the work shall be performed within those stated limits. The Engineer shall determine if work is in reasonably close conformity with such lines, grades, cross sections and dimensions, and his determination shall be final.

C. All deviations from the approved plans and working drawings must be authorized in writing by the Engineer.

G-05.5 Construction Stakes

A. The Engineer shall set such construction stakes and marks establishing lines and grades as he may deem necessary. The Contractor shall assume full responsibility for detailed dimensions and elevations measured from such stakes and marks.

B. When an automatically controlled machine is required or used to trim the subgrade using reference lines, the Engineer will set control stakes for line and grade one time only after grading has been completed.

The Contractor shall set the reference lines for trimming the subgrade and surfacing and controlling the paving machine from these control stakes.

C. Stakes and marks shall be carefully preserved by the Contractor. The Contractor shall be charged for the costs of necessary replacement of stakes and marks which in the opinion of the Engineer were carelessly or willfully destroyed or damaged by the Contractor's operation. This charge will be deducted from moneys due or to become due the Contractor.

D. The Contractor shall provide sufficient space and safe facilities to enable the Engineer to set points and elevations.

E. The Contractor shall keep the Engineer informed of his staking requirements far enough in advance of the time when the stakes will be required to provide a reasonable amount of time for the Engineer to set the stakes. Requests for stakes shall be made at least three working days prior to the need to commence staking operations. Delays not the fault of the Port incurred by reason of lack of stakes are deemed a risk to the Contractor and shall not be the basis for claims for additional time or compensation.

G-05.6 Inspection of Work and Materials

A. All work done and all materials furnished shall be subject to inspection by the Engineer, or his inspectors. At all times during construction he shall have access to the work, and shall be furnished sufficient, safe and proper facilities such as walkways, railings, ladders and platforms for ascertaining that the materials furnished and work performed are as required by the contract.

*B. Upon request of the Engineer, the Contractor shall furnish without charge such samples of materials used or to be used in the construction as may be required to insure conformance with the contract. Work done or materials used without inspection may be ordered removed and replaced at the Contractor's expense.

C. Inspections, tests, measurements or other acts or functions performed by Port personnel are recognized as being for the sole purpose of assisting the Resident Engineer to determine with reasonable assurance that the work, materials, rate of progress and quantities comply with the contract terms. Such acts or functions shall in no manner be construed to relieve the Contractor from determining to his own satisfaction that he is in full compliance with contract requirements at all times nor to relieve him from any of the responsibility for the work assigned to him by the contract. Work and materials not meeting contract requirements shall be made good, and unsuitable work and materials are to be rejected notwithstanding that such work or materials may have been previously inspected or that payment therefor may have been included in a progress estimate.

D. If the Engineer requests it, the Contractor shall remove or uncover such portions of the completed work as may be directed. After examination, the Contractor shall restore said portions of the work to the standard required by the contract. Should the work thus exposed or examined prove acceptable, the uncovering or removing, and the replacing of the covering or the making good of the parts removed, shall be paid for by agreed price or as force account, but should the work so exposed or examined prove unacceptable, or if the work was placed without due notice to the Engineer or without authority, the uncovering or removing, and replacing of the covering and the making good of parts removed, shall be at the Contractor's expense.

E. Where work is required to be done on any railroad, utility, or facility of a public agency, or to the satisfaction of any federal, state or local governmental agency, representatives thereof shall be permitted to inspect the work when the Contractor is advised by the Engineer to permit them to do so.

*G-05.7 Removal of Defective and Unauthorized Work

Work and materials which do not conform to the requirements of the contract, work done beyond lines and grades shown on the plans or established by the Engineer, and extra work and materials furnished thereon without written approval of the Engineer will be considered unauthorized and will not be paid for by the Port. Upon order of the Engineer, defective or unauthorized work or materials immediately shall be remedied, removed, replaced, or disposed of at the Contractor's expense.

G-05.8 Automatically Controlled Equipment

Whenever equipment is required to be operated automatically under the contract and a breakdown or malfunction of the automatic controls occurs, the equipment may be operated manually or by other methods for the remainder of the normal working day on which the breakdown or malfunction occurred provided this method of operation will produce results otherwise meeting specifications. Continued operation of the equipment manually or by other methods beyond the end of the normal working day on which the breakdown or malfunction of the automatic controls occurs shall be permitted only by specific authorization of the Engineer.

G-05.9 Equipment

On request by the Engineer, the Contractor shall make available operating and maintenance manuals for each model type of mixing, placing or processing equipment prior to its use on the project. The Contractor shall also make available instruments to check the vibration rate, number of revolutions or any other instrumentation necessary to confirm that operating functions of the equipment are in conformance with those specified.

G-05.10 Final Inspection

The Engineer will not make the final inspection until the work required by the contract, including final cleanup and all extra work ordered by the Engineer, has been completed.

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G-05.11 Final Acceptance

A. Final Acceptance shall be by formal action of the Port Commission. The final estimate of quantities shall be dated as of the date of such acceptance. Payment of progress estimates shall not be construed as acceptance of any work under this contract.

B. Final acceptance shall not constitute acceptance of any unauthorized or defective work or material. The Port shall not be barred from requiring the Contractor to remove, replace, repair or dispose of any unauthorized or defective work or material or from recovering damages for any such work or material.

G-05.12 Superintendents, Labor and Equipment of Contractor

A. A set of contract documents must be kept on the work site at all times. The Contractor shall give the work the attention necessary to facilitate reasonable progress thereon and shall cooperate with the Engineer and his inspectors in every way possible.

B. The Contractor shall be present in person or by a duly authorized representative at the site of the work continually during its progress. The Contractor shall designate in writing before starting work a superintendent who shall be experienced, capable of understanding the contract, and able to supervise performance of the work as provided in the contract. The superintendent shall have full authority to represent and act for the Contractor under the contract while on the project in the absence of the Contractor.

C. All work under the contract shall be performed under the continuous supervision of competent personnel experienced in the class of work specified, and incompetent or careless or negligent employees shall be forthwith discharged by the Contractor upon written request of the Engineer. Failure to comply with such request shall be sufficient grounds for termination of the contract.

D. All machinery and equipment shall be adequate for the purposes used, kept in good workable condition, and operated by competent operators.

G-05.13 Cooperation with Other Contractors

The Port reserves the right to perform other and additional work, by contract or otherwise, at or near the site, including material sites, at any time by the use of other forces. Should work be underway or subsequently undertaken within or adjacent to this project the Contractor shall coordinate his work with all other contractors or other forces and so conduct his work that the operations of both suffer the least interference and delay. If there should be any disagreement between the Contractors or the Contractor and the Port as to the manner and order of performing work, the Engineer shall make the decision, and such decision shall be final and binding on all parties.

G-05.14 Method of Service of Notices

A. Any written notice to the Contractor required under these specifications may be served on him, either personally, by mailing, or by leaving the same at his last post office address known to the Engineer.

B. All correspondence from the Contractor shall be directed to the Resident Engineer.

Section G-06
Control of Material

*G-06.1 Source of Supply and Quality of Materials

Promptly after the approval of the contract, the Contractor shall notify the Engineer of the proposed sources of supply of all materials to be furnished by him. The source of supply of each of the materials shall be approved by the Engineer before the delivery is started. Representative samples at the frequency required by the Engineer, sampled by the Engineer or in his presence, shall be submitted by the Contractor or Producer for examination and tests by the Engineer prior to incorporating the material in the work. Unless otherwise authorized by the Engineer, samples not taken by him or in his presence will not be accepted for test. Only materials conforming to the requirements of these specifications and approved by the Engineer shall be used in the work. Any of the materials proposed to be used may be inspected or tested at any time during their preparation and use. If, after test, it is found that sources of supply which have been approved do not furnish a uniform product, or if the product from any source is determined to be unacceptable at any time, the Contractor shall furnish approved material from other approved sources. No material which, after approval, has in any way become unfit for use shall be used in the work.

G-06.2 Samples and Tests

*A. Tests of materials furnished by the Contractor shall be made by the Engineer in accordance with commonly recognized standards, or by special methods and tests as are in use at the laboratory of the Port, or as set forth in the special conditions and specifications. All tests repeated because of defective material shall be at the Contractor's expense.

B. Field tests of materials will also be made by the Engineer when deemed necessary and these tests shall be made in accordance with standard practices of the Port.

C. The Contractor shall furnish without charge such samples of all materials as may be requested by the Engineer. Materials shall not be used until they have been approved by the Engineer. Samples will be secured and tested whenever necessary to determine the quality of the material.

D. Materials shall be delivered on the work in advance, in such quantities as to afford the Engineer an opportunity to make tests before the materials are to be used.

E. The following shall apply in the use of specifications and methods of tests of the organizations named below:

*F. A.S.T.M. - American Society for Testing and Materials. The ASTM designation number refers to the latest adopted standard or tentative standard of this society. The standard or tentative standard in effect on the date of advertising for bids shall apply in each case, unless referenced otherwise.

*G. A.A.S.H.O. - American Association of State Highway Officials. The specifications or test method shown by number refers to the "Standard Specifications for Highway Materials and Methods of Sampling and Testing," currently published by the Association, or to such revisions as may have been subsequently adopted by the Association or to the "Interim Specifications Methods adopted by the AASHO Committee on Materials." Revisions and Interim Standards in effect on the date of advertising for bids shall apply, unless referenced otherwise.

*H. Federal Specifications - U.S. Government Federal Stock Catalogue. The specification number refers to the latest revised specification adopted by the General Services Administration. Revisions in effect on the date of advertising for bids shall apply. Revisions shall be considered as becoming effective sixty days after adoption, unless referenced otherwise.

G-06.3 Publications

A. Copies of any separate ASTM specifications or method of test may be obtained from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania.

B. Copies of standard grading and dressing rules may be obtained from the West Coast Lumber Inspection Bureau, Seattle, Washington, or Portland, Oregon, and from the Western Pine Association, Portland, Oregon.

G-06.4 Handling and Storage of Materials and Equipment

A. All materials and equipment shall be handled in such manner as to preserve their quality and fitness for the work.

B. All materials and equipment intended for use in the work shall be stored by the Contractor by means that will prevent damage from exposure to the elements, from admixture of foreign material, or from any other cause. The Engineer will refuse to accept, or to sample for testing, any materials that are improperly stored.

Section G-07
Legal Relations and Responsibilities to the Public

*G-07.1 Laws to be Observed

A. The Contractor at all times shall comply with federal, state and local laws and ordinances, and any regulations which in any manner affect the performance of the contract. He shall defend, indemnify and save harmless the Port, the Commission, the Engineer and any agents, officers or employees thereof against any claims arising from any violation or alleged violation of any such laws, ordinances, or regulations, whether such violations are by the Contractor, his subcontractors or employees.

B. Attached hereto, designated as Appendix "A", and made a part of these specifications, is a List of Federal, State and Local Environmental Statutes Ordinances and Regulations dealing with the prevention of environmental pollution and the preservation of public natural resources that may affect or be affected by this project. This is provided pursuant to Chapter 62, Laws of 1973, First Extra Session.

*G-07.2 State Taxes

The State of Washington and Local Retail Sales Taxes shall not be included in the bid price(s) or any other compensation to be paid to the Contractor under the contract. However, the Contractor is advised that, in accordance with RCW 82.04 et seq, and applicable Washington State Department of Revenue Regulations, all or a portion of the labor or materials provided under this contract may be subject to payment, by the Contractor, of retail sales or other state taxes. The Port makes no interpretation or representation concerning the interpretation or applicability of either the statutory or regulatory provisions as they may apply to individual contractors or contracts or portions thereof. All questions concerning applicable taxes on any portion of the work to be furnished under this contract, or the procedure for inclusion or exclusion of retail sales tax costs, shall be directed to the Washington State Department of Revenue prior to submission of the contract proposal.

G-07.3 Sanitation

The Contractor shall provide and maintain in a neat and sanitary condition such accommodations for the use of his employees as may be necessary to comply with the applicable requirements and regulations of the State Department of Social and Health Services and other bodies. He shall commit no public nuisance. He shall keep all job sites clean, maintain all latrines, or portable toilets in a clean and sanitary condition, dispose of all refuse in a proper manner, leaving the premises in a neat and sanitary condition.

G-07.4 Permits and Licenses

A. The Contractor shall procure all permits and licenses which are necessary and incidental to his operation in the performance of the work and give all notices required by such permits and licenses unless otherwise specified in the Special Conditions.

B. Where local ordinances or controlling agency policy prohibits issuance of temporary operational permits to other than public agencies, the Port will support the Contractor's request for such temporary permit and will accept the same in its name provided:

(1) The Contractor takes all necessary action leading to the issuance of the permit,

(2) It is determined to be in the public interest,

(3) It applies only to work performed in connection with the subject contract,

(4) The Contractor agrees in writing to abide by all requirements of the issuing agency and holds the Port harmless from any liability in connection with work under the permit, and

(5) The Port will incur no expense in connection with such permit.

G-07.5 Equal Employment Opportunity Responsibilities

Attached hereto, designated as Appendix "B" and made a part of these specifications, is the Port of Seattle's Affirmative Action requirements to assure equal employment opportunities. The conditions set forth in these requirements shall constitute the specific affirmative action requirements for project activities under the contract. The Contractor shall work with the Port and the Federal government where required, in carrying out equal employment opportunity obligations and in their review of his activities under the contract.

G-07.6 Federal Agency Inspection

On projects involving federal funding, federal laws, rules and regulations must be observed by the Contractor, and the work shall be subject to inspection by the appropriate federal agency. The Contractor shall cooperate with the federal agencies in making their inspections. Such inspection shall in no sense make the federal government a party to this contract and shall not constitute an interference with the rights of either party hereunder.

G-07.7 Contractor's Responsibility for Work

*A. All work and material for the contract, including extra work, if any, shall be at the sole risk of the Contractor until the entire project has been finally accepted by the Commission, except as otherwise provided in this section. Any damage to either permanent or temporary work, utilities, materials, or equipment and plant shall be repaired to the satisfaction of the Engineer at the Contractor's expense.

*B. Exceptions to the above provision shall be limited exclusively to the following:

(1) Any part of the permanent work completed to a fully functional stage and permanently opened and being used for its intended purposes which is damaged as a result of such use or vandalism.

(2) Any building that has been completed in its entirety, is fully functional and is open to use for which constructed in compliance with the contract or by order of the Engineer which is damaged as a result of such use or vandalism.

C. Damage qualifying under the exceptions listed above shall be repaired promptly as ordered by the Engineer, and compensation therefor shall be made at applicable unit prices for unit price contracts or an agreed amount for lump sum contracts. Should unit prices be determined by the Engineer as not being applicable, payment shall be made by agreed price or by force account. Where public safety is affected, the Engineer may elect to accomplish repair by means of Port provided forces.

D. Nothing contained in this section shall be construed as relieving the Contractor of responsibility for, or damage resulting from, the Contractor's own operations or from his negligence, nor shall the Contractor be relieved from full responsibility for making good any defective work or materials.

G-07.8 Responsibility for Damage

*A. The Port Commission, Engineer, agents, and all officers and employees of the Port shall not be responsible in any manner for any loss or damage that may happen to the work or any part thereof; for any loss of material or damage to any of the materials or other things used or employed in the performance of the work; for injury to or death of any persons, either workmen or the public for any cause which might have been prevented by the Contractor, or his workmen, or anyone employed by him.

B. The Contractor shall be responsible for any liability imposed by law for injuries to, or the death of, any persons or damages to property resulting from any cause whatsoever arising out of or in connection with his performance of the work, or before final acceptance.

*C. The Contractor shall insure, defend, indemnify and save harmless the Port Commission, Engineer, and all officers, agents, and employees of the Port from all claims, suits or actions brought for injuries to, or death of, any persons or damages resulting from construction of the work or in consequence of any negligence in the performance of the work, or the use of any improper materials in the work, caused in whole or in part by any act or omission of the Contractor or his agents or employees during performance of the work or at anytime before final acceptance.

D. The Contractor shall insure, defend, indemnify and save harmless, any officer, agent or employee of federal or state government or any political subsidiary thereof connected with the work being performed in the same manner and to the same extent as provided above for the protection of the Port, its officers and employees.

E. The Contractor shall bear sole responsibility for damage to any portion of the project and to property located off the project caused by erosion, siltation, run-off or other related items during the construction of the project. The Contractor shall also bear sole responsibility for any pollution of rivers, streams, ground water or other waters which may occur as a result of construction operations.

F. The Contractor shall exercise all necessary precaution throughout the life of the project to prevent pollution, erosion, siltation, and damage to property.

POS 22678

G. In order to effectively control pollution, erosion, run-off and related damage, the Contractor shall, at Contractor's expense, perform items of work including but not limited to, the following:

(1) Construct ditches, berms, culverts, etc., to control surface water.

(2) Construct dams, settling basins, energy dissipators, etc., to control downstream flows.

(3) Provide means of controlling underground water which may be encountered during construction.

(4) Protect slopes by covering or by other means until permanent erosion control measures are effective.

H. When and if the control facilities are no longer needed, they shall, upon the direction and/or approval of the Engineer, be removed and the areas finished as directed by the Engineer, at the Contractor's expense.

I. In the event that a suspension of work is ordered in accordance with Section G-08.6, the Contractor shall take all action necessary to control erosion, pollution and run-off during the shutdown period before the Port will assume responsibility for maintenance.

J. Erosion control items shall be considered as part of the work included in the contract.

K. Should rutting and erosion of the slope occur because of natural elements, the Contractor shall be responsible for restoring and repairing the slopes and for cleanup of eroded material including that in ditches and culverts and replacement of the material on the slopes.

*G-07.9 Protection and Restoration of Property

A. The Contractor shall be fully responsible for the site and be responsible for the work until its full completion in accordance with the contract and the acceptance thereof by the Port Commission, damages by fire or other fortuitous event not excepted. The fact that an inspector was present during the progress of any construction does not relieve the Contractor from responsibility for defects nor bind the Port Commission in passing upon the final acceptance of the work.

B. The Contractor shall at his own expense procure and maintain Builders Risk insurance against fire and any other casualty upon the work to an extent of at least an amount equal to the value of the Work, the companies to be approved by the Port Commission and the policies to be delivered to the Port and to be for the benefit of the Contractor as Contractor and Port of Seattle as owner, as their interests may appear. The Port of Seattle, upon written request, will secure release of subrogation against the Contractor under Port's applicable insurance policies for losses covered by said policies, provided such written request is made prior to any losses. In case of any loss by fire or other casualty during the performance of the contract, or the life of the policy, the insurance money shall be paid by the insurance company to the Port and shall, to an amount equal to the sums of money theretofore paid under the contract to the Contractor by the Port, be thereafter paid by the Port to the Contractor in installments as the work shall be reconstructed in conformance with the terms of the contract and specifications, and if the contract shall not thereafter be performed, the Contractor will have no demand against the Port for any portion of said insurance money remaining in the possession of the Port of Seattle at the time of such failure.

C. He shall give to the proper authorities all required notice relating to the work in his charge, and obtain and pay for all official permits required for, and in connection with, the work. He shall take charge of, and be responsible for any loss or injury from any cause to any material delivered at or in the vicinity of the work, to be used by him thereon, in connection with this contract prior to its completion. The Contractor shall assume all responsibility for damage to life and limb, and adjacent property. He shall erect substantial barricades at all obstructions or other dangerous places, and shall observe and obey all laws and ordinances relating thereto. The Contractor shall keep proper lights each night, between the hours of sunset and sunrise at such places as required by ordinances or as directed by the Engineer. Derricks, hoists, scaffolding and other apparatus shall be sound, safe and secure, and shall be maintained until taken down and removed. The Contractor alone shall be responsible for the safety of all workmen employed on the premises, under this contract, and shall be responsible for injury to other persons due to his negligence or that of his employees.

G-07.10 Utilities and Similar Facilities

A. The Contractor shall protect from damage private, public and Port-owned utilities, including, but not limited to, telephone and telegraph lines, power lines, sewer and water lines, railroad tracks and appurtenances, highway lighting and signal systems and similar facilities.

B. Removal or relocation of utilities and similar facilities, where necessary to accommodate the construction are to be performed at Contractor's expense unless specified to be performed by owner or others.

C. Where the owner is responsible for removing or relocating such facilities, such work will be accomplished at the owner's convenience, either during or in advance of construction. If the Contractor notes the presence of any such facility, he shall immediately notify the Engineer in writing.

D. The right is reserved to the Port and the owners of facilities, or their authorized agents, to enter upon the construction site for the purpose of making such changes as are necessary for the rearrangement of their facilities or for making necessary connections or repairs. The Contractor shall cooperate with forces engaged in such work and shall conduct his operations in such a manner as to avoid any unnecessary delay or hindrance to the work being performed by such other forces. Wherever necessary, the Contractor shall make arrangements with the owner of such facilities for the coordination of the work.

E. Should the Contractor desire to have any rearrangements made in any utility, facility, or other improvement, for his convenience in order to facilitate his construction operations, which rearrangement is in addition to or different from the rearrangements indicated on the plans or in the special conditions he shall make whatever arrangements are necessary with the owners of such utility or other non-Port facility for such rearrangement and bear all expenses in connection therewith.

*F. All costs incurred as a result of performance of the Contractor's obligations under this section shall be considered as incidental to the contract and included in the contract price or prices. No additional compensation will be paid. Any loss of time suffered by the Contractor due to delay in removal or relocation of any facilities by others will be adjusted in accordance with Section G-08.8 permitting extensions of time. However, such delay shall not be the basis for any claim by the Contractor for additional compensation.

G. Provided, however, when the relocation of underground facilities, the existence of which are not shown on the plans or in the Special Conditions, are necessary to accommodate the project, the Engineer will provide for the relocations of such facilities by other forces or such relocations shall be performed by the Contractor pursuant to written authorization and will be paid for by applicable unit prices, agreed price or as force account.

G-07.11 Public Liability and Property Damage Insurance

A. The Contractor shall obtain and keep in force during the term of the contract, public liability and property damage insurance with companies and in form subject to the approval of the Engineer.

*B. The coverage provided shall protect against claims for personal injuries, death, and property damage arising in whole or in part from any act or omission of the Contractor or a subcontractor, or anyone employed by either, and shall name the Port as the additional insured. Coverage shall include contractural liabilities assumed by the Contractor. On any project involving any other governmental agency, that agency shall be extended the same coverage as the Port, except where additional coverage is required.

C. The policy, and any endorsement shall include a provision requiring written notification to the Port of termination and of any change in any of its terms which relate to this contract.

D. The minimum coverage shall be as specified in the special conditions.

E. Certification by the Contractor that a policy, or endorsement to an existing policy, satisfying the requirements set forth in these General Conditions has been obtained from a particular company and is in effect shall be forwarded to the Engineer with the signed contract as provided in Section G-03.3.

F. Coverage in the minimum amount set forth herein shall not be construed to relieve the Contractor from liability in excess of such coverage.

G-07.12 Gratuities

The Contractor shall not extend any loan, gratuity or gift of money in any form whatsoever to any employee or officer of the Port, nor will he rent or purchase any equipment or materials from any employee or officer of the Port.

*G-07.13 Patented Devices, Materials and Processes

The Contractor shall assume all costs arising from the use of patented devices, materials or processes used on or in performance of the work, and agrees to defend, indemnify and save harmless the Port, Commission, Engineer and their duly authorized agents and employees from all actions of any nature for, or on account of the use of any patented devices, materials or processes.

G-07.14 Use of Explosives

A. When the use of explosives is necessary for the prosecution of the work, the Contractor shall use the utmost care, so as not to endanger life or property, cause slides or disturb the materials outside the neat lines of the cross section.

POS 22680

G-07.14 Use of Explosives. (continued)

B. Blasting shall be completed in the vicinity of proposed structures before construction on the structures is undertaken. All explosives shall be stored in a secure manner and place in compliance with laws and ordinances and all such storage places shall be clearly marked "Dangerous - Explosives." No explosives shall be left in an unprotected manner along or adjacent to any construction site.

C. The Contractor shall notify public utilities and railroads having facilities near the site of the work of his intention to use explosives and the location, date, time and approximate duration of such blasting. Such notice shall be given sufficiently in advance to enable the companies to take such steps as they may deem necessary to protect their property from injury.

G-07.15 Public Convenience and Safety

A. The Contractor shall so conduct his operations as to offer the least possible obstruction and inconvenience to the public, and he shall have under construction no greater amount of work than he can prosecute properly with due regards to the rights of the public. He shall not open up sections of the work and leave them unfinished, but he shall finish the work as he goes insofar as practicable.

B. Construction shall be conducted so as to cause as little inconvenience as possible to abutting property owners. Convenient access to driveways, houses and buildings along the line of work shall be maintained and temporary approaches to crossing or intersecting highways shall be provided and kept in good condition. When the abutting owners' access across the right-of-way line is to be eliminated and replaced under the contract by other access, the existing access shall not be closed until the replacement access facility is available.

C. On his own responsibility and expense, the Contractor shall provide adequate safeguards, safety devices and protective equipment, except such as are specified in other sections of these specifications to be furnished by the Port, and take any other needed actions, on his own responsibility or as the Engineer may determine reasonably necessary to protect the life, health and safety of the public and to protect property in connection with the performance of the work covered by the contract.

*D. The Contractor shall be responsible for providing adequate flagmen, barricades, lights and signs for the protection of the work and the public at all times regardless of whether or not such flagmen, barricades, lights and signs are ordered by the Engineer or furnished by the Port, and the Contractor shall be liable for injuries and damages to persons and property suffered by reason of the Contractor's operations or negligence in connection therewith.

*E. Contractor agrees that in performing the work contained within this contract that he will meet all regulations of safety as specified by applicable State and Federal laws. Contractor further agrees that he will bring to the attention of the Port conditions on the job site or contained within the specifications which appear to be in violation of any provisions of said law. Contractor further agrees that he will include within any sub-contract or contract of purchase of materials provisions requiring said suppliers or sub-contractors to meet standards set by appropriate Federal and State laws. Specifically, all materials, components, bidder design elements of said contract shall meet the requirements of Federal and State safety provisions.

G-07.16 Beneficial Occupancy

A. The Port reserves the right to use and open to the public any substantially completed portion of the work before completion of the entire contract without incurring any liability to the Contractor except as otherwise provided in the contract and without constituting acceptance of any of the work.

*B. When partial occupancy is specified in the contract or when the Contractor has failed to prosecute the work continuously and efficiently to a stage of completion that would permit partial use or occupancy without undue interference to the work, work remaining after a portion of the project is open to use shall be performed by the Contractor at the contract price or prices for the items of work involved. No additional compensation will be made for costs incurred by the Contractor as a result of such use or occupancy, or for additional safety and warning device costs necessary to protect his operations and the public. The Contractor shall take all costs due to using portions of the work into account when submitting his proposal and the contract prices for the various items of work involved shall include all such costs.

G-07.17 Warranty

A. The Contractor warrants to the Port that all materials and equipment furnished under this Contract will be new unless otherwise specified, and that all Work will be of best quality, free from faults and defects and in conformance with the Contract Documents. All work not so conforming to these standards may be considered defective. If required by the Port, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. The Contractor shall remedy at his own expense any failure of the work including equipment to conform to contract specifications and any defect of material,

D. The right is reserved to the Port and the owners of facilities, or their authorized agents, to enter upon the construction site for the purpose of making such changes as are necessary for the rearrangement of their facilities or for making necessary connections or repairs. The Contractor shall cooperate with forces engaged in such work and shall conduct his operations in such a manner as to avoid any unnecessary delay or hindrance to the work being performed by such other forces. Wherever necessary, the Contractor shall make arrangements with the owner of such facilities for the coordination of the work.

E. Should the Contractor desire to have any rearrangements made in any utility, facility, or other improvement, for his convenience in order to facilitate his construction operations, which rearrangement is in addition to or different from the rearrangements indicated on the plans or in the special conditions he shall make whatever arrangements are necessary with the owners of such utility or other non-Port facility for such rearrangement and bear all expenses in connection therewith.

*F. All costs incurred as a result of performance of the Contractor's obligations under this section shall be considered as incidental to the contract and included in the contract price or prices. No additional compensation will be paid. Any loss of time suffered by the Contractor due to delay in removal or relocation of any facilities by others will be adjusted in accordance with Section G-08.8 permitting extensions of time. However, such delay shall not be the basis for any claim by the Contractor for additional compensation.

G. Provided, however, when the relocation of underground facilities, the existence of which are not shown on the plans or in the Special Conditions, are necessary to accommodate the project, the Engineer will provide for the relocations of such facilities by other forces or such relocations shall be performed by the Contractor pursuant to written authorization and will be paid for by applicable unit prices, agreed price or as force account.

G-07.11 Public Liability and Property Damage Insurance

A. The Contractor shall obtain and keep in force during the term of the contract, public liability and property damage insurance with companies and in form subject to the approval of the Engineer.

*B. The coverage provided shall protect against claims for personal injuries, death, and property damage arising in whole or in part from any act or omission of the Contractor or a subcontractor, or anyone employed by either, and shall name the Port as the additional insured. Coverage shall include contractural liabilities assumed by the Contractor. On any project involving any other governmental agency, that agency shall be extended the same coverage as the Port, except where additional coverage is required.

C. The policy, and any endorsement shall include a provision requiring written notification to the Port of termination and of any change in any of its terms which relate to this contract.

D. The minimum coverage shall be as specified in the special conditions.

E. Certification by the Contractor that a policy, or endorsement to an existing policy, satisfying the requirements set forth in these General Conditions has been obtained from a particular company and is in effect shall be forwarded to the Engineer with the signed contract as provided in Section G-03.3.

F. Coverage in the minimum amount set forth herein shall not be construed to relieve the Contractor from liability in excess of such coverage.

G-07.12 Gratuities

The Contractor shall not extend any loan, gratuity or gift of money in any form whatsoever to any employee or officer of the Port, nor will he rent or purchase any equipment or materials from any employee or officer of the Port.

*G-07.13 Patented Devices, Materials and Processes

The Contractor shall assume all costs arising from the use of patented devices, materials or processes used on or in performance of the work, and agrees to defend, indemnify and save harmless the Port, Commission, Engineer and their duly authorized agents and employees from all actions of any nature for, or on account of the use of any patented devices, materials or processes.

G-07.14 Use of Explosives

A. When the use of explosives is necessary for the prosecution of the work, the Contractor shall use the utmost care, so as not to endanger life or property, cause slides or disturb the materials outside the neat lines of the cross section.

POS 22682

G-07.14 Use of Explosives, (continued)

B. Blasting shall be completed in the vicinity of proposed structures before construction on the structures is undertaken. All explosives shall be stored in a secure manner and place in compliance with laws and ordinances and all such storage places shall be clearly marked "Dangerous - Explosives." No explosives shall be left in an unprotected manner along or adjacent to any construction site.

C. The Contractor shall notify public utilities and railroads having facilities near the site of the work of his intention to use explosives and the location, date, time and approximate duration of such blasting. Such notice shall be given sufficiently in advance to enable the companies to take such steps as they may deem necessary to protect their property from injury.

G-07.15 Public Convenience and Safety

A. The Contractor shall so conduct his operations as to offer the least possible obstruction and inconvenience to the public, and he shall have under construction no greater amount of work than he can prosecute properly with due regards to the rights of the public. He shall not open up sections of the work and leave them unfinished, but he shall finish the work as he goes insofar as practicable.

B. Construction shall be conducted so as to cause as little inconvenience as possible to abutting property owners. Convenient access to driveways, houses and buildings along the line of work shall be maintained and temporary approaches to crossing or intersecting highways shall be provided and kept in good condition. When the abutting owners' access across the right-of-way line is to be eliminated and replaced under the contract by other access, the existing access shall not be closed until the replacement access facility is available.

C. On his own responsibility and expense, the Contractor shall provide adequate safeguards, safety devices and protective equipment, except such as are specified in other sections of these specifications to be furnished by the Port, and take any other needed actions, on his own responsibility or as the Engineer may determine reasonably necessary to protect the life, health and safety of the public and to protect property in connection with the performance of the work covered by the contract.

*D. The Contractor shall be responsible for providing adequate flagmen, barricades, lights and signs for the protection of the work and the public at all times regardless of whether or not such flagmen, barricades, lights and signs are ordered by the Engineer or furnished by the Port, and the Contractor shall be liable for injuries and damages to persons and property suffered by reason of the Contractor's operations or negligence in connection therewith.

*E. Contractor agrees that in performing the work contained within this contract that he will meet all regulations of safety as specified by applicable State and Federal laws. Contractor further agrees that he will bring to the attention of the Port conditions on the job site or contained within the specifications which appear to be in violation of any provisions of said law. Contractor further agrees that he will include within any sub-contract or contract of purchase of materials provisions requiring said suppliers or sub-contractors to meet standards set by appropriate Federal and State laws. Specifically, all materials, components, bidder design elements of said contract shall meet the requirements of Federal and State safety provisions.

G-07.16 Beneficial Occupancy

A. The Port reserves the right to use and open to the public any substantially completed portion of the work before completion of the entire contract without incurring any liability to the Contractor except as otherwise provided in the contract and without constituting acceptance of any of the work.

*B. When partial occupancy is specified in the contract or when the Contractor has failed to prosecute the work continuously and efficiently to a stage of completion that would permit partial use or occupancy without undue interference to the work, work remaining after a portion of the project is open to use shall be performed by the Contractor at the contract price or prices for the items of work involved. No additional compensation will be made for costs incurred by the Contractor as a result of such use or occupancy, or for additional safety and warning device costs necessary to protect his operations and the public. The Contractor shall take all costs due to using portions of the work into account when submitting his proposal and the contract prices for the various items of work involved shall include all such costs.

G-07.17 Warranty

A. The Contractor warrants to the Port that all materials and equipment furnished under this Contract will be new unless otherwise specified, and that all Work will be of best quality, free from faults and defects and in conformance with the Contract Documents. All work not so conforming to these standards may be considered defective. If required by the Port, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. The Contractor shall remedy at his own expense any failure of the work including equipment to conform to contract specifications and any defect of material,

G-07.17 Warranty (continued)

*A. (continued)
workmanship, or design in the work, (where design of work is the bidder's responsibility), provided that the Port gives the Contractor notice of such failure or defect not later than one year after final acceptance of the Contract by the Port Commission. The Contractor shall, at his own expense, remedy damage to equipment which is the result of failure or defect, and restore work damaged in fulfilling terms of this clause. Should the contractor fail to remedy such failure or defect within a reasonable time after receipt of notice thereof, the Port shall have the right to replace, repair, or otherwise remedy such failure or defect at the Contractor's expense.

*B. All subcontractors', manufacturers' and suppliers' warranties and guarantees, express or implied, respecting any part of the work and all materials used therein shall be deemed obtained -- and shall be enforced -- by the Contractor as the agent and for the benefit of the Port without the necessity of separate transfer or assignment thereof, provided that, if directed by the Chief Engineer, the Contractor shall require such subcontractors, manufacturers and suppliers to execute such warranties and guarantees in writing to the Port.

*C. Work repaired or replaced pursuant to Section G-07.17 A & B shall also be subject to the provisions of this section to the same extent as work originally performed. The rights and remedies of the Port provided in this section are in addition to and do not limit rights afforded to the Port by other provision of this contract.

*G-07.18 Personal Liability of Public Officers

Neither the Commission, the Engineer, nor any other officer or employee of the Port, shall be personally liable for acts or failure to act in connection with the contract, it being understood that in such matters they are acting solely as agents of the Port.

*G-07.19 No Waiver of Port's Legal Rights

The Port shall not be precluded or estopped by any measurement, estimate, or certificate made either before or after the completion and acceptance of the work and payment therefor from showing the true amount and character of the work performed and materials furnished by the Contractor, or from showing that any such measurement, estimate, or certificate is untrue or incorrectly made, or that the work or materials do not conform in fact to the requirement of the contract. The Port shall not be precluded or estopped, notwithstanding any such measurement, estimate or certificate, and payment in accordance therewith, from recovering from the Contractor and his Sureties such damages as it may sustain by reason of his failure to comply with the terms of the contract. Neither the acceptance by the Engineer nor any payment for the whole or any part of the work, nor any extension of time, nor any possession taken by the Port, shall operate as a waiver of any portion of the contract or of any power herein reserved or any right to damages herein provided, or bar recovery of any money wrongfully or erroneously paid to the Contractor. Failure by the Port to act upon any breach of the contract shall not be held to be a waiver of any other breach or subsequent breach of the Contract.

POS 22684

Section G-08
Prosecution and Progress

G-08.1 Subcontracting

A. No work shall be subcontracted without written consent of the Engineer. All requests to subcontract shall be submitted in writing to the Engineer within thirty (30) calendar days of Notice to Proceed and show the names of the subcontractors. The Contractor shall require the subcontractor to pay not less than the minimum wage for labor for all work performed by a subcontractor and require the subcontractor to furnish all certificates and statements required by the contract. Consent to subcontract will not be given unless the Engineer is satisfied with the proposed subcontractor's prior performance, equipment, experience and ability to perform the work. Consent to subcontract any portion of the work shall not relieve the Contractor of any responsibility for performance of the contract. Subcontracting shall create no contract between the Port and the subcontractor nor shall the subcontractor have any rights against the Port by reason of its subcontract with the Contractor. The Contractor shall be responsible for all work and material furnished and no subcontract shall in any case release the Contractor of his obligations or liability under the contract and the Contractor's bond.

B. Production or processing of materials is construed to include work at a materials site or plant setup which has been established or reopened for the primary purpose of furnishing materials for this and other related projects. Such work including haul to the project site shall be considered as subcontracting unless performed by the Contractor.

C. The purchase of sand, gravel, crushed stone, crushed slag, batched concrete aggregates, ready mix concrete, fabricated structural steel and/or other materials produced and furnished from established and recognized commercial plants together with the delivery of such materials to the site of the work by means of vehicles owned or operated by such plants or by recognized commercial hauling companies shall not be considered as subcontracting under these provisions.

D. If batching plants or mixing plants are set up at rail or water delivery points and materials are in part supplied to such plants by rail or water transportation companies the remaining materials required at such batching or mixing plants may be hauled to such plants without such hauling being considered as subcontracting.

E. When a portion of the work which has been subcontracted by the Contractor is not being prosecuted in a manner satisfactory to the Engineer, the subcontractor shall be removed immediately on the written request of the Engineer and shall not again be employed on the work.

G-08.2 Assignment

The Contractor may assign moneys due or to become due him under the contract. Such assignment will be recognized by the Port if given written notice thereof, to the extent permitted by law; but any assignment of moneys shall be subject to all setoffs, withholdings, and deductions provided for by law and under the contract.

G-08.3 Progress Schedule

A. Promptly after award of the contract, unless stated otherwise in the Special Conditions, the Contractor shall prepare a Progress Schedule in a form satisfactory to the Engineer. It shall consist of a network analysis of the Critical Path Method (CPM) in arrow diagram form showing an activity description and duration (in calendar days) for all significant design, manufacturing, construction and installation activities. An activity list shall be included with each copy of the Progress Schedule. The Contractor shall submit six (6) copies, two (2) of which will be returned to the Contractor upon approval.

*B. The Progress Schedule shall be submitted within ten (10) days after Date of Notice to Proceed and will be returned to the Contractor within ten (10) days after receipt. Failure of the Contractor to obtain an approved Progress Schedule within the allotted time will not constitute grounds for a contract time extension. Payment to the Contractor will be withheld until a Progress Schedule has been submitted and approved.

C. The Progress Schedule is to outline the proposed operations, the interrelations of the various operations and the order of performance in sufficient detail that progress of the work can be evaluated accurately at any time during the performance of the contract.

G-08.3 Progress Schedule (continued)

D. If milestone completions are required by the contract, then those milestones shall be clearly defined on the Progress Schedule.

*E. The Critical Path shall be clearly indicated on the Progress Schedule.

F. If abbreviations are used in the make up of the Progress Schedule, a legend shall be provided to define all abbreviations.

G. Should it become evident that the Contractor may fail to meet the scheduled dates as shown, the Contractor, shall upon request, be required at his own expense to submit a revised Progress Schedule and/or to increase his work force and/or working hours (second and third shifts) as required to bring the actual completion dates of the activities into conformance with the approved Progress Schedule. Further, he will be asked to submit a revised Progress Schedule at no cost to the Port if and when, in the opinion of the Resident Engineer, his sequence of work varies significantly from that shown on the Progress Schedule. The Port reserves the right to withhold progress payments until such time as an approved modified Progress Schedule has been provided by the Contractor.

*G-08.4 Prosecution of Work

The Contractor shall begin work within 10 days from the date of notice to proceed by the Port and shall diligently prosecute the same to completion within the time specified in the special conditions.

*G-08.5 Time of Completion

All Work under this Contract shall be completed within the time specified in the special conditions or as extended in writing by the Engineer, pursuant to Section G-08.8. The contract time for completion shall commence with the date of notice to proceed. Upon completion of all work required by the contract, the Engineer shall advise the Contractor in writing of the date on which such work was completed. Such date shall constitute the date of completion of the contract. Such notifications of date of completion shall not constitute acceptance of the work by the Port Commission.

G-08.6 Suspension of Work

A. The Engineer may order all or any part of the work suspended for such period as he deems proper because of unsuitable weather, or because of the failure of the Contractor to perform any provisions of the contract or orders given to him. The Contractor shall not suspend work unless ordered or authorized to do so by the Engineer and he shall immediately comply with such an order when given. He shall resume the suspended work when ordered by the Engineer to do so.

*B. Suspension of work by the Engineer shall not be grounds for any claim by the Contractor for damages. The periods of suspension, because of unsuitable weather, shall be allowed as a time extension unless the Engineer concludes that the Contractor could have performed the suspended work if he had diligently prosecuted the work prior to such suspension. The Engineer will determine the number of days the completion of the entire project has been delayed. The time extension allowed shall be the number of calendar days so determined, which shall constitute the Contractors sole remedy for the delay. Any suspension due to the failure of the Contractor to carry out orders or perform any conditions of the contract or failure to timely perform work, shall not be grounds for allowance of a time extension but shall be counted against the contract completion date and not relieve the Contractor from any responsibility assigned under the contract.

C. The Engineer may order all or any part of the work suspended for a reasonable period because of conditions the Engineer deems necessary to be fulfilled or corrected prior to continuance of such work. Such suspension shall not be deemed to constitute a breach on the part of the Port nor excuse or invalidate the responsibilities of either party.

*G-08.7 Protection of Work During Suspension

In preparation for and during suspensions of work as provided in Section G-08.6, the Contractor shall take every precaution to prevent damage to or deterioration of the work. Except as provided elsewhere in these specifications, the Contractor shall assume responsibility for all damage or deterioration to the work during the period of suspension and shall at his own expense correct or restore the work to a condition, acceptable to the Engineer prior to the resumption of work. A suspension of work shall not relieve the Contractor of his responsibilities under the contract.

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G-08.8 Extensions of Time

A. The time for completion of the contract may be extended for a period equivalent to the time which the Chief Engineer determines the work was delayed by one or more of the following causes occurring during the performance of work:

(1) Fire or other casualty for which the Contractor is not at fault or otherwise responsible.

(2) Strike, riot, war and civil disorders.

(3) Unsuitable weather as provided in Section G-08.6 above.

*(4) Utility relocation by others as provided in Section G-07.10F.

B. Extension of time shall constitute Contractor's sole remedy for delays due to causes set forth in Section G-08.8A.

C. No extension of time shall be allowed for any of the conditions set forth in G-08.8A above which are caused by or result from default or collusion of the Contractor or his act or failure to act or to perform the work according to the contract.

*D. Failure to procure materials or workmen or perform the work in accordance with the requirements of the contract or to adequately plan for such functions will not be considered as an adequate reason for an extension of time.

E. The Engineer may, in his sole and independent discretion (but shall in no event be required to), grant extensions of time for exceptional causes not specifically identified herein above subject to the Contractor's request for such extension being fully supported with documented proof that the Contractor had no direct or indirect control over the cause of the delay and could take no reasonable action to avoid or offset the delay. Failure by the Contractor to utilize efficiently all available time after execution of the contract shall be considered in evaluating any requests for extensions of time.

F. The reasons for and times of extensions shall be determined by the Engineer. To warrant consideration, requests for extensions of time must be submitted in writing by the Contractor within ten (10) calendar days after the commencement of the occurrence of such delay giving the reasons for and the claimed time of delay.

G. Any time extension granted will be set forth in a written change order, which order will specify, in addition to the calendar days granted, the basis of compensation for such extension. Payment for time extensions, where allowed, shall be made as provided in Section G-09.4.

*G-08.9 Damages for Delay

A. The parties expressly agree that time is of the essence of this contract, and that any unexcused delay in the prosecution and completion of this work will cause inconvenience and expense to the Port, its lessees and other users of its facilities. It is further acknowledged by the Contractor that any unexcused delays in the prosecution and completion of this work may obstruct air, water or other traffic, interfere with and delay business and commerce, and cause increased risks to persons and property, all of which may cause substantial damage to the Port and/or expose the Port to claims for direct and consequential damage for third parties. Additionally, such delays may cause the Port to incur substantially increased costs of engineering, administration, supervision and inspection in connection with the completion of the work or expedition thereof.

B. In certain circumstances, it will be impracticable and extremely difficult to ascertain and determine the actual damages, as generally described above, which will be suffered by the Port as a result of unexcused delays. In such circumstances, where specifically provided for in the Special Conditions of the Contract, the Contractor agrees to pay and/or authorizes the Port to deduct, from any sum due or to be due the Contractor, as liquidated damages, an amount, as provided in the special conditions, for each calendar day after the established or adjusted completion date during which the job remains uncompleted. Neither this subsection nor any amounts specified in the Special Conditions as liquidated damages shall be considered to be a penalty, it being the express agreement of the parties that any liquidated damages provided shall be a reasonable approximation of actual damages to be suffered by the Port in the event of an unexcused delay.

C. Liquidated damages will not be assessed for any days for which an extension of time has been granted in accordance with the Contract Documents. Any deduction or payment of liquidated damages shall not in any way release the Contractor from any further or other obligations and liabilities with respect to Contractor's performance of the entire contract.

D. If the special conditions do not provide for liquidated damages as provided herein, the Contractor shall nonetheless be subject to liability for actual damages for such delays.

G-08.10 Termination of Contract and Other Remedies

*A. The Port may terminate the contract as to all or any portion of the work remaining to be performed and to complete the work and recover the costs thereof from the Contractor in the event the Contractor:

(1) Refuses or fails to supply sufficient, properly skilled workmen or materials of the proper quality or quantity;

(2) Fails to prosecute the work continuously to completion with promptness and diligence;

(3) Fails to perform any of its obligations under the contract; or

(4) Becomes insolvent or is declared bankrupt or commits any acts of bankruptcy or insolvency or makes an assignment for the benefit of his creditors.

B. Any decision by the Port to pursue any remedy provided for herein shall not be construed to bar the Port from the pursuit of any other remedy provided for by law or equity in the case of similar, different or subsequent breaches of this agreement.

Section G-09
Measurement and Payment

G-09.1 Measurement of Quantities

A. All bid items of work acceptably completed under the contract will be measured by the Engineer according to United States standard measure.

B. Measurements will be made as hereinafter provided unless otherwise provided for by their individual measurement specifications.

C. The method of measurement and computations to be used in determination of quantities of material furnished or of work performed under the contract will be those methods generally recognized as conforming to good engineering practice and will be carried to the proper significant figures or fractions of units for each item to conform to the usual practice of the Port Engineering Department.

*D. Unless otherwise specified, measurements will be made horizontally or vertically. In determining the area for items bid on a square yard basis, the measurements will be on the neat dimensions indicated on the drawings or as altered by the Engineer. No deductions in area will be made for individual fixtures having an area of 9 square feet or less.

*E. Structures will be measured according to neat lines indicated on the drawings or as altered by the Engineer to fit field conditions.

*F. All items which are measured by the linear foot, such as sewers, watermains, pipe culverts, gutters, underdrains, etc., will be measured parallel to the base or foundation upon which such structures are placed, unless otherwise noted on the drawings or specified.

*G. In computing volumes of excavation and embankment, the methods used will be as stated in the appropriate sections of the specifications.

H. The term "Gage," when used in connection with the measurement of plates, means the U.S. Standard Gage, except that when reference is made to the measurement of galvanized sheets used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing, the term "gage" or thickness means that specified in AASHO M 36, M 167, M 196, M 197 or M 219. Corrugated siding of roofing or coated material gage shall refer to material measurement before coating or covering.

I. When the term "gage" refers to the measurement of wire, it means the wire gage specified in AASHO M32.

J. The term "ton" means the short ton consisting of 2,000 pounds avoirdupois. All materials which are measured or proportioned by weight shall be weighed in accordance with the requirements of Section G-09.2. If material is shipped by rail, the car weight may be accepted provided that only the actual weight of material be paid for. However, car weights will not be acceptable for material to be passed through mixing plants. Trucks used to haul material being paid for by weight shall be weighed empty at least daily at such times as the Engineer directs, and each truck shall bear a plainly legible identification mark.

K. Materials to be measured by volume in the hauling vehicle shall be hauled in approved vehicles and measured therein at the point of delivery. Vehicles for this purpose may be of any size or type acceptable to the Engineer, provided that the body is of such shape that the actual contents may be readily and accurately determined. When required by the Engineer, the loads shall be leveled when the vehicles arrive at the point of delivery to facilitate measurement.

L. Asphalt will be measured by the gallon or ton. Volumes will be measured at 60 degrees F. or will be corrected to the volume at 60 degrees F. in accordance with ASTM D 1250. Net certified scale weights or weights based on certified volumes in the case of rail shipments will be used as a basis of measurement, subject to correction when asphalt material has been lost from the car or the distributor, wasted, or otherwise not incorporated in the work. When asphalt is shipped by truck or transport, net certified weights or volumes, subject to correction for loss or foaming, may be used for computing quantities.

M. Cement will be measured by the pound or sack. The term "sack" means 94 pounds of cement.

N. Timber will be measured by the thousand feet board measure (MBM) actually incorporated in the structure. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.

O. The term "lump sum" when used as an item of payment means complete payment for the work described for that item in the contract.

G-09.1 Measurement of Quantities (continued)

P. When a complete structure or structural unit or piece of equipment is specified as the unit of measurement, the unit will be construed to include all necessary fittings and accessories.

Q. When standard manufactured items are specified such as railroad rail, ties, fence, wire, plates, rolled shapes, pipe conduit, etc., and these items are identified by gage, unit weight, section dimensions, etc., such identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.

*R. No measurement will be made for work performed or materials placed outside of lines indicated on the plans or established by the Engineer; materials wasted, used or disposed of in a manner not called for under the contract; rejected materials, including materials rejected after it has been placed, by reason of the failure of the Contractor to conform to the provisions of the contract; hauling and disposing of rejected materials; material remaining on hand after completion of the work; or other work or material payment for which is contrary to the provisions of the contract.

G-09.2 Weighing Equipment

A. Scales for the weighing of natural, manufactured, or processed construction materials obtained from natural deposits, stockpiles or bunkers, which are required to be proportioned or measured and paid for by weight, shall be furnished, erected and maintained by the Contractor, or be certified permanently installed commercial scales.

B. General Requirements of Weighing Equipment

(1) Equipment for weighing construction materials shall be accurate within one-half percent of the correct weight throughout the range of use. It shall be the Contractor's responsibility to provide scales with beams or dial scales or other reliable equipment built and erected in a manner which will prevent displacement, binding or vibration of the various components. The use of spring balances will not be permitted.

(2) Beams, dials, platforms and other scale equipment shall be so arranged that the operator and inspector can safely and conveniently view the dials, beams, rods, and operating mechanism of the scale. All working parts of scales or connections shall be protected from material falling upon or against them, and protected from wind and weather. Special care and protection of knife edges shall be exercised. Bunkers and platforms shall be kept clean of all materials which may accumulate and introduce errors.

(3) Each batching and platform scale installation shall have available throughout the period of use, ten standard fifty-pound weights for calibrating and testing the weighing equipment or suitable weights and devices for other approved equipment. Valid certificate shall be displayed on the scale.

C. Specific Requirements for Batching Scales

(1) Weighing equipment and hopper shall be so arranged that the operator can conveniently remove material from the hopper and view beams or dials simultaneously. Scales shall be of a type well suited for supporting a weighing hopper. Weighing hoppers mounted on platform scales shall have the center of gravity directly over the center line of the platform.

(2) Batch scales must be tested for accuracy and serviced by the scale company's designated representative before use at a new site and every six months thereafter. The Engineer shall be provided with a copy of the final test results each time the scales are checked. Subsequently, the Contractor shall have the scales checked by his operating personnel under the observation of the inspector at such other times as requested.

(3) The scales used for weighing Portland cement and asphalt cement shall be separate from those for weighing other materials. The intervals shall be uniform in spacing throughout the graduated or marked length of the beam or dial and based on the nominal rated capacity of the scale. Graduated intervals for all scales shall not exceed one-tenth of one percent of the nominal rated capacity of the scale; but not less than one pound.

(4) All materials proportioned by weight shall be weighed on accurate, approved scales by competent, qualified Contractor personnel at locations approved by the Engineer.

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D. Specific Requirements for Platform Scales

(1) Platform scales shall be of sufficient size and capacity to weigh the entire hauling vehicle or combination of connected vehicles at one time. No part of the connected vehicle or combination will be permitted off the platform at the time of weighing, unless otherwise specifically authorized.

(2) The Contractor will be required to furnish appropriate tickets for self-printing types of scales. Unless otherwise authorized by the Engineer, the operator of each vehicle weighed shall obtain a weigh or load ticket from the scale operator and deliver the ticket to the Material Receiver at the point of delivery of the material from a standing vehicle. If the Contractor elects to use commercial scales, he will be required to furnish approved load tickets at the scale and duplicate copies to the Material Receiver at the delivery point and guarantee permission for a Port Representative to periodically observe the weighing and to check and compile the daily record of scale weights. The Contractor shall furnish certified weights of the materials in accordance with the Laws of the State of Washington. Tare weights shall be taken of each conveyance at least daily.

(3) The original copy of the weight tickets shall accompany the load of material and be delivered to the Material Receiver at the delivery point.

(4) Platform scales shall be installed and maintained with the platform level and rigid bulkheads at each end to eliminate binding and shifting. The platform scale beam or dial shall have graduated intervals of no more than 40 pounds. When testing the scales, the weights shall be read and recorded to the nearest 20 pounds and during weighing operations, weights shall be read and recorded to the nearest cwt.

(5) Before use at a new site and every six months thereafter, the scales shall be approved in accordance with local ordinances or rules of the State Department of Agriculture's Weights and Measures Section, or be serviced and tested by a scale company representative with at least 10,000 pounds, with a copy of the final test results provided to the Engineer.

E. Measurement

In the event inspection reveals the scales have been underweighing, they shall be adjusted and no additional payment to the Contractor will be allowed for materials previously weighed and recorded. Scales overweighing (indicating more than true weight) will not be permitted to operate and all materials received subsequent to the last previous correct weighing accuracy test will be reduced by the percentage of error in excess of one-half of one percent. No payment will be made for materials received by weight which have not been weighed in accordance with the foregoing specification, or other method specifically approved in writing for the individual project.

F. Payment

All costs in connection with furnishing, installing, having certified and maintaining scales, for furnishing check weights and scale house, and for all other items specified in this section for the weighing of construction materials for proportioning or payment shall be included in the unit contract prices for the various pay items of the project.

G-09.3 Scope of Payment

*A. The Contractor shall receive and accept compensation provided for in the contract as full payment for furnishing all materials and for performing all work under the contract, including changes in work, materials, or plans as provided herein, in a complete and acceptable manner; also for all risk, loss, damage, or expense of whatever character arising out of the nature of the work or the prosecution thereof; and for all expense incurred in consequence of the suspension or discontinuance of the work as specified under the contract. Neither the payment of an estimate nor of retained percentage shall relieve the Contractor of the obligation to make good defective work or material, or shall constitute a waiver of other provisions of the Agreement.

*B. The unit contract prices for the various bid items of the contract shall be full compensation for all labor, materials, supplies, equipment, tools and all things of whatever nature required for the complete incorporation of the item into the work the same as though the item were to read "In Place," unless the drawings and specifications shall provide otherwise.

*C. If the "Payment" clause in the specifications relating to a unit contract price in the proposal requires that said unit price cover and be considered compensation for certain work or material essential to the item, this same work or material will not also be measured or paid for under any other pay item which may appear elsewhere in the specifications.

*G-09.4 Changes

Payment for work or time extension pursuant to a change order as provided in Section G-04.4 or G-08.8, other than deleted work, shall be full compensation for such changes, including payment for costs of all delays in connection with such change and including full payment for all expense for inconvenience, disruption of schedule and/or loss of efficiency or productivity by the Contractor. Where the work performed can be measured and paid for at unit prices as provided in the contract, it shall be measured and paid at such prices. Otherwise, payment shall be at the price agreed by the parties. The Contractor shall furnish the Engineer with a copy of his detailed estimate as justification for the price asked to make the change requested. If no price is agreed upon in advance the Engineer may, by written change order, instruct the Contractor to proceed by Force Account as provided in Section G-09.6. The value of deleted work will be determined as provided in Section G-09.5. No allowance will be made for any anticipated profits which would have been earned on work deleted as the result of a change.

G-09.5 Deleted Items

*A. The Port shall have the right to cancel all or portions of the contract relating to the construction of any item or items therein. The amount credited to the Contract Sum for deleted work shall be determined by one of the following methods:

(1) By the unit contract price stated in the Proposal and in accordance with Section G-04.4 A(2).

(2) By a price agreed upon in advance of the execution of a Change Order.

(3) By an estimate prepared itemizing all elements of the work so deleted, including labor, equipment, and material, priced at the same rate as in the Contractor's preparation of its original bid, less any costs properly expended to date in connection with the performance of the deleted work. The total price shall also include an appropriate allowance for mark-up, contingencies, overhead, profit and/or fee at the same rate as applied in the preparation of the original bid. In the event that the contractor cannot satisfactorily document the above elements of credit to the satisfaction of the Engineer, allowances for mark-up, contingencies, overhead, profit and/or fees shall be calculated in the same manner as for Force Account work as described in Section G-09.6 of the General Conditions.

B. Acceptable materials ordered by the Contractor or delivered on the work prior to the date of cancellation of the work by the Engineer, may at the Port's option either be purchased from the Contractor by the Port at the actual cost and shall thereupon become the property of the Port, or the Port will reimburse the Contractor for his actual costs connected with these materials less their salvage value.

*G-09.6 Force Account

A. Whenever under the terms of the contract, work or materials are to be paid for as Force Account, the amount of such payments shall be determined as follows:

(1) Labor

For all labor, including such forman supervision, but excluding general superintendents as may be necessary upon any particular operation, the Contractor shall be reimbursed for labor costs, overhead and fee as outlined hereinafter.

Payment made for labor shall be the sum of the following:

(a) Weighted Wage Rate

The agreed weighted wage rate for all labor used shall include and be restricted to the current prevailing basic wage plus fringe benefits made the obligation of the Contractor by labor agreement, and benefits paid on behalf of labor by the Contractor as follows:

(1) Federal Insurance Compensation Act (FICA)
(2) Federal Unemployment Tax Act (FUTA)
(3) State Unemployment Compensation Act (SUCA)

The above items shall be combined into a single wage rate for each classification of labor used which shall be designated as the "Weighted Wage Rate" for the identified class of labor.

(b) Travel Allowance and/or Subsistence

The Contractor shall be reimbursed the actual costs of travel and/or subsistence allowances paid to labor engaged upon the work when said allowances are required by labor agreement.

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(c) Industrial Insurance and Medical Aid Premiums

The Contractor shall receive reimbursement for Marine Industrial Insurance, State of Washington Industrial Insurance and Medical Aid premiums which become an obligation of the Contractor and are chargeable to the force account work on the basis of time worked. The agreed rate(s) of compensation for the above premiums shall be a composite rate(s) based upon the full premium for Industrial Insurance and one-half the premium for Medical Aid which premiums are prescribed by the regulatory body for composite rate may be adjusted upon request to conform with adjustments prescribed by the regulatory body.

(d) Overhead and Fee

The Contractor shall be reimbursed an amount equal to twenty percent (20%) of the sum of the items hereinbefore listed (a), (b), and (c) above for overhead and fee, bond, insurance (except as specified in G-09.6 A.(1)(c) above), and all other cost incurred including contingencies in supplying such labor.

(2) Materials

(a) For all materials furnished by the Contractor for the work, payment shall be made for his actual invoice cost of such materials including actual freight and express charges and applicable taxes less all offered or available discounts and rebates, not withstanding the fact that they may not have been taken by the Contractor. To the above cost shall be added a sum equal to fifteen percent (15%) for overhead, fee, bond, insurance and all other cost incurred including contingencies in supplying such materials.

(b) The Contractor shall furnish as support for all charges for materials valid copies of vendor's invoices including freight and express bills. As to such materials as may be furnished from Contractor's stocks for which an invoice is not available, the Contractor shall furnish an affidavit certifying to his actual cost of such materials.

(c) If the Contractor's cost of such materials furnished is excessive, in the opinion of the Engineer, or if the Contractor does not furnish evidence of his costs satisfactory to the Engineer, the Port reserves the right to establish the cost of all or part of such materials at the lowest current wholesale prices less all applicable discounts and exemptions at which said materials are available in the quantities required delivered to the location of the work.

(d) The Port reserves the right to furnish such materials as it deems advisable, and the Contractor shall have no claims for any costs, overhead or fee on such materials.

(3) Equipment

(a) For any machine-power tools or equipment which the Engineer deems necessary or desirable to use, payment shall be made in accordance with the current AGC-Department of Highways equipment rental agreement and the included "Maximum Hourly Rental Rates for Force Account Work" schedule for each hour that said tools or equipment are in use on the work. To the total due the Contractor for rental of tools and equipment shall be added an amount equal to fifteen percent (15%) of that total for overhead, fee, bond, insurance and all other costs incidental to furnishing and operating such equipment.

(b) The rates in effect at the time of the performance of the force account work, as set forth in the schedule of "Maximum Hourly Rental Rates for Force Account Work," are the maximum rates allowable for equipment of modern design and in good working conditions and include and are full compensation for furnishing all fuel, oil, lubrication, repairs, maintenance, insurance and incidental expenses except labor for operation thereof. If equipment is required for which a rental rate is not included in the current schedule, an agreed rental rate shall be established for that equipment based upon the same elements of costs used in establishing the current schedule of rental rates. Such rates must be approved by the Engineer prior to use of the equipment on the Force Account work.

(c) A current schedule of "Maximum Hourly Rental Rates for Force Account Work" is maintained at each district office of the Department of Highways and at each of the offices of the Associated General Contractors of America, located at Seattle, Spokane, Tacoma and Portland, where the schedule is available for inspection.

(d) If the necessary equipment is not already at the site of the project and it is not anticipated that it would be required for the performance of other work under the terms of the contract, the Contractor will be paid an agreed amount for the costs of the necessary transportation of such equipment. To this agreed amount shall be added an amount equal to fifteen percent (15%) of that sum for all other cost contingencies, overhead, fee, and necessary bond and insurance.

G-09.6 Force Account (continued)

*(4) Subcontractors

When work is performed on a Force Account basis by approved subcontractors, the Contractor will be allowed an additional markup based on the following schedule:

(a) First $10,000.00 of work done on each change order by subcontractors (less markups for overhead and fee) the Contractor will be allowed ten percent (10%) supplemental markup.

(b) All work in excess of $10,000.00 done by subcontractors on each change order (less markups for overhead and fee) the Contractor will be allowed a five percent (5%) supplemental markup.

The ten percent supplemental markup shall apply to the first $10,000.00 accumulated total of all Force Account work performed by all subcontractors on any single change order.

*(5) Sub-subcontractors

The provisions of subparagraph (4) above as they apply to Contractors and Subcontractors shall also apply in the same sense to Subcontractors and Sub-subcontractors at all tiers.

*B. The payments provided for in section G-09.6A items (1) through (5) shall be full payment for all work done on a Force Account basis and for all delays which may have been suffered prior to the change requiring force account payment or result from the performance of such changed work. The payment shall cover all costs of labor, materials, equipment, overhead, damages, if any, fee and all other costs or expenses, of whatever kind or type, which are occasioned either directly or indirectly, including payments required under the Social Security Act, State Unemployment Compensation Act, occupational tax and any other federal or state insurance policies, and for the use of small tools and equipment for which no rental is allowed.

*C. No claim for Force Account shall be allowed except upon written order by the Engineer prior to the performance of such work. No work shall be considered to be as Force Account work which can be measured under the specifications and paid for at the unit prices named in the contract.

D. The amount and costs of any work to be paid by Force Account shall be certified by the Resident Engineer. All claims for work done on a Force Account basis may be submitted for payment at any time subsequent to the performance of the work, however all such claims must be made before final acceptance of the work.

*E. The Contractor's and all subcontractor's cost records pertaining to work paid for on a Force Account basis shall be open to inspection or audit by representatives of the Port during the life of the contract and for a period of not less than 3 years after the date of acceptance thereof, and the Contractor shall retain such records for that period. The Port shall have the right to seek reimbursement of any amount it determines was overpaid to the Contractor. Where payment for materials or labor is based on the cost thereof to forces other than the Contractor, the Contractor expressly guarantees that the cost records of such other forces shall be open to inspection and audit by representatives of the Port on the same terms and conditions as the cost records of the Contractor. If an audit is to be commenced more than 60 days after the acceptance date of the contract, the Contractor will be given a reasonable notice of the time when such audit is to begin.

G-09.7 Payment for Material on Hand

*A. Partial payments may be made on monthly estimates to the extent of the cost of materials to be incorporated into the completed work, if said materials meet the requirements of the contract documents and are delivered to and properly stored at the jobsite in a manner approved by the Engineer.

B. The cost of the materials will be determined by the invoices to the Contractor. Such material may include, but not necessarily be limited to, the following: sand, gravel, surfacing material, aggregates, reinforcing steel, bronze plates, structural steel, machinery, piling, timber and lumber (not including forms or falsework), large signs peculiar to the specific project and prestressed concrete beams and girders. No partial payment will be made on living or perishable plant materials, nor will payment be made for individual items on hand amounting to less than five hundred dollars ($500.00). Credits equal in amount to the partial payments for the various materials involved, will be taken on future estimates as the materials are used in the work.

*C. Partial payment for materials on hand, if any, as specified above shall not constitute acceptance thereof, and faulty material discovered will be rejected even though partial payment therefor may have been made.

G-09.8 Payments

A. The basis of payment will be the actual quantities of work performed according to the contract and as specified for payment therein.

B. Payments shall be made for work and labor performed and materials furnished under the contract according to the prices in the proposal unless otherwise provided.

C. Partial payments shall be made at the Contractor's request once each month, based upon partial estimates prepared by the Engineer. Unless otherwise provided, payments shall be made upon presentment of vouchers signed by the Contractor and approved by the Engineer.

*D. Failure by the Contractor to perform any of his obligations under the contract may be considered by the Port to be adequate reason for withholding any payments until compliance is achieved.

E. Upon completion and acceptance of all work, the amount due the Contractor under the contract shall be paid based upon the final estimate made by the Engineer.

F. Payment to the Contractor of partial estimates, final estimates and retained percentages shall be subject to controlling laws.

*G-09.9 Payment Under CPM/Cost Module

Payment for work performed under the CPM/Cost Module will be based on the Engineer's estimate of the percent complete of each cost activity on the CPM, rounded to the nearest whole percent.

*G-09.10 Contractor's Release

When the contract is accepted by the Engineer as complete and in compliance with the contract requirements, the Contractor shall execute a "Contractor's Release," a copy of which is provided elsewhere in these specifications, prior to final acceptance by the Commission.

Section G-10
Contract Forms

G-10.1 Contract Forms

The following forms by their inclusion are made a part of these General Conditions:

*1. Form of Bond
*2. Agreement or Contract Form
3. Escrow Agreement
4. Contractor's Release
5. Certificate of Insurance (Property)
6. Certificate of Insurance (Liability)
7. Request for Proposal
8. Change Order

POS 22696

CONTRACT BOND

KNOW ALL MEN:

That We, _____ and
(Principal)

_____ are held and
(Surety)

firmly bound unto The Port of Seattle and all others entitled to recovery hereunder, in the sum of

_____ Dollars ($_____) for payment

of which we bind ourselves, our legal representatives, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has executed a contract with The Port of Seattle (Hereinafter "Port"), dated

_____ for _____

_____

a copy of which contract is by reference made a part hereof (the term "contract" as used herein, to include the aforesaid instrument together with the plans, specifications, drawings, addenda and related documents executed in conjunction therewith, together with all existing and subsequent alterations thereof and additions thereto, and deletions therefrom);

NOW, THEREFORE,

(1) If Principal shall faithfully perform all the provisions of such contract and shall pay all laborers, mechanics, subcontractors and materialmen, and all persons who shall supply the Principal or subcontractors with provisions, equipment or supplies for the carrying on of said work and shall indemnify the Port and save it harmless from all cost and damage by reason of Principal's default, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

(2) This bond is executed pursuant to the provisions of Chapter 39.08, Revised Code of Washington.

(3) All persons who have furnished labor or material, or equipment or supplies, for use in or about the improvement shall have a direct right of action under this bond, subject to the Port's priority.

(4) The Surety recognizes that the contract includes provisions for additions, deletions and modifications to the work which may result in a change in the general scope of the work and the amounts payable to Principal. Surety agrees that no such addition, deletion or modification, nor any combinations thereof, shall avoid or impair the Surety's obligation hereunder.

(5) In the event of the Principal's default, Surety shall promptly, after receipt of notice of of the Port's determination of such default (and in no event more than 60 days following receipt of the Port's notice unless an extension of time is agreed to in writing by the Port and the Surety), notify the Port that it has elected to take over and assume completion of the contract and become entitled to payment of the balance of the contract price according to the terms of the contract or that it has elected to pay the Port in cash the cost of completion together with all other reasonable costs and expenses incurred by the Port as a result of the Principal's default including but not limited to those reasonable costs and expenses incurred by the Port in its efforts to mitigate its losses which may include efforts to complete the work prior to the Surety exercising the options available to it.

(6) If the Surety shall assume completion of the contract following Principal's default, then the work to complete the contract shall be prosecuted under the full supervision of the Chief Engineer of the Port of Seattle or his representative.

(7) If the Port or any party entitled to recover under this bond shall commence suit and obtain judgment against the Surety for recovery hereunder, then the Surety, in addition to such judgment, shall pay such costs and attorney fees as may be awarded by the Court.

(8) In no event, however, shall the total amount of recovery hereunder, exceed the penal sum of this bond (plus the sum of all change orders executed pursuant to the contract not to exceed 10% of the penal sum of the bond) unless consented to in writing by the Surety.

Signed and Sealed this _____ day of _____, 19 _____, A. D.

IMPORTANT: Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Washington.

_____ _____
(Surety) (Principal)

"Power of Attorney" attached

POS 22697

820/17B/09 - *Revised 9/1/77

PORT OF SEATTLE

AGREEMENT

THE PORT OF SEATTLE ("Port") and the undersigned Contractor ("Contractor") agree as follows:

Article I
The Work

Contractor, for the consideration specified in the Contract Documents, shall in strict accordance therewith perform all of the work required by Contract Documents for the following project:

The Port agrees to pay the Contractor for the Work as provided in the Contract Documents.

Article II
The Contract Documents

The Contract Documents consist of the Agreement, Conditions of the Contract (General, Special, Supplementary and other Conditions), Drawings, Specifications, Addenda and other documents listed below issued prior to execution of this Agreement and all Modifications and Change Orders issued subsequent thereto. These form the Contract, and all are as fully a part of the Contract as if attached to this Agreement or repeated herein. An enumeration of the Contract Document is set forth below.

1. This Agreement
2. The Project Manual Dated _____ 19___, including the Specifications.
3. Addenda Nos. _____

The Work to be performed under this Contract shall be commenced not later than _____ calendar days following issuance of the "Notice to Proceed" and completed not later than _____ calendar days following issuance of the "Notice to Proceed."

The Port shall pay the Contractor for the performance of the Work, subject to additions and deductions by Change Order as provided in the General Conditions, in current funds, the Contract Sum of _____ as the Lump Sum price or as the total of unit prices according to the following attached schedule of unit prices consisting of _____ pages.

Executed this _____ day of _____ 19 ___.

Port	Contractor
THE PORT OF SEATTLE	
By _____ Its President	By _____
ATTEST:	Its _____
By _____ Its Secretary	

POS 22698

820/17B/10 - *Revised 9/1/77

Escrow No. _____

Public Body _____

_____

Contract No. _____

Completion Date _____

ESCROW AGREEMENT

TO: _____ ESCROW AGENT
ESCROW DEPARTMENT

_____ _____, WASHINGTON _____

This Escrow Agreement is for the investment of the retained percentages of the above contract in accordance with Chapter 38, Laws of 1970, amending RCW 60.28.010, 60.28.030 and 60.28.050.

The Undersigned, _____, hereinafter referred to as the Contractor, has directed _____, hereinafter referred to as the Public Body, to deliver to you its warrants, checks or drafts which shall be payable to you and the Contractor jointly. Such warrants, checks or drafts are to be held and disposed of by you in accordance with the following instructions and upon the terms and conditions hereinafter set forth.

INSTRUCTIONS

1. Upon delivery to you, warrants, checks or drafts made payable to you and the Contractor jointly shall be endorsed by you and forwarded for collection. The moneys from all such warrants, checks or drafts received hereunder shall be used by you to purchase bonds or other securities selected by the Contractor and approved by the Public Body. For the purpose of each such purchase, you may follow the last written direction received by you from the Contractor, provided said direction otherwise conforms with the restrictions on investments recited herein. Attached is a list of such bonds, or other securities approved by the Public Body. Other bonds or securities, except stocks, may be selected by the Contractor, subject to express written approval of the Public Body.

2. The investments selected by the Contractor, approved by the Public Body and purchased by you must mature on or prior to the date set for the completion of the contract, including extensions thereof. After the completion date of the contract, you shall not be required to invest the money held by you and derived from the sale or redemption of matured investments until authorized to do so by the Contractor and the Public Body, which authorization shall include the completion date of the extension.

3. When and as interest on the securities held by you pursuant to this agreement accrues and is paid, you shall collect such interest and forward it to the Contractor at its address designated below unless otherwise directed by the Contractor.

4. You are not authorized to deliver to the Contractor all or any part of the securities held by you pursuant to this agreement (or any moneys derived from the sale of such securities, or the negotiation of the Public Body's warrants) except in accordance with written instructions from the Public Body. Compliance with such instructions shall relieve you of any further liability related thereto.

5. In the event the Public Body orders you to do so in writing, you shall, within thirty-five (35) days of receipt of such order, reconvert into money the securities held by you pursuant to this agreement and return such money together with any other moneys held by you, hereunder, to the Public Body.

POS 22699

6. The Contractor agrees to pay you for your services hereunder compensation in accordance with your published schedule of Escrow Fees-Public Works Contracts. Payment of all fees shall be the sole responsibility of the Contractor and shall not be deducted from any property placed with you pursuant to this agreement until and unless the Public Body directs the release to the Contractor of the securities and moneys held hereunder whereupon you shall be granted a first lien upon such property released and shall be entitled to reimburse yourself from such property for the entire amount of your fees as provided for herein above. In the event that you are made a party to any litigation with respect to the property held by you hereunder, or in the event that the conditions of this escrow are not promptly fulfilled or that you are required to render any service not provided for in these instructions, or that there is any assignment of the interests of this escrow or any modification hereof, you shall be entitled to reasonable compensation for such extraordinary services from the Contractor and reimbursement from the Contractor for all costs and expenses, including attorney fees occasioned by such default, delay, controversy or litigation.

7. This agreement shall not be binding until executed by the Contractor and the Public Body and accepted by you.

8. This instrument contains the entire agreement between you, the Contractor, and the Public Body with respect to this escrow and you are not a party to nor bound by any instrument or agreement other than this; you shall not be required to take notice of any default or any other matter, nor be bound by nor required to give notice or demand, nor required to take any action whatever except as herein expressly provided; you shall not be liable for any loss or damage not caused by your own negligence or willfull misconduct.

9. The foregoing provisions shall be binding upon the assigns, successors, personal representatives and heirs of the parties hereto.

The undersigned have read and hereby approve the instructions as given above governing the administration of this escrow and do hereby execute this agreement on this _____ day of _____, 1970.

_____ (Contractor)

By _____ (Title)

_____ (Address)

_____ (Tax Identification No.)

_____ (Public Body)

By _____

The above escrow instructions received and accepted this _____ day of _____, 1970.

_____ ESCROW AGENT

By _____ (Authorized Officer)

RCW 60.28-107 9-30-70

POS 22700

CONTRACTORS RELEASE

Contractors Release under contract _____

KNOW ALL MEN BY THESE PRESENTS:

In consideration of the premise and the sum of _____

_____ ($_____)

lawful money of the United States of America _____

_____ ($_____)

of which has already been paid and _____

_____ ($_____)

of which is to be paid by the Port of Seattle under the above-mentioned contract, the undersigned Contractor does, and by the receipt of said sum shall, for itself, its successors and assigns, remise, release and forever discharge the Port of Seattle, its officers, agents and employees, of and from all liabilities, obligations and claims whatsoever in law and in equity under or arising out of said contract.

IN WITNESS WHEREOF, this release has been executed this _____ day of _____, 19___.

_____
Contractor

WITNESSES:

_____ By: _____

_____ Title: _____

CERTIFICATE

I, _____, certify that I am the _____ _____ secretary of the corporation named as Contractor in the foregoing release; that _____ who signed said release on behalf of the Contractor was then _____ of the said corporation; that said release was only signed for and in behalf of said corporation by authority of its governing body and is within the scope of its corporate powers.

(Corporate Seal) _____

CERTIFICATE OF INSURANCE

P R O P E R T Y

Date _____

This is to certify to the PORT OF SEATTLE, P. O. Box 1209, Seattle, Washington 98111, that the following policies are in force for:

Name of Insured* _____

Address _____

Contract Title and/or Description of Job _____

*Named Insured includes OWNER AND SUBCONTRACTORS

TYPE OF INSURANCE	LIMITS OF LIABILITY
"All Risk" Builder's Risk (including Earthquake, Tidal Wave and Flood)	$
Fire, Extended Coverage, Vandalism and Malicious Mischief	$

Insurance Company(ies)	Policy No.	Effective	Expires

SAMPLE

In the event of cancellation of or material change in the coverage provided by these policies, ten (10) days' written notice will be furnished the PORT OF SEATTLE prior to date of cancellation or change.

_____
Authorized Representative

DO NOT WRITE BELOW THIS LINE

1. Contract No._____ or Purchase Order No._____

2. Comments:

POS 22702

CERTIFICATE OF INSURANCE

L I A B I L I T Y

Date _____

This is to certify to the PORT OF SEATTLE, P.O. Box 1209, Seattle, Washington 98111, that the following policies are in force for:

Name of Insured _____

Address _____

Contract Title and/or Description of Job _____

_____

_____

_____

TYPE OF INSURANCE	LIMITS OF LIABILITY	
	Personal Injury	Property Damage
Comprehensive General-Automobile Liability, including Broad Form Contractual and Contractor's Protective Liability:		
Automobile - Each Person	$_____	
- Each Occurrence	$_____	
- Each Occurrence		$_____
Other than Auto - Each Person	$_____	
- Each Occurrence	$_____	
- Aggregate Products, Complete Operations	$_____	
- Each Occurrence		$_____
- Aggregate(s)		$_____

Special Conditions: Coverage extended to include Contractual Liability Coverage as required under Insurance Requirements of the above contract. Property Damage includes coverage for XCU hazards.

In the event of cancellation of or material change in the coverage provided, ten (10) days' written notice will be furnished the Port of Seattle prior to date of cancellation or change.

Insurance Company(ies)	Policy No.	Effective	Expires

_____
Authorized Representative

WORKMEN'S COMPENSATION - STATE OF WASHINGTON -- Account No. _____

The undersigned hereby certifies that his operations are covered by the Washington State Compensation Fund.

_____
Signature of Contractor

DO NOT WRITE BELOW THIS LINE

1. Contract No. _____ or Purchase Order No. _____

2. Comments:

POS 22703

PORT OF SEATTLE

REQUEST FOR PROPOSAL

ENGINEERING DEPARTMENT

Contractor: _____ Request for Proposal No. _____

Project: _____ Contract No. _____

_____ Date _____

Your Proposal, if accepted, will modify your contract and covers everything in connection with this change; does not extend the time of completion unless stated to the contrary; and shall be subject to the same terms, conditions, specifications and drawings as contained in said contract.

This is a Request for a Proposal only. It is not an authorization to cease any work; to perform work; or to incur expenses, nor is it a directive of any kind, other than to submit your Proposal.

Please submit within _____ calendar days, three copies of your Proposal and itemized cost breakdown form as called for in the General Specifications, _____ for the following described work:

Continued on _____ page (s)

PORT OF SEATTLE

By _____

Title _____ Date _____

POS 22704

PORT OF SEATTLE

CONTRACT CHANGE ORDER

ENGINEERING DEPARTMENT

Contractor:_____ Change Order No._____

Project:_____ Contract No._____

_____ Date_____

The Port of Seattle hereby accepts the below-listed Proposals, pursuant to the change clause of the above-referenced contract with such modifications, if any, as are set forth herein.

Continued on_____page (s).

As a result of the above described change (s), the price of the contract shall be (increased) (decreased) by the (fixed) (estimated) sum of $_____, and the contract completion date shall be (extended) (reduced) by _____days from_____to_____. Acceptance by the Port of the Contractor's Proposal (s) stated above are subjected to the following conditions:

1. The adjustment in contract price includes and covers all costs of labor, materials, equipment, overhead, damages, if any, profit and all other costs or expenses, of whatever kind or type, which are occasioned either directly or indirectly by the Contractor as a result of this Change Order.

2. All other items, conditions, and obligations of the contract shall remain in full force and effect except as expressly modified herein, in writing, by this Change Order.

If the above conditions are acceptable to the Contractor, he may consider this document as his authority to proceed with the work described herein by signing in the space provided for "Acceptance and Approval" and returning the original copy of this Change Order to the Port.

ACCEPTANCE AND APPROVAL
By the Contractor

By_____

Title_____Date_____

ACCEPTANCE AND APPROVAL
By the Port of Seattle

By_____

Title_____Date_____

POS 22705

APPENDIX "A"

FEDERAL, STATE AND LOCAL ENVIRONMENTAL
STATUTES, ORDINANCES AND REGULATIONS

In accordance with the provisions of Chapter 62, Laws of 1973, H. B. 621, the contractor shall comply fully with all provisions of the following laws, ordinances, and resolutions, where they are applicable to this project:

I. FEDERAL

A. Statutes

1. National Environmental Policy Act: Establishes a federal policy on the environment and requires the appropriate federal agency, in any federal-assisted or authorized project, to prepare an environmental impact statement for any "major action significantly affectly the quality of the human environment."

2. Clean Air Act of 1970: Establishes a federal policy on air quality and directs each state to promulgate air quality laws and regulations to achieve the goals set forth in the Act.

3. Federal Water Pollution Control Act of 1972: Establishes a federal policy on water quality and directs each state to promulgate water quality laws and regulations to achieve the goals set forth in the Act. In addition, the Act sets forth oil spill prevention provisions and penalties.

4. Rivers and Harbors Act of 1899: Provides that discharge of refuse without a permit into navigable waters is prohibited. Violation is punishable by fine. Any citizen may file a complaint with the U.S. Attorney and share a portion of the fine. Requires permit for construction on navigable waters.

5. Port and Waterways Safety Act of 1972: Provides vessel design and construction standards to protect the marine environment.

B. Regulations

1. Environmental Protection Agency Regulations on National Primary and Secondary Ambient Air Quality Standards: Establishes national primary and secondary ambient air quality standards for certain compounds pursuant to Section 109 of the Clean Air Act.

2. Environmental Protection Agency Regulations on Discharge of Oil: Regulations promulgated pursuant to the Federal Water Pollution Control Act of 1972.

3. Coast Guard Regulations on Oil Spills: Regulations promulgated pursuant to the Federal Water Pollution Control Act of 1972.

4. Army Corps of Engineers Regulations on Navigable Waters: Establishes procedures for obtaining permits required by the Rivers and Harbors Act of 1899.

II. STATE

A. Statutes

1. State Environmental Policy Act: Establishes a state policy on the environment and requires the appropriate state or local agency to prepare an environmental impact statement for any "major action significantly affecting the quality of the environment" which the agency either undertakes directly or authorizes.

2. Shoreline Management Act: Requires a permit for development on state shorelines.

3. Clean Air Act: Provides that it is the public polity of the State to secure and maintain such levels of air quality to protect health and comply with the federal Clean Air Act.

4. Water Pollution Control Act: Establishes a state policy to maintain the highest possible standards to ensure the purity of all water of the State consistent with the public health and public enjoyment thereof, the propagation and protecting of wildlife, birds, game, fish, and other aquatic life, and the industrial development of the State, and to that end require the use of all known available and reasonable methods to prevent and control the pollution of the waters of the State of Washington.

POS 22706

A. Statutes (continued)

5. Washington Solid Waste Management Law: Establishes uniform statewide program for handling solid wastes which will prevent land, air and water pollution. Makes it unlawful to dump or deposit solid wastes onto or under the surface of the ground or into the waters of this State except at a solid waste disposal site for which there is a valid permit.

B. Regulations and Guidelines

1. Department of Ecology Guidelines for the Implementation of the State Environmental Protection Agency

2. Department of Ecology Shoreline Development Permit Regulations: State guidelines for the issuance of permits.

3. Air Pollution Regulations on Record Keeping: Requires operators of stationary sources of air contaminants to maintain records of emissions, periodically report to the State information concerning these emissions from his operations, and to make such information available to the public. See Puget Sound Pollution Control Agency Regulation I.

4. Department of Ecology Regulations Relating to Minimum Functional Standards for Solid Waste Handling: Regulations promulgated pursuant to the State Solid Waste Act.

5. Water Quality Standards: Water quality standards promulgated pursuant to the State Water Pollution Control Act.

III. LOCAL

A. Ordinances

1. King County Environmental Policy Ordinance: Provisions for carrying out the County's responsibilities pursuant to the State Environmental Policy Act.

2. King County Shoreline Management Ordinance: Establishes procedures for obtaining a permit under the Shoreline Management Act.

3. King County Solid Waste Code: Establishes provisions for the disposal of solid waste.

4. King County Grading Ordinance: Requires permit for grading, land fills, gravel pits, dumping, quarrying and mining operations.

5. Seattle Shoreline Development Ordinance: Establishes procedures for obtaining a permit under the Shoreline Management Act.

B. Regulations and Orders

1. Seattle Environmental Policy Executive Order: Provisions for carrying out the City's responsibilities pursuant to the State Environmental Policy Act.

2. Puget Sound Air Pollution Control Agency Regulation I: A regulation to control the emission of air contaminants from all sources within the jurisdiction of the Puget Sound Air Pollution Control Agency (King, Pierce, Snohomish, and Kitsap Counties) in accordance with the Washington Clean Air Act.

APPENDIX "B"

EQUAL EMPLOYMENT OPPORTUNITY - AFFIRMATIVE ACTION REQUIREMENTS

1. Coverage The provisions of these requirements shall be applicable to contractors and subcontractors in regard to all construction trades used on Port of Seattle construction projects.

2. Requirement -- An Affirmative Action Plan CONTRACTORS AND SUBCONTRACTORS WILL NOT BE ELIGIBLE FOR ANY PAYMENT UNDER THIS CONTRACT UNLESS THEY HAVE SUBMITTED, AND HAD APPROVED BY THE PORT OF SEATTLE, A WRITTEN AFFIRMATIVE ACTION PLAN, EMBODYING BOTH (1) GOALS AND TIMETABLES OF MINORITY* AND FEMALE MANPOWER UTILIZATION, AND (2) SPECIFIC AFFIRMATIVE ACTION STEPS DIRECTED AT INCREASING AND MAINTAINING MINORITY AND FEMALE MANPOWER UTILIZATION BY MEANS OF APPLYING GOOD-FAITH EFFORTS TO CARRY OUT STEPS. BOTH THE GOALS AND TIMETABLES, AND THE AFFIRMATIVE ACTION STEPS MUST MEET THE REQUIREMENTS OF THESE CONDITIONS AS SET FORTH BELOW FOR ALL TRADES WHICH ARE TO BE UTILIZED ON THE PROJECT, IRRESPECTIVE OF WHETHER THE WORK TO BE PERFORMED BY THEM HAS BEEN COORDINATED.

NOTE: **"Minority" is defined as including Blacks, Asians, American Indians, and Spanish-surnamed Americans, Chicanos, Puerto Ricans, Latinos, etc.*

3. Goals and Timetables

A. The Plan must set forth goals of minority and female manpower utilization for all contractors and subcontractors for all trades to be used for this contract. The goals shall be expressed in terms of manhours. No less than 13% MINORITIES and no less than 12% FEMALES will be allowed for this contract.

B. Whenever a contractor or subcontractor uses trades not contemplated at the time he submits his bid, he shall be deemed to be committed to these requirements with respect to those trades. Whenever a contractor or subcontractor is so deemed to be committed to these requirements, he shall be considered to be committed to a manpower utilization goal of the minimum percentage for that trade.

C. The above percentage of minority and female manpower utilization is expressed in terms of manhours of training and employment as a proportion of the total manhours to be worked by the contractor's and subcontractor's entire work force in that trade on this Port of Seattle contract. The percentage of manhours for minority and female work and training must be substantially uniform throughout the length of the contract, for each of the trades. Further, the transfer of minority and female employees or trainees from employer-to-employer and from project-to-project for the sole purpose of meeting the Contractor's or subcontractor's goal(s) shall be a violation of these requirements.

D. The goals of minority and female manpower utilization required of contractors pursuant to these conditions may be satisfied by the enrollment of minority and female in pre-apprenticeship, apprenticeship and journeyman training or similar programs; but such utilization of minority and female manpower shall be apportioned as equally as possible to all such programs used or available for use. In order that the nonworking training hours for trainees may be counted in meeting the goals, such trainees must be employed by the contractor during the training period. Journeymen, however, may be employed in lieu of a like number of percentage of minority and female trainees or apprentices otherwise to be employed and/or trained in accordance with the contractor's or subcontractor's goals, except where governed by Judge Lindberg's court orders.

E. No contractor or subcontractor shall be found to be in noncompliance solely on account of its failure to meet its goals within its timetables, but such contractor shall be given the opportunity to demonstrate that it has instituted all of the specific affirmative action steps specified in Section 4 of these requirements and has made every good-faith effort to make these steps work toward the attainment of its goals within its timetables, all to the purpose of expanding and maintaining minority and female manpower utilization on all Port of Seattle construction projects.

F. In all cases, the compliance of a contractor or subcontractor will be determined in accordance with its respective obligations under the terms of these requirements. Therefore, contractors or subcontractors who are governed by the provisions thereof shall be subject to its requirements regardless of the obligations of its prime contractor or lower-tier subcontractors should they in any way be different.

G. **All contractors and subcontractors shall include in all bid invitations or other prebid communications, written or otherwise, with respect to their prospective subcontractors, the goals, as applicable which are required.** Whenever a prime contractor or subcontractor subcontracts a portion of the work in any trade, he shall include in such subcontract his commitment made under these requirements, as applicable, which shall be adopted by his subcontractor, who shall be bound thereby and by this order to the full extent as if he were the prime contractor. THE PRIME CONTRACTOR SHALL BE ACCOUNTABLE FOR THE FAILURE OF THE SUBCONTRACTOR TO FULFILL HIS REQUIREMENTS; AND, THE PRIME CONTRACTOR SHALL GIVE NOTICE TO THE PORT, OF THE REFUSAL OR FAILURE OF ANY SUBCONTRACTOR TO FULFILL HIS OBLIGATIONS UNDER THESE REQUIREMENTS. FAILURE OF COMPLIANCE BY ANY SUBCONTRACTOR WILL BE TREATED IN THE SAME MANNER AS SUCH FAILURE BY THE PRIME CONTRACTOR.

Goals and Timetables, (continued)

H. Contractors and subcontractors hereby agree to refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who is determined not to be a "responsible" bidder for, Government contracts and federally assisted construction contracts pursuant to the Executive Order. The contractor or subcontractor shall carry out such sanctions and penalties for violation of the equal opportunity clause including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered by the Port or the Office of Federal Contract Compliance pursuant to the Executive Order. Any contractor or subcontractor who shall fail to carry out such sanctions and penalties shall be deemed to be in noncompliance with these conditions and Executive Order 11246.

4. Specific Affirmative Action Steps

A. The plans for the contractors and subcontractors must set forth specific affirmative action steps directed at increasing and maintaining minority and female manpower utilization, which steps must be at least as extensive and and as specific as in the following paragraphs.

B. The contractor shall notify community organizations that the contractor has employment opportunities available and shall maintain records of the organizations' response.

C. The contractor shall maintain a file of the names and addresses of each minority and female worker referred to him and what action was taken with respect to each such referred worker; and if the worker was not employed, the reason therefor. If such worker was not sent to the union hiring hall for referral or if such worker was not employed by the contractor, the contractor's file should document this and the reasons therefor.

D. THE CONTRACTOR SHALL PROMPTLY NOTIFY THE PORT WHEN THE UNION OR UNIONS WITH WHOM THE CONTRACTOR HAS A COLLECTIVE BARGAINING AGREEMENT HAS NOT REFERRED TO THE CONTRACTOR A MINORITY OR FEMALE WORKER SENT BY THE CONTRACTOR OR THE CONTRACTOR HAS OTHER INFORMATION THAT THE UNION REFERRAL PROCESS HAS IMPEDED HIM IN HIS EFFORTS TO MEET HIS GOAL.

E. The contractor shall participate in training programs in the area, especially those funded by the Department of Labor.

F. The contractor shall disseminate his EEO policy within his own organization by including it in any policy manual; by publicizing it in company newspapers, annual report, etc.; by conducting staff, employee and union representatives' meetings to explain and discuss the policy; by posting of the policy; and by specific review of the policy with minority and female employees.

G. The contractor shall disseminate his EEO policy externally by informing and discussing it with all recruitment sources; by advertising in news media, specifically including minority and female news media; and by notifying and discussing it with all subcontractors and suppliers.

H. The contractor shall make specific and constant personal (both written and oral) recruitment efforts directed at all minority and female organizations, schools with minority and female students, minority and female recruitment organizations and minority and female training organizations, within the contractor's recruitment area.

I. The contractor shall make specific efforts to encourage present minority and female employees to recruit their friends and relatives.

J. The contractor shall validate all man specifications, selection requirements, tests, etc.

K. The contractor shall make every effort to provide after-school, summer and vacation employment to minority and female youths.

L. The contractor shall develop on-the-job training opportunities and participate and assist in any association or employer-group training programs relevant to the contractor's employee needs consistent with its obligations hereunder.

M. The contractor shall continually inventory and evaluate all minority and female personnel for promotion opportunities and encourage minority and female employees to seek such opportunities.

N. The contractor shall make sure that the seniority practices, job classifications, etc., do not have a discriminatory effect.

O. The contractor shall make certain that all facilities and company activities are nonsegregated.

P. The Contractor shall continually monitor all personnel activities to ensure that his EEO policy is being carried out.

Q. The Contractor shall solicit bids for subcontracts from available minority and female subcontractors engaged in the trades covered by these requirements, including cirulation of minority and female contract associations.

5. Nondiscrimination In no event may a contractor or subcontractor utilize the goals, timetables, or affirmative action steps required by these conditions in such a manner as to cause or result in discrimination against any person on account of creed, race, age, color, religion, sex or national origin.

6. Contractors and Subcontractors Bound THE AFFIRMATIVE ACTION PLAN REQUIRED BY THESE REQUIREMENTS SHALL BE DEEMED A PART OF THIS CONTRACT. The Contractor shall cause the affirmative action plan, as established and approved, to be a part of all subcontracts, regardless of tier, under this contract. No subcontract shall be executed until an authorized representative of the Port of Seattle has determined, in writing, that the affirmative action plan required by these conditions, as applicable, has been incorporated into such subcontract, regardless of tier. Any subcontract executed without such written approval shall be void. Any equal employment opportunity submission required to be made by the Contractor pursuant to these requirements which will govern the Contractor's performance on the project shall be made a part of his contract. FAILURE TO SUBMIT AN AFFIRMATIVE ACTION PLAN, AS REQUIRED, WILL RENDER THE CONTRACTOR INELIGIBLE FOR PAYMENT.

7. Compliance and Enforcement

A. CONTRACTORS AND SUBCONTRACTORS ARE RESPONSIBLE FOR INFORMING THEIR SUBCONTRACTORS (REGARDLESS OF TIER) AS TO THEIR RESPECTIVE OBLIGATIONS UNDER THESE REQUIREMENTS (AS APPLICABLE). Contractors and subcontractors hereby agree to refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1963, with a contractor debarred from, or who is determined not to be a "responsible" bidder, for all Government contracts and Federally-assisted construction contracts pursuant to the Executive Order. The Contractor or subcontractor shall carry out such sanctions and penalties for violation of the equal opportunity clause including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered by the Port pursuant to the Executive Order. Any Contractor or subcontractor who shall fail to carry out such sanctions and penalties shall be deemed to be in noncompliance with these requirements and Executive Order 11246.

B. Nothing herein is intended to relieve any contractor or subcontractor during the term of its contract on this project from compliance with Executive Order 11246 and the Equal Employment Opportunity Clause of its contract, with respect to matters not covered in the Court's Orders, the Consent decree or in these requirements.

C. THE PORT WILL REVIEW ITS CONTRACTORS' AND SUBCONTRACTORS' EMPLOYMENT PRACTICES DURING THE PERFORMANCE OF THE CONTRACT. In regard to these requirements, if the Contractor or subcontractor meets its goals or if the Contractor or subcontractor can demonstrate that it has made every good-faith effort to meet those goals, the Contractor shall be presumed to be in compliance with Executive Order 11246, the implementing regulations and its obligations under these requirements and no formal sanctions or proceedings leading toward sanctions shall be instituted unless the Port otherwise determines that the Contractor or subcontractor is not providing equal employment opportunities. In judging whether a contractor or subcontractor has met its goals, the Port will consider each contractor's and subcontractor's minority and female manpower utilization and will not take into consideration the minority and female manpower utilization of its subcontractors. Where the Port finds that the Contractor or subcontractor has failed to comply with the requirements of Executive Order 11246, the implementing regulations and its obligations under these requirements, the Port shall take such action and impose such sanctions as may be appropriate under the Executive Order and the regulations. When the Port proceeds with such formal action, it has the burden of proving that the Contractor has not met the conditions of these requirements, but the Contractor's failure to meet his goals shall shift to him the requirement to come forward with evidence to show that he has met the "good-faith" provisions of these requirements by instituting at least the Specific Affirmative Action steps of No. 4 above, and by making every good-faith effort to make those steps work toward the attainment of its goals within its timetables. Such noncompliance by the Contractor or subcontractor can comply with the requirements of Executive Order 11246 and is therefore a "responsible prospective contractor" within the meaning of the Federal procurement regulations.

D. IT SHALL BE NO EXCUSE FOR A CONTRACTOR'S OR SUBCONTRACTOR'S FAILURE TO COMPLY WITH ITS OBLIGATIONS UNDER THESE REQUIREMENTS THAT THE UNION WITH WHICH IT HAS A COLLECTIVE BARGAINING AGREEMENT PROVIDING FOR THE EXCLUSIVE REFERRAL OF EMPLOYEES HAS FAILED TO REFER MINORITIES AND FEMALE EMPLOYEES.

E. The procedures set forth in these requirements shall not apply to any contract when the Port determines that such contract is essential to the national security and that its award without following such procedures is necessary to the national security.

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Compliance and Enforcement (continued)

F. Contractors and subcontractors must keep such records and file such reports relating to the provisions of these requirements and shall be required to provide the Port of Seattle three (3) copies of each of the following items on a weekly basis, starting with the notice to proceed and every week thereafter until the completion of the project:

1. LETTER OF TRANSMITTAL
2. WEEKLY PAYROLL
3. STATEMENT OF COMPLIANCE
4. PORT OF SEATTLE MINORITY AND FEMALE REPORT

With the FIRST PAYROLL submitted, A CERTIFIED WAGE RATE AFFIDAVIT in accord with State of Washington statutory requirement shall be included.

G. These requirements are issued pursuant to Executive Order 11246 (30 FR 12319, September 28, 1965) Parts II and III; Executive Order 11375 (32 FR 14303, October 17, 1967); and 41 CFR Chapter 60.

8. Interpretation The term, "open hiring and employment practices", does not preclude the utilization of exclusive hiring halls where required by applicable collective bargaining agreements, provided such hiring halls shall be operated on a basis that assures fair, equal and nondiscriminatory treatment of all qualified job applicants.

9. Enforcement IF THE CONTRACTOR OR ANY OF HIS SUBCONTRACTORS FAILS TO COMPLY WITH THE AFFIRMATIVE ACTION REQUIREMENTS OF THIS CONTRACT, THE PORT SHALL WITHHOLD PROGRESS PAYMENTS AND MAY TERMINATE THE CONTRACT AS PROVIDED FOR IN CONTRACT DOCUMENTS.

SPECIAL CONDITIONS
Noise Monitoring System

SC-00.1 These SPECIAL CONDITIONS are additions to or revisions of the GENERAL CONDITIONS as required to properly define or delineate this particular project. Therefore, any GENERAL CONDITION not specifically referenced within these SPECIAL CONDITIONS shall remain in force unmodified, as set forth in the text of the GENERAL CONDITIONS. The SPECIAL CONDITIONS bear the same paragraph number as the GENERAL CONDITIONS in the event conditions require their modification.

SC-02.1 Prequalification of Bidders

In order to be considered qualified, the bidder shall meet the following requirements:

A. Be an established manufacturer of Airport Noise Monitoring Systems (NMSs) as evidenced by the fact that he has produced and installed at least two NMSs of similar configuration and complexity to that proposed for the Port of Seattle.

B. Have a minimum of three years experience in the manufacture, installation and servicing of Airport NMSs.

C. Have an established domestically located "Parts Department" with the capacity of providing parts support.

D. Have domestically available service personnel.

E. Have an established "In-House" software programming, editing, compiling, assembly, and documentation capability.

SC-02.4 Examination of Plans, Specifications and Site Work

Pre-bid examination of the work sites shall be coordinated with Mr. Doug Lynch, Resident Engineer, (206) 433-5321.

SC-02.6 Preparation of Proposal

G. This specification is intended to be a performance specification except where specific requirements are stated to meet a size, a standard, or similar restriction. The proposal shall be sufficient to enable the Port to make an objective determination that the proposed system complies with the specifications. It is required that the proposal consist of:

   a. Indication of compliance or "No Exception" to system specification requirements on a paragraph by paragraph and sectional basis, where the bidder sees no problem in complying and concurs with the feasibility of the requirement or procedures. Alternates or

exceptions may be submitted providing the bidder has submitted a conforming proposal on a no exception basis (Reference SC-02.15).

b. The recommended alternate, and brief justification therefor, when the specification invites or lists alternate approaches.

c. Indication that the bidder can or cannot supply an item or procedure specified as an option, with a statement similar to a. above.

d. A short summary of each major section, in which may be included a rationale for the bidder's approach to the specified objectives. Exceptions, alternates, and options shall be noted.

e. A list of all off-the-shelf equipment to be supplied.

f. A statement certifying the requirements listed in SC-02.1 above and the completed "Manufacturer's Experience Record" form included as a part of the Proposal. The manufacturer may include additional information, brochure, photographs, etc., relative to the manufacturer of Airport Noise Monitoring Systems.

g. The name, address and technical qualifications of the local maintenance service representative. The Port reserves the right to reject the bidder's submittal and request resubmittal due to geographical location or the qualifications of the proposed service representative.

h. Progress schedule (see SC-08.3, substitute "bidder" for "contractor").

i. See Section 16900, 1.06 E.

j. See Section 16900, 1.06 F8.

k. See Section 16910, 2.01 A.

l. See Section 16910, 2.01 B.

m. See Section 16910, 2.05 A.

n. See Section 16910, 2.09 B.

o. See Section 16910, 2.09 C.

p. See Section 16910, 2.10 B.

q. See Section 16930, 2.04 E.

r. See Section 16930, 2.10 B.

s. See Section 16930, 3.01 A Items 1 and 3 (substitute "bidder" for "contractor").

t. See Section 16930, 3.03.

u. See Section 16940, 2.18.

The information presented in the Technical Proposal should be arranged in the order of this specification. Elaborate covers, formats and binders are neither necessary nor desired. Data previously submitted, if any, may not be considered by the Port; hence, any such data should not be relied upon or incorporated in the proposal by reference.

The proposal package shall consist of the Cost Proposal on forms furnished by the Port, plus three copies of the Technical Proposal with all required submittals.

Any symbols or abbreviations used in the proposal, including all submittals, shall be the same as those appearing in this specification.

SC-02.12 Irregular Proposals

Add the following:

I. If the proposal fails to respond to each work item of the Technical Specifications on a "No Exception" basis.

J. If the required submittals, such as manufacturer's literature, schematic diagrams, or technical information, are not included with the proposal.

SC-02.15

Add the following:

Alternates or exceptions shall reference the section or paragraph concerned. A concise statement of the reason for the exception should be included, along with a recommended alternative if applicable.

SC-03.1 Consideration of Bids:

Paragraph B is supplemented to include the following:

Any or none of the Alternates listed in the Proposal may be accepted by the Port Commission as considered in the best interest of the Port.

SC-03.2 Award of Contract

The award of contract, if awarded, shall be made within sixty (60) calendar days after date of opening of bids.

SC-03.5 Contract Bond

With each performance, payment or contract bond required for construction contract, a power of attorney certificate stamped with a corporate seal must be attached certifying that the attorney-in-fact has the authority to sign the bond.

SC-04.7 Progress Estimates and Payments

Upon successful completion of Factory Acceptance Tests, an incremental payment of twenty-five (25) percent of the contract price for the Noise Monitoring System, excluding the Maintenance Service contract price, will be made. Upon successful completion of On-Site Acceptance Tests, an additional payment of fifty (50) percent of the same contract price shall be made. Upon Final Acceptance of the NMS by the Port, the remaining twenty-five (25) percent of the same contract price shall be made. Normal retained percentages (10%) will be withheld on each incremental payment. Other partial payments shall not be made.

Payments during the Warranty and Maintenance Period shall be made monthly and shall be the lesser of, one-twelfth (1/12) of the price of the Maintenance Service contract or the total allowed amount of the Contractor's monthly invoice submitted to the Port for work performed during the month. First monthly payment shall be considered one month following the date of Final Acceptance of the NMS.

SC-04.12 Work Not Included

Electrical Power - AC power supply in the vicinity of the Central Processing System, RMSs, and remote input devices.

Communication Lines - Telephone signal wires from the Central Processing System room to RMSs.

Remote Monitoring Station Supports - Poles, or similar structures on which the Contractor mounts the RMS components.

Central Processing System Room - Space, partition(s), and lighting for the CPS and local Display System.

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SC-05.12 Superintendents, Labor and Equipment of Contractor

The first line of Paragraph B is deleted and replaced as follows:

B. The Contractor shall be present in person or by a duly authorized representative at the sites of the work during the installation of the NMS and during the On-Site Acceptance Testing in Seattle, and as required in the Technical Specifications.

SC-07.1 Laws To Be Observed

The following is applicable to work performed in Washington State:

In addition to the requirements of the GENERAL CONDITIONS, the contractor's attention is directed to that portion of RCW 39.12 as amended which reads in part:

> "The prevailing rate of wages to be paid to all workmen, laborers, or mechanics employed in the performance of any part of this contract shall be in accordance with the provisions of Chapter 39.12 RCW, as amended. The rules and regulations of the Department of Labor and Industries and the schedule of prevailing wage rates for the locality or localities where this contract will be performed as determined by the Industrial Statistician of the Department of Labor and Industries, are by reference made a part of this contract as though fully set forth herein."
>
> "Inasmuch as the contractor will be held responsible for paying the prevailing wages, it is imperative that all contractors familiarize themselves with the current wage rates before submitting bids based on these specifications."
>
> "In case any dispute arises as to what are the prevailing rates of wages for work of a similar nature and such dispute cannot be adjusted by the parties in interest, including labor and management respresentatives, the matter shall be referred for arbitration to the Director of the Department of Labor and Industries of the State and his decision therein shall be final and conclusive and binding on all parties involved in the dispute as provided for by RCW 39.12.060 as amended."

SC-07.11 Public Liability and Property Damage Insurance

The Contractor shall furnish, prior to start of construction, evidence satisfactory to the Port that insurance in the following kinds and minimum amounts has been secured. These requirements supplement Section G-07.9 and G-07.11 of the GENERAL CONDITIONS. Evidence of insurance, including coverage for XCU Hazard, shall be provided on certificates provided by the Port of Seattle. Copies of these are included with the GENERAL CONDITIONS.

Type of Policy:

All risk builders risk, excluding flood and tidal wave, for the value of the work. Comprehensive public liability - single limit of $250,000.00 for personal injury and property damage.

SC-08.3 Progress Schedule

In lieu of the CPM network called for in this section of the GENERAL CONDITIONS, the Contractor shall submit a standard bar chart in a format satisfactory to the Engineer. It shall be drawn to illustrate a time scale and shall indicate start and completion dates, duration, and costs for each activity. Total cost must equal bid Item 1.

The Contractor shall include, in the standard bar chart submitted, project milestones and phases such as: submittal of drawings, plans, and NMS documentation, completion of hardware manufacture, design reviews and integration, RMS Burn-In Period, Factory Acceptance Testing, RMS site inspection, shipment, installation and calibration period, On-Site Acceptance Testing, personnel training, 30-Day Operational Demonstration Period, and Final Acceptance.

SC-08.5 Time of Completion

The contract in its entirety shall be completed within 270 calendar days after the Notice to Proceed. The contract time as set forth above, shall commence with the date of the Notice to Proceed or within twenty (20) calendar days after the date of Notice to Award, whichever occurs first.

SC-08.8 Extensions of Time

Add the following causes for allowable extensions of time:

(5) Non-availability or outage of public utilities linking or supplying NMS components.

(6) Non-completion of RMS site preparation by others.

SC-08.9 Damages for Delay

Pursuant to the requirements of Section G-08.9 of the GENERAL CONDITIONS, the Liquidated Damages for the entire project shall be Two Hundred Dollars ($200.00) per day.

The damages stipulated above are to be deducted as Liquidated Damages from any monies due or coming due the Contractor.

SC-09.7 Payment for Material on Hand

Delete Section G-09.7 from the GENERAL CONDITIONS.

* * * * *

DIVISION 1 - GENERAL REQUIREMENTS
Section 01010 - Summary of Work

Part 1 - GENERAL

1.01 Scope

The work included in this contract is defined within these specifications under the following Division Numbers:

1. GENERAL REQUREMENTS

16. ELECTRICAL

1.02 Description of Work

A. Included in the work under this contract is the design, fabrication, installation, testing, warranty, training and maintenance of a Noise Monitoring System (NMS) with eight (8) Remote Monitoring Stations (RMSs).

B. Included in this contract is the furnishing of all labor, material, parts and services, as necessary for the complete installation of the NMS on Port-supplied site facilities. Materials shall include all consumables required to operate the NMS prior to Final Acceptance.

C. The Contractor's work and storage areas and the RMS sites shall be as designated by the Engineer. The Contractor shall confine his activities to these areas.

D. All work shall be accomplished either by the Contractor or other qualified personnel; but, in either case, the insurance requirements and the provisions for the protection of property, as set forth elsewhere in these specifications, shall be equally applicable.

E. The NMS shall be considered to be qualified for On-Site Acceptance when it has undergone trial runs and has had final adjustments and is ready for Final Acceptance tests. The services of a qualified service engineer, employed by the Contractor, shall be provided for the final adjustments of electrical, mechanical and software components and for assistance during the On-Site Acceptance tests.

F. Factory Acceptance and performance demonstration tests at the Contractor's plant shall be performed by the Contractor prior to shipment of the NMS to Seattle.

G. Complete Warranty and Maintenance Services, including trouble shooting and calibration, shall be provided by the Contractor

on all NMS delivery items for a one (1) year period commencing on the date following Final Acceptance of the NMS.

1.03 Location

The work areas are located within Central Control Facility and Sea-Tac International Airport, and at eight (8) RMS locations within a 5-mile radius of the airport, which is located about 10 miles South of Seattle, Washington, U.S.A.

1.04 Access to Site

A. The Contractor shall request access to the RMS and Central Control Facility sites by written notice during the period of this contract.

B. Access to the sites will be made available to the Contractor sixty (60) calendar days prior to scheduled completion of Final Acceptance Tests, and as necessary during the Warranty and Maintenance period.

1.05 Work Performed Under Separate Contracts

Site preparation at RMS sites will be under separate contract. The Contractor shall, by way of the Engineer, familiarize himself of these contracts. The Contractor shall coordinate the progress of his work with the established schedules for phasing and completion.

1.06 Shipment

A. All parts to be shipped shall be boxed, crated or otherwise suitably protected to prevent damage or loss in shipment. If overseas shipment is involved, export packing shall be provided by the Contractor.

B. Shipment shall be made in the name of the Contractor to the job sites and he shall receive, store and be responsible for the safe transportation and handling of his equipment.

C. The Contractor shall be responsible for the adjustment of any claims due to loss or damage in shipment and for the loss of any parts or equipment at the job sites.

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DIVISION 1 - GENERAL REQUIREMENTS
Section 01081 - Applicable Standards and References

PART 1 - GENERAL

1.01 The Contractor shall comply with current technical standards and practices during NMS fabrication, assembly, wiring, installation, testing, and maintenance. In case of redundancy or conflict, the most stringent performance standard or practice shall apply unless superceded by the specifications contained herein.

PART 2 - PRODUCTS

None

PART 3 - EXECUTION

3.01 General Codes, Standards, and Regulations

Unless stated otherwise, all work generated by or by way of this contract shall be in full conformity with current requirements of the following:

A. Uniform Building Code (1973 Edition).

B. State of Washington Electrical Code.

C. Port of Seattle Electrical Safety Rules (see Section 16100).

D. American National Standards Association (ANSI), S1.4-1971, Specification for Sound Level Meters.

E. California Department of Aeronautics, Title 4, Subchapter 6 (Noise Standards), Dec. 1, 1971.

F. Bell System Technical Reference Publication No. 41004, Data Communications Using Voiceband Private Line Channels, October 1973.

G. Applicable Electronic Industries Association (EIA) Standards for electronic components, assemblies, interfaces, and interconnection.

H. Applicable National Electrical Manufactures (NEMA) Standards for electrical devices and indicating instruments.

I. Applicable ANSI recommendations on acoustical and vibration measurement and calibration procedures.

J. USA Standard Code for Information Interchange (USASCII), X3.4-1967.

K. Applicable International Telegraph and Telephone Consultive Committee (CCITT) recommendations on data transmission systems.

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POS 22722

DIVISION 1 - GENERAL REQUIREMENTS
Section 01300 - Submittals

PART 1 - GENERAL

1.01 Related Work Described Elsewhere

A. Contractual requirements for submittals:

1. General Conditions
2. Special Conditions

B. Individual submittals required in accordance with the pertinent Sections of these Specifications.

C. All submittals shall be in the English language and dimensions expressed in feet and inches.

PART 2 - PRODUCTS

2.01 Shop Drawings

A. Quality: Shop drawings shall be prepared accurately to a scale sufficiently large to indicate all pertinent features of the products and the method of fabrication, connection, erection, or assembly with respect to the work.

B. Type of Prints Required:

1. The Contractor shall submit nine black-line prints or copies of all shop drawings or supplemental working drawings in accordance with General Conditions G-05.3.

2. In lieu of the above the Contractor may submit Shop Drawings or supplemental working drawings in the form of one sepia transparency of each sheet plus one black-line print of each sheet. Blue-print submittals will not be acceptable.

3. Distribution: In the event the action described in B2 above is selected by the Contractor, the Port will review the drawings, mark the sepia with appropriate notations, prepare the required number of prints for their use and return the marked sepia to the Contractor.

2.02 Manufacturer's Literature

A. The Contractor shall submit nine (9) copies of manufacturer's literature for approval.

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B. Catalog Cuts or brochures shall show the type, technical data, style, color, manufacturer and catalog number of each item and be complete enough to provide for positive and rapid identification in the field. Catalog data shall be submitted in an orderly bound form. Specific items shall be clearly marked. General catalogs or partial lists will not be accepted or considered.

2.03 Samples

A. The Sample submitted shall be the exact or precise article proposed to be furnished.

B. Samples, color chips, finish styles, etc., shall be submitted in sufficient number as to provide the Engineer with alternate choices.

2.04 Substitutions

A. The Contract is based on the materials, equipment, and methods described in the Contract Documents.

B. The Engineer will consider proposals for substitutions of materials, equipment, and methods only when such proposals are accompanied by full and complete technical data and all other information required by the Engineer to evaluate the proposed substitution.

C. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved for this Work by the Engineer.

D. Requests for substitutions may be made prior to bid. Such requests shall be accompanied by complete data for evaluation and shall be delivered to the Engineer not later than eight (8) days prior to bid opening. In the event the substitution is approved, an addendum advising the plan-holders will be issued.

E. Requests for substitutions may be made after award. Such requests shall be accompanied by all technical data and costs, and delivery information. When, in the sole opinion of the Engineer, the product is equal in all respects to or better than, that specified product will be approved subject to contract requirements and the Contractor assuming the responsibility for all extenuating circumstances.

F. Where the phrase "or equal" or "or equal as approved by the Engineer" occurs in the Contract Documents, do not assume that material, equipment, or methods will be approved as equal by the Engineer unless the item has specifically been approved for this Work by the Engineer.

G. The decision of the Engineer shall be final.

2.05 System Operating Manuals

2.06 System Set-Up and Trouble-Shooting Manuals

"Cookbook" type maintenance manuals

2.07 Software Source Documentation

Operating system
System software
Application software
Higher order and/or assembly language documentation.

2.08 Complete and Accurate "As-Built" Hardware and Software Drawings

Flow charts with narrative
Block diagrams
Detailed drawings

PART 3 - EXECUTION

3.01 Transmittals

A. General: The Contractor shall submit all shop-drawings, catalog cuts, brochures and mailable samples accompanied with a "Multi-transmittal Form and Record." Forms will be supplied by the Engineer.

B. Preparation: A separate submittal form shall be prepared for each product or procedure and shall be further identified by referencing the Specification Section and paragraph number.

C. Mailing: The original shall be sent in every instance and will be the Contractors record and final correspondence for every submittal.

3.02 Coordination

A. Shop and detail drawings shall be submitted in related packages. All equipment or material details which are inter-dependent or

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are related in any way must be submitted indicating the complete installation. Submittals shall not be altered once approved for construction. Revisions shall be clearly marked and dated. Major revisions must be submitted for approval.

B. The Contractor shall thoroughly review all shop and detail drawings, prior to submittal, to assure coordination with other parts of the work. The Contractor's failure to do this will be cause for rejection. Submittals shall bear his approval stamp and initials.

C. Components or materials which require shop drawings and which arrive at the job site prior to approval of shop drawings shall be considered as not being made for this project and shall be subject to rejection and removal from the premises.

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DIVISION 1 - GENERAL REQUIREMENTS
Section 01500 - Temporary Facilities & Controls

PART I - GENERAL

1.01 Related Work Described Elsewhere

The provisions and intent of the Contract, including the General Conditions, Special Conditions, and other Sections of the General Requirements apply to this Work as if specified in this Section.

1.02 Description of Work

The Work includes the requirements to provide temporary facilities required by both the Contractor and the Port of Seattle until the acceptance of the Contract. The Work also includes the compliance of all controls or ordinances with respect to safety, noise, dust, fire, police action, civil disobedience, security, or traffic.

PART 2 - PRODUCTS

2.01 Utilities

It shall be the Contractor's responsibility to provide adequate facilities for his operation, including:

A. Water: Drinking water for employees shall be provided by the Port in the Central Control Facility area. Drinking and construction water will not be supplied by the Port at the RMS job sites.

B. Construction Electricity: Construction electricity for small hand tools and electronic equipment shall be provided by the Port in the Central Control Facility area.

C. Toilet Room Facilities: Toilet facilities shall be provided by the Port in the Central Control Facility area. Toilet facilities shall not be supplied by the Port at RMS job sites.

2.02 Use and Occupancy

The Contractor will be allowed space for the storage of materials and the pursuance of the work under this contract. Employee parking will be confined to public parking areas at the Contractor's or individual's expense.

2.03 Security

A. The Central Control Facility construction site shall be closed to the public at all times. No access control shall be exercised at the RMS job sites.

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B. The Contractor shall ensure the security of his own equipment and materials by the construction of temporary fences or other enclosures as he may require and upon the prior approval of the Engineer.

C. The Contractor shall abide by special requests of security personnel or Port of Seattle Fire and Police Departments.

PART 3 - EXECUTION

3.01 General

Maintain all temporary facilities and controls as long as needed for the safe and proper completion of the Work. Remove as directed by the Engineer or at the completion of the Work.

3.02 Special Controls

A. Noise Control

1. During assembly and installation, the Contractor shall schedule his work at any RMS site between the hours of 7:00 a.m. to 10:00 p.m. Overtime and weekend work will not be allowed except with written approval of the Engineer. Consideration of requests for overtime or weekend work will only be made in case of emergency. The Contractor shall maintain a minimum of objectionable noise. The following rules shall be observed.

   a. Equip Air Compressors with silencing packages.

   b. Equip Jack-hammers with silencers on the air outlet.

   c. Any equipment that can be electrically driven instead of gas or diesel is preferred. If noise levels on any equipment cannot reasonably be brought down to criteria, as listed as follows, either the equipment will not be allowed on the job or use time will have to be scheduled subject to approval of the Engineer.

2. Objectionable noise received on neighboring (non-Port owned) properties shall be defined as any noise exceeding the noise limits of State regulations (WAC-173-60-040) or County Ordinance (No. 3139), or as any noise causing a public nuisance in residential areas, as determined by the Port and community representatives, or by the nuisance provisions of the County ordinance.

3. Noise control shall be exercised within Central Control to ensure that interuptions of operational activities are kept to a minimum.

B. Contractor Quality Control

1. The Contractor shall establish a quality control system to perform sufficient inspection and tests of all items of work, including that of his subcontractors, to ensure conformance to applicable specifications with respect to the materials, workmanship, construction, finish, functional performance, and identification. This control will be established for all construction, except where the technical provisions of the contract provide for specific Port of Seattle control by inspections, tests or other means. The Contractor's control system will specifically include the surveillance and tests required in the technical provisions of the contract specifications.

2. The Contractor's quality control system is the means by which he assures himself that his construction complies with the requirements of the contract specifications. The controls shall be adequate to cover all construction operations and should be keyed to the proposed construction sequence.

3. The Contractor's job supervisory staff may be used for quality control, supplemented as necessary by additional personnel for surveillance, special technicians, or testing facilites to provide capability for the controls required by the technical provisions of the specification.

4. The Contractor shall furnish to the Port of Seattle within thirty (30) days after receipt of the Notice to Award, or within such additional time as determined by the Engineer, a quality control plan, which shall include the procedures, instructions and reports to be used. This document will include, as a minimum:

   a. The quality control organization.

   b. Number and qualifications of personnel to be used for this purpose.

   c. Authority and responsibilities of quality control personnel.

   d. Methods of quality control, including that for his subcontractor's work.

   e. Test methods, including, as specificed, name of qualified testing laboratory to be used.

f. Method of documenting quality control operation, inspection, and testing.

g. A copy of a letter of direction to the contractor's representative responsible for quality control, outlining his duties and responsibilites, and signed by a responsible officer of the firm.

5. After the contract is awarded and before construction operations are started, the Contractor shall meet with the Engineer or his representative, and discuss quality control requirements. The meeting shall develop mutual understanding relative to details of the system, including the forms to be used for recording the quality control operations, inspections, administration of the system, and the inter-relationship of Contractor and Port of Seattle inspection.

6. Unless specifically authorized by the Engineer, no construction will be started until the Contractor's quality control plan is approved.

7. All compliance inspections and test data will be recorded on an approved form, including but not limited to the specific items required in each technical section of the specifications. This form will include records of corrective action taken.

* * * * *

POS 22730

DIVISION 1 - GENERAL REQUIREMENTS
Section 01560 - Special Airport Controls

PART 1 - GENERAL

1.01 Limitation of Operations

The Contractor shall conduct the work in such a manner that will assure the least interference with aircraft operations and with the public.

There is a possibility that the Contractor will have to install equipment in a restricted area; if so, the following limitations shall be observed by the Contractor.

PART 2 - N.A.

PART 3 - EXECUTION

3.01 Airport Rules and Regulations

The Contractor shall acquaint himself with the following Rules and Regulations, including Section 4 Motor Vehicle Operations (copy attached), and shall abide by these rules and regulations except as deviations may specifically be allowed by the Director of Aviation at Sea-Tac International Airport. The Contractor shall in no way impede ready entry to project and Contractor's area by fire, emergency, or security personnel, nor shall he in any way hinder their operation or activities.

3.02 Security

A. Perimeter Fencing. The construction site shall be closed to the public at all times.

The Contractor shall be held responsible to ensure that no unauthorized persons or large domestic animals enter through any gate opened or hole made in a security fence. Prior to the close of work each day, the Contractor will be responsbile to close any access to the Air Operations Area he may have opened.

B. Restricted Areas. When contractor work areas are located within designated Airport restricted areas, Contractor personnel are limited to the specific work area, storage area, or other areas designated by the Director of Aviation.

C. Identification. When contractor work areas are located within designated Airport restricted areas, Contractor personnel must be provided with and carry on their person identification which positively associates them with the Contractor's firm.

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This will be in the form of a letter on the Contractor's company stationery and signed by the local Contractor representative, listing the individual by name as an employee of the firm. Such letter may then be presented in conjunction with a valid drivers license or other form of identification bearing recognizable photograph of the employee. Certain work areas of this project are located within restricted areas and may be occupied by Contractor personnel only during the execution of that portion of the project. Contractor personnel within restricted areas shall remain in the immediate vicinity of their work site, and in established ingress and egress routes to the site. Straying into other areas may result in apprehension and prosecution under Federal Trespass Statutes.

All Contractor vehicles operating within the airfield security fence must be equipped with signs of commercial design affixed to or painted on both sides of the vehicle. The firm name shall appear in letters a minimum of two inches high. This requirement applies to superintendent's personal vehicles as well. Unmarked or improperly marked vehicles encountered by the Ramp Patrol, without exception, will be escorted from the airfield immediately.

D. Inspections. The Port of Seattle reserves the right to enter work or storage areas at any time for the purpose of fire protection, emergency and routine security, safety, and health inspections.

The contractor shall abide by special requests of security personnel or Port of Seattle Police Department at all times.

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SECTION 4

MOTOR VEHICLE OPERATIONS

A. GENERAL

Motor vehicle operations within and on the Airport premises shall be governed generally by the provisions of the Washington State Motor Vehicle Codes and traffic direction procedures, and signals for turns, lights, and safe driving precaution shall be in conformity therewith. In addition, motor vehicles shall conform to all special regulations prescribed by the Commission or procedures imposed pursuant to Commission regulation by the Director.

1. No person shall operate a motor vehicle of any kind on the Airport in excess of speed limits as prescribed by the Director and indicated by posted traffic signs.

2. No person shall operate a motor vehicle of any kind on the Airport in a reckless manner so as to indicate a willful or wanton disregard for the safety of persons or property.

3. No person shall operate a motor vehicle of any kind on the Airport other than in a careful and prudent manner, having regard for the width, grade, curves, corners, traffic and use of streets, weather conditions and all other attendant circumstances so as not to endanger the life, limb and/or property of any person.

4. No person shall operate a motor vehicle on the Airport at such a slow speed as to impede or block the normal and reasonable movement of traffic except when a reduced speed is necessary for safe operation or in compliance with the law.

5. Any person operating a motor vehicle traveling slowly on any road on the Airport shall keep to the right to allow safe passage.

6. Persons operating motor vehicles shall come to a complete stop at all crosswalks that are occupied by pedestrians.

7. No person shall obstruct or delay the free flow of traffic by making turns from the incorrect lanes or by weaving in and out of traffice or in any other improper manner.

8. No person shall sound a motor horn except as a warning signal.

9. No person shall operate a motor vehicle on the roadways, parking lots, or other areas of the Airport unless the vehicle is in reasonably safe condition.

10. All safe driving procedures, rules, and regulations adopted by tenant organizations for their employees shall remain in force unless the context

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MOTOR VEHICLE OPERATIONS

thereof shall indicate to the contrary of any provision set forth in this section.

B. IN-TERMINAL BUILDING

1. Any person operating equipment within the passenger terminal building will abide by all posted speed regulations in these areas and in any event not exceed five miles per hour.

2. Any person operating equipment prior to leaving any tunnel area shall, within three feet of any exit, bring his equipment to a complete stop in addition to sounding his horn before entering the apron or adjoining area.

3. Any person operating equipment in the immediate tunnel area shall, where applicable, sound his horn approximately 50 feet before entering a curve or where the operator's view is obstructed and in all instances travel to the extreme right of established center lines.

C. FIELD

▲ 1. All vehicular equipment in the air operations areas, cargo, tunnel, access road, aircraft parking or storage area must at all times comply with any lawful signal or direction of Port employees. All traffic signs, lights, and signals shall be obeyed, unless otherwise directed by Port employees.

2. Every person operating motorized equipment of any character on any area mentioned in the previous paragraph shall operate the same in a careful and prudent manner and at a rate of speed fixed by this section and at no time greater than is reasonable and proper under the conditions existing at the point of operation, taking into account traffic and road conditions, view obstruction and consistent with all conditions so as not to endanger the life, limb or property or the rights of others entitled to the use thereof.

▲ 3. Any person operating equipment in air operations areas shall, in addition to this section, abide by all existing Federal Aviation Administration and other Government rules and regulations.

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S E C T I O N 4

MOTOR VEHICLE OPERATIONS

4. All conditions set forth in this section shall be in conformity and consistent with current Federal Aviation Administration and other Government rules and regulations.

▲ 5. No person shall operate any motor vehicle or motorized equipment in the air operations areas except:

(A) Persons assigned to duty in such areas.

(B) Persons authorized by the Director, and in the case of runways and taxiways with the prior permission of the Airport Control Tower by radio. Necessary vehicle traffic on taxiways not in use will be the discretion of the Airport Control Tower during slack traffic periods.

6. No person shall operate any motor vehicle or motorized equipment on runways or taxiways of the airport unless the motor vehicle or motorized equipment is equipped with two-way radio and in ground control frequency radio contact with Airport Control Tower.

7. No person shall operate any motor vehicle or motorized equipment with an aircraft in tow on any portion of the airport unless the motor vehicle or motorized equipment is equipped with two-way radio contact with the Airport Control Tower and with prior permission of the Airport Control Tower.

8. No person shall operate any motor vehicle or motorized equipment on the aircraft movement or parking areas of the airport at a SPEED IN EXCESS OF TWENTY MILES PER HOUR, or less where conditions warrant. Designated motor vehicle drive lanes shall be utilized where provided unless specific authorization to the contrary is given by a Port employee.

9. Any person operating any motor vehicle or motorized equipment on the air operations areas of the airport shall obey any and all posted traffic signals.

† 10. Any vehicular equipment operating within the air operations area must display signs of commercial design on both sides of the vehicle which identify the vehicle to the airport tenant, construction firm, or vendor concerned. In addition any vendor's vehicle must display a

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SECTION 4

MOTOR VEHICLE OPERATIONS

current ramp permit issued by the Director. Firm names must appear in letters a minimum of 2" high.

▲ 11. No person operating a motor vehicle or motorized equipment in the air operations areas shall in any way hinder, stop, slow, or otherwise interfere with the operation of any aircraft on the airport.

▲ 12. No person shall park any motor vehicle, other equipment or materials in air operations area of the airport, except in a neat and orderly manner an at such points as prescribed by the Director.

▲ 13. No person shall park any motor vehicle, or other equipment, or materials in the air operations sarea of the airport within fifteen (15) feet of any fire hydrant or standpipe.

▲ 14. No person shall paint, repair, maintain, or overhaul any motor vehicle, other equipment, or materials in the air operations area of the airport, except in such areas and under such terms and conditions as prescribed by the Director.

▲ 15. No person shall operate any motor vehicle or motorized equipment in the air operations area of the airport unless such motor vehicle or motorized equipment is in a reasonably safe condition for such operation.

D. PARKING

▲ 1. All airport roadways shall be restricted to parking. The primary purpose of airport roadways shall be for motor vehicular travel. However, the Director may designate areas adjacent to entrances as load/unload zones to be utilized in a manner designed to expedite the movement of persons, passengers, freight, supplies, and baggage to airport buildings and terminals. In designating such areas, the Director may:

(A) Establish restricted use to actual loading or unloading and prohibit waiting for any purpose, and require motor vehicles to move without regard to their status of loading or unloading.

(B) Require drivers of motor vehicles stopped on roadways to remain in such vehicles.

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ADOPTED BY THE PORT OF SEATTLE COMMISSION NOVEMBER 14, 1972-EFFECTIVE DECEMBER 1, 1972

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MOTOR VEHICLE OPERATIONS

(C) Prohibit motor vehicles requiring additional time to assemble passengers and/or baggage from occupying space in roadways. (Including curb lanes).

(D) Reserve parking areas for the use of vehicles for hire assembling passengers and baggage.

2. No motor vehicle shall park unattended except in:

(A) Areas operated or leased for commercial parking by the Port or under a Port lease or concession agreement.

(B) Areas leased or specified for the parking of airport employees including the employees of lessees, permittees and concessionairs.

(C) Metered parking areas which may be specially reserved or assigned.

(D) Other areas specifically signed or designated as a permit parking area by the Director.

E. OPERATION - VEHICLES FOR HIRE

1. No person shall operate a vehicle for hire to pick up passengers on the airport without first having executed a permit agreement in form and content approved by the Director and paying the appropriate fees and/or charges as provided in said permit agreement.

2. No vehicle for hire shall load or unload passengers at the airport in any place other than that designated by the Director.

▲ 3. Taxicabs shall comply with the following additional specific regulations:

(A) Only taxicabs operated by the Taxicab Concessionaire shall be permitted to pick up passengers at the airport. This shall not preclude other taxicabs from responding to specific requests for their services from prospective customers. Nor shall this preclude any taxicab from discharging passengers at the airport.

(B) The Taxicab Concessionaire shall conduct his operations in

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MOTOR VEHICLE OPERATIONS

(B) conformity with the terms of his concession agreement, these regulations and subsequent written instructions from the Director.

4. All vehicles for hire shall comply with the following rules and regulations:

(A) Placing, throwing, or dropping of waste, refuse or rubbish upon any taxi/bus stand, roadway, street, or sidewalk adjacent thereto, is strictly forbidden and should this be disregarded, the drivers of vehicles for hire then on the airport shall clean the area upon order to do so.

(B) The owners or operators of all vehicles for hire, their employees, invitees, and those doing business with them shall conduct themselves in an orderly and proper manner, at all times.

(C) No owner or operator of a vehicle for hire, or any person, at any time while on the airport, by words, gestures, or otherwise, shall solicit, persuade, or urge any person to use or hire any vehicle for hire, or other means of transportation or conveyance at the airport.

(D) Any driver of a vehicle for hire who violates any of these rules and regulations shall be subject to immediate expulsion from the airport and will not be allowed to re-enter the airport without the permission of the Director. Also, such vehicle permit may be revoked.

(E) Any vehicle for hire company or owner failing to comply with these rules and regulations or who permits, encourages, or allows any of its representatives to violate these rules and regulations shall be subject to exclusion from the airport and/or cancellation of his permit to operate on the airport.

(F) The vehicle for hire companies or owners shall assist and render all possible cooperation to Port employees in enforcing these rules and regulations and failure to so cooperate or assist shall be considered a violation of these rules and regulations and may result in a revocation of their permit.

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DIVISION 1 - GENERAL REQUIREMENTS
Section 01660 - Environmental Factors

PART 1 - GENERAL

1.01 NMS Performance

The NMS shall operate as specified herein during exposure to the appropriate environmental factors described in this section. The outdoor components shall not be degraded physically or functionally by exposure to the environment over the specified 10 year life-span, with the normal preventive maintenance as described by the Contractor in the NMS Maintenance Manual.

1.02 Applicability

The environmental factors of this section shall be used as an applicable basis for NMS system and component designs by the Contractor.

PART 2 - PRODUCTS

None

PART 3 - EXECUTION

3.01 Outdoor NMS Components

NMS outdoor components shall operate as specified under the following environmental limits:

A. Dry Bulb Temperature: 0^{o} to $120^{o}F$

B. Relative Humidity: 10 to 100 percent.

C. Precipitation: Rain, 3.5-inches per hour; Snow/Ice, 6-inches per hour.

D. Noise Exposure: 130 dB (SPL) re. 0.0002 microbar.

E. Shock and Vibration: Seismic Zone 3 (Intensity VIII, Modified Mercalli Intensity Scale of 1931).

F. Salt Spray, Sand, Dust, and Contaminants: intermittant industrial area exposures.

G. Winds: 8 to 10 mean speed (MPH); 100 MPH maximum wind load.

H. Ground Elevation: 0 to 500 Ft. above mean sea level.

I. Possible Hazards: Vandalism and bird droppings.

J. Electromagnetic Fields: as applicable beyond 50 feet of high-voltage power transmission lines, beyond 1 mile of radio/television broadcasting stations, and within 5 miles of Sea-Tac International Airport.

K. A.C. Power Voltage Fluctuations: ± 10% of 118 VAC.

L. A.C. Power Frequency Fluctuations: ± 3% of 60 Hz.

3.02 Indoor NMS Components

NMS indoor components shall operate as specified under the following environmental limits:

A. Dry Bulb Temperature: 65^{o} to 78^{o}F normally; 90^{o}F intermittantly.

B. Relative Humidity: 25 to 60 percent normally; 10 to 90% intermittantly.

C. Ventilation Air; Approximately 0.125 cubic foot per minute per square foot of floor space. No additional forced ventilation provided on equipment racks or console spaces by the Port.

D. Illumination Levels: 15 to 70 foot-candles.

E. A.C. Power Voltage Fluctuation: ± 10% of 118 VAC with switch-over to standby A.C. generator (diesel engine driven) source possible.

F. A.C. Power Frequency Fluctuation: ± 3% of 60 Hz.

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DIVISION 1 - GENERAL REQUIREMENTS
Section 01700 - Project Closeout

PART 1 - GENERAL

1.01 Related Work Described Elsewhere

A. The provisions and intent of the Contract, including the General Conditions, Special Conditions and other Sections of the General Requirements apply to this Work as is specified in this section. Work related to this Section is described throughout the Specifications.

B. Prior to requesting inspections, plant tests, on-site tests, and Final Acceptance of the NMS, the Contractor shall assure himself that the project phases are complete in all aspects.

PART 2 - PRODUCTS

2.01 Acceptance Testing

A phased acceptance test and performance demonstration program shall be conducted by the Contractor. The first phase shall consist of inspections and tests at the Contractor's plant prior to NMS shipment. The second phase shall consist of on-site inspection and tests immediately following complete NMS installation and operation in Seattle. The third phase shall consist of a 30-day operational demonstration period following On-Site Acceptance. All as-built NMS documentation shall be submitted and and approved by the Engineer prior to Final Acceptance of the NMS, which is scheduled to occur immediately upon completion of the 30-day operational demonstration period.

PART 3 - EXECUTION

3.01 Testing and Final Documents

A. Factory Tests, Demonstrations, and Documentation

The Contractor shall submit his proposed Factory Test and Demonstration procedure to the Port for approval 60 days prior to the start of in-plant testing. This preliminary test procedure will be approved, or approved with corrections, and returned to the Contractor within 20 days. The Contractor shall submit his final (corrected) test procedure 20 days prior to the start of in-plant testing. All definitions, clarifications, and additional test requirements shall be considered a part of this specification. These tests shall be performed during a continuous, 5-day period at the Contractor's plant under the responsibility of the Contractor. The Contractor shall notify the Port when tests are to be performed so that a Port representative may witness the tests, or they may be certified by competent authority approved by the Port. Written results and documentation of all tests conducted shall be provided.

Demonstration tests on all equipment to be delivered shall include performance verification of the following items over the specified conditions:

1. RMS weather resistance shall be tested by operation during humidity/temperature cycles to consist of starting at 70°F and lowering to 20°F at or near 100% relative humidity. Raise temperature to 100°F in about an hour. Measure noise floor of hydrophone and pre-amplifier. Repeat cycle four times. Hydrophone assembly and RMS electronics must function normally during these tests. Immediately prior to these tests, all RMSs shall be acoustically calibrated at 250 and 1000 Hz and RMS adjustments finalized. During or immediately following these tests, electrical Frequency Response, Dynamic Range and Accuracy, Linearity, Detection, Averaging Display, Insert Calibration, Audio Output, and Data Transmission Performance shall be demonstrated and documented.

2. The hydrophone assemblies shall be exposed to the equivalent of a heavy rain for two hours. The hydrophone shall be periodically checked for valid operation with the insert calibrators during the exposure and acoustically calibrated at 250 and 1000 Hz immediately following the exposure.

3. The acoustic frequency response of the hydrophone assembly, including windscreen and preamplifier, shall be measured in an anechoic chamber at incidence angles of 0°, 30°, 45°, 60°, and 90° with respect to the upward vertical axis of the field installation. This shall be done for each hydrophone assembly for frequencies from 125 Hz to 11,000 Hz. Documentation of these tests, as well as random incidence curves (measured or calculated) shall be supplied by the Contractor.

4. The accuracy of the computation of HNL and SEL shall be demonstrated by applying the equivalent of square wave modulated inputs to the insert calibration lines of the RMSs over a variety of durations and frequencies as defined in Section 5080.3(c), (4), (A) and (B) of the California Noise Standards. The accuracy for each combination shall be defined as the difference between the calculated and measured value for each test, and shall be documented and be in compliance with the requirements.

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5. RMS immunity to line voltage and frequency changes shall be demonstrated over a voltage range of 110 to 130 VAC, and frequency range of 58 to 62 Hz.

6. RMS Bit Error Rate of 10^{-5} or less shall be demonstrated at 20 dB signal-to-noise ratio. Command Message Miss Rate of 10^{-2} or less and zero False Alarm Rate shall be demonstrated at 12 dB signal-to-noise ratio during a one hour test per RMS.

7. Wind-induced noise shall be measured at 5, 10, 15, and 20 MPH and documented.

8. The Contractor shall make available for selected testing, as time permits, all NMS hardware and software items and their integrated operation in a mock-up configuration at his plant. The purpose of this demonstration is to permit the Port to observe the status of NMS component completion and integration and to flag major system deficiencies prior to delivery.

   Demonstration and tests to be conducted on the mock-up system during the available time are listed under paragraph B., On-Site Acceptance Tests, Demonstrations, and Documentation.

In the event that the specific performance tests and demonstrations required in items A.1 thru A.7 above are not successfully completed within the 5-day allotted time period due to incomplete status of the NMS, lack of adequate test equipment or facilities, performance deficiencies which lead to component repair and/or retesting, or test procedures which are contrary to the approved test procedures, the Contractor shall reimburse the Port for the additional labor and travel expenses incurred by the Port's representative for extending the test period.

Successful completion of the Factory Acceptance Tests by the Contractor does not eliminate his obligation to meet all NMS performance requirements specified herein for On-Site Acceptance or Final Acceptance of the NMS. Copies of all Factory Acceptance Test data as well as RMS Burn-In results shall be delivered to the Port's test representative prior to his departure from the Contractor's plant. A bound and typed Factory Acceptance Test Results document shall be submitted to the Port and approved prior to On-Site Acceptance of the NMS.

B. On-Site Acceptance Tests, Demonstration, and Documentation

The Contractor shall submit his proposed On-Site Acceptance Test and Demonstration procedure to the Port for approval 60 days prior to the start of on-site testing. This preliminary test procedure will be approved, or approved with corrections, and returned to

the Contractor within 20 days. The Contractor shall submit his final (corrected) test procedure 20 days prior to the start of testing. All definitions, clarifications, and additional test requirements shall be considered a part of this specification.

Following initial installation, calibration, and mechanical adjustment of the NMS, the Contractor shall notify the Port by written memo that the NMS is ready for On-Site Acceptance Testing. The following delivery items shall be inspected, demonstrated and tested by the Contractor in accordance with the approved test procedure, to verify that all NMS specifications are met.

1. RMS operation, calibration, integration with the CPS, interchangeability, and error rate performance.
2. Communications Channel Interfaces and Monitor Jack Panel.
3. Digital Computer operation, fail-safe features, and mainframe expansion cability.
4. Computer Peripherals (Printer, Keyboard, and Cassette Tape Unit) and Interface Connections.
5. RMS I/O Interfaces and Data Error Detection Method.
6. CPS Hardware Expansion Capability to accommodate 15 RMSs total
7. Audio Selector and Stereo Monitors.
8. RMS-to-CPS Voice Communications System.
9. Two-Channel Graphic Level Recorder.
10. RMS Data, Wind, and Date-Time Display.
11. VHF Receiver and Interfaces to Dictaphone 4000.
12. EXCEED Event Alerting System.
13. Wind and Traffic Pattern Signal Interfaces, Usage, and Outage Override.
14. MAP/METER/LAMP Display Performance, Workmanship, and Appearance.
15. Performance of optional or extra work hardware items delivered.

16. Hardware vendor manuals, cables, and spare components.

17. Hardware installation, workmanship, appearance, and cabling.

18. All cumulative noise data computational accuracy and printout formats.

19. All single event noise data computational accuracy and printout formats.

20. Aircraft/Non-Aircraft discrimination algorithms and software test performance.

21. EXCEED Event logging and integrated NMS response to EXCEED Events.

22. Single Event Counting accuracy.

23. Automatic and manual RMS insert calibration stability and reliability.

24. RMS data error detection, counting, and word rejection performance.

25. NMS Time-Day-Year accuracy with Master-Time Clock operating.

26. NMS Traffic Pattern slave and override performance.

27. MAP/Meter/Lamp Display integration and operation with NMS.

28. Printer Terminal Usage, output formats, and response to NMS data availability cues.

29. Data Cassette Unit Usage, tape formats, and response to NMS data availability cues.

30. NMS Operator input command list usage, and fail-safe NMS response.

31. DEBUG Command usage for data readout and software modifications.

32. NMS Software expansion capability to 15 RMSs.

33. NMS Fail-Safe Operation and automatic restart capabilities.

34. Software RELOAD, DUMP, and Storage capability.

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35. Performance of optional software bid items delivered.

36. Updated software flow charts, Memory Maps, and lists of sub-routines and program variable names.

37. Updated software program listing in fully annotated and modular format.

38. Preliminary system documentation.

39. List of all finalized NMS and RMS parameter settings and supporting data.

Written results and documentation of all tests conducted shall be provided.

The Contractor will be advised of NMS delivery items which are found deficient by the Engineer and which preclude granting of On-Site Acceptance by the Port. Request for waivers of minor NMS items from the On-Site Acceptance Tests with anticipated delivery dates may be made in writing to the Engineer by the Contractor. The 30-day Operational Demonstration Phase shall commence upon successful completion of On-Site Acceptance Tests as determined and documented by the Engineer. The Contractor will be notified in writing of the official On-Site Acceptance date.

C. Training of Port Designated Personnel

NMS training sessions shall be conducted to familiarize Port of Seattle personnel with the NMS. The Port will designate key maintenance and operating people to receive this training. Included in this program will be a minimum of two days for electronic theory and electronic troubleshooting practice. The contractor shall submit a training syllabus for approval by the Engineer 60 days prior to conducting the training class. The Contractor shall provide in Seattle, at least one person thoroughly acquainted with all aspects of the NMS hardware and software for a period of at least two on-site days prior to and three on-site days immediately following satisfactory completion of the On-Site Acceptance Tests. This person(s) will make himself available and be responsive to the needs of the Engineer in operating the Noise Monitoring System and in personnel training requirements.

D. 30-Day Operational Demonstration

Following On-Site Acceptance of the NMS by the Port, a temporary DEBUG entry lockout shall be installed by the Contractor, and

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the NMS will be operated by the Port for a continuous 30-day period. Trouble shooting, documentation, reporting procedures and forms required during this period shall be specified and delivered by the Contractor to the Port prior to the 30-day demonstration period. Upon notification by the Engineer of system deficiencies, the Contractor shall effect immediate repair to continue the operation of the complete NMS. Depending upon the severity of the NMS failure and its implications on performance items previously tested, or late delivery of waived test items, the Engineer shall make a determination of the necessity to restart the 30-day clock upon successful repair. The Port shall notify the Contractor in writing of the successful completion of the 30-Day Operational Demonstration and of Final Acceptance of the NMS.

E. Final NMS Drawings, Manuals and Documentation

Prior to Final Acceptance of the NMS, all as-built NMS technical and operating manuals, drawings, and software listings shall be submitted in triplicate and in draft form for approval and editing by the Engineer. Submittals with serious lack of clarity or completeness shall be returned for resubmittal to the Contractor. The Contractor shall furnish one (1) complete set of mylar (duplicate) "As-Built" drawings in addition to other documentation requirements specified.

In addition to the mylar submittals, the Contractor shall supply three (3) complete sets of system operation and technical manuals, suitably bound in 8½ x 11 inch looseleaf binders. Quality of all materials shall be suitable for reproduction. The system operating manual shall include all instructions required to initiate NMS operation, to select and utilize the installed NMS performance features, computer halt and reload procedures, and to diagnose improper NMS operation or failure. Reference to DEBUG subroutine usage shall be omitted. Documentation including photographs, drawings, samples of NMS I/O formats, RMS locations, equipment delivered, and preventive maintenance procedures shall be included. The operating manual shall be written for non-technical NMS Operators.

The NMS technical manuals shall be complete in every respect such that trained NMS maintenance personnel are provided with all necessary technical data, NMS functional descriptions, instructions for diagnosing and localizing NMS failures, and procedures for documenting maintenance actions taken, for restoring proper NMS operation given the availability of replacement components. Hardware documentation shall include (but not be necessarily limited to)

wiring diagrams, block diagrams, schematic diagrams, assembly drawings, bill of materials, cable assembly drawings, connector pin lists, voltage/current test points and typical readings and/or waveforms which are to be expected.

Included in this NMS technical manual documentation shall be recommended trouble shooting and calibration procedures. Software documentation shall be complete in every respect, such that trained NMS maintenance personnel are provided with all necessary technical descriptions, software listings, flow charts, memory maps, and functional descriptions to modify RMS parameter tables, RMS thresholds, software instructions, readout-selected data registers, installation of additional expansion RMS sites, and performance of minor software additions and changes. Use of the DEBUG and other diagnostic routines supplied shall be explained in depth.

3.02 Clean-up

Final clean-up and clean-up during the course of the Work is defined in General Condition G-04.10 and G-04.11. Those paragraphs are supplemented to provide the following:

A. Definition: Except as otherwise specifically provided, "clean" (for the purpose of this Article) shall be interpreted as meaning the level of cleanliness generally provided by commercial building maintenance subcontractors using commercial quality building maintenance equipment and materials.

B. General: Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris and waste. Conduct final progress cleaning as described above.

C. Site: Unless otherwise specifically directed by the Engineer, hose down all paved areas on the site and all public sidewalks directly adjacent to the site. Completely remove all resultant debris.

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DIVISION 16 - ELECTRICAL
Section 16100 - General

A. Port of Seattle Electrical Safety Rules

1. Electrical circuits, operating over 120 volts, phase-to-ground, or served by transformer capabity over 150 kva, shall be de-engerized before work is accomplished thereon.

2. Electrical circuits shall be considered de-energized only when one of the following conditions exists:

   a) Switches connecting subject circuit to the energy supply are observed in the OPEN position, with an air break, and safety tagged in the OPEN position.

   b) Electrically-operated switches are visibly OPEN, blocked or racked in the OPEN position, and safety tagged OPEN.

   c) Whenever the supply circuit break is not visible and clearly identified, all circuit supply conductors shall be grounded and the ground connection safety tagged before work thereon.

   d) Oil switches observed OPEN in a sight window and tagged OPEN, or oil fuse cutouts with fuse carrier removed and tagged OPEN.

3. Use of Red Safety Tags

   a) Safety tags shall be filled out and connected to any switch or equipment opened for protection of personnel working upon circuits connected thereto.

   b) Safety tags shall be removed only by the Port of Seattle employee who placed the tag, or by another Port of Seattle employee, designated in writing by the employee who placed the tag, to remove the tag.

   c) Equipment with a safety tag attached shall not be operated. Any connection with a safety tag attached shall not be changed.

   d) Insulated cables, operated at over 240 volts to ground, shall be handled only with 15,000-volt rubber gloves and when wearing a face shield.

   e) Insulated cables, which have been in operation, shall be cut only with grounded cable shears or shall be spudded before cutting.

   f) All personnel working around energized electrical equipment shall wear standard insulated, non-conducting hard hats, and

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shall wear no garments with metallic zipper fasteners, or other exposed metallic articles.

g) Contractors engaged on Port of Seattle projects or working in Port of Seattle property, shall be governed by Port of Seattle rules, except all safety tags shall be placed or removed by the Port of Seattle employee inspecting the Contractor's work. The Contractor shall designate a supervisor for all contract personnel and operations, said supervisor shall be on the job whenever contract operations are in progress.

h) Port of Seattle "Electrical Safety Rules" and Washington State Department of Labor and Industries "Electrical Workers' Safety Rules" shall be read and observed by all personnel engaged in electrical work upon premises controlled by the Port of Seattle.

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DIVISION 16 - ELECTRICAL
Section 16900 - Noise Monitoring System

PART 1 - GENERAL

1.01 Purpose and Uses of NMS

The NMS for Seattle- Tacoma International Airport will serve as a tool in the Port of Seattle's aircraft noise measurement and abatement programs. The system will consist of fixed acoustic sensors located near the runway ends and at selected locations in King County. Noise picked up by the sensors will be transmitted to a central station which will process the data. The processing will determine noise exposure levels resulting from Sea-Tac aircraft operations as differentiated from other community and aircraft noise sources.

In general, the measurement standards will be similar to those used in California, but the thresholds, tabulations and reports will be tailored to conditions at Sea-Tac and needs of the Port.

The NMS will be operated by or under jurisdiction of the Port of Seattle. There are at present no state laws requiring aircraft noise monitoring. It is the intention of the Port to operate the airport in a responsible fashion and to reduce its noise impact to the extent feasible within the spirit of the Sea-Tac Communities Plan.

1.02 Airport Description and Operations

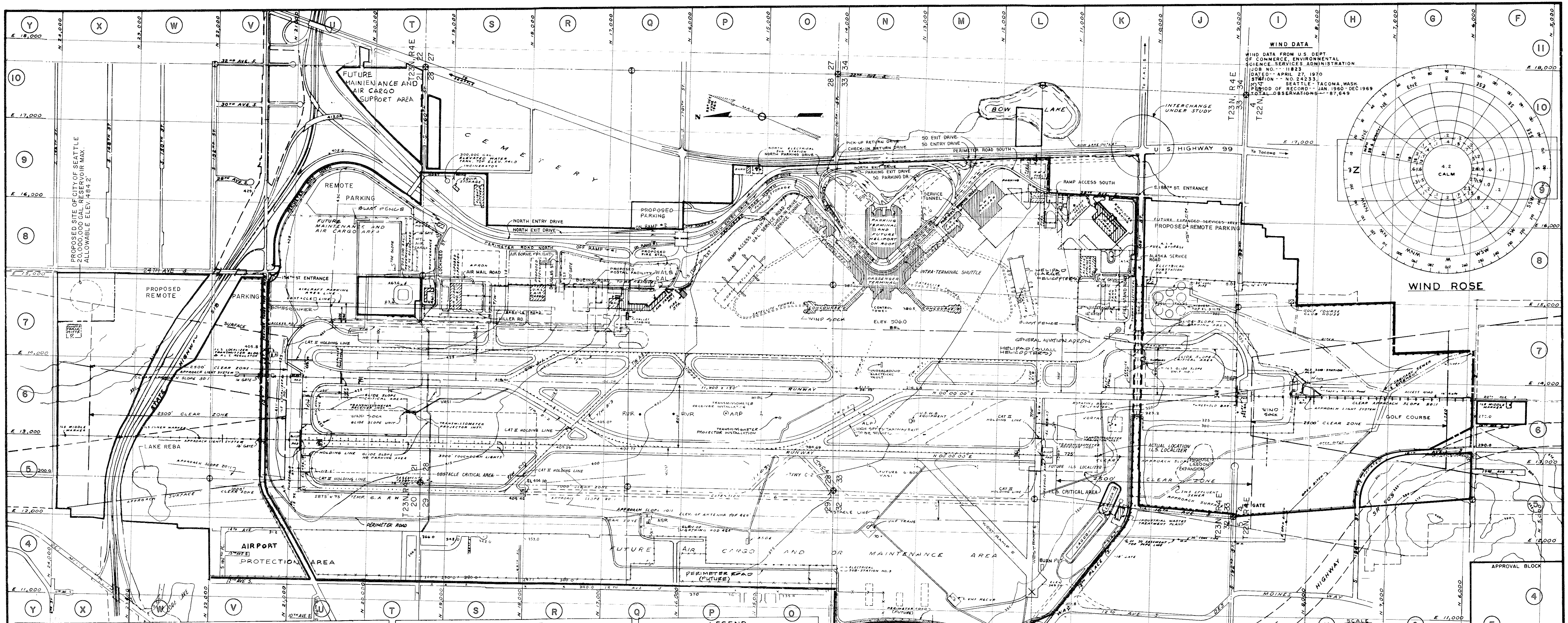
Sea-Tac International Airport is the primary air carrier airport for the Puget Sound Region and is sited as shown in Figure 1. Approximately 80% of Sea-Tac's airline passenger traffic is generated from within King, Kitsap, Pierce, and Snohomish Counties. Projected annual aircraft operations at Sea-Tac are:

	Air Carrier	Commuter Air Taxi	General Aviation	Military
1978	123,000	20,000	25,000	2,000
1983	144,000	24,000	30,000	2,000
1993	178,000	32,000	40,000	2,000

Key characteristics of the two active runways at Sea-Tac International Airport are as follows:

16L-34R	150' x 11,900'
16R-34L	150' x 9,425'

The runway centerlines are separated by 800 ft.



RUNWAY DATA	RUNWAYS 16L - 34R		RUNWAYS 16R - 34L		RUNWAY 17-35	
	EXISTING	ULTIMATE	EXISTING	ULTIMATE	EXISTING (TEMP)	ULTIMATE
EFFECTIVE GRADIENT (IN %)	0.72	0.72	0.71	0.71	0.52	0.52
% WIND COVERAGE	99.0	SAME	99.0	SAME	99.0	SAME
INSTRUMENT RUNWAY	✓	✓		✓		
PAVEMENT STRENGTH	150D, 270DT	200D, 350DT	200D, 350DT	SAME	200D, 350 DT	20 S,
APPROACH SURFACES	50:1	SAME	16R-50:1, 34L-40:1	34L - 50:1	20:1	SAME
RUNWAY LIGHTING	HIRL * **	SAME	HIRL	HIRL ℄ TDZ **	NONE	SAME
RUNWAY MARKING	ALL WEATHER	SAME	ALL WEATHER	ALL WEATHER	BASIC	SAME
NAVIGATIONAL AIDS	ALS (SF) ILS	SAME	INSTRUMENT	ALS (SF) ILS	VFR	SAME
			VASI			
RUNWAY SURFACING	ASPHALT	SAME	CONCRETE	ASPHALT	CONCRETE	SAME

NOTE: ALL RUNWAY OPERATIONS ON TEMP. G.A. RUNWAY 17-35 ARE VFR OPERATIONS. LIGHTING ON THIS RUNWAY IS TAXIWAY LIGHTING.

* INOPERATIVE

** STANDBY GENERATORS AS ALTERNATE POWER FOR HIRL, ℄ & TDZ

AIRPORT DATA	EXISTING	ULTIMATE
AIRPORT ELEVATION	428.0	SAME
AIRPORT REFERENCE POINT (ARP) COORDINATES	N 15446.94 E 13446.42	N 15967.34 E 13221.36
AIRPORT LOCATION POINT (ALP) COORDINATES	LAT. 47°26' 37.8" LNG. 122°18' 28.5"	SAME
NORMAL MAX. TEMP. OF HOTTEST MONTH	74.4°	—
AIRPORT AND TERMINAL NAV. AIDS	VORTAC, ASR	SAME
PRACTICAL ANNUAL CAPACITY — MOVEMENTS PER YEAR	260,000	280,500
MISCELLANEOUS FACILITIES TAXIWAY LIGHTING, CENTERLINE MARKING, ASDE, ASR.	✓	✓

NOTES:
ALL TAXIWAYS ARE 75' WIDE EXCEPT AS NOTED. ALL HAVE STANDARD MARKINGS WORK BY END 1970 SHOWN EXISTING. TAXIWAY A-6 HAS BEEN ELIMINATED. REFER ALSO TO PORT COMPREHENSIVE PLAN, TERMINAL AREA PLAN, CARGO AREA CARGO AREA PLAN, APPROACH & CLEAR ZONE PLAN. FLOODING HAS BEEN CONSIDERED

LEGEND

* EXISTING	ULTIMATE	
(line symbol)		BOUNDARY FENCE
(dotted symbol)		CENTER LINE LIGHTS
(line symbol)	(dashed symbol)	BOUNDARIES OF AIRPORT PROPERTY
(hatched symbol)	(dashed symbol)	BUILDINGS
(dashed symbol)		BUILDING RESTRICTION LINE (BRL)
⊙ ARP		AIRPORT REFERENCE POINT - DEC. 1970
● ALP		AIRPORT LOCATION POINT
(line symbol)	(line symbol)	LEASE LINES
× 380.5		SPOT ELEVATION

* EXISTING	END 1971	ULTIMATE	
(symbol)	(symbol)	(symbol)	PAVING

* EXISTING OR CURRENT CONTRACTS

REVISIONS				
NO.	DESCRIPTION	DATE	BY	APP'D
A	UP-DATED	7/76	M.M.	
B	UP-DATED	1/25/77	M.M.	
C	UP-DATED	6/30/77	M.M.	

PORT OF SEATTLE COMMISSION

SEATTLE-TACOMA INTERNATIONAL AIRPORT

KING COUNTY, WASHINGTON

AIRPORT PLAN

Fig. 1

APPROVED: [signature] CHIEF ENGINEER

DESIGN NO. D 820.8010

DWG. NO. STIA-7304-C-1

DRAWN BY T. M. Ward | DATE JULY 18, 1973

CHECKED BY R. G. PETIT | SCALE AS NOTED

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Division 16 (4)

Runway 16R, equipped with ILS (Instrument Landing System), has Category II capability (see note). Located at the north end of the runway are the approach lighting system and 3,000' touchdown lights. The runway, surfaced with concrete, has high intensity runway lighting (HIRL) and all-weather marking. Runway 16L-34R meets requirements for Category I weather conditions. It is equipped with an approach lighting system and all-weather marking on an asphalt surface.

NOTE: CAT I - An instrument approach procedure which provides for approaches to a decision height of not less than 200 feet and visibility not less than 1/2 mile.

CAT II - An instrument approach procedure which provides for approaches to a decision height of not less than 100 feet and visibility not less than 1200 feet.

Approximately 65 per cent of all arrivals and departures are in the direction of Runway 16. When this traffic pattern is in effect, 90 per cent of all air carrier approaches occur on 16R, and 90 percent of all air carrier departures occur from 16L. When the reverse traffic pattern is in effect (for approximately 35 per cent of total operations), 90 per cent of all air carrier approaches occur on 34R, and 90 per cent of all air carrier departures occur on 34L. Occasionally there will be individual aircraft operating against the regular pattern flow, particularly at night and during warm summer days.

1.03 Boeing International Airport

Boeing International Airport is located approximately 5 miles north of Sea-Tac International Airport, and services unscheduled air carriers, Sea-Tac diversions, general aviation, and military aircraft. Total operations of jet aircraft at Boeing in 1977 were approximately 12,650 or about 10 per cent of annual Sea-Tac jet air carrier operations. It is possible that the Sea-Tac NMS sensors may detect aircraft noise resulting from operations at Boeing. However, it is anticipated that these aircraft noise sources will be automatically separated from those resulting from aircraft operations at Sea-Tac. Therefore, cumulative values of aircraft noise exposure as determined by the NMS should represent those resulting from Sea-Tac operations.

1.04 General System Configuration

Figure 2 is a schematic Diagram of the Sea-Tac NMS. Major system components include eight (8) Remote Monitoring Stations (RMSs) located at Port-designated sites within a 5-mile radius of Sea-Tac, a Central Processing System (CPS) operating automatically under the control and supervision of a general purpose mini-computer, and a Port-supplied Dictaphone 4000 voice logging/recording system. The CPS shall be

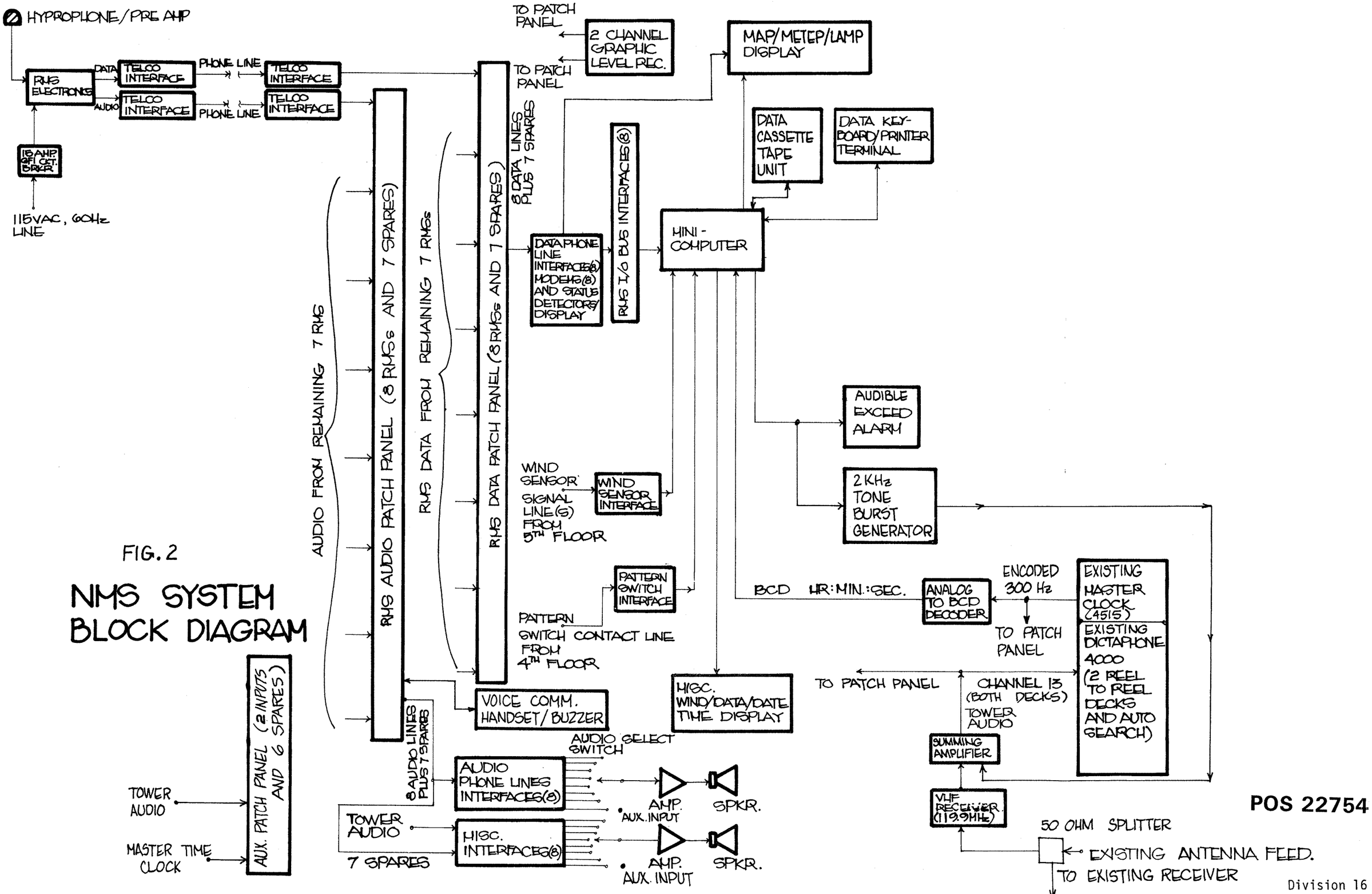

FIG. 2

NMS SYSTEM BLOCK DIAGRAM

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located in the Central Control Facility in the parking garage at Sea-Tac International Airport, and shall be but one of several central monitoring/control operations conducted in the facility.

1.05 RMS Locations and Site Preparation

Figure 3 is a map showing the locations and identification numbers of the 8 RMSs, and the addresses listed below. More complete site descriptions are available from the Port.

RMS SITE NUMBER	LOCATION
1	Parkside Elementary School, S. 247 St. and 21 Ave. S., 200 ft. SE of school building.
2	150 ft. east of 12 Ave. S. on S.226th St.
3	North end of Midway Elementary School, S. 225 St. and 24 Ave. S.
4	200 ft. north of S. 200 St. on access road bisecting Tyee Golf Course (south trigger site).
5	(Sideline site, near the intersection of S. 170 St. and 12 Ave. S.)
6	75 ft. north of S. 146 St. on an alignment midway between runways (north trigger site).
7	70 ft. south of S. 120 St. midway between 13 and 14 Aves. S.
8	Glendale Jr. High School, about 200 ft. south of S. 104 St. midway between 13 and 14 Aves. S.

The Contractor shall install all RMS work items on RMS site facilities to be supplied by others. CPS site preparation requirements are minimal, and the Contractor shall supply all CPS work items at the Central Control Facility without support from others

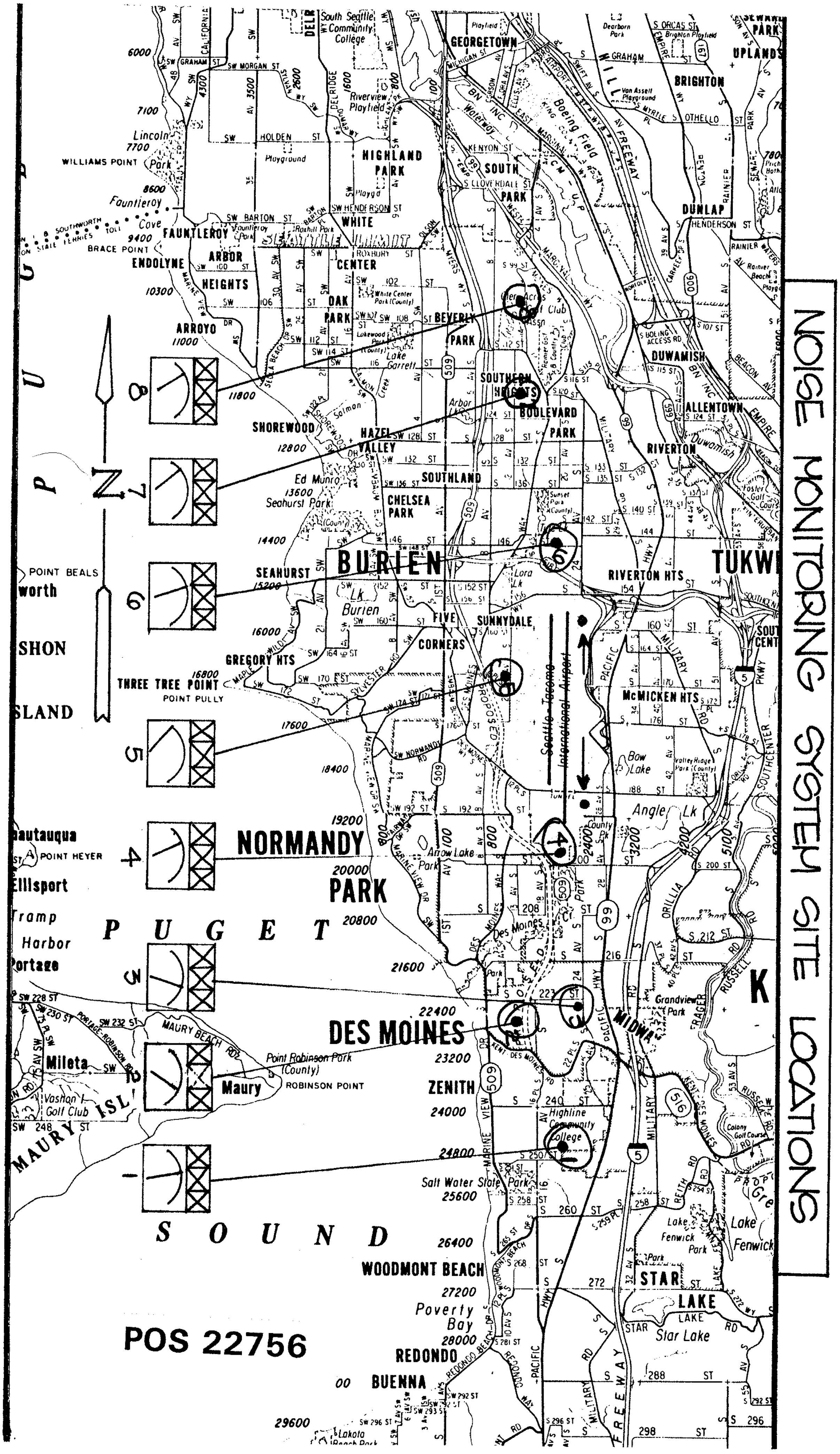

FIGURE 3

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Division 16 (8)

1.06 Overall (End-to-End) System Performance Requirements:

A. Noise Descriptors and Definitions:

1. Sound Pressure Level (SPL)

The Sound Pressure Level, in decibels (dB), of a sound is 20 times the logarithm to the base of 10 of the ratio of the pressure of this sound, P(t), to the reference pressure, P_o. The reference pressure shall be 20 micronewtons/square meter (2×10^{-4} microbar).
$SPL = 20 \log[P(t)/P_o]$.

2. Noise Level (NL)

Noise level, in dBA, is an A-weighted sound pressure level, $P_A(t)$, as measured using the SLOW dynamic characteristic for sound level meters specified in ANSI S1.4-1971 (Type 1), American National Standard Specification for Sound Level Meters, or latest revision thereof. The A-weighting characteristic modifies the frequency response of the measuring instrument to account approximately for the frequency characteristics of the human ear. The reference pressure, P_o. is 20 micronewtons/square meter (0.0002 microbar).
$NL = 20 \log[P_A(t)/P_o]$.

3. Maximum Noise Level (MNL)

The Maximum Noise Level, in dBA, is the maximum value of the Noise Level which occurs during a single noise event, such as an aircraft flyby.

4. Equivalent Noise Level (LEQ)

The Equivalent Noise Level is the steady state equivalent of noise accumulated during a given event, with reference to a duration of one second. More specifically, Equivalent Noise Level, in decibels, is the time-integrated and time-averaged Noise Level for given time interval between t_1 and t_2.

$$LEQ = 10 \log \left[\int_{t_1}^{t_2} P_A^2(t)dt\right] - 10 \log \left[t_2-t_1\right] - 20 \log \left[P_o\right].$$

5. Single Event Level (SEL)

The Single Event Level, in decibels, in the time-integrated Noise Level of a single event, such as an aircraft flyby, measured over the time interval between the initial and final times for which the noise level of a single event exceeds a selectable Single Event Threshold value (i.e., the integration interval (t_1, t_2) is defined when

$P_A(t)$ is greater than the selected Single Event Threshold value).

$$SEL = 10 \log \left[\int_{t_1}^{t_2} P_A^2 (t)\, dt\right] - 20 \log \left[P_o\right]$$

6. Single Event Noise Limit and Exceed Event

The Single Event Noise Limit is the maximum allowable Single Event Level at a given RMS. An EXCEED Event is an aircraft generated noise event whose SEL value exceeds the Single Event Noise Limit.

7. Hourly Noise Level (HNL)

The Hourly Noise Level, in decibels, is the Equivalent Noise Level for a particular hour of the day. Hourly Noise Level is determined by subtracting 35.56 decibels (equal to 10 $\log_{10}$ 3600), from the integrated Noise Levels measured during the particular hour and integrating for those N periods during which the Noise Levels are sampled. An option provides for threshold controlled integration (See Section 16940, 2.10)

$$HNL = 10 \log \left[\sum_{i=1}^{N} (t_{i+1} - t_i) 10^{\frac{LEQ_i}{10}}\right] - 35.56$$

8. Community Hourly Noise Level (HNLC)

The Community Hourly Noise Level is HNL as defined in A.7 above, except it is comprised only of HNL's which are determined by the NMS to be other than noise associated with Sea-Tac air operations.

9. Aircraft-Generated Hourly Noise Level (HNLA)

The Aircraft-Generated Hourly Noise Level is HNL as defined in A.7 above, except it is comprised of HNL's which are determined by the NMS to be only aircraft generated noises associated with Sea-Tac air operations.

10. Day-Night Sound Level (LDN)

Day-Night Sound Level, in decibels, represents an equivalent steady state noise level during a 24-hour period. Since there is a lower tolerance to noise during the nighttime hours, 10 dB is added to Hourly Noise Levels measured during the hours from 10:00 pm to 7:00 am (HLN_n) and then averaged, on an energy basis along with the daytime Hourly Noise Levels (HNL_d).

$$LDN = 10 \log \left[\sum_{d=1}^{15} 10^{\frac{HNL_d}{10}} + \sum_{n=1}^{9} 10^{\frac{HNL_n+10}{10}}\right] - 10 \log 24.$$

Where: HNL_d are HNL values for the 15 hourly periods between 7:00 am and 10:00 PM.

HNL_n are HNL values for the 9 hourly periods between 10:00 pm and 7:00 am.

11. Day-Night Community and Aircraft Generated Sound Levels (LDNC and LDNA)

LDNC and LDNA represent Day-Night Sound Levels determined by the NMS as attributable to non-Sea-Tac and Sea-Tac associated noise sources respectively. The relationships amoung LDNC, LDNA, and LDN are analogous to the relationships among HNLC, HNLA, and HNL.

12. Time Duration Above Threshold (TXX)

The time duration in minutes for which the Noise Level at a measurement location is above a selected Noise Level Threshold of XX dBA. For example: T85 represents the time in minutes for which the Noise Level exceeded a threshold of 85 dBA.

B. System Accuracy and Measurement Range

Sound Pressure Level data shall be monitored at each RMS and converted to Noise Levels (dBA, SLOW), in conformance with the requirements for a Precision Sound Level Meter (Type 1), ANSI S1.4-1971. Data are to be transmitted to a Central Processing System (CPS) over communications lines provided for each RMS, and automatically processed in real time to output the following noise descriptors: NL, MNL, SEL, HNL, HNLA, HNLC, LDN, LDNA, LDNC, LEQ, LEQA, and TXX, and to drive various digital and meter displays. Noise levels shall be measured over a range of at least 45 to 130 dBA without NMS operator intervention for manual gain switching, and with a Noise Level measurement resolution element no greater than 0.4 dBA. For zero wind velocity, zero sensor acceleration, and input Noise Levels of 50 to 130 dBA, the end-to-end system accuracy shall be $\pm$ 1.5 dB for the output noise descriptiors required. (See Section 16910 on RMS Electrical Noise Floor).

C. Applicable Standards

Applicable standards and specifications referenced throughout this specification are listed in DIVISION 1 - GENERAL REQUIREMENTS. It shall be the responsibility of the Contractor to meet these, and other current technical, performance and safety standards applicable to all components and to the entire system, even when not specifically referenced.

D. System Life

The service life of the system shall be a minimum of 10 years. The Contractor shall indicate the periodic maintenance required in a service manual necessary to provide the 10-year service life. Where considered necessary, the Contractor shall indicate the expected time to replacement of any system element which will not meet the required service life.

E. System Reliability

The system is to be operated 24 hours per day, seven days per week, with a

Mean-Time-Between-Failure (MTFB) of not less than 1500 hours. A MTBF estimate shall be provided, based on the best available data for the major components in the system, referencing the source of such data. The Mean-Time-To-Repair (MTTR, restore system to full operation) shall not be be greater than 48 hours. An estimate of MTTR shallalso be provided using similar criteria and based on the designated location of the NMS trained maintenance personnel, and available spare components.

F. System Maintainability

All equipment provided under the contract shall be capable of meeting maintainability requirements as follows:

1. Provide for the capability of removal of component items within each equipment with minimal requirement for removal of other items to gain access to a specified item.

2. Reduce the need for special tools, test equipment, and extender boards, to a minimum.

3. Be designed to utilize available and proven general purpose tools and test equipment to a maximum.

4. Be self-sufficinet to the extent that performance can be verified, failures detected and located, and calibration performed with a minimum of externally applied tools and test equipment.

5. Incorporate features which shall reduce the following maintenance practices to a minimum of time:

   a. Preventive Maintenance

   b. Repair of failures

   c. Verification of system performance.

6. Provide test extender cards and cables to assist in maintenance operations and front access to all circuits (electrical and mechanical) requiring maintenance. Front access to all circuits is preferred, and is required for the RMS.

7. Provide test points for all external inputs and for common supply internal voltages. The test points shall be located on the control panel or within easy access from the front of the equipment.

8. A recommended preventive maintenance schedule for all elements of the system shall be provided. In addition to this schedule, the following information is to be estimated:

a. Manhours per month required for preventive maintenance.

b. Specific maintenance materials required per month and their cost.

c. Specialized problems in maintenance, i.e., problems involving the common carrier.

d. Definition of any special maintenance equipment required.

G. Environmental Requirements

All outdoor components shall be constructed such that the performance specified will not be degraded while the system is operating within the range of outdoor environmental conditions found in Seattle. All indoor components shall be constructed such that the performance specified shall not be degraded while operating within the range of environmental conditions found in the air-conditioned spaces at Sea-Tac. These parameters are detailed in DIVISION 1 - GENERAL REQUIREMENTS.

H. System Automation

Consistent with economics, the system shall be as automatic as possible. The system must be capable of operating under normal circumstances for at least 72 hours without an operator. Requirements for operator interaction with the system shall be minimized.

I. Fail Safe Operation

Telephone line and/or primary power outage at any RMS shall not result in the system reporting invalid data. Level monitoring circuits, data quality detection circuits, reasonable checks, or other means must be provided at the CPS and/or each RMS to prohibit collection of invalid data from any RMS as a result of RMS or CPS faults, or telephone line or RMS power outages. Power, input RMS data, or Master Time Clock outages within the CPS complex or at any CPS sub-system component shall not result in an NMS computer software failure requiring program reloading by an NMS operator, or system repair.

The NMS shall be isolated from all other Sea-Tac systems to ensure that any NMS failure or misuse will not cause failure or degradation of other systems. Any failure of the NMS will not cause an unsafe condition.

* * * * *

DIVISION 16 - ELECTRICAL
Section 16910 - Remote Monitoring Stations (RMSs)

PART 1 - GENERAL

1.01 General Characteristics of Each RMS

Each RMS shall be identical and shall include a weatherproof hydrophone, vibration isolation mounts, protective windscreen, bird spike, pre-amplifier, A-weighting network, electrical insert calibrator, logarithmic converter, averaging/detector networks, control circuits, NL display, interfacing equipment for transmission of the NL data and audio signals over telephone lines, power supply, intercabling, enclosure, and mounting brackets and hardware to connect to the facilities provided by the Port.

1.02 Data Transmission Facilities

A. One Type C3002-Basic, 2 wire, Full Duplex, private telephone line shall be provided by the Port for transmitting Noise Level data, and all commands and levels associated with the calibration system and RMS operating modes. RMS control signals originating from the CPS and associated with calibration, or RMS mode changes shall not interfere with the NL data transmission or cause invalid Noise level data to be processed at the CPS.

B. A second telephone line shall be provided by the Port for transmission of the compressed audio for aural monitoring at the CPS. This phone line shall be of identical type to the NL data line. The audio signal shall be compressed to meet telephone line limits. Switching shall be provided so that this audio telephone line may also be used as a two-way voice communication system between each RMS and the CPS.

PART 2 - PRODUCTS

2.01 Weatherproof Hydrophone Assembly

A. The basic RMS Noise Level sensor shall be a hydrophone. The complete hydrophone assembly shall meet the requirements of a Type 1 system, per ANSI S1.4 - 1971, as well as additional RMS technical requirements given in this specification. Data to be provided shall consist of A-weighted frequency response tolerance limits (in dB) which will be met by the proposed lot of sensors for incident sound angles of 0, 30, 45, 60, and 90 degrees relative to the upward direction of the vertical axis of the sensor. These frequency tolerance limits vs. incident sound angles will be provided in a continuous curve, graphic format from 125 Hz to 11,000 Hz. Also provide the Port with random incidence, frequency response tolerance limits which will be met by the proposed lot of sensors. A continuous curve, graphic format from 125 Hz to 11,000 Hz should be used. All frequency response curves must be derived from and apply to the complete RMS sensor installation, which includes proposed windscreen, protective hardware, mounting hardware, pre-amplifier A-weighting network and associated electronics (see also Section 01700, 3.01 A.3).

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B. Additional data to be submitted are, descriptions of the recommended sensor mounting details, plus the following technical specifications and data for the RMS sensor subsystem proposed:

1. Nominal Sensitivity (re dBv/0.0002 ubar) at 1000 Hz.

2. Linearity (in ± dB SPL) over a dynamic range of 40 to 130 dB SPL.

3. Sensitivity changes (in + dB SPL) over a temperature range of 0^{o} F to 120^{o} F.

4. Vibration sensitivity (in dB SPL/g) from 20 Hz to 20,000 Hz for white, broad-band, longitudinal and transverse axes excitations.

5. Sensor capacity in picofarads.

C. The complete hydrophone assembly will be designed such that wind induced noise shall be less than 55 dBA for wind speeds up to 20 MPH from any direction under dry weather conditions. As an option, a quote for a lower wind induced noise floor at 20 MPH and exceptions to other performance submittals required under the above paragraphs A and B is requested.

D. The NMS electrical noise floor, at 100^{o} F ambient temperature and 100 percent relative humidity, shall not exceed an equivalent input Noise Level of 45 dBA when the RMS NL sensors are substituted by shielded capacitors whose values are within ± 15 percent of the nominal RMS sensor capacity.

2.02 Electrical Frequency Response

The electrical frequency response of each RMS and associated NL data transmission devices shall comply with ANSI S1.4-1971, Table 1, A-weighting relative response from 20 Hz to 12,500 Hz. with a tolerance of ± 0.5 dB.

2.03 Electrical Dynamic Range and Accuracy

The electrical components of each RMS and associated NL data transmission devices shall be of sufficient design to meet the overall NMS measurement range and accuracy requirements of paragraph 1.06(B) of Section 16900.

2.04 Electrical Linearity

The electrical amplitude response of each RMS and associated NL data transmission circuitry, to any sine wave within the frequency range of 20 Hz to 12,500 Hz shall be linear within ± 0.5 dB over the SPL measurement range of 50 to 130 dB.

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2.05 Electrical Detection, Averaging, and Display

A. Electrical detection, averaging, and display responses shall conform to ANSI S1.4-1971, Type 1, tolerances for ROOT MEAN SQUARE, SLOW response. A description must be provided describing the implementation methods regarding detection, averaging and display.

B. A Built-in Noise Level display (meter or electronic) shall be provided at each RMS to facilitate field calibration and maintenance. Resolution shall not be more than 0.5 dBA. For coded binary displays, a decimal conversion chart for each RMS will be provided.

2.06 Automatic and Field Insert Calibration

A. Once each day, and also upon manual activation at the CPS, the CPS shall send commands to each RMS which will cause calibration signals to be inserted in the hydrophone system. Insertion of each calibration signal shall also be field activated by a switch provided at each RMS . Test points shall be provided at the output of the RMS for field monitoring the inserted calibration signals. The calibration signals shall be a 250 Hz and a 1,000 Hz sine wave of 100 to 120 dB (equivalent) SPL amplitude. Each tone shall be separately identified when observed at the CPS. Distortion of the tones shall be no greater than 1%. The accuracy and stability of the tones shall be $\pm$ 3 per cent of calibration frequency under all conditions. Amplitude stability shall be better than + 0.25 dB under all conditions. The duration of each calibration tone shall be 10 second $\pm$ 0.5 second.

B. Calibration data shall not appear or be included in the cumulative NL data of the NMS.

2.07 Field Calibration

A. Using a sine wave oscillator and voltmeter, it shall be possible to electrically calibrate each RMS in the field over the full dynamic and frequency range of the system by substituting a variable frequency and voltage source for the internal insert calibrator source described above in paragraph 2.06. Signal input receptacles shall be supplied for this type of field calibration.

B. It shall also be possible to acoustically calibrate the hydrophone with:

1. a pistonphone and adaptor, and

2. a five-frequency acoustic calibrator,

both to be supplied with the system. The Contractor shall provide all necessary acoustic calibration equipment and documentation such that traceability to National Bureau of Standards is possible.

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2.08 Audio Output and Communication Interfaces:

A. The NL audio monitoring output shall have a frequency response of at least 300 to 3000 Hz, ± 3.0 dB. Due to the narrow dynamic range characteristics of the telephone line, the gain of the output audio signal shall be compressed on the audio monitor line, to meet telephone company standards. However, the fidelity of the audio monitoring circuits will be sufficient to allow for aural discrimination of birds, human voices, motor vehicles, aircraft, horns, etc.

B. The interface to the telephone lines shall be contained in the RMS, and shall meet the requirements specified herein and in Section 16920, Communication Channels.

C. Provision shall be made to easily switch the telephone line used for NL audio monitoring to a two-way communication system. A portable communications handset or microphone and headset shall be provided for connection to a receptable at each RMS. From the RMS, it shall be possible to call the CPS and a two-way audio alert system (e.g. a buzzer) shall be provided.

2.09 Noise Level Data Link and Communication Interface:

A. Noise Level data transmission format shall be serial and digital, and shall utilize Frequency Shift Keying (FSK) modulation. The Contractor will provide sufficient data modulator/demodulator and interface hardware to comply with telephone company standards and to insure that reliable data transmission will result over the communications facilities provided by others. Digital data error rates of less than 1 bit per 10^5 bits (10^{-5} BER) will be considered acceptable for a Signal (FSK)-to-Noise (3KHz Band Limited, Gaussian, White) ratio of 20 dB. Minimum Noise Level data transmission rates shall be not less than two NL data words (in encoded dBA) per second per RMS.

B. Bit Error Rate vs. Signal-to-Noise ratio performance curves which are applicable to the NL data transmission method shall be provided. Bit Error Rates over a 0 to 40 dB range of Signal-to-Noise ratios are to be shown on these curves, with noise characteristics being Gaussian, White, and band-limited from 300 to 3000 Hz.

C. A detailed description of the proposed NL word data format, serial data transmission scheme, synchronization and control characters used, FSK mark-space frequencies, demodulation method, and post-discriminator bit detection method shall be provided.

2.10 CPS to RMS Command Message Subsystem Performance:

A. All CPS to RMS Command Messages used for RMS mode changes (such as insert calibration) shall be transmitted over the Full Duplex, NL data,

telephone line, and not interfere with NL data transmissions from the RMS to CPS. These Command Messages shall be reliably detected by the RMS and control functions (such as insert calibration) performed with a maximum Miss Rate of 1 missed command per 100 commands sent (10^{-2} Miss Rate), and a minimum False Alarm Rate of 1 false control function activated per month per RMS for phone line Signal (Command Message Carrier)-to-Noise (3KHz Band Limited, Gaussian, White) ratios of 12 dB or greater. All other CPS to RMS data transmission used for NL data synchronization or RMS polling shall meet the performance requirements of Paragraph 2.09-A above.

B. A detailed description of the proposed CPU to RMS command codes, transmission scheme, demodulation method, and detection/decoding method shall be provided.

2.11 Weatherproof Enclosures:

A. The electronics of the RMS shall be placed in rugged, weatherproof enclosures comparable to enclosures manufactured by Eagle Signals or Hoffman, and must discourage vandalism with items such as keyed-alike locks. The enclosure shall be no larger than 30" high x 16" wide x 12" deep, and shall meet applicable NEMA specifications.

B. A second weatherproof enclosure, separately accessible by telephone company personnel, shall be provided to house two Channel Interface Units (CIUs). These CIUs are to be supplied by the telephone company and are approximately 5-1/2" long x 4-1/4" wide x 2" deep. All attachment hardware and padlocks for these enclosures will be supplied by the Contractor.

PART 3 - EXECUTION

3.01 Power:

Each RMS shall not consume more than 20 watts, continuous, of power. Commercial, 110 to 120 VAC, 60 Hz power will be supplied by the Port, having the characteristics specified in Section 01660, Environmental Factors. The RMS shall include a dual AC convenience outlet. All internal wiring and connections shall be in accordance with the NEC 1975 and NEMA. A 15A circuit breaker and grounding wire will be provided by the Port for each service installation.

3.02 RMS Burn-In Requirement:

Each RMS, including the hydrophone assembly, shall be subjected to a one (1) week burn-in with power applied in a controlled ambient of 120^{o} F and 90% R.H. Any failures will be identified and replacement

made with appropriate components. At failure, the accumulated time to failure shall be reduced by 50% and the system burn-in continued from that point until a total of 168 hours have been accumulated.

RMS-Burn-In shall be performed by the Contractor prior to the Factory Acceptance Tests. Burn-In results, including failures and replacement actions, shall be submitted to the Port's Factory Acceptance Test representative.

3.03 Environmental:

Each RMS shall function dependably in the environment of the Seattle area. The parameters are specified in Section 01660, Environmental Factors, and test requirements are detailed in Section 01700, Project Close-out.

3.04 Installation - RMS

A. The Contractor shall install the hydrophone, windscreen, preamplifier, and all other RMS delivery components on the facilites provided by the Port at each site in the areas shown in Figure 3. The hydrophone will be at least 10 feet above surrounding structures, and 20 feet above the ground. The cable from the pre-amp will run not over 18 feet to the RMS cabinet where the Port will make available AC power and communication lines. All RMS and CIU enclosure entries for power and communications lines, and grounding will be through the bottom surfaces of the enclosures. The Port will provide RMS mounting poles, two conduits, applicable lines in these conduits, and grounding in accordance with installation details provided by the NMS Contractor, who will be responsible for the proper weather-tight termination of the conduits, power and signal lines, and grounding. Interconnection of conduits between the RMS and CIU enclosures will be the responsibility of the NMS Contractor.

B. The Port will make arrangements for use of and access to the mounting locations by the Contractor, and will provide him with site facility details.

C. It shall be the responsibility of the Contractor to visit each site and verify its suitability and readiness for his installation work 30 days before delivery of the system.

3.05 Acceptance and Repair of Telephone and Power Facilities:

The Contractor is responsible for notifying the Engineer of the acceptability of power or communications facilities supplied prior to final RMS installation or 10 calendar days prior to On-Site System

Acceptance. The Port will be responsible for maintaining proper service during the 30-day Operational Demonstration Period.

3.06 Calibration and Final Adjustments:

Prior to On-Site Acceptance, each RMS shall be adjusted as necessary to meet the requirements of this specification. Acoustic calibration at 125 Hz, 250 Hz, 500 Hz, 1000 Hz, and 2000 Hz shall also be performed utilizing a pistonphone and a multiple frequency acoustic calibrator. Calibration results shall be documented and submitted to the Engineer prior to On-Site Acceptance. All calibration equipment (two calibrators and adapters, calibrated on delivery) and documentation of traceability to National Bureau of Standards shall be delivered to the Port at the completion of On-Site Acceptance.

3.07 On-Site Acceptance Tests

On-Site Acceptance tests shall be conducted in accordance with Section 01700.

3.08 30-Day Operational Demonstration:

Following On-Site Acceptance, the Contractor shall demonstrate successful RMS operation and performance for a continuous 30-Day period without RMS alterations, substitutions, or adjustments. RMS failures or performance degradation which occur during this 30-day period shall be immediately corrected by the Contractor upon notification by the Engineer. The Port reserves the right to extend the 30-Day Operational Demonstration period to account for RMS down-time or to test the operation of the RMS for a continuous 30-Day period following repair. In the event of power or telephone facilty failure during the 30-Day Operational Demonstration Period, the Port shall restore the utility service and continue the 30-Day Operational Demonstration Period. Failures of other NMS components during this period which prohibit continuous RMS performance evaluations, may lead to extensions of the 30-Day Operational Demonstration period if deemed necessary by the Engineer.

* * * * *

POS 22768

DIVISION 16 - ELECTRICAL
Section 16920 - Communication Channels

PART 1 - GENERAL

1.01 Functional Description

All communication channels required to link RMS components to the Central Processing System (CPS) will consist of voiceband, private telephone lines. The functions of these communication channels will be to serve as: Noise Level data transmission lines from each RMS to the CPS; Command (Control) Message data transmission lines from the CPS to each RMS; Noise Level audio (aural) transmission lines from each RMS to the CPS; and two-way voice transmission lines between each RMS and the CPS. Additionally, the NMS remote sensor input lines for wind data and traffic pattern shall be installed by the contractor.

PART 2 - PRODUCTS

2.01 Contractor Responsibilites

The Port shall be notified of possible technical conflicts which may arise between the communication channels and the transmission methods. All data modems and interfacing equipment will be supplied by the Contractor and will comply with local telephone company (Bell System) standards such that adequate protection and private line design specifications are realizable. If other types of communication channels (such as those with special conditioning) are required, the Port reserves the right to apply the phone line lease cost differential to the total system price bid. A 10-year, life cycle cost method will be used with an annual discount rate of 8 per cent. (See Section 16910, RMSs., for additional requirements).

2.02 Contractor Installations

The Contractor shall supply and install approximately 1,200 ft. of multiple, twisted pair, signal cable between the CPS in the Central Control Facility and 4th and 5th floor spaces of the Sea-Tac Main Passenger Terminal Building. Four pairs of conductors (spares included) shall be installed between the CPS and 4th floor, FAA equipment rack, where the traffic pattern switch signals are accessible. An additional 4 pairs of conductors (spares included) shall be supplied between the CPS and the 5th floor NOAA equipment rack where the wind speed/direction signals are accessible. Conductors shall be copper, shall be no less tha No. 22 AWG in size, and shall have thermoplastic insulation and an overall thermoplastic jacket.

2.03 Optional Bid Item for Elimination of Contractor Installation

As an optional bid item, provide a quote for the reduction of the contract bid price amount if the installation requirements of paragraph 2.02 and 3.02 of this section are omitted from the specifications, and simplex, Type 3002-Basic telephone lines are supplied by the Port

for the traffic pattern signals. The wind sensor work would be eliminated from this specification if this option is exercised by the Port. All performance provisions and contractor responsibilities applicable to RMS phone lines shall apply to this simplex phone line option.

PART 3 - EXECUTION

3.01 Telephone Facilites To Be Provided by the Port

The Port of Seattle will supply the voice band telephone line channels and their respective wire-pair terminations for the RMS data and audio information transmission requirements described above in paragraph 1.01. It is anticipated that all channels will be private line, point-to-point, two-wire, Type 3002, Basic (unconditioned) circuits. Full Duplex circuits will be supplied for all communication channels linking each RMS to the CPS. All circuit terminations supplied by the Port will include standard termination blocks or strips which will define the communication channel limits of the Port supplied telephone facilities.

3.02 Communications Channels to Be Supplied by the Contractor

Traffic pattern switch and wind sensor conductors shall be installed and routed via existing vertical shafts and horizontal cabletray. All installation work shall be coordinated with and approved by the Engineer. The Port will provide the Contractor with details of and access to the existing facilities necessary for completion of this work. All wire pair terminations shall be identified and permanently labeled. Spare conductors shall be neatly coiled-in-place. Installation shall be in accordance with National and State electrical codes for Class 3 circuits.

3.03 Other Terminations

The Port will also provide incoming line drops and/or termination blocks in the immediate vicinity of the CPS for Master Time Clock signals, and FAA Tower VHF signals. These signals, as well as the wind sensor and traffic pattern signals, will be utilized as inputs by the NMS as described in Sections 16930 and 16940. The Contractor will be responsible for the proper interfacing and connection of all these lines to the NMS.

* * * * *

DIVISION 16 - ELECTRICAL
Section 16930 - Central Processing System - Hardware

PART 1 - GENERAL

1.01 General Description

A. The Contractor shall supply all the necessary Central Processing System (CPS) hardware required to implement the Sea-Tac NMS as specified, with the Port responsible for providing the RMS communication channels of Section 16920, adequate a.c. line power, air conditioned spaces, equipment racks, and console space. The Contractor will be provided a.c. power at panel G.G. No. 4, circuit No. 16 in Central Control. The Contractor is responsible for fusing, routing and terminating power from the panel to the CPS hardware.

B. The CPS shall be capable of accommodating eight (8) RMSs upon delivery, with provision (wiring, cables, and card slots) for future expansion capability to 15 RMS. Identifiable hardware components include the following items:

1. Communication Channel Interfaces and Monitor Jack Panel
2. RMS Noise Level Data Demodulators and Status Displays
3. Digital Computer to RMS I/O Interfaces
4. Digital Computer
5. DC Power Supplies
6. System I/O Line Printer, Keyboard Terminal, and Data Cassette Recorder/Reproducer
7. Audio Selector and Stereo Monitoring Amplifier/Speakers
8. Two-Way, Voice Communications System
9. 2-channel, Graphic Level Recorder
10. RMS Data, Wind, and Date-Time Display
11. Audible EXCEED Event Alarm and Electronic Signaling
12. MAP/METER/LAMP Display
13. VHF Receiver (119.9 MHz) and Amplifier
14. Master Time Clock to Computer Interface
15. Traffic Pattern Switch to Computer Interfaces
16. Wind Sensor to Computer Interfaces
17. Miscellaneous Mounting Hardware, and Interconnecting Cables, Spares, and Consumables.

POS 22771

C. The CPS shall scan the Noise Level data from each RMS at least twice a second to obtain values of MNL, SEL, SEL duration, HNL, HNLA, HNLC, LDN, LDNA, LDNC, LEQ, LEQA, and TXX, and shall record these values as required. The CPS shall activate calibration signals at the RMSs, and control the various displays. The CPS shall be capable of executing all command and control functions required for automatic and manual operations.

PART 2 - PRODUCTS

2.01 Communication Channel Interfaces and Monitor Jack Panel

A. All two-wire communication channels which link the CPS with RMSs, Master Time Clock, and FAA Tower (local control) Audio, shall be interfaced as required in Section 16920 Communication Channels, and shall be electrically accessible at a monitor jack panel. Interface cabling, connectors, and monitor panel should include sufficient spares for a total of 15 RMSs and a total of 6 additional two-wire circuits. Monitor panel wiring shall be such that continuous aural, oscilloscope, or Graphic Level Recorder monitoring of these circuits is possible without continuous circuit interruption. (Intermittant circuit interruption is allowable).

B. All interconnecting cables and interface connectors between data terminal equipment and the CPS or between data terminal equipment and data communication equipment will comply with EIA or Bell System standards.

2.02 Digital Computer

All NMS data processing, storage and control functions required for daily noise monitoring will be automated via a general purpose digital computer. This computer shall comply with the following minimum requirements: software programmable; memory size of 16 K words, with mainframe expansion provisions for 32 K words of total memory; 16 bit word length; 1200 nanosecond maximum cycle time; automatic bootstrap loader for tape cassette; power failure detect/automatic restart; memory protection; register contents display; real time clock; STEP/RUN modes; and lockout manual keyboard. The I/O architecture shall be configured such that additional peripherals, interconnecting cables, I/O controllers, and software may be added to the basic NMS at a later date without altering the mainframe chassis.

POS 22772

2.03 Master Time Clock Interface

A. The Port will supply encoded Master Time Clock signals for use by the NMS as a time-of-day reference. The Contractor shall insure that event dates and times of NMS output printouts are slaved to this Master Clock. In the event of Master Clock outage (loss of signal, data errors, or no update), the NMS will automatically transfer to an internal time-of-day clock within 10 seconds following the outage. Following the restoration of the Master Clock signals, the NMS will automatically resume its original slave status. Loss and restoration of Master Clock signals will be logged by the NMS printer.

B. The Port will supply a Master Clock in the form of a Dictalog Model 4515 Time Code Generator, which is manually reset once per day. The Contractor is responsible for interfacing, decoding and routing the Master Clock analog signals to the NMS.

2.04 Computer Peripherals

A. Computer I/O Peripherals to be supplied with the CPS include a keyboard-printer terminal and a data cassette tape unit, both located in the immediate vicinity of the CPS computer.

B. The printer shall be a quiet unit capable of operating at 30 characters per second, of printing not less than 64 USASCII characters, of printing approximately 80 characters per line, of allowing operator access to printed lines for manual printout annotation without excessive (greater than 10) line feeds, of automatically folding or spooling printed material, and of printing keyboard commands/instructions to the computer.

C. The keyboard should be physically coupled to the printer as a combined unit, and must be capable of generating a minimum of 64 USASCII printable characters plus all control codes required by the NMS.

D. The data cassette tape unit shall be capable of loading and dumping all NMS software and computer maintenance programs onto digital magnetic tape cassettes at a minimum transfer rate of 1200 bits per second. Also, while the NMS is operating with the printer off-line, recording of selected NMS derived single event, and cumulative noise output data onto cassette tape shall be possible. A maximum density, continuous record, tape format shall be used. End-of-Tape, Beginning-of-Tape, Cassette-in-Place, and Write Tab Sensors shall be provided with the cassette unit.

E. EIA standard RS-232C connectors and interconnection cables shall be provided between the computer and the peripheral I/O terminals. Data communication equipment (modems) for these peripherals are not required for the current Sea-Tac installation. However, a description will be provided of the compatibility of the proposed I/O devices with commercially available, two-wire, data communications equipment.

2.05 RMS Interfaces

RMS to computer interfaces shall be supplied to input demodulated NL data from each RMS to the NMS computer, to drive the NL indicators on the MAP/METER/LAMP Display, to detect RMS data transmission errors, and to send encoded commands originating from the computer to selected RMSs. These interfaces shall be designed and installed to be fully campatible and error free when used in conjunction with I/O Bus arrangements of the NMS computer selected by the Contractor.

2.06 Expandability

The system shall have an expansion capability to handle up to 15 RMSs. The NMS shall be delivered with expansion provisions such that seven (7) additional RMSs may be added without wiring changes or additions, and at most, by inserting electronic modules in prewired, spare card slots.

2.07 Audio Selector and Stereo Monitoring Amplifiers/Speakers

A two-channel audio monitoring system shall be provided to selectably monitor RMS audio and FAA tower audio by rotary or push-button switch selection. In addition, auxiliary input provisions shall be supplied to continuously monitor two circuits which are accessible at the Monitor Jack Panel of paragraph 2.01 via patch cord. The two-channel amplifiers shall be solid state, fused, and be capable of delivering 5 watts into 8 ohms over a frequency range of 100 to 5000 Hz at less than 1% total harmonic distortion and less than 1% intermodulation distortion, and have an adjustable gain control. The loudspeaker shall be matched to the amplifier, be capable of operating at a continuous input power of 5 watts, and be at least 8 inches in diameter. The installed loudspeaker shall have a smooth frequency response from 200 to 5000 Hz.

2.08 RMS-to-CPS Voice Communications System

A single channel facility shall be provided at the CPS to allow for two-way voice communication between the CPS and a selected RMS via the RMS NL audio circuit supplied by the Port (see Section 16910). From the CPS, it shall be possible to call the selected RMS, and a

two-way audio alert system (e.g., a buzzer) shall be provided at each end. A telephone communications handset shall be provided for connection to a receptacle at the CPS.

2.09 Two-Channel, Graphic Level Recorder

A two-channel graphic level recorder shall be provided for printing strip chart records of Noise Level (dBA) vs. Time and Line Level (dBm) vs. Time. Selector switches or a patch cord arrangement must be provided to record any pair of all NL data or line levels which are routed through the Monitor Jack Panel (see para. 2.01). Recording of Noise Level data over a minimum range of 45 to 125 dBA shall be possible without operator gain switching. Recordings of Line Levels over a minimum range of -40 to +10 dBm shall be possible without operator gain switching. Internal graphic level calibration signals shall be provided. A nominal paper speed of approximately 6 inches per minute is required. Lined paper with 1 dB amplitude resolution and 1 second time resolution is required. Pen response shall equal or exceed the SLOW response characteristic of the RMSs (see Section 16910). Writing method shall be by multi-color, felt-tipped pens.

2.10 RMS Data, Wind, and Date-Time Display

A. A multi-function display shall be provided to display the following data inputs to the NMS upon request by the NMS operator.

1. RMS Number and Noise Level (dBA).

2. Wind Direction (Magnetic Compass) and Speed (MPH).

3. Current Date in Month:Day:Year.

4. Current Time in Hour:Minute:Second.

B. A written description and diagram (or photograph) of the proposed display method shall be submitted.

2.11 VHF Receiver and Interfaces

A. A VHF, AM receiver and required interfaces shall be provided to route FAA Tower (Local Control) conversations to two channels of an existing Dictaphone 4000 tape recorder system. A roof-top VHF antenna and r.f. cable drop to the Central Control Facility currently exist and are in use by a VHF scanning receiver. The contractor will use a 50 ohm r.f. splitter, and 50 ohm cable run to gain access to and match this r.f. drop.

B. The VHF receiver supplied shall be crystal controlled, receive the

Sea-Tac Local Control frequency of 119.9 MHz, and meet the following performance specifications:

1. Frequency Stability: ± 0.002% from -30°C to +60°C.
2. Usable Sensitivity: 0.75 uv for 12 dB SINAD with 30% modulation at 1 KHz.
3. Selectivity: Not more than 40 KHz bandwidth at -80 dB; not less than 30 KHz bandwidth at -6 dB.
4. Antenna Input Impedance: 50 ohms
5. Spurious and Image Rejection: 80 dB.
6. Noise Squelch Range: 0.30 to 15 uv.
7. Volume and Squelch Controls: Variable volume control electrically disabled and substituted with a fixed gain network. Variable squelch control physically shielded from public access.

C. Associated cabling and connections shall be provided between the VHF receiver and the existing Dictaphone 4000 Recorder System, which consists of two reel-to-reel, 1/2 inch tape decks operating at 15/32 inches per second. The Port shall provide two record channels and assocatied AGC record electronics. Access and connection of the VHF receiver audio to the two channels of the recorder system shall be the responsibility of the Contractor.

2.12 EXCEED Event Alterting System

A. An audible and visual alarm shall be provided to alert the NMS operator whenever an aircraft noise event is detected at an RMS and exceeds the SEL Limit threshold. The visual alarm shall be located on the MAP/METER/LAMP Display. The audible alarm shall be located at the NMS Operator console and shall be screwdriver adjustable from 40 to 70 dB SPL re. 0.0002 ubar at 5 feet distance. A 3-position switch shall be provided to manually deactivate, enable or energize the audible alarm. Both the audible and visual alarms will be energized for 5 seconds following the detection of an EXCEED event.

B. In addition to the above alarms, a 2 KHz tone burst of 100 milliseconds duration will be recorded on the FAA Tower (Local Control) audio tracks (2) of the Dictaphone 4000 System. The Contractor will supply the electronics necessary to sum this tone burst signal onto the Tower audio tracks following the detection of an EXCEED event. Tone burst record level adjustment from 0.10 to 1.0 volt peak shall be provided.

POS 22776

2.13 Other Interfaces to the NMS

A. The Port will make available, traffic pattern switch and wind sensor signal terminals for connection, transmission, and interfacing to the NMS by the Contractor.

B. Three traffic pattern switch signal contact terminals shall be utilized and connected to the NMS interfaces. Signal source characteristics are as follows:

- For north flow (RWYS 34 in use), terminal N goes high (+48 volts dc), and terminal S is floated. Terminal G is connected to the neutral side of the +48 volt supply.

- For south flow (RWYS 16 in use), terminal N is floated and terminal S goes high (+48 volts dc). Terminal G remains connected to neutral.

100 ma of source current is available at terminals N and S.

C. At the FAA equipment rack, the Contractor shall utilize a pair of optical isolator (coupler) interfaces between the source terminals N, S, and G and the signal transmission wire pairs to the CPS. Input current limiting of 100 ma shall be provided with fixed resistors connected to the N and S terminals. Isolation voltage rating of the couplers shall be no less than 200 volts dc. Both North and South flow signals shall be routed to the CPS via the signal cables installed by the Contractor (See Section 16920, Communications Channels) , or optionally, by telephone line.

D. At the CPS, the Contractor shall utilize the redundant switch information provided by the two optical isolators to detect possible faults or malfunctions in the traffic pattern interfaces or cable runs. Detector and logic circuitry shall be provided to input the received traffic pattern signals to the NMS computer.

E. Wind sensor speed and direction signals shall be obtained from existing F420 Series Wind Equipment located at the NOAA equipment rack, and maintained by NOAA. Wind speed information is available as an analog dc voltage appearing between two "indicator" terminals and derived from a rotating wiper contact and potentiometer. Wind direction information is available as differential dc servo voltages appearing between three terminals and derived from two rotating wiper contacts (180 degrees apart) and a 3-tap potentiometer.

F. In the NOAA equipment rack the Contractor shall provide high input impedance (20K ohm or greater), dc operational amplifiers to sense and buffer the wind speed and direction voltages prior to transmission to the CPS.

Amplifier input offset voltage shall not exceed 1.0 millivolt dc and 1% voltage conversion accuracy shall be maintained. Calibration adjustments for wind speed and direction shall be provided. All wind sensor signals shall be routed to the CPS via the communication wires installed by the Contractor (See Section 16920, Communications Channels).

G. At the CPS, the Contractor shall input the wind sensor information to the NMS computer utilizing analog-to-digital converters, and logic and control gate circuitry. Conversion accuracy of $\pm$ 5 degrees for wind direction and $\pm$ 0.50 miles per hour for speed shall be maintained by the interface circuitry.

2.14 MAP/METER/LAMP Display

A. A NMS display shall be provided for mounting in the Central Control Facility at Sea-Tac. The Port will supply a 4 FT wide x 8 FT long aerial photomap of the airport and surrounding communities where RMSs are to be located. This photomap will be used by the Contractor as a background for the NMS display devices. The Contractor is responsibile for supplying an operational NMS Display system, including mounting structure and hardware, associated wiring and electronics for an 8 RMS system, and pre-wired expansion capability to 15 RMSs. The display construction shall be aesthetically pleasing, reflect first-class workmanship, and shall be approved by the Port prior to fabrication. The display format shall be as shown in Figure 3.

B. The following functional display items shall be incorporated in the NMS Display:

1. Lights: 1 dual color lamp per RMS and positioned at the 8 RMS locations on the photomap.

2. Light Modes: Green - Normal RMS status.

Red - RMS off-line (inoperative)

Flash Green - Possible Aircraft single event detected at RMS location.

Flash Red - EXCEED Event detected at RMS location. This mode shall coincide with the audible EXCEED Event Alarm.

3. Meters: 50 to 120 dBA range, backlit with adjustable intensity control; 2 updates/second; ANSI SLOW response; 1 dBA resolution; ± 2 dBA accuracy; located in immediate vicinity of RMS location on photomap; spatially keyed to RMS locations.

4. North-South Traffic Pattern Indicator Lamps (amber).

5. Digital Readout: 1½" minimum height; 1 per RMS; 3 amber colored digits per readout; one update per second; 45 to 125 dBA range; mounted above meters (see Figure 3), and readable from 20 ft. distance.

2.15 Consumables and Miscellaneous Components

All NMS consumables such as printer terminal paper and ribbon, graphic level recorder paper and pens, or data cassette tapes and miscellaneous components such as patch cords or keys necessary to operate and test the NMS to the Final Acceptance date shall be supplied by the Contractor. Dictaphone 4000 tapes shall be supplied by the Port. The Contractor shall provide an additional 6 months supply of consumables (printer and graphic level recorder paper) necessary to continue NMS operation after Final Acceptance. The Contractor shall reimburse the Port for items procured by the Port due to nondelivery by the Contractor.

2.16 Optional Bid Items for Omitting Wind Sensor and Using TELCO Line for Traffic Flow Signal

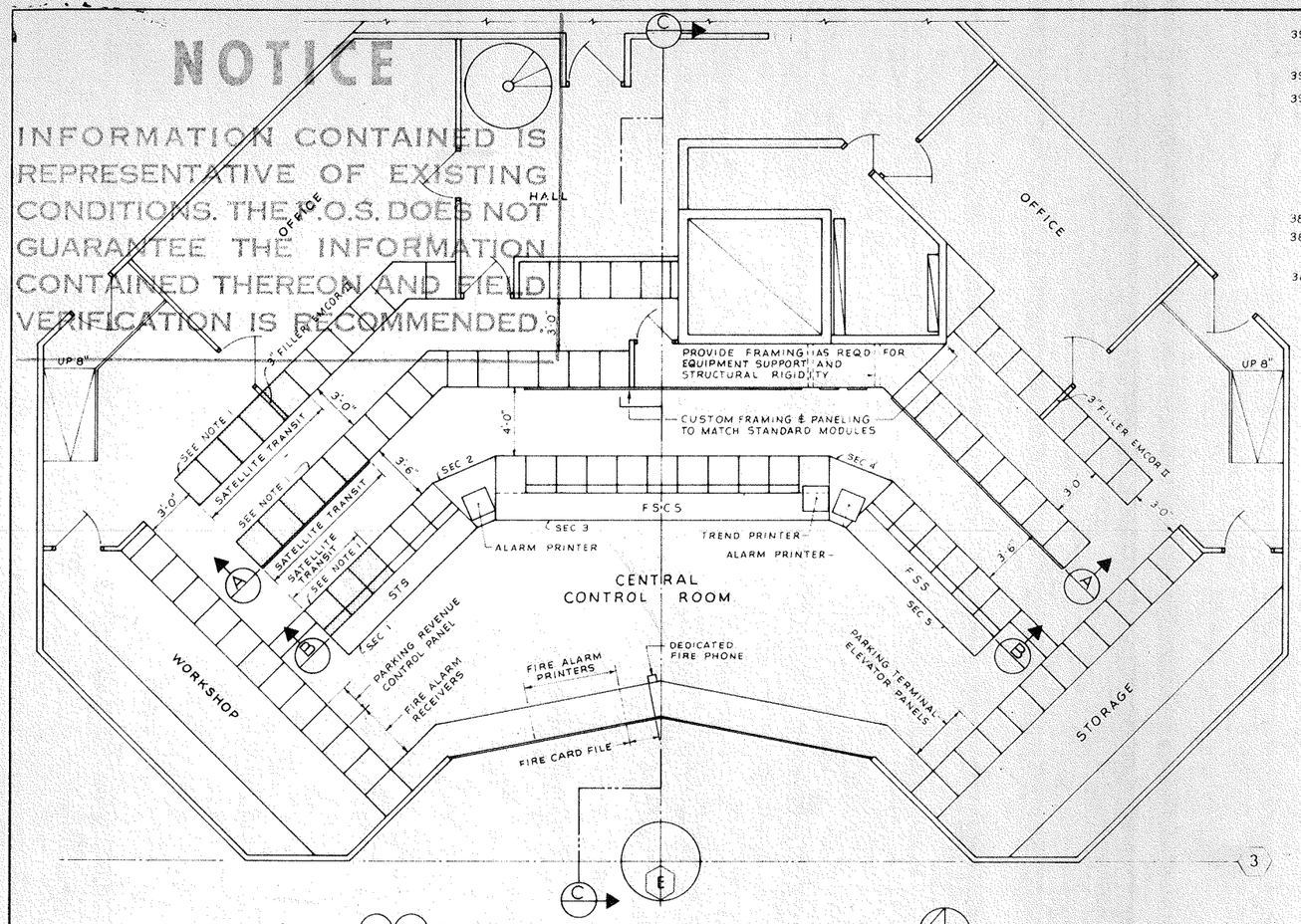
As an optional bid item, a quote shall be provided for the reduction of the contract bid price amount if the wind sensor interface hardware and software (see Section]6940) items are omitted entirely from these specifications, and the traffic pattern switch signals are routed via a two-wire, simplex, Type 3002-Basic telephone line. Interface requirements for the pattern switch signals remain unchanged, except for the addition of modulation/demodulation hardware for transmission of the pattern switch signals via the telephone line to the CPS. If this option is selected, the Contractor shall also route the received and undemodulated traffic pattern switch signals thru the Monitor Jack Panel.

PART 3 - EXECUTION

3.01 Physical Layout

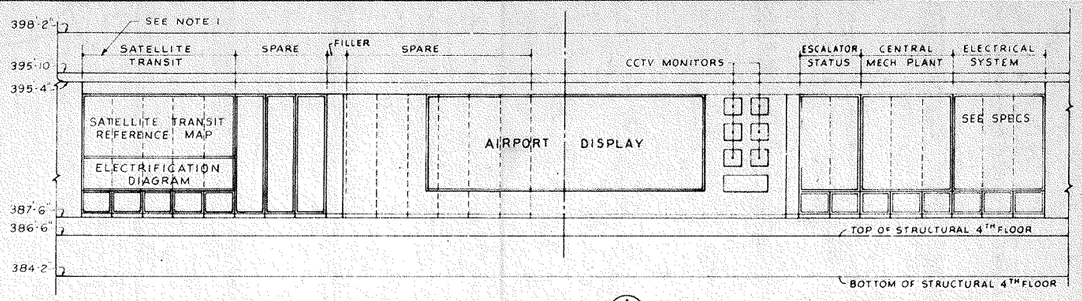
A. The Central Processing System of the NMS shall be installed by the Contractor in the Sea-Tac Central Control Facility. A floor plan, equipment rack, and operator console details are shown in Drawing No. CC-43, STIA-7038-E-44, dated September 14, 1970. (See Fig. 4.) The Port will make available the following facilities:

POS 22779



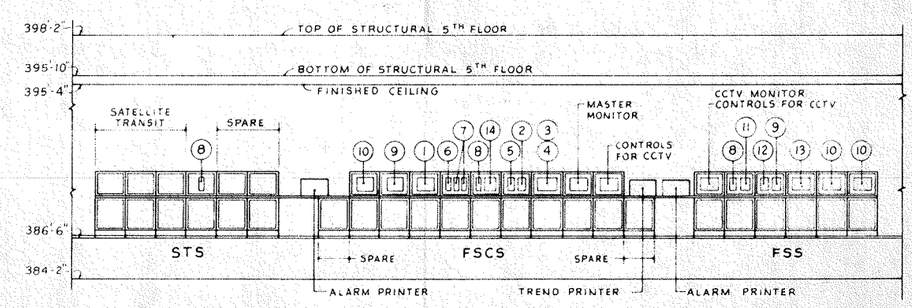
(LL)(R) PLAN OF CONTROL ROOM - 4TH FLOOR (N)

1/4" = 1'-0"



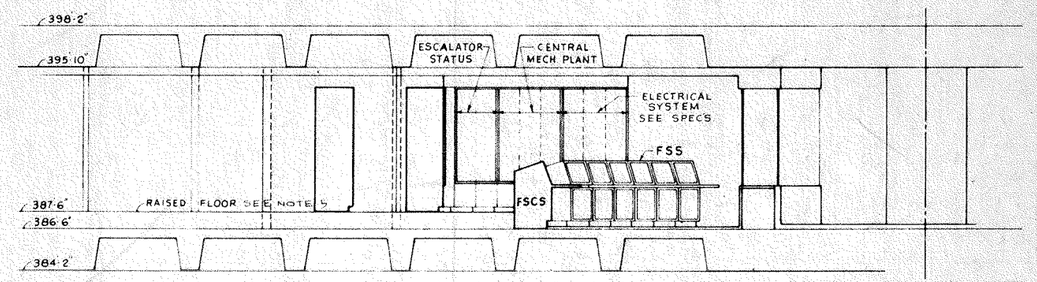
SECTION (A)

1/4" = 1'-0"



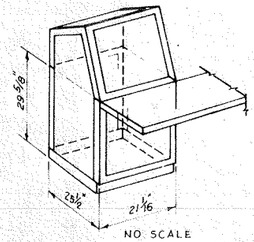
SECTION (B)

1/4" = 1'-0"



SECTION (C)

1/4" = 1'-0"



NO SCALE

20° TURRET
STANDARD
COLOR, BLACK, EMCOR EN2BK
EMCOR II NO AFRT-X2X-251419

20° TURRET BACK PANEL
STANDARD
COLOR, BLUE, EMCOR EN2BU
EMCOR II NO APNS-XXX-000519

MAIN RACK
NO LIFTING DEVICES
STANDARD BASE
COLOR, BLACK, EMCOR EN2BK
EMCOR II NO AFRV-XXX-252419

TOP & BACK PANELS
STANDARD
SOLID, FLUSH,
COLOR, BLUE, EMCOR EN2BU
EMCOR II NO APNS-XXX-SIZE TO FIT

FRONT DOOR
STANDARD
SOLID, FLUSH,
RIGHT HAND HINGE
COLOR, BLUE, EMCOR EN2BU
EMCOR II NO. ADOR-FKX-002219

WRITING TABLE
5 PIECE, 4 JOINTS, 18½" DEEP (BASIC)
± LENGTH FOR SEC 1 & SEC 5
SPECIAL FOR SEC 2,3 & 4
COLOR, FORMICA NO 953

20° TURRET FRONT PANEL
BLACK ANODIZED SEE NOTE 2

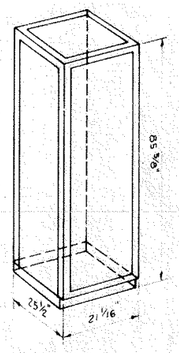
FRONT PANEL: SAME AS STATIC DISPLAY PANELS - SEE NOTE 4 THIS SHEET

RIGHT SIDE
COLOR, BLACK, EMCOR EN2BK
EMCOR II NO ASPR-DIX-241420

LEFT SIDE
COLOR, BLACK, EMCOR EN2BK
EMCOR II NO ASPL-DIX-251420

PONTOON BASE
STANDARD 25"x19"
COLOR, BLACK, EMCOR EN2BK
EMCOR II NO APBS-XXX-250019
OR EMCOR II NO APBM-705211-00
AS APPLICABLE

TYPICAL DETAILS
DISPATCHERS CONSOL
SEE NOTE A



NO SCALE

MAIN RACK
STANDARD 25"x80"x19"
NO LIFTING DEVICES
STANDARD BASE
COLOR, BLACK, EMCOR EN2BK
EMCOR II NO AFRV-XXX-258019

TOP PANEL
STANDARD 22"x19"
FLUSH TYPE
COLOR, BLACK, EMCOR EN2BK
EMCOR II NO APNS-XX2-002219

FRONT DOOR & BACK DOOR
SOLID DOOR 80"x19"
FLUSH TYPE, KEY LOCK
RIGHT HAND HINGE
COLOR, BLUE, EMCOR EN2BU
EMCOR II NO ADOR-FKX-008019

SIDE PANELS
STANDARD 25"x80"
SOLID
FLUSH TYPE
COLOR, BLACK, EMCOR EN2BK
EMCOR II NO ASPX-FIX-258000

COMP DOORS
STANDARD
SOLID
KEY LOCK
COLOR, BLUE, EMCOR EN2BU
EMCOR II NO ADOR-FKX-006319

PONTOON BASE
STANDARD 25"x9"
COLOR, BLACK, EMCOR EN2BK
EMCOR II NO APBS-XXX-250019

VENT GRILL
ANODIZED ALUMINUM
EMCOR II NO AVGX-XXX-000819

MOUNTING ANGLE
COLOR, BLACK, EMCOR EN2BK
EMCOR II NO AMAX-DXX-008000

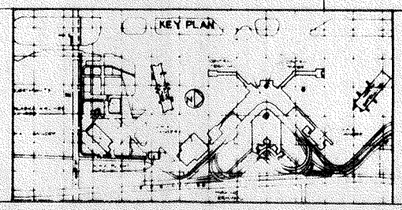
DOORS, UNDER DISPLAY PANELS
SOLID, FLUSH, KEY LOCK
COLOR, BLUE, EMCOR EN2BU
EMCOR II ADOR-FXX-SIZE TO FIT

TYPICAL DETAIL
BACK PANEL & BASE UNITS
SEE NOTE 4

NOTE A

CABINETRY CALLOUTS ARE GIVEN FOR **EMCOR II UNITS**
CONTRACTOR MAY SUBSTITUTE UNITS OF COMPARABLE QUALITY AND OF SAME DIMENSIONS

ARTHUR B SIRJORD — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER



LEGEND

1. SLAVE FIRE PRINTER & SELECTOR SWITCHES
2. SECURITY ALARM & CONTROLS
3. ELEVATOR INTERCOM & PARKING TERMINAL-ELEVATOR POSITION INDICATOR & CONTROLS
4. SECURITY AUDIO MONITORING
5. PUBLIC ADDRESS INTERFACE
6. FIRE PHONE - DEDICATED TO FIRE STATION
7. EMERGENCY PHONES (a) PARKING TERMINAL (b) OTHERS
8. COMMERCIAL PHONES (CALL DIRECTOR AND INDICATOR
3. RADIO, 2 STATIONS (KQV, KAA, PAGE BOY ENCODER), TURRET MOUNTED MICROPHONE
10. PROJECTOR AND INDICATORS
11. PRINTER CONTROLS
12. MAINTENANCE INTERCOM
13. SLIDE SELECTION, REMOTE START-STOP, REMOTE RESET ALARM LIMIT RESET, POINT SELECTION AND READOUT
14. AUDIO TAPE RECORDER CONTROLS

NOTES

1. SAT TRANSIT FURNISHED UNDER ANOTHER CONTRACT
2. LETTERING TO BE HELVETICA REGULAR STYLE (FOR DISPLAY PANELS)
   ALL LARGE LETTERING TO BE 120 POINT
   ALL SMALL LETTERING TO BE 60 POINT
   ALL LETTERING TO BE WHITE ALL COLOR TO BE 20° GLOSS ± 4° TOLERANCE. PANEL BORDER TO BE PARALLEL AND SQUARE OVERALL PANEL DIMENSIONS TO BE ± 0.03 TOLERANCE
3. FINAL EXACT LOCATION OF CABINETRY SHALL BE ESTABLISHED BY A SUBSEQUENT CONTRACT (TO BUILD THE ROOM)
4. STATIC DISPLAY PANELS SHALL BE CONSTRUCTED WITH BLACK ANODIZED ALUMINUM (6 BES GAGE, WITH A 1" BRUSHED FINISH ALUMINUM (EXTRUDED) FRAME. SPECIAL PANEL CONSTRUCTION TO PROVIDE FLEXIBILITY (ELECTRICAL DISTRIBUTION SYSTEM) IS DESCRIBED IN THE SPECIFICATIONS, DIVISION II, SECTION 6, ARTICLE 5.
5. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING OF ALL FLOOR PENETRATIONS (RAISED FLR. SYSTEM), FOR CABLING CONNECTIONS TO CABINET MOUNTED ELECTRICAL & ELECTRONIC COMPONENTS.

THE RICHARDSON ASSOCIATES
ARCHITECTS • ENGINEERS • PLANNERS
ALLEN D. MOSES AIA • PROJECT ARCHITECT
CENTRAL BUILDING • SEATTLE WASHINGTON 98104

11017 REGISTERED ARCHITECT — The Richardson Associates — STATE OF WASHINGTON

REVISIONS

NO	DESCRIPTION	DATE	BY	APP'D

PORT OF SEATTLE

SEATTLE-TACOMA INTERNATIONAL AIRPORT
ENTRAL CONTROL FACILITY
MONITORING AND CONTROL SYSTEM
CENTRAL CONTROL ROOM

APPROVED: DENNIS E DAHLGARD, CHIEF ENGINEER
DESIGN NO D-70112
DRAWN BY:
DATE SEPT 14 1970
CHECKED BY A B SIRJORD
SCALE AS SHOWN
DWG NO **CC-43**

POS 22780

Fig. 4

Division 16 (32) STIA-7038-E-44

1. Two (2) empty Electrical System Equipment racks, with front and rear access, as shown in Section A of the referenced drawing. The third rack space will be reserved for telephone company termination equipment. The contractor shall submit his proposed mounting configuration for approval by the Port.

2. Display surface on the Central Mechanical Plant equipment racks, as shown in Section A of the referenced drawing, for mounting of the NMS MAP/METER/LAMP Display.

3. Approximately 10 to 20 percent of existing FSS Console space as shown in Section B of the referenced drawing. The console architecture may be altered to accommodate system components upon prior approval of the Port. The contractor shall submit his proposed layout of the console installation for approval by the Port.

4. Access to the raised floor system for cable routing.

5. Access to the Dictaphone 4000 Recording System, Master Clock, and VHF antenna drop during installation.

6. Commercial A.C. power as necessary in the immediate vicinity of the equipment racks and FSS Console.

B. The Dictaphone 4000 Recorder and the Master Time Clock are located in an equipment rack next to the Parking Terminal Elevator Panels shown in the Floor Plan of the referenced drawing. The VHF antenna drop is located in the center of the FSCS Console as shown in the floor plan. All other Port supplied terminations will be located in the Electrical System rack space.

3.02 Installation

A. The following CPS equipment shall be located and installed in the FSS Console space supplied by the Port:

1. Computer I/O Keyboard

2. Computer I/O Printer

3. Audio Selector Switches and Stereo Speakers

4. RMS-to-CPS Voice Communications System and Controls

5. RMS Data, Wind and Date-Time Display

6. Audible EXCEED Event Alarm.

B. All finishes of the CPS equipment installed will not conflict with the existing interior design of the Central Control Facility and

the desires of the Port. The raised floor system will be used for all cable routing, and compliance with the 1975 National Electric Code shall be met. Working drawings of the CPS installation shall be submitted by the Contractor for approval by the Port no later than 30 days after Notice-to-Proceed.

C. Installation of traffic pattern switch and wind sensor interfaces shall be coordinated and approved by the Engineer. The Port shall obtain all adminstrative approvals for final connection and installation of the interfaces by the Contractor. Submittals of working schematic diagrams of the proposed interfaces and installation details shall be submitted to the Engineer for approval eight (8) weeks following Notice-to-Proceed.

3.03 Hardware Component Documentation

Vendor data sheets on all off-the-shelf, hardware components proposed to be utilized in the CPS shall be provided. These include, but are not limited to, the computer, I/O peripherals, graphic level recorder, VHF receiver, modems, power supplies, and amplifiers/speakers. The Port reserves the right to request additional documentation as required during its bid evaluation process.

3.04 Calibration, Final Adjustments

All calibration and final mechanical adjustments of the integrated CPS shall be made by the Contractor prior to conducting On-Site Acceptance Tests. The Engineer or his authorized representative will inspect and test all CPS hardware work items while the Contractor is present in the Central Control Facility. Changes in NMS configuration or adjustments during the On-Site Acceptance Tests, which the Engineer determines cause negation of prior On-Site Acceptance test results, shall warrant retesting of CPS hardware components. Changes in NMS configuration or adjustment deemed necessary by the Engineer during the On-Site Acceptance tests for compliance with the specifications shall be made by the Contractor.

3.05 On-Site Acceptance Tests

On-Site Acceptance tests shall be conducted in accordance with Section 01700.

3.06 30-Day Operational Demonstration

Following On-Site Acceptance of the NMS by the Port, the Contractor shall demonstrate successful CPS hardware operation and performance

for a continuous 30-day period without CPS alternations or substitutions. Hardware failures or performance degradations which occur during this 30-day period shall be immediately corrected by the Contractor upon notification by the Engineer. The Port reserves the right to extend the 30-Day Operational Demonstration Period to account for CPS component down-time, or to test the entire NMS for a continuous 30-day period.

* * * * *

DIVISION 16 - ELECTRICAL
Section 16940 - Central Processing System - Software

PART 1 - GENERAL

1.01 General Requirements

The CPS software, resident in the NMS computer, shall be provided such that all NMS control, data processing, input/output, and storage requirements specified herein are met by the delivered NMS. The software shall consist of a real time operating system, application programs for data acquisition and processing, parameter tables, keyboard command response routines, report message output (line printer) routines, on-line DEBUG routines, cassette tape LOAD/DUMP routines, and miscellaneous housekeeping, diagnostic, and fail-safe routines. The software delivered shall be operable, fail-safe, modular, and completely documented. Use of proprietary software programs is acceptable if the documentation requirements of this specification are met. (See para. 2.25, Section 16940.)

PART 2 - PRODUCTS

2.01 Cumulative Noise Data Output Requirements

The software shall control operation of the CPS such that Noise Level data from each RMS is sampled at least twice per second to output the following cumulative noise descriptors

1. HNL (Total Hourly Noise Level)
2. HNLA (Hourly Noise Level associated with Sea-Tac Aircraft Operations)
3. HNLC (Hourly Noise Level not associated with Sea-Tac Aircraft Operations)
4. LDN (Total Day-Night Sound Level)
5. LDNA (Day-Night Sound Level associated with Sea-Tac Aircraft Operations)
6. LDNC (Day-Night Sound Level not associated with Sea-Tac Aircraft Operations)
7. Daily LEQ (Total Equivalent Noise Level)
8. Daily LEQA (Equivalent Noise Level associated with Sea-Tac Aircraft Operations)
9. Daily TXX (Total Time, in Minutes, NL data exceeded XX dBA, for XX equal to 65, 75 and 85 dBA).

POS 22784

2.02 Single Event Data Output Requirements

For each Single Event, which the NMS determines is associated with Sea-Tac aircraft operations, an output of the following Single Event noise descriptors shall be provided:

1. MNL (Maximum or peak Noise Level), dBA
2. SEL (See Section 16900, para. 1.06. A.5), dBA
3. Time of Day (HOUR:MINUTE:SECOND) when MNL occurred (SEL Time)
4. RMS Identification Number
5. SEL Threshold Setting (See para. 2.03.1), dBA
6. Single Event Noise Limit for EXCEED Events (See para. 2.07), dBA
7. Single Event Duration above SEL Threshold, Seconds
8. "EXCEED" or "NON-EXCEED" Event Descriptor
9. Traffic Pattern (160 or 340)
10. Aircraft Operation (Approach or Departure)
11. Wind Direction and Speed during the event (may be deleted by Port option).

2.03 Discrimation Between Sea-Tac Aircraft Noise (AIRCRAFT) and Other Noises (COMMUNITY)

The NMS shall have resident software routines for separating Noise Levels associated with Sea-Tac aircraft (aircraft) from those not associated with Sea-Tac aircraft operations (community). The Port shall provide access to a traffic pattern signal input to the NMS to assist the NMS in this discrimination process. Also, the Port shall provide site facilities for two Trigger RMSs, one located approximately 3000 ft. north of 16L threshold and one located 2000 ft. south of 34R threshold for Sea-Tac aircraft correlation purposes. Minimum discrimination software routines provided by the Contractor are as follows:

1. Noise Level and Duration Above SEL Threshold Test

   At all RMSs, Noise Level versus time histories, whose Noise Level values exceed a SEL Threshold value continuously for a

POS 22785

given range of time durations, shall be screened by the NMS as possibly related to aircraft noise. Those which do not meet the above Noise Level and duration test shall be labeled as community noise. SEL Threshold values shall be controllable by the NMS operator via keyboard command entry over a range of 50 to 85 dBA in 1 dBA increments for each RMS. Maximum and minimum time durations above SEL Threshold for possible aircraft events shall be maintained by the software in a RMS paramenter table. Durations shall be adjustable in one second increments over a range of one to 200 seconds.

2. Trigger RMS NL Testing

In addition to the NL-Duration Test of para. 1. above, NL data from the two Trigger RMSs at the runway ends shall be subjected to the following MNL test for final determination of aircraft versus community noise. Those single events whose Maximum Noise Level exceed a selectable MNL Threshold value shall be screened by the NMS as definitely related to aircraft noise. Those which do not meet the above MNL test shall be labeled as community noise. MNL Thresholds shall be maintained in the RMS parameter table, and shall be adjustable in 1 dBA increments over a range of 70 to 110 dBA.

3. Time Gate Test With Traffic Pattern Input

The single events of all non-Trigger RMSs shall be capable of being Time Gate Tested against two other reference aircraft events (one for north and one for south traffic pattern), which may occur within the NMSs single event logging process. For all RMSs other than the two Trigger RMSs, the two reference aircraft events will normally be those which occur at the nearest Trigger RMS for northern and southern traffic flow (pattern). Traffic pattern information will normally be derived from traffic flow signals, which originate from the FAA Tower spaces and, under special conditions, be manually entered by the NMS operator.

For each traffic pattern and for each non-Trigger RMS, RMS Time Gate Test parameter tables shall be provided which specify the reference Trigger RMS number, algebraic time difference (delay or lead) between the Trigger RMS's SEL Time, and the acceptable tolerance (time bin) of the SEL Time difference. Time gate test parameters shall be adjustable in one second increments over an absolute range of 0 to 400 seconds. Based upon this pair of Time Gate Test parameters for a non-Trigger RMS, the following Time Gate Test shall be applied to single events which are determined to be possible aircraft events by the Noise Level-Duration Test of para. 1.

POS 22786

a. Possible aircraft SEL events at RMSs upwind of an aircraft departure event logged at a Trigger RMS shall be determined to be aircraft event if the SEL Event Time at the upwind RMS follows the Trigger RMS Event Time by an amount within the limits specified by the Time Gate Test parameter table.

b. Possible aircraft SEL events at RMSs downwind of an aircraft arrival event logged at a Trigger RMS shall be determined to be aircraft events if the SEL Event Time at the downwind RMS preceeds the Trigger RMS Event Time by an amount within the limits specified by the Time Gate Test parameter table.

c. For sideline RMSs, the upwind Trigger RMS shall be the reference, and the downwind or upwind RMS test (para. 3a and b)shall be usable.

d. Possible aircraft SEL events at non-Trigger RMSs which do not meet one of the above three Time Gate Tests shall be classified and accumulated by the NMS as being related to community noise events (see 2.05 following).

4. RMS Self-Track Without Time Gate

At all non-Trigger RMSs, software provision shall be supplied for individually bypassing the Time-Gate Test of para. 3. above at the discretion of the Operator. This feature, designated Self-Track, shall be made available at all non-Trigger RMSs for northern and southern traffic flows. Whenever the Self-Track feature is exercised at a given RMS, a SEL Event, which is initially classified as a possible aircraft event by the Noise Level and Duration Test of para. 1., shall be automatically labeled as an aircraft event by the NMS. Note that the two Trigger RMSs are to be configured with a Self-Track feature plus the MNL Test feature.

2.04 Aircraft and Community Noise Data Outputs

HNLA, LDNA, LEQA, and all Single Event NMS outputs shall be solely derived from NL data which successfully meet the applicable aircraft noise criteria set for the individual RMSs. Those that do not meet the applicable screening criteria, including NL data which do not exceed the fixed HNL thresholds (an option), shall be accumulated in the HNLC and LDNC descriptors. The cumulative total of aircraft and community noise shall be summed as follows:

POS 22787

1. $HNL = 10 \log \left[10^{\frac{HNLA}{10}} + 10^{\frac{HNLC}{10}}\right]$

2. $LDN = 10 \log \left[10^{\frac{LDNA}{10}} + 10^{\frac{LDNC}{10}}\right]$

3. $LEQ = 10 \log \left[\sum_{i=1}^{24} 10^{\frac{HNL_i}{10}}\right] - 10 \log 24$

4. $LEQA = 10 \log \left[\sum_{i=1}^{24} 10^{\frac{HNLA_i}{10}}\right] - 10 \log 24$

2.05 Hourly LEQ Optional Bid Item

As an optional bid item, the Contractor shall provide additional software capability to supply the following additional hourly data which are to be printed at the discretion of the NMS operator:

1. Hourly LEQs of all single events which meet the Noise Level-Duration Test requirements (para. 2.03.1) but do not meet the Time Gate Test requirements (para. 2.03.3). These Hourly LEQs only apply to non-Trigger RMSs which are not in Self-Track mode.

2. Hourly LEQs of all single events which meet the Noise Level-Duration Test requirements (para. 2.03.1) but do not meet the MNL Test requirements (para. 2.03.2). These Hourly LEQs only apply to the two Trigger RMSs.

2.06 Day-Night SEL Threshold Optional Bid Item

As an optional bid item, the Contractor shall provide additional software capability to automatically lower daytime (5:00 AM to 10:00 PM) SEL thresholds by 0 to 10 dBA at 10:00 PM for use during the nighttime (10:00 PM to 5:00 AM) hours, and to automatically raise SEL thresholds by identical step amounts to daytime levels at 5:00 AM. Additional step parameters must be added to RMS Parameters Tables, and these step parameters must be individually selectable in 1 dBA increments from 0 to 10 dBA for each RMS. All step changes would be made in reference to most current SEL threshold settings at each RMS.

2.07 EXCEED Event Logging and Alerting System

For both northern and southern traffic flows (patterns), Single Event Noise Limits shall be included in the NMS software. Single

Event Noise Limits shall be selectable by the Operator for each traffic pattern, and for each RMS, over a range of 70 to 120 dBA in 1 dBA increments. All single events which are determined by the NMS to be caused by aircraft as per para. 2.03, and whose computed SEL values are greater than the Single Event Noise Limited applicable to the detecting RMS, shall cause an EXCEED Event to be reported by the NMS. Immediately following the occurrence of an EXCEED Event, the following will occur under software control:

1. An audible alarm will be energized for 5 seconds.

2. A flashing Red visual alarm keyed to the detecting RMS will be energized for 5 seconds (same as Display Board).

3. A 2 KHz tone burst will be energized for 100 milliseconds (see Section 16930, 2.12 B).

4. The Single Event Output Data associated with the EXCEED Event at an RMS shall be logged on the line printer, as per para. 2.02.

5. If a Time Gate Test was performed, and the EXCEED Event successfully met the conditions of the test, SEL event data of the reference Trigger RMS used during the test shall also be printed as per para. 2.02.

2.08 Single Event Counting

A. All single events detected at the two Trigger RMSs and determined by the NMS to be related to aircraft noise by para. 2.03 shall be counted (tabulated) on an hourly and daily basis. These tabulations will be as follows:

1. Total Arrivals: XXX - RWYS 34; YYY - RWYS 16

2. Total Departures: WWW - RWYS 34; ZZZ - RWYS 16.

Departure and arrival determination by the NMS shall be based upon the Trigger RMS locations and the resident traffic pattern information. NMS discrimination of Left/Right Runway Usage is not required.

2.09 TXX Accumulations

A. For all RMSs, daily totals of times above threshold (TXX) shall be provided by the NMS. Fixed XX thresholds of 65, 75, and 85 dBA shall be established by the software. All Noise Level data

received from the RMSs shall be separately tested against these three thresholds and tabulated accordingly if they are greater than 65, 75 or 85 dBA.

2.10 Optional HNL Threshold - Controlled Accumulations

A. To eliminate excessive LDNC errors attributable to the RMS noise floor and the 10 dB nighttime penalty, HNL computations at each RMS shall be controlled by a fixed HNL Threshold Setting of approximately 45 to 55 dBA in 1 dBA steps. HNL accumulations of NL data which exceed this threshold setting shall be performed as shown in Section 16900, para. 1.06.A.7. If the HNL Threshold was not exceeded during a given hour, a correction factor of (10^4) x THNL x 60 shall be added to the HNL accumulator. Under these conditions, HNL shall be computed as follows:

$$HNL = 10 \log \left[\sum_{i=1}^{N} (t_{i+1} - t_i)\, 10^{\frac{LEQ_i}{10}} + (6 \times 10^5 \times THNL) \right] - 35.56$$

Daily LEQ and LDN values under this option shall be computed from corrected HNL values as described above for each RMS.

B. For all RMSs, hourly and daily totals of times at or below HNL Thresholds (THNL) shall be provided by the NMS. These thresholds shall be individually established and fixed by the Contractor upon determination of RMS electrical noise floor.

2.11 RMS Insert Calibration

A. Once per day, between 3:00 AM and 4:00 AM, the CPS shall command each RMS to transmit electrical calibration data (for 250 and 1000 Hz) rather than ambient Noise Level data (see Section 16910). Calibration shall not be attempted if possible aircraft single event is in progress, but shall be delayed until Noise Level data is below the SEL Threshold. Calibration data shall not be included in or processed to derive the data outputs of para. 2.01. A compact table of daily insert calibration results shall be printed.

B. Upon keyboard command from the NMS Operator, an Insert Calibration Command shall be sent to the selected RMS. A maximum of two successful insert calibration responses shall be required to obtain the 250 Hz and 1000 Hz results. As specified above, the calibration data will not interfere with single event data or be included in cumulative noise data outputs. A near real time insert calibration report will be printed following receipt of the calibration response by the CPS.

POS 22790

C. Calibration data outputs required for daily and manually activated insert calibration include:

1. Time-of-Day (HR:MIN:SEC) when calibration levels received

2. RMS Identification Number

3. Inject Calibration Tonal Frequency (Hz)

4. MNL (Maximum or peak level)

5. SEL based upon a 10-second duration of the inject calibration signal.

2.12 RMS Data Error Detection

A. The CPS shall perform the following minimum tests on each 1/2 second NL data word or binary encoded character received:

1. Bit parity check

2. Number of bits received per character or word frame.

Following detection of one or both types of errors by the CPS, the entire 1/2 second NL data word shall be rejected and not processed for cumulative or single event noise data outputs. In addition, total counts of word or character errors detected by the CPS shall be accumulated individually for each RMS on a daily basis. Access to these total counts via the DEBUG routine is required.

2.13 Master Time Clock Usage and Display

A. The valid Master Time Clock signals originating from Port supplied equipment shall be interfaced and sampled such that it is used as the sole time-of-day reference by the NMS. Internal computer clocks for high speed data transfer and information exhange need not be slaved to this Master Time Clock. However, all noise data outputs which have associated Event Times (HR:MIN:SEC) and NMS control functions required to be keyed to the time-of-day shall use the Master Time Clock as a reference. These include, but are not limited to EXCEED and NON-EXCEED Events, Hourly and Daily report generation, Power Failure/Restart Times, and RMS status changes.

B. In the event of receipt of invalid Master Clock Signals, the NMS shall automatically report such a failure and time of outage, and, within 10 seconds, revert to an internally-derived time-of-day clock whose timing stability is not worse than 1 part in 10^4.

Upon restoration of valid Master Clock Signals, the NMS shall automatically report the restoration and time of restoration, and utilize the Master Time Clock information as described previously.

C. Day and Year changes shall automatically be made by the CPS at 2400 hours. A day-month-year calendar to the year 1990 shall be resident in the software.

2.14 CPS Processing and Storage Accuracy

A. The following accuracies of the CPS data inputs shall be preserved and maintained by the CPS hardware used and program software until final transfer to output peripherals:

1. Noise levels: ± 0.5 dBA
2. SEL: ± 0.5 dB
3. HNL, HNLA, HNLC: ± 1.0 dB
4. LDN, LDNA, LDNC: ± 1.0 dB
5. LEQ, LEQA: ± 1.0 dB
6. TXX: ± 1.0 Sec.
7. THNL: ± 1.0 Sec. (Option)
8. Time-of-Day: ± 0.5 second or running Master Time Clock.
9. Data Error Counts: Accurate Count Required
10. Runway Usage Counts: Accurate Count Required
11. Wind Data: ± 1 degree; ± 0.5 miles per hour

2.15 Logging of Current Traffic Pattern and Changes

A. Immediately following a 180 degree change in Sea-Tac traffic pattern as derived from the Traffic Pattern Signal line, the Event Time and new traffic pattern shall be logged on the NMS printer terminal, displayed on the MAP/METER/LAMP Display (see Section 16930), and used in the Time Gate Test of para. 2.03.3.

B. A software override feature shall be provided to disregard the Traffic Pattern Signal Line under the discretion of the NMS operator. The NMS operator via keyboard command, shall have the capability of selecting either traffic pattern and manually overriding the traffic pattern signal or returning the NMS to non-override mode.

POS 22792

2.16 Control of MAP/METER/LAMP Display

All RMS status and Traffic Pattern lamps on the MAP/METER/LAMP Display shall be controlled by the CPS software (see Section 16930). Meter movements and digital dBA readout must be hardwired to RMS data demodulators and not controlled by program software. Off-line status of RMS shall be indicated by a steady Red of duration not less than 10 seconds per drop-out. An RMS shall be declared Off-line if the CPS detects 4 or more consecutive 1/2 second samples of NL data errors per para. 2.12. Restoration of RMS On-Line status shall be preceeded by not less than 20 consecutive 1/2 second samples of error-free NL data. Program halts, register overflows, or computer failures shall also result in Steady Red Off-Line indicators.

2.17 Control of RMS Data, Wind, and Date-Time Display

Under NMS Operator control, the software shall enable the multi-function display to readout the data inputs described in Section 16930. RMS data shall be updated every 1/2 second. All other input displays shall be updated at least once per second. Current Time (in HR:MIN:SEC) display shall be Master Time Clock derived if operating and internal CPS time during Master Time Clock outages. Current Date (Month:Day:Year) display shall be software derived.

2.18 NMS Report Outputs and Formats

Primary NMS output devices for hardcopy or permanent storage shall be a line printer terminal, with the data cassette tape unit used as a back-up device (see Section 16930). The majority of all output reports shall only involve the line printer. However, capability for storage of selected reports on cassette tape shall be provided. Printer output formats shall be provided for the Sea-Tac requirements specified below. All output formats used are subject to final approval by the Port.

2.19 Printer Outputs and Formats

A. Daily summaries of LDN, LDNA, LDNC, LEQ, LEQA, T65, T75, T85, THNL (option), Daily Insert Calibration for all RMSs, threshold settings (SEL and EXCEED Event) and RMS status for all RMSs, arrival/departure counts, hourly wind data, and a maximum of 50 EXCEED Events shall be provided in compact form between midnight and 0100 HRS. Printer output formats and symbols used shall be consistent with noise descriptor abreviations, paged, dated, expandable to 15 RMSs, and capable of being reproduced on 8-1/2" x 11" paper size. Use of abbreviated category codes requiring legend tables is discouraged.

POS 22793

B. Hourly summaries of HNL, HNLA, HNLC, THNL (option), and Data Error Counts for all RMSs, wind data, and arrival departure counts shall be provided with an NMS Operator controlled enable/disable flag feature. Each hourly summary,when requested, shall be printed within 5 minutes following the hour, be dated, and shall be consistent with daily summary abbreviations and noise descriptors used. Hourly summaries shall be suppressed when disabled by a single NMS Operator command, and printed when enabled by a single NMS Operator command no later than 15 minutes prior to the hour. The optional hourly LEQ output printout (see para. 2.05) shall also be provided if selected by the Port.

C. Dated EXCEED Events (and associated Trigger RMS events) shall be printed in near real time, and shall include all single event output requirements of para. 2.02. Printer format of one line per event is required with column headings repeated only as necessary. Excessive line feeds between events should be avoided to conserve paper.

D. Dated traffic pattern changes and times shall also be logged on the printer (see para. 2.15) as well as power, Master Time Clock, Traffic Pattern, and Wind Data failures, re-starts and event times.

E. NON-EXCEED Events, single RMS Status Reports, single RMS Manual Calibration Results, and single RMS Status Change Reports shall only be printed as requested by the NMS Operator. Para 2.02 applies to all NON-EXCEED Event outputs. Para 2.11 output requirements apply to all manual calibration results. RMS Status Reports shall include: Time-of-Day (HR:MIN:SEC) RMS Identifier; ON-Line or OFF-Line; SEL Threshold; EXCEED Event Limit for Approaches, and EXCEED Event Limit for Departures. RMS Status Change Reports shall be printed following all RMS status change instructions of the NMS Operator. Previous requirements for printout clarity , compactness and dates also apply to these report.

2.20 Cassette Data Storage

In the event of NMS printer failure or OFF-Line status, all NMS printed data outputs required under paragraph 2.19 shall be automatically recorded on the data cassette tapes. Continuous (rather than line) tape format shall be used. Following and during normal printer operation, the cassette tape unit shall be automatically restored to standby-mode. Printer unit failures shall be logged on cassette tape and cassette unit failures logged on NMS printer as they occur.

POS 22794

Cassette tape playback onto the NMS printer at the option of the NMS operator is also required.

2.21 NMS Operator Input Commands and Software Control

A. Via keyboard entry, the following command functions shall be provided for use by the NMS Operator:

1. Input correct date or time of day
2. Set selected RMS On or Off-Line
3. Request RMS status
4. Request RMS calibration
5. Request/suppress NON-EXCEED event outputs
6. Request/suppress Hourly Summary Printouts
7. Select RMS Data, Wind Data, or Date-Time Display
8. Select data cassette tape playback onto printer
9. Use operator selected traffic pattern
10. Use traffic pattern signals as data input.

All of the above command functions shall be fail-safe and not cause system failure in the event of operator entry errors. All commands shall be entered via the NMS keyboard and printed after computer acceptance for record purposes on the printer terminal.

B. The following control functions shall be made possible by secure code using the NMS keyboard (direct interactive or DEBUG subroutine):

1. Modification of all RMS parameter table values without system restart
2. Modification of all RMS thresholds without system restart
3. Modification of NMS software instructions
4. Readouts of data storage registers without system interruptions.

All DEBUG entries, and I/O responses, except for secure code, shall be printed for record purposes.

POS 22795

2.22 Software Expansion Capability

The installed software shall have the capability of accommodating a maximum of 15 RMSs with required program alterations limited to NMS and RMS parameter insertions via the keyboard command. Only two Trigger RMSs are envisioned for Sea-Tac, and the seven expansion RMSs are to be Non-Trigger RMSs. All NMS data input and output requirements for the initial eight RMSs apply to the seven expansion RMSs.

2.23 Fail-Safe Operation

Only power line failures shall cause the NMS to HALT. Software restart capability shall be provided whereby NMS Operator intervention or inputs are not required to restore normal NMS operation following restoration of line power. Memory protection shall be provided such that cumulative noise data obtained prior to the power interruption are not altered and that data obtained following the power restoration is correct and includes the cumulative data obtained prior to the interruption.

2.24 Software RELOAD, DUMP and Storage

NMS software and bootstrap routines shall be provided to RELOAD, DUMP and store the entire NMS software from or onto data cassette tape. The digital computer shall not require manual programming by the NMS operator. All manual entries and display of register contents to initiate and complete RELOAD and DUMP operations shall be possible via the computer keyboard and display. Following program RELOAD, NMS operation shall be restarted by the NMS Operator without re-entry of NMS or RMS parameters except for date, RMS ON-LINE status and Operator Input Commands of paragraph 2.21A.

2.25 Optional Higher Language Software Programming

As an optional bid item, if machine language programming proposed is in the Contractor's basic CPS software, the Contractor shall provide higher level language programming such as FORTRAN, extended BASIC or BASIC, and as necessary, additional computer core. As a minimum, all computational, processed data storage and retrieval, and report message output routines shall be written in a higher software language.

PART 3 - EXECUTION

3.01 Software Installation

The Contractor shall install all NMS and RMS parameters prior to Final System Acceptance to meet the overall system requirements. Inputs from the Port such as final RMS locations, numbering scheme, ambient noise levels estimates, and EXCEED Event Limit estimates settings will be supplied prior to factory acceptance tests. In the event that the Contractor determines that items over which he has no control will jeopardize his ability to successfully install the complete NMS software, he shall so notify the Port in writing immediately upon his awareness of the potential conflict.

3.02 Final Parameter Settings

A. Prior to On-Site Acceptance of the CPS software, all final NMS software parameters shall be inserted by the Contractor, and the finalized program shall be stored on a cassette tape(s) A duplicate cassette tape shall be held by the Contractor for final software documentation purposes.

B. During the On-Site Acceptance Tests, each CPS software parameter set shall be finalized and documented by the Contractor with the Engineer or his authorized representative present. The Contractor shall present substantiating data and rationale to the Engineer prior to inserting the final software parameters. This phase of the work shall be integrated with the Personnel Training Program. The Contractor shall insure that the CPS software parameters in use during the On-Site Acceptance Testing do not negate or nullify conclusions of NMS hardware or software acceptability made prior to On-Site Acceptance.

3.03 On-Site Acceptance Tests

On-site acceptance tests shall be run in accordance with Section 01700.

3.04 Thirty-Day Operational Demonstration

Following On-Site Acceptance of the NMS, no software changes shall be made without the Engineer's approval. The DEBUG routine shall be de-activated until Final Acceptance or until required by the Contractor for maintenance during the thirty-day demonstration period. The Port shall be allowed to exercise all other normal I/O options on the NMS Operator Command List. Computer halts during the demonstration period or other latent defects (other than parameter settings) requiring program modification shall be cause for restarting the Thirty-Day Operational Demonstration upon repair

and upon the discretion of the Engineer.

3.05 Submittals

Sixty days prior to the scheduled start of Factory Tests and Demonstrations, the Contractor shall submit a program flow chart for NL data acquisition, threshold testing, aircraft vs. non-aircraft discrimination, cumulative and single event processing and data storage and output. In addition to this flow chart, a software memory map showing computer core allocation for data storage, and foreground/background routines, and spares shall be submitted.

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DIVISION 16 - ELECTRICAL
Section 16950 - Warranty

PART 1 - GENERAL

1.01 At no additional cost to the Port, the Contractor shall guarantee all equipment delivered under the contract to be free from defects in design, material or workmanship, and against damage caused prior to Final Acceptance of the NMS.

1.02 The warranty period shall be for a one (1) year period from the date of Final Acceptance of the NMS.

1.03 All Original Equipment Manufacturers' warranties which extend beyond the one-year period from the Final Acceptance date shall be recorded in the name of, or transferred as necessary by the Contractor, to benefit the Port of Seattle.

PART 2 - PRODUCTS

2.01 All NMS work delivered under this contract and found to be defective within a one-year period following Final Acceptance of the NMS shall be promptly replaced or repaired by the Contractor at no additional cost to the Port.

2.02 All Original Equipment Manufacturers' warranties which extend beyond the one-year period following Final Acceptance shall be transferred to the Port by the Contractor.

PART 3 - EXECUTION

3.01 Damages to the NMS work items subsequent to Final Acceptance resulting from uncontrollable yandalism, which are not related to the Contractor's lack of due care in the prosectuion of this work, or damages resulting from severe environmental factors beyond the limits described in Section 01660 - Environmental Factors, are not included in these product warranty provisions.

3.02 The Contractor shall maintain complete itemized records of equipment defects or failures, serial numbers, corrective action (repair or replacement) taken, cost of material and NMS down-time, if any. Should the Contractor determine that the warranty provisions do not apply because of factors listed in paragraph 3.01 above, he shall promptly notify the Engineer in writing. The Engineer shall make a determination, and advise the Contractor of the applicability of this specification and of the follow-up action required of the Contractor. The decision of the Engineer shall be final.

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3.03 Excessive delays in replacing or repairing defective items shall result in extension of the Warranty as well as the Maintenance Contract if deemed warranted by the Port. The Contractor shall restore proper NMS operation within 48 hours of a malfunction report originated by the Port (see Section 16960, Maintenance Services). The Contractor shall maintain an adequate inventory of spare components to meet this Time-To-Repair requirement. Written waivers of this requirement received by the Engineer from the Contractor will be considered on a case-by-case basis.

3.04 All replacement parts and materials used by the Contractor shall be identical to the original work installed and shall be of unused condition. The Port shall reject replacement parts and materials considered nonconforming to these specifications. The Contractor may install, on a temporary basis, used parts and material as necessary to effect timely and proper restoration of NMS operation. However, upon receipt of the new replacement item(s), the Contractor shall replace all used parts and materials at his expense without additional compensation from the Port.

3.05 Sixty (60) days prior to the expiration date of the one-year Warranty, the Contractor shall submit a cost proposal to the Port for extension of the Warranty Period. The contractual conditions of the warranty and maintenance period (Section 16960) extensions shall be negotiated separately.

DIVISION 16 - ELECTRICAL
Section 16960 - Maintenance Services

PART 1 - GENERAL

1.01 Exclusive of parts and materials, the Contractor shall provide complete maintenance and calibration services for a one-year period following Final Acceptance of the NMS.

1.02 The Contractor shall provide on-call, all labor and travel costs to restore NMS malfunctions. Port personnel will notify the Contractor's maintenance subcontractor of NMS malfunctions if not readily correctable by the NMS Operator. The subcontractor, upon notification of an NMS malfunction, shall provide on-site maintenance services such that proper NMS operation is restored within 48 hours of the malfunction report. The availability of all necessary spare NMS components for efficient troubleshooting and repair are the responsibility of the NMS Contractor.

1.03 The services of a local electronics repair and maintenance subcontractor, suitably trained by the Contractor, shall be retained during the one-year period following Final Acceptance to provide on-site maintenance of the NMS and to effect timely repair.

PART 2 - PRODUCTS

2.01 Complete one-year maintenance services shall be provided by the Contractor to promptly trouble shoot, recalibration (when a component in the hydrophone assembly is replaced), calibrate and keep the NMS operating. NMS delivery items include RMS and CPS hardware components and the CPS software package.

2.02 In the event of NMS failure, during such time or in such a location that immediate repairs are mandatory, the Contractor, or his local maintenance representative, shall respond promptly, irrespective of time. If the Contractor or his authorized maintenance representative is not available, the Port may effect repair. The Contractor shall then reimburse the Port for all costs necessary to effect repair.

PART 3 - EXECUTION

3.01 Following a determination of an NMS failure, Port personnel will notify the Contractor's local service representative. The remaining obligations to effect NMS repair shall be borne by the Contractor.

3.02 Maintenance service invoices shall be submitted monthly to the Port for approval by the Engineer. Monthly payments shall be the lesser of total allowable costs associated with on-site maintenance services performed and replacement part transportation costs, or one-twelfth of the contract amount of the Maintenance Services bid item.

3.03 The Contractor shall submit to the Port an executed contract or agreement between himself and his local service representative, prior to Final acceptance of the NMS.

3.04 Sixty (60) days prior to the expiration date of the one-year Maintenance Service period, the Contractor shall submit a cost proposal to the Port for extension of the Maintenance Service Period.