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CONTRACT DOCUMENTS AND SPECIFICATIONS
FOR

CITY OF SELDOVIA
WATER SYSTEM IMPROVEMENTS

EDA PROJECT NO. 07-01-02156

Seldovia, Alaska

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Plans and Specifications by:

Tryck, Nyman & Hayes
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July, 1979

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Contract Documents

Advertisement for Bids
Information for Bidders
Bid Conditions - Affirmative Action Requirements
Equal Employment Opportunity
Bid Bond
Bid for Unit Price Contracts
Agreement
Notice of Award
Performance Bond
Payment Bond
Certification of Proposed Subcontractor Regarding
Equal Employment Opportunity
Notice to Proceed
Change Order

General Conditions

1. Definitions
2. Additional Instructions and Detail Drawings
3. Schedules, Reports and Records
4. Drawings and Specifications
5. Shop Drawings
6. Materials, Services and Facilities
7. Inspection and Testing
8. Substitutions
9. Patents
10. Surveys, Permits, Regulations
11. Protection of Work, Property, Persons
12. Supervision by Contractor
13. Changes in the Work
14. Changes in Contract Price
15. Time for Completion and Liquidated Damages
16. Correction of Work
17. Subsurface Conditions
18. Suspension of Work Termination and Delay
19. Payments to Contractor
20. Acceptance of Final Payment as Release
21. Insurance
22. Contract Security
23. Assignments
24. Indemnification
25. Separate Contracts
26. Subcontracting
27. Engineer's Authority
28. Land and Rights-of-Way
29. Guaranty
30. Arbitration
31. Taxes

TABLE OF CONTENTS
(Continued)

GENERAL SUPPLEMENTAL CONDITIONS

- S1 Definitions
- S2 Required Provisions Deemed Inserted
- S3 Inspection by EDA Representatives
- S4 Construction Schedule and Periodic Estimates
- S5 Contractor's Title to Material
- S6 Inspection and Testing of Materials
- S7 "Or Equal" Clause
- S8 Patents
- S9 Claims for Extra Costs
- S10 Contractor's and Subcontractor's Insurance
- S11 Contract Security
- S12 Certification of Nonsegregated Facilities
- S13 Safety and Health Regulations for Construction
- S14 Minimum Wages
- S15 Withholding of Payments
- S16 Payrolls and Basic Records
- S17 Apprentices and Trainees
- S18 Copeland "Anti-Kickback" Provisions
- S19 Subcontracts
- S20 Termination and Debarment
- S21 Overtime Requirements
- S22 Equal Employment Opportunity
- S23 Other Prohibited Interests
- S24 Employment of Local Labor
- S25 Signs
- S26 Historical and Archeological Data Preservation Act of 1974
- S27 Clean Air and Federal Water Pollution Control Act
- S28 Use of Lead-Based Paints on Residential Structures

TABLE OF CONTENTS
(Continued)

<u>Drawings</u>	<u>Sheet No.</u>
Title Sheet and Drawing Index	1
Project Plan and Drawings - Key Map	2
Plan and Profile of Water Line - Airport Avenue	3
Plan and Profile of Water Line - Airport Avenue	4
Filter Station Structural Plan Sections	5
Filter Station Mechanical Plan & Sections	6
Filter Station, Plumbing & Heating Plan and Details	7
Filter Station, Electrical Plan and Notes	8
Chlorination Building, Structural and Mechanical Plan	9
Chlorination Building, Mechanical Elevations, Heating and Details	10
Chlorination Building, Electrical Plan.	11
Site Plan for Water Storage Tank and Chlorination Building	12
Water Storage Tank Plan and Details	13

TABLE OF CONTENTS
(Continued)

Specifications

DIVISION 1 GENERAL REQUIREMENTS (Special Conditions)

01010 Summary of the Work
01020 Mobilization
01100 Alternatives
01200 Progress and Payment
01300 Submittals
01500 Temporary Facilities and Controls

Technical Specifications

DIVISION 2 SITE WORK

02110 Demolition
02210 Earthwork

DIVISION 3 CONCRETE

03100 Concrete Formwork
03200 Concrete Reinforcement
03300 Cast in Place Concrete

DIVISION 4 MASONRY

04100 Mortar
04200 Unit Masonry

DIVISION 5 METALS

05100 Structural Metal
05500 Miscellaneous Metals

DIVISION 6 WOOD

06100 Rough Carpentry
06200 Finish Carpentry

DIVISION 7 THERMAL AND MOISTURE PROTECTION

07200 Insulation
07400 Preformed Metal Roof
07900 Caulking and Sealants

TABLE OF CONTENTS
(Continued)

DIVISION 8	DOORS AND WINDOWS
08100	Metal Doors and Frames
08600	Wood Windows
08700	Hardware
08720	Protection Screens
08750	Louvers
DIVISION 9	FINISHES
09900	Painting
DIVISION 10	SPECIALTIES
10250	Firefighting Devices
DIVISION 12	FURNISHINGS
12300	Cabinets and Fixtures
DIVISION 15	MECHANICAL
15150	Heating
15160	Ventilation
15400	Plumbing
15900	Controls and Instrumentation
DIVISION 16	ELECTRICAL
16010	General Provisions
16100	Basic Materials and Methods
DIVISION 17	WATER PIPING AND TREATMENT
17100	Water Piping System
17200	Water Treatment
DIVISION 18	WATER STORAGE TANK
18100	Water Storage Tank

ADVERTISEMENT FOR BIDS

Project Number _____

City of Seldovia

(Owner)

Separate sealed bids for City of Seldovia Water System Improvements

for City of Seldovia

will be received by City of Seldovia

at the office of Tryck, Nyman & Hayes

until _____ o'clock p.m. Anchorage Local Time _____,

and then at said office publicly opened and read aloud.

The Information for Bidders, Form of Bid, Form of Contract, Plans, Specifications, and Forms of Bid Bond, Performance and Payment Bond, and other contract documents may be examined at the following:

Associated General Contractors Alaska Chapter	3201 Spenard Road	Anchorage, AK 99503
Plan Bureau Office	824 5th Avenue, N.	Seattle, WA 98109
Associated General Contractors Tacoma Chapter	3820 S. Pine St.	Tacoma, WA 98409
Dodge-Scan	315 N. Tower, 100 W. Harrison Place	Seattle, WA 98119
Construction Plan Bureau	3217 Arctic Blvd.	Anchorage, AK 99503
Construction Plan Bureau	801 Barnette Street	Fairbanks, Ak 99701
Tryck, Nyman & Hayes	740 'I' Street	Anchorage, AK 99501
City Manager Office	P. O. Box 226	Seldovia, AK 99663

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Copies may be obtained at the office of Tryck, Nyman & Hayes
located at 740 '11' Street, Anchorage, Alaska 99501 upon payment of
\$ 50.00 for each set. Copies to be mailed will require an additional
non-refundable \$8.00 per set. Any unsuccessful bidder, upon returning
such set promptly and in good condition, will be refunded his payment, and
any non-bidder upon so returning such a set will be refunded \$ 40.00.
The Owner reserves the right to waive any informalities or to reject any
or all bids.

Each bidder must deposit with his bid, security in the amount, form and
subject to the conditions provided in the Information to Bidders.

Attention of bidders is particularly called to the requirements as to
conditions of employment to be observed and minimum wage rates to be paid
under this contract.

No bidder may withdraw his bid within 30 days after the actual date of
the opening thereof.

A pre-bid conference will be held at the Office of Tryck, Nyman & Hayes
at _____ P.M. (local time) on _____, for the purpose
of answering any questions bidders may have and to consider any suggestions
they may wish to make. Any changes resulting from this conference will
be made by Addendum.

(Date)

Don Caswell
City Manager
City of Seldovia

INFORMATION FOR BIDDERS

1. Receipt and Opening of Bids

The _____ (herein called the "Owner"), invites bids on the form attached hereto. All blanks must be appropriately filled in. Bids will be received by the Owner at the office of _____ until _____ o'clock A.M. - P.M., _____ ST/DST _____, 19____, and then at said office publicly opened and read aloud. The envelopes containing the bids must be sealed, addressed to _____ at _____ and designated as Bid for _____.

The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 30 days after the actual date of the opening thereof.

2. Preparation of Bid

Each bid must be submitted on the prescribed form and accompanied by "Certification by Bidder Regarding Equal Employment Opportunity", Form ED-119. All blank spaces for bid prices must be filled in, in ink or typewritten, in both words and figures, and the foregoing certification must be fully completed and executed when submitted.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his address, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in the bid form.

3. Subcontracts

The bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this contract - -

- a. Must be acceptable to the Owner and Economic Development Administration.
- b. Must submit Form ED-120, "Certification by Proposed Subcontractor Regarding Equal Employment Opportunity". Approval of the proposed subcontract award cannot be given by the Owner unless and until the proposed subcontractor has submitted the certification and/or other evidence showing that it has fully complied with any reporting requirements to which it is or was subject.

Although the bidder is not required to attach such Certifications by proposed subcontractors to his bid, the bidder is here advised of this requirement so that appropriate action can be taken to prevent subsequent delay in subcontract awards.

Telegraphic Modification

Any bidder may modify his bid by telegraphic communication at any time prior to the scheduled closing time for receipt of bids, provided such telegraphic communication is received by the Owner prior to the closing time, and, provided further, the Owner is satisfied that a written confirmation of the telegraphic modification over the signature of the bidder was mailed prior to the closing time. The telegraphic communication should not reveal the bid price but should provide the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the sealed bid is opened. If written confirmation is not received within two days from the closing time, no consideration will be given to the telegraphic modification.

5. Method Bidding

The Owner invites the following bid(s):

6. Qualifications of Bidder

The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids will not be accepted.

7. Bid Security

Each bid must be accompanied by cash, certified check of the bidder, or a bid bond prepared on the form of bid bond attached hereto, duly executed by the bidder as principal and having as surety thereon a surety company approved by the Owner, in the amount of 5% of the bid. Such cash, checks or bid bonds will be returned to all except the three lowest bidders within three days after the opening of bids, and the remaining cash, checks, or bid bonds will be returned promptly after the Owner and the accepted bidder have executed the contract, or if no award has been made within 30 days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid.

8. Liquidated Damages for Failure to Enter into Contract

The successful bidder, upon his failure or refusal to execute and deliver the contract and bonds required within 10 days after he has received notice of the acceptance of his bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his bid.

9. Time of Completion and Liquidated Damages

Bidder must agree to commence work on or before a date to be specified in a written "Notice to Proceed" of the Owner and to fully complete the project within _____ consecutive calendar days thereafter. Bidder must agree also to pay as liquidated damages, the sum of \$ _____ for each consecutive calendar day thereafter as hereinafter provided in the General Conditions.

10. Conditions of Work

Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his contract. Insofar as possible the contractor, in carrying out his work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

11. Addenda and Interpretations

No interpretation of the meaning of the plans, specifications or other prebid documents will be made to any bidder orally.

Every request for such interpretation should be in writing addressed to

at _____

and to be given consideration must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be mailed by certified mail with return receipt requested to all prospective bidders (at the respective addresses furnished for such purposes), not later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.

12. Security for Faithful Performance

Simultaneously with his delivery of the executed contract, the Contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract, as specified in the General Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the Owner.

13. Power of Attorney

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

14. Notice of Special Conditions

Attention is particularly called to those parts of the contract documents and specifications which deal with the following:

- (a) Inspection and testing of materials.
- (b) Insurance requirements.
- (c) Wage rates.
- (d) Stated allowances.

15. Laws and Regulations

The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

16. Method of Award - Lowest Qualified Bidder

If at the time this contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the amount of funds then estimated by the Owner as available to finance the contract, the contract will be awarded on the base bid only. If such bid exceeds such amount, the Owner may reject all bids or may award the contract on the base bid combined with such deductible alternates applied in numerical order in which they are listed in the Form of Bid, as produces a net amount which is within the available funds.

17. Obligation of Bidder

At the time of the opening of bids, each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve any bidder from any obligation in respect to his bid.

18. Compliance Review

If the bid is in the amount of five hundred thousand dollars or more, the bidder and his proposed non-exempt subcontractors will be subject to full pre-award equal opportunity compliance reviews by EDA personnel before the award of the contract for the purpose of determining whether the bidder and his subcontractors are able to comply with the provisions of the equal opportunity clause of Executive Order 11246.

19. Hiring of Local Labor

The maximum feasible employment of local labor is covered in Section 57 of the General Conditions. This section emphasizes that every Contractor and Subcontractor undertaking to do work on any EDA assisted project shall employ to the maximum extent practical, in carrying out such contract work, qualified persons who regularly reside in the designated area where such project is located.

The Contractor will be responsible for assuring that his subcontractors comply with Section 57.

20. Affirmative Action Requirements

Where the EDA assisted project is in an area covered by an Office of Federal Contract Compliance imposed plan or hometown plan approved by Office of Federal Contract Compliance the Contractor will be required to complete a certificate that he intends to comply with the applicable plan. In addition, the Contractor will be required to complete monthly, Std. Form 257, Monthly Employment Utilization Report.

21. Equal Employment Affirmative Action Requirements

This project is located in an area that is covered by a plan for increasing minority employment in the construction industry. There will be found in this set of bidding documents a page section entitled, "Bid Conditions, Affirmative Action Requirements, Equal Employment Opportunity, For All Non-Exempt Federal and Federally-Assisted Construction Contracts to be awarded in Alaska." To be considered as an eligible responsible bidder, the bidder must comply with these "Bid Conditions".

Any questions that bidders may have on complying with these Bid Conditions should be directed to the following agency:

HUD, Dept. of Fair Housing & Equal Employment
1321 Second Street
Seattle, Washington 98101
Phone: (206) 442-0226

22. Standard Form 257, Monthly Employment Utilization Report

After the contract is awarded, the successful bidder will be required to complete and submit Standard Form 257 to the above address each month, with a copy to the following address:

Ms. Patricia Mayo
Manager, Alaska Region
Office for Equal Opportunity
U. S. Department of the Interior
204 East Fifth Avenue
Anchorage, Alaska 99501

ALASKA

Area Covered - State of Alaska

Goals and Timetables

Timetable	Trade	Goal (percent)
Until further notice	Asbestos Workers.....	26.4 to 28.0
	Carpenters.....	25.7 to 28.0
	Electricians.....	25.7 to 28.0
	Ironworkers.....	25.7 to 28.0
	Operating Engineers.....	26.1 to 28.0
	Painters.....	25.8 to 28.0
	Pile Drivers.....	25.1 to 28.0
	Plumbers & Steamfitters.....	25.4 to 28.0
	Roofers.....	27.6 to 28.0
	Sheetmetal Workers.....	25.6 to 28.0
	Teamsters.....	25.6 to 28.0
	All Other.....	26.1 to 28.1

BID CONDITIONS AFFIRMATIVE ACTION REQUIREMENTS

Notice of Requirement for Affirmative
Action to Ensure Equal Employment
Opportunity (Executive Order 11246)

1. The Offeror's or Bidders attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workfo in each trade on all construction work in the covered area, are as follows:

The following goals and timetables for female utilization shall be included in all Federal and federally assisted construction contracts and subcontracts in excess of \$10,000. The goals are applicable to the contractor's aggregate on-site construction workforce whether or not pa of that workforce is performing work on a Federal or federally assisted construction contract or subcontract.

Area Covered

Goals for Woman apply nationwide.

Goals and Timetables

<u>Timetable</u>	<u>Goals</u>
	(percent)
From Apr. 1, 1978 until Mar. 31, 1979.....	3.1
From Apr. 1, 1979 until Mar. 31, 1980.....	5.0
From Apr. 1, 1980 until Mar. 31, 1981.....	6.9

Until further notice, the following goals and timetables for minori utilization shall be included in all Federal or federally-assisted construction contracts and subcontracts in excess of \$10,000 to be perform in the respective covered areas. The goals are applicable to the contractor's aggregate on-site construction workforce whether or not part that workforce is performing work on a Federal or federally-assisted construction contract or subcontract.

These goals are applicable to all Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10-working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is (insert description of the geographical areas where the contract is to be performed giving the state, county and city, if any.)

Standard Federal Equal Employment
Opportunity Construction Contract
Specifications (Executive Order 11246)

1. As used in these specifications:

a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;

b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;

c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

d. "Minority" includes:

(i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);

(ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);

(iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and

(iv) American Indian or Alaskan Native (all persons having origin in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U. S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract results are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining unit, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U. S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its efforts to achieve

maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union, or if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources complied under 7b above.

f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of

these items with onsite supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are non-segregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these

Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, religion, sex, or national origin.

11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least, include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g. mechanic apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained

in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Progra

- 6

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____
_____ as Principal, and
_____ as Surety, are hereby
held and firmly bound unto _____ as OWNER
in the penal sum of _____
for the payment of which, well and truly to be made, we hereby jointly and severally
bind ourselves, successors and assigns.

Signed, this _____ day of _____, 19_____.

The Condition of the above obligation is such that whereas the Principal has submitted
to _____ a certain BID,
attached hereto and hereby made a part hereof to enter into a contract in writing, for the

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID,

then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Principal (L.S.)

Surety

By: _____

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 where the project is located.

BID

Proposal of _____ (hereinafter called "BIDDER"), organized and existing under the laws of the State of _____ doing business as _____*.

To the _____ CITY OF SELDOVIA _____ (hereinafter called "OWNER").

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all WORK for the construction of _____ WATER SYSTEM IMPROVEMENTS _____ CITY OF SELDOVIA _____

in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID each party thereto certifies as to his own organization, that this BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this contract on or before a date to be specified in the NOTICE TO PROCEED and to fully complete the PROJECT within _____ 240 _____ consecutive calendar days thereafter. BIDDER further agrees to pay as liquidated damages, the sum of \$ 200.00 for each consecutive calendar day thereafter as provided in Section 15 of the General Conditions.

BIDDER acknowledges receipt of the following ADDENDUM:

*Insert "a corporation", "a partnership", or "an individual" as applicable.

UNIT PRICE SCHEDULE
FOR THE
CITY OF SELDOVIA
WATER SYSTEM IMPROVEMENTS
BASIC BID

Item No.	Estimated Quantity	Work Description	Unit Bid Price	Total Bid Price
001	10 hrs.	Allowance for exploration for underground utilities for dimensions and locations at _____ _____ per hour.	\$ _____	\$ _____
100	Lump Sum	Mobilization _____ _____ per l.s.	\$ _____	\$ _____
101	Lump Sum	Construct gravity system filter house, complete with backwash system, strainer, filters, mechanical and electrical systems, pipe and fittings and the 10" meter and associated piping installations required that are shown on Shts. 6, 7 and 8 and including 10" filter to include 3 spare sets of polypropylene screens plus spare parts specified _____ _____ per l.s.	\$ _____	\$ _____
102	Lump Sum	Construct gravity system chlorination building complete including chlorinator installation, heating and mechanical and electrical systems, altitude valve, pipe and fittings and the meter required and all work required is shown on Shts. 9, 10, 11 and 12 _____ _____ per l.s.	\$ _____	\$ _____
103	710 l.f.	Provide and install 10" Class 52 ductile iron water main from the tee outside the filtration building to outside wall of chlorination building and from tie in to existing steel line to chlorination building and from chlorination building to water tank (includes excavation and backfill required) _____ _____ per l.f.	\$ _____	\$ _____

104	750 l.f.	Provide and install 8" Class 52 ductile iron water main, including fittings as required to construct water tank overflow and drain from the existing 8" drain line located near the proposed filtration building to the connection to the water storage tank piping (includes excavation and backfill as required)_____		
		_____ per l.f.	\$ _____	\$ _____

105	Lump Sum	Provide and install 500,000 (nom.) gallon water storage tank including underground piping (to 5' beyond exterior of tank) including all site preparation work and including rock bolt tie down anchors, tank insulation and all other work required as is shown on shts. 12 and 13 of the plans for tank construction_____		
		_____ per l.s.	\$ _____	\$ _____

AIRPORT AVENUE WATERLINE
DEDUCTIVE ALTERNATE NO. 1

201	1820 l.f.	Provide and install 10" Class 52 ductile iron water main from the Fish Creek pumping line along Airport Avenue to connect to the new 10" D.I. line crossing Seldovia Slough at the new highway bridge_____		
		_____ per l.f.	\$ _____	\$ _____

202	30 l.f.	Provide and install 6" Class 52 ductile iron water main for fire hydrant leads on the Airport Avenue fire hydrants_____		
		_____ per l.f.	\$ _____	\$ _____

203	2 ea.	Provide and install 10" gate valve and valve box_____		
		_____ per ea.	\$ _____	\$ _____

204 2 ea. Provide and install fire hydrant
assembly at _____

_____ per ea. \$ _____ \$ _____

205 1 ea. Furnish and install 3/4" copper
service connection including
corporation stop, service box
valve and copper service line
extended to ground surface to
provide an air bleeder line _____

_____ per ea. \$ _____ \$ _____

TOTAL BASIC BID (Including Deductive
Alternate No. 1)

\$ _____

TOTAL BASIC BID (Without Deductive
Alternate No. 1)

\$ _____

CONTRACTOR _____

BY _____

TITLE _____

DATE _____

Bidder agrees to perform all the City of Seldovia Water System Improvements work described in the specifications and shown on the plans, for the above unit prices:

(Amounts are to be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.)

The unit prices shall include all labor, materials bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for.

Bidder understands that the Owner reserves the right to reject any or all bids.

The bidder agrees that this bid shall be good and may not be withdrawn for a period of 30 calendar days after the scheduled closing time for receiving bids.

Upon receipt of written notice of the acceptance of this bid, bidder will execute the formal contract attached within 10 days and deliver a Surety Bond or Bonds as required by Paragraph 29 of the General Conditions. The bid security attached in the sum of _____

\$ _____ is to become the property of the Owner in the event the contract and bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

Respectfully submitted:

By: _____
(Title)

(SEAL - if bid is by a corporation)

(Business Address)

Alaska General Contractor's Reg. No.

AGREEMENT

THIS AGREEMENT, made this _____ day of _____, 19_____, by
and between CITY OF SELDOVIA, hereinafter called "OWNER"
(Name of Owner), (an individual)

and _____ doing business as (an individual,) or (a
partnership,) or (a corporation) hereinafter called "CONTRACTOR".

WITNESSETH: That for and in consideration of the payments and agreements herein-
after mentioned:

1. The CONTRACTOR will commence and complete the construction of

2. The CONTRACTOR will furnish all of the material, supplies, tools, equipment,
labor and other services necessary for the construction and completion of the PROJECT
described herein.

3. The CONTRACTOR will commence the work required by the CONTRACT DOC-
UMENTS within 10 _____ calendar days after the date of the NOTICE TO PRO-
CEED and will complete the same within 200 _____ calendar days unless the period
for completion is extended otherwise by the CONTRACT DOCUMENTS.

4. The CONTRACTOR agrees to perform all of the WORK described in the CON-
TRACT DOCUMENTS and comply with the terms therein for the sum of \$ _____,
or as shown in the BID schedule.

5. The term "CONTRACT DOCUMENTS" means and includes the following:

- (A) Advertisement For BIDS
- (B) Information For BIDDERS
- (C) BID
- (D) BID BOND
- (E) Agreement

(F) General Conditions

(G) SUPPLEMENTAL GENERAL CONDITIONS

(H) Payment BOND

(I) Performance BOND

(J) NOTICE OF AWARD

(K) NOTICE TO PROCEED

(L) CHANGE ORDER

(M) DRAWINGS prepared by Tryck, Nyman & Hayes
numbered _____ through _____, and dated _____
19 _____

(N) SPECIFICATIONS prepared or issued by Tryck, Nyman & Hayes

dated _____, 19 _____

(O) ADDENDA:

No. _____, dated _____, 19 _____

No. _____, dated _____, 19 _____

No. _____, dated _____, 19 _____

No. _____, dated _____, 19 _____

No. _____, dated _____, 19 _____

No. _____, dated _____, 19 _____

6. The OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.

7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in (_____) each of which shall be deemed an original on the date first above written.

(Number of Copies)

(SEAL)

ATTEST:

Name

(Please Type)

Title

(SEAL)

ATTEST:

Name

(Please Type)

OWNER:

BY _____

Name

(Please Type)

Title

CONTRACTOR:

BY _____

Name

(Please Type)

Address

NOTICE OF AWARD

To: _____

PROJECT Description: WATER SYSTEM IMPROVEMENTS

CITY OF SELDOVIA

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated _____, 19_____, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of \$_____.

You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____ day of _____, 19_____.

CITY OF SELDOVIA

Owner

By _____

Title MAYOR

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

by _____

this the _____ day of _____, 19_____

By _____

Title _____

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal, and
(Corporation, Partnership, or Individual)

(Corporation, Partnership, or Individual)

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto _____

(Name of owner)

(Address of Owner)

hereinafter called OWNER, in the penal sum of _____

Dollars, - \$ ()

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____, 19____, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any wise affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each
(Number)
one of which shall be deemed an original, this the _____ day of _____
19_____.

ATTEST:

(Principal) Secretary

(SEAL)

(Witness as to Principal)

(Address)

ATTEST:

(Surety) Secretary

(SEAL)

Witness as to Surety

(Address)

Principal

By _____ (s)

(Address)

Surety

By _____
Attorney-in-Fact

(Address)

NOTE: Date of BOND must not be prior to date of Contract.

If CONTRACTOR is Partnership, all partners should execute BOND.

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 where the PROJECT is located.

U.S. DEPARTMENT OF COMMERCE
ECONOMIC DEVELOPMENT ADMINISTRATION

CERTIFICATION BY CONTRACTOR OR SUBCONTRACTOR REGARDING
EQUAL EMPLOYMENT OPPORTUNITY

Name of Prime Contractor or Subcontractor _____

EDA Project No. _____

Address _____

Internal Revenue Service Employer Identification Number _____

GENERAL

In accordance with Executive Order 11246 (30 F.R. 12319-25), the implementing rules and regulations thereof, and orders of the Secretary of Labor, a Certification regarding Equal Opportunity is required of bidders or prospective contractors and their proposed subcontractors prior to the award of contracts or subcontracts.

CONTRACTOR'S CERTIFICATION

1. Participation in a previous contract or subcontract.

- a. Contractor has participated in a previous contract or subcontract subject to the Equal Opportunity clause ☐ Yes ☐ No
- b. Compliance reports were required to be filed in connection with such contract or subcontract. ☐ Yes ☐ No
- c. Contractor has filed all compliance reports required by Executive Order 11246 or by regulations of the Office of Federal Contract Compliance Programs issued pursuant to Title VII of the Civil Rights Act of 1964. ☐ Yes ☐ No

d. If answer to item c is "No," please explain in detail on reverse side of this certification.

2. Dollar amount of proposed contract \$ _____

3. Nonsegregated facilities.

a. Notice to Prospective Federally-Assisted Construction Contractors

- (1) A Certification of Nonsegregated Facilities, as required by the May 9, 1967, order (32 F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted to the recipient prior to the award of a federally-assisted construction contract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity clause.
- (2) Contractors receiving federally-assisted construction contract awards exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause will be required to provide for the forwarding of the following notice to prospective subcontractors for supplies and construction contracts where the subcontracts exceed \$10,000 and are not exempt from the provisions of the Equal Opportunity clause:

b. Notice to Prospective Subcontractors of Requirement for Certification of Nonsegregated Facilities

- (1) A Certification of Nonsegregated Facilities, as required by the May 9, 1967, order (32 F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted to the contractor prior to the award of a subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity clause.

No contract shall be awarded unless this report is received. 42 U.S.C. 2000a-2000a-17;
E.O. 11246, Sec. 203(b); 41 C.F.R. 60-1.8(b).

- (2) Contractors receiving subcontract awards exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause will be required to provide for the forwarding of this notice to prospective subcontractors supplies and construction contracts where the subcontracts exceed \$10,000 and are not exempt from the provision the Equal Opportunity clause.

c. Certification of Nonsegregated facilities

The federally-assisted construction contractor certifies that he does not maintain or provide for his employees segregated facilities at any of his establishments, and that he does not permit his employees to perform their service any location, under his control, where segregated facilities are maintained. The federally-assisted construction contractor certifies further that he will not maintain or provide for his employees any segregated facilities at any of establishments, and that he will not permit his employees to perform their services at any location, under his control where segregated facilities are maintained. The federally-assisted construction contractor agrees that a breach of certification is a violation of the Equal Opportunity clause in this contract. As used in this certification, the "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom or otherwise. The federally-assisted construction contractor agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications in duplicate proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provision the Equal Opportunity clause, and that he will retain the duplicate of such certifications in his files. The contractor will include the original in his Bid Package.

REMARKS

Certification - The information above is true and complete to the best of my knowledge and belief.

Name and title of signer (Please type)

Signature

Date

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

NOTICE TO PROCEED

To: _____

Date: _____
Project: _____

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 19_____, on or before _____, 19_____, and you are to complete the WORK within _____ consecutive calendar days thereafter. The date of completion of all WORK is therefore _____, 19_____.

Owner
By _____
Title Mayor _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _____

this the _____ day
of _____, 19_____

By _____
Title _____

CHANGE ORDER

Order No. _____

Date: _____

Agreement Date: _____

NAME OF PROJECT: _____

OWNER: _____

CONTRACTOR: _____

The following changes are hereby made to the CONTRACT DOCUMENTS:

Justification:

Change to CONTRACT PRICE:

Original CONTRACT PRICE \$ _____

Current CONTRACT PRICE adjusted by previous CHANGE ORDER \$ _____

The CONTRACT PRICE due to this CHANGE ORDER will be (increased) (decreased) by: \$ _____

The new CONTRACT PRICE including this CHANGE ORDER will be \$ _____

Change to CONTRACT TIME:

The CONTRACT TIME will be (increased) (decreased) by _____ calendar days.

The date for completion of all work will be _____ (Date).

Approvals Required:

To be effective this Order must be approved by the Federal agency if it changes the scope or objective of the PROJECT, or as may otherwise be required by the SUPPLEMENTAL GENERAL CONDITIONS.

Requested by: _____

Recommended by: _____

Ordered by: _____

Accepted by: _____

Federal Agency Approval (where applicable) _____

GENERAL CONDITIONS

1. Definitions
2. Additional Instructions and Detail Drawings
3. Schedules, Reports and Records
4. Drawings and Specifications
5. Shop Drawings
6. Materials, Services and Facilities
7. Inspection and Testing
8. Substitutions
9. Patents
10. Surveys, Permits, Regulations
11. Protection of Work, Property, Persons
12. Supervision by Contractor
13. Changes in the Work
14. Changes in Contract Price
15. Time for Completion and Liquidated Damages
16. Correction of Work
17. Subsurface Conditions
18. Suspension of Work, Termination and Delay
19. Payments to Contractor
20. Acceptance of Final Payment as Release
21. Insurance
22. Contract Security
23. Assignments
24. Indemnification
25. Separate Contracts
26. Subcontracting
27. Engineer's Authority
28. Land and Rights-of-Way
29. Guaranty
30. Arbitration
31. Taxes

1. DEFINITIONS

1.1 Wherever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:

1.2 ADDENDA—Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS and SPECIFICATIONS, by additions, deletions, clarifications or corrections.

1.3 BID—The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.

1.4 BIDDER—Any person, firm or corporation submitting a BID for the WORK.

1.5 BONDS—Bid, Performance, and Payment Bonds and other instruments of security, furnished by the CONTRACTOR and his surety in accordance with the CONTRACT DOCUMENTS.

1.6 CHANGE ORDER—A written order to the CONTRACTOR authorizing an addition, deletion or revision in the WORK within the general scope of the CONTRACT DOCUMENTS, or authorizing an adjustment in the CONTRACT PRICE or CONTRACT TIME.

1.7 CONTRACT DOCUMENTS—The contract, including Advertisement For Bids, Information For Bidders, BID, Bid Bond, Agreement, Payment Bond, Performance Bond, NOTICE OF AWARD, NOTICE TO PROCEED, CHANGE ORDER, DRAWINGS, SPECIFICATIONS, and ADDENDA.

1.8 CONTRACT PRICE—The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.

1.9 CONTRACT TIME—The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.

1.10 CONTRACTOR—The person, firm or corporation with whom the OWNER has executed the Agreement.

1.11 DRAWINGS—The part of the CONTRACT DOCUMENTS which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.

1.12 ENGINEER—The person, firm or corporation named as such in the CONTRACT DOCUMENTS.

1.13 FIELD ORDER—A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the ENGINEER to the CONTRACTOR during construction.

1.14 NOTICE OF AWARD—The written notice of the acceptance of the BID from the OWNER to the successful BIDDER.

1.15 NOTICE TO PROCEED—Written communication issued by the OWNER to the CONTRACTOR authorizing him to proceed with the WORK and establishing the date of commencement of the WORK.

1.16 OWNER—A public or quasi-public body or authority, corporation, association, partnership, or individual for whom the WORK is to be performed.

1.17 PROJECT—The undertaking to be performed as provided in the CONTRACT DOCUMENTS.

1.18 RESIDENT PROJECT REPRESENTATIVE—The authorized representative of the OWNER who is assigned to the PROJECT site or any part thereof.

1.19 SHOP DRAWINGS—All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, SUPPLIER or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.

1.20 SPECIFICATIONS—A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

1.21 SUBCONTRACTOR—An individual, firm or corporation having a direct contract with the CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.

1.22 SUBSTANTIAL COMPLETION—That date as certified by the ENGINEER when the construction of the PROJECT or a specified part thereof is sufficiently completed, in accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended.

1.23 SUPPLEMENTAL GENERAL CONDITIONS—

Modifications to General Conditions required by a Federal agency for participation in the PROJECT and approved by the agency in writing prior to inclusion in the CONTRACT DOCUMENTS, or such requirements that may be imposed by applicable state laws.

1.24 SUPPLIER—Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site.

1.25 WORK—All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated or to be incorporated in the PROJECT.

1.26 WRITTEN NOTICE—Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the WORK.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

2.1 The CONTRACTOR may be furnished additional instructions and detail drawings, by the ENGINEER, as necessary to carry out the WORK required by the CONTRACT DOCUMENTS.

2.2 The additional drawings and instruction thus supplied will become a part of the CONTRACT DOCUMENTS. The CONTRACTOR shall carry out the WORK in accordance with the additional detail drawings and instructions.

3. SCHEDULES, REPORTS AND RECORDS

3.1 The CONTRACTOR shall submit to the OWNER such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the CONTRACT DOCUMENTS for the WORK to be performed.

3.2 Prior to the first partial payment estimate the CONTRACTOR shall submit construction progress schedules showing the order in which he proposes to carry on the WORK, including dates at which he will start the various parts of the WORK, estimated date of completion of each part and, as applicable:

3.2.1. The dates at which special detail drawings will be required; and

3.2.2 Respective dates for submission of SHOP DRAWINGS, the beginning of manufacture, the testing and the installation of materials, supplies and equipment.

3.3 The CONTRACTOR shall also submit a schedule of payments that he anticipates he will earn during the course of the WORK.

4. DRAWINGS AND SPECIFICATIONS

4.1 The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and all incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy or operation by the OWNER.

4.2 In case of conflict between the DRAWINGS and SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over scale dimensions, and detailed DRAWINGS shall govern over general DRAWINGS.

4.3 Any discrepancies found between the DRAWINGS and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the CONTRACTOR'S risk.

5. SHOP DRAWINGS

5.1 The CONTRACTOR shall provide SHOP DRAWINGS as may be necessary for the prosecution of the WORK as required by the CONTRACT DOCUMENTS. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S approval of any SHOP DRAWING shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS. The approval of any SHOP DRAWING which substantially deviates from the requirement of the CONTRACT DOCUMENTS shall be evidenced by a CHANGE ORDER.

5.2 When submitted for the ENGINEER'S review, SHOP DRAWINGS shall bear the CONTRACTOR'S certification that he has reviewed, checked and approved the SHOP DRAWINGS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.

5.3 Portions of the WORK requiring a SHOP DRAWING or sample submission shall not begin until the SHOP DRAWING or submission has been approved by the ENGINEER. A copy of each approved SHOP DRAWING and each approved sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the ENGINEER.

6. MATERIALS, SERVICES AND FACILITIES

6.1 It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified time.

6.2 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.

6.3 Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

6.4 Materials, supplies and equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the ENGINEER.

6.5 Materials, supplies or equipment to be incorporated into the WORK shall not be purchased by the

CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

7. INSPECTION AND TESTING

7.1 All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the CONTRACT DOCUMENTS.

7.2 The OWNER shall provide all inspection and testing services not required by the CONTRACT DOCUMENTS.

7.3 The CONTRACTOR shall provide at his expense the testing and inspection services required by the CONTRACT DOCUMENTS.

7.4 If the CONTRACT DOCUMENTS, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any WORK to specifically be inspected, tested, or approved by someone other than the CONTRACTOR, the CONTRACTOR will give the ENGINEER timely notice of readiness. The CONTRACTOR will then furnish the ENGINEER the required certificates of inspection, testing or approval.

7.5 Inspections, tests or approvals by the engineer or others shall not relieve the CONTRACTOR from his obligations to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS.

7.6 The ENGINEER and his representatives will at all times have access to the WORK. In addition, authorized representatives and agents of any participating Federal or state agency shall be permitted to inspect all work, materials, payrolls, records, of personnel, invoices of materials, and other relevant data and records. The CONTRACTOR will provide proper facilities for such access and observation of the WORK and also for any inspection, or testing thereof.

7.7 If any WORK is covered contrary to the written instructions of the ENGINEER it must, if requested by the ENGINEER, be uncovered for his observation and replaced at the CONTRACTOR'S expense.

7.8 If the ENGINEER considers it necessary or advisable that covered WORK be inspected or tested by others, the CONTRACTOR, at the ENGINEER'S request, will uncover, expose or otherwise make available for observation, inspection or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such WORK is defective, the CONTRACTOR will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such WORK is not found to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate CHANGE ORDER shall be issued.

8. SUBSTITUTIONS

8.1 Whenever a material, article or piece of equip-

ment is identified on the DRAWINGS or SPECIFICATIONS by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered. The CONTRACTOR may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the CONTRACT DOCUMENTS by reference to brand name or catalogue number, and if, in the opinion of the ENGINEER, such material, article, or piece of equipment is of equal substance and function to that specified, the ENGINEER may approve its substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS shall be appropriately modified by CHANGE ORDER. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the CONTRACTOR without a change in the CONTRACT PRICE or CONTRACT TIME.

9. PATENTS

9.1 The CONTRACTOR shall pay all applicable royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and save the OWNER harmless from loss on account thereof, except that the OWNER shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified, however if the CONTRACTOR has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the ENGINEER.

10. SURVEYS, PERMITS, REGULATIONS

10.1 The OWNER shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the WORK together with a suitable number of bench marks adjacent to the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the OWNER, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pile locations and other working points, lines, elevations and cut sheets.

10.2 The CONTRACTOR shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

10.3 Permits and licenses of a temporary nature necessary for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise stated in the SUPPLEMENTAL GENERAL CONDITIONS. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the OWNER, unless otherwise specified. The CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the WORK as drawn and specified. If the CONTRACTOR

observes that the CONTRACT DOCUMENTS are at variance therewith, he shall promptly notify the ENGINEER in writing, and any necessary changes shall be adjusted as provided in Section 13. CHANGES IN THE WORK.

11. PROTECTION OF WORK, PROPERTY AND PERSONS

11.1 The CONTRACTOR will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the WORK and other persons who may be affected thereby, all the WORK and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

11.2 The CONTRACTOR will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He will erect and maintain, as required by the conditions and progress of the WORK, all necessary safeguards for safety and protection. He will notify owners of adjacent utilities when prosecution of the WORK may affect them. The CONTRACTOR will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the CONTRACTOR, any SUBCONTRACTOR or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or to the acts or omissions of the OWNER or the ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.

11.3 In emergencies affecting the safety of persons, or the WORK or property at the site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the ENGINEER or OWNER, shall act to prevent threatened damage, injury or loss. He will give the ENGINEER prompt WRITTEN NOTICE of any significant changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall thereupon be issued covering the changes and deviations involved.

12. SUPERVISION BY CONTRACTOR

12.1 The CONTRACTOR will supervise and direct the WORK. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The CONTRACTOR will employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by the CONTRACTOR as the CONTRACTOR'S representative at the site. The supervisor shall have full authority to act on behalf of the CONTRACTOR and all communications given to the supervisor shall be as binding as if given to the CONTRACTOR. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the WORK.

13. CHANGES IN THE WORK

13.1 The OWNER may at any time, as the need arises,

order changes within the scope of the WORK without invalidating the Agreement. If such changes increase or decrease the amount due under the CONTRACT DOCUMENTS, or in the time required for performance of the WORK, an equitable adjustment shall be authorized by CHANGE ORDER.

13.2 The ENGINEER, also, may at any time, by issuing a FIELD ORDER, make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the ENGINEER unless the CONTRACTOR believes that such FIELD ORDER entitles him to a change in CONTRACT PRICE or TIME, or both, in which event he shall give the ENGINEER WRITTEN NOTICE thereof within seven (7) days after the receipt of the ordered change. Thereafter the CONTRACTOR shall document the basis for the change in CONTRACT PRICE or TIME within thirty (30) days. The CONTRACTOR shall not execute such changes pending the receipt of an executed CHANGE ORDER or further instruction from the OWNER.

14. CHANGES IN CONTRACT PRICE

14.1 The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of precedence listed below:

(a) Unit prices previously approved.

(b) An agreed lump sum.

(c) The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the work. In addition there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual cost of the WORK to cover the cost of general overhead and profit.

15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

15.1 The date of beginning and the time for completion of the WORK are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on a date specified in the NOTICE TO PROCEED.

15.2 The CONTRACTOR will proceed with the WORK at such rate of progress to insure full completion within the CONTRACT TIME. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the CONTRACT TIME for the completion of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.

15.3 If the CONTRACTOR shall fail to complete the WORK within the CONTRACT TIME, or extension of time granted by the OWNER, then the CONTRACTOR will pay to the OWNER the amount for liquidated damages as specified in the BID for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT DOCUMENTS.

15.4 The CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the WORK is due to the following, and the CONTRACTOR has promptly given WRITTEN NOTICE of such delay to the OWNER or ENGINEER.

15.4.1 To any preference, priority or allocation

order duly issued by the OWNER.

15.4.2 To unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God, or of the public enemy, acts of the OWNER, acts of another CONTRACTOR in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and

15.4.3 To any delays of SUBCONTRACTORS occasioned by any of the causes specified in paragraphs 15.4.1 and 15.4.2 of this article.

16. CORRECTION OF WORK

16.1 The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and re-execute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the OWNER and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.

16.2 All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.

17. SUBSURFACE CONDITIONS

17.1 The CONTRACTOR shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the OWNER by WRITTEN NOTICE of:

17.1.1 Subsurface or latent physical conditions at the site differing materially from those indicated in the CONTRACT DOCUMENTS; or

17.1.2 Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.

17.2 The OWNER shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK, an equitable adjustment shall be made and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER. Any claim of the CONTRACTOR for adjustment hereunder shall not be allowed unless he has given the required WRITTEN NOTICE; provided that the OWNER may, if he determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

18. SUSPENSION OF WORK, TERMINATION AND DELAY

18.1 The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety days or such further time as agreed upon by the CONTRACTOR, by WRITTEN NOTICE to the CONTRACTOR and the ENGINEER which notice shall fix the date on which WORK shall be resumed. The CONTRACTOR

will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.

18.2 If the CONTRACTOR is adjudged a bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the CONTRACTOR or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials or equipment or if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the WORK or if he disregards the authority of the ENGINEER, or if he otherwise violates any provision of the CONTRACT DOCUMENTS, then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and his surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take possession of the PROJECT and of all materials, equipment, tools, construction equipment and machinery thereon owned by the CONTRACTOR, and finish the WORK by whatever method he may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the OWNER. Such costs incurred by the OWNER will be determined by the ENGINEER and incorporated in a CHANGE ORDER.

18.3 Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.

18.4 After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR and the ENGINEER, the OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the Contract. In such case, the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit.

18.5 If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to act on any request for payment within thirty (30) days after it is submitted, or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER or awarded by arbitrators within thirty (30) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER and the ENGINEER, terminate the CONTRACT and recover from the OWNER payment for all WORK exe-

cated and all expenses sustained. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days written notice to the OWNER and the ENGINEER stop the WORK until he has been paid all amounts then due, in which event and upon resumption of the WORK, CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK.

18.6 If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.

19. PAYMENTS TO CONTRACTOR

19.1 At least ten (10) days before each progress payment falls due (but not more often than once a month), the CONTRACTOR will submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER's title to the material and equipment and protect his interest therein, including applicable insurance. The ENGINEER will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTOR indicating in writing his reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The OWNER will, within ten (10) days of presentation to him of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the approved partial payment estimate. The OWNER shall retain ten (10) percent of the amount of each payment until final completion and acceptance of all work covered by the CONTRACT DOCUMENTS. The OWNER at any time, however, after fifty (50) percent of the WORK has been completed, if he finds that satisfactory progress is being made, shall reduce retainage to five (5%) percent on the current and remaining estimates. When the WORK is substantially complete (operational or beneficial occupancy), the retained amount may be further reduced below five (5) percent to only that amount necessary to assure completion. On completion and acceptance of a part of the WORK on which the price is stated separately in the CONTRACT DOCUMENTS, payment may be made in full, including retained percentages, less authorized deductions.

19.2 The request for payment may also include an allowance for the cost of such major materials and

equipment which are suitably stored either at or near the site.

19.3 Prior to SUBSTANTIAL COMPLETION, the OWNER, with the approval of the ENGINEER and with the concurrence of the CONTRACTOR, may use any completed or substantially completed portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.

19.4 The OWNER shall have the right to enter the premises for the purpose of doing work not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.

19.5 Upon completion and acceptance of the WORK, the ENGINEER shall issue a certificate attached to the final payment request that the WORK has been accepted by him under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK.

19.6 The CONTRACTOR will indemnify and save the OWNER or the OWNER'S agents harmless from all claims growing out of the lawful demands of SUBCONTRACTORS, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the WORK. The CONTRACTOR shall, at the OWNER'S request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the CONTRACTOR fails to do so the OWNER may, after having notified the CONTRACTOR, either pay unpaid bills or withhold from the CONTRACTOR'S unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the CONTRACTOR shall be resumed, in accordance with the terms of the CONTRACT DOCUMENTS, but in no event shall the provisions of this sentence be construed to impose any obligations upon the OWNER to either the CONTRACTOR, his Surety, or any third party. In paying any unpaid bills of the CONTRACTOR, any payment so made by the OWNER shall be considered as a payment made under the CONTRACT DOCUMENTS by the OWNER to the CONTRACTOR and the OWNER shall not be liable to the CONTRACTOR for any such payments made in good faith.

19.7 If the OWNER fails to make payment thirty (30) days after approval by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the CONTRACTOR.

20. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

20.1 The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK. Any payment, however, final or otherwise, shall not release the CONTRACTOR or his sureties from any obligations under the CONTRACT DOCUMENTS or the Performance BOND and Payment BONDS.

21. INSURANCE

21.1 The CONTRACTOR shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the CONTRACTOR'S execution of the WORK, whether such execution be by himself or by any SUBCONTRACTOR or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

21.1.1 Claims under workmen's compensation, disability benefit and other similar employee benefit acts;

21.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;

21.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;

21.1.4 Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person; and

21.1.5 Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

21.2 Certificates of Insurance acceptable to the OWNER shall be filed with the OWNER prior to commencement of the WORK. These Certificates shall contain a provision that coverages afforded under the policies will not be cancelled unless at least fifteen (15) days prior WRITTEN NOTICE has been given to the OWNER.

21.3 The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, liability insurance as hereinafter specified:

21.3.1 CONTRACTOR'S General Public Liability and Property Damage Insurance including vehicle coverage issued to the CONTRACTOR and protecting him from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any

operations under the CONTRACT DOCUMENTS, whether such operations be by himself or by any SUBCONTRACTOR under him, or anyone directly or indirectly employed by the CONTRACTOR or by a SUBCONTRACTOR under him. Insurance shall be written with a limit of liability of not less than \$500,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than \$500,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than \$200,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than \$200,000 aggregate for any such damage sustained by two or more persons in any one accident.

21.3.2 The CONTRACTOR shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the PROJECT to the full insurable value thereof for the benefit of the OWNER, the CONTRACTOR, and SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.

21.4 The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, in accordance with the provisions of the laws of the state in which the work is performed, Workmen's Compensation Insurance, including occupational disease provisions, for all of his employees at the site of the PROJECT and in case any work is sublet, the CONTRACTOR shall require such SUBCONTRACTOR similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous work under this contract at the site of the PROJECT is not protected under Workmen's Compensation statute, the CONTRACTOR shall provide, and shall cause each SUBCONTRACTOR to provide, adequate and suitable insurance for the protection of his employees not otherwise protected.

21.5 The CONTRACTOR shall secure, if applicable, "All Risk" type Builder's Risk Insurance for WORK to be performed. Unless specifically authorized by the OWNER, the amount of such insurance shall not be less than the CONTRACT PRICE totaled in the BID. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft, and smoke during the CONTRACT TIME, and until the WORK is accepted by the OWNER. The policy shall name as the insured the CONTRACTOR, the ENGINEER, and the OWNER.

22. CONTRACT SECURITY

22.1 The CONTRACTOR shall within ten (10) days after the receipt of the NOTICE OF AWARD furnish the OWNER with a Performance Bond and a Payment Bond in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by

the CONTRACTOR of all undertakings, covenants, terms, conditions and agreements of the CONTRACT DOCUMENTS, and upon the prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the CONTRACT DOCUMENTS. Such BONDS shall be executed by the CONTRACTOR and a corporate bonding company licensed to transact such business in the state in which the WORK is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these BONDS shall be borne by the CONTRACTOR. If at any time a surety on any such BOND is declared a bankrupt or loses its right to do business in the state in which the WORK is to be performed or is removed from the list of Surety Companies accepted on Federal BONDS, CONTRACTOR shall within ten (10) days after notice from the OWNER to do so, substitute an acceptable BOND (or BONDS) in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such BOND shall be paid by the CONTRACTOR. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable BOND to the OWNER.

23. ASSIGNMENTS

23.1 Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of his right, title or interest therein, or his obligations thereunder, without written consent of the other party.

24. INDEMNIFICATION

24.1 The CONTRACTOR will indemnify and hold harmless the OWNER and the ENGINEER and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the WORK, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

24.2 In any and all claims against the OWNER or the ENGINEER, or any of their agents or employees, by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.

24.3 The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, his agents or employees arising out of the preparation or approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, designs or SPECIFICATIONS.

25. SEPARATE CONTRACTS

25.1 The OWNER reserves the right to let other con-

tracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the introduction and storage of their materials and the execution of their WORK, and shall properly connect and coordinate his WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other CONTRACTOR, the CONTRACTOR shall inspect and promptly report to the ENGINEER any defects in such WORK that render it unsuitable for such proper execution and results.

25.2 The OWNER may perform additional WORK related to the PROJECT by himself, or he may let other contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are parties to such Contracts (or the OWNER, if he is performing the additional WORK himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of WORK, and shall properly connect and coordinate his WORK with theirs.

25.3 If the performance of additional WORK by other CONTRACTORS or the OWNER is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, written notice thereof shall be given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or others involves him in additional expense or entitles him to an extension of the CONTRACT TIME, he may make a claim therefor as provided in Sections 14 and 15.

26. SUBCONTRACTING

26.1 The CONTRACTOR may utilize the services of specialty SUBCONTRACTORS on those parts of the WORK which, under normal contracting practices, are performed by specialty SUBCONTRACTORS.

26.2 The CONTRACTOR shall not award WORK to SUBCONTRACTOR(s), in excess of fifty (50%) percent of the CONTRACT PRICE, without prior written approval of the OWNER.

26.3 The CONTRACTOR shall be fully responsible to the OWNER for the acts and omissions of his SPECIAL CONTRACTORS, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

26.4 The CONTRACTOR shall cause appropriate provisions to be inserted in all subcontracts relative to the WORK to bind SUBCONTRACTORS to the CONTRACTOR by the terms of the CONTRACT DOCUMENTS insofar as applicable to the WORK of SUBCONTRACTORS and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under any provision of the CONTRACT DOCUMENTS.

26.5 Nothing contained in this CONTRACT shall create any contractual relation between any SUBCONTRACTOR and the OWNER.

27. ENGINEER'S AUTHORITY

27.1 The ENGINEER shall act as the OWNER'S representative during the construction period. He shall decide questions which may arise as to quality and acceptability of materials furnished and WORK performed. He shall interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The

ENGINEER will make visits to the site and determine if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.

27.2 The CONTRACTOR will be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship and execution of the WORK. Inspections may be made at the factory or fabrication plant of the source of material supply.

27.3 The ENGINEER will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

27.4 The ENGINEER shall promptly make decisions relative to interpretation of the CONTRACT DOCUMENTS.

28. LAND AND RIGHTS-OF-WAY

28.1 Prior to issuance of NOTICE TO PROCEED, the OWNER shall obtain all land and rights-of-way necessary for carrying out and for the completion of the WORK to be performed pursuant to the CONTRACT DOCUMENTS, unless otherwise mutually agreed.

28.2 The OWNER shall provide to the CONTRACTOR information which delineates and describes the lands owned and rights-of-way acquired.

28.3 The CONTRACTOR shall provide at his own expense and without liability to the OWNER any additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

29. GUARANTY

29.1 The CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of SUBSTANTIAL COMPLETION. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of SUBSTANTIAL COMPLETION of the system that the completed system is free from all defects due to faulty materials or workmanship and the CONTRACTOR shall promptly make such corrections as may be

necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. The OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments, or other WORK that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. The Performance BOND shall remain in full force and effect through the guarantee period.

30. ARBITRATION

30.1 All claims, disputes and other matters in question arising out of, or relating to, the CONTRACT DOCUMENTS or the breach thereof, except for claims which have been waived by the making and acceptance of final payment as provided by Section 20, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.

30.2 Notice of the demand for arbitration shall be filed in writing with the other party to the CONTRACT DOCUMENTS and with the American Arbitration Association, and a copy shall be filed with the ENGINEER. Demand for arbitration shall in no event be made on any claim, dispute or other matter in question which would be barred by the applicable statute of limitations.

30.3 The CONTRACTOR will carry on the WORK and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

31. TAXES

31.1 The CONTRACTOR will pay all sales, consumer, use and other similar taxes required by the law of the place where the WORK is performed.

**SUPPLEMENTAL
GENERAL CONDITIONS**

JUNE 1978



**U.S. DEPARTMENT OF COMMERCE
Economic Development Administration**

SUPPLEMENTAL GENERAL CONDITIONS

These Supplemental General Conditions are intended for use by Economic Development Administration Grantees. They contain specific EDA and other Federal requirements not normally found in non Federal contract documents. The requirements contained herein must be incorporated into all construction contracts and subcontracts funded wholly or in part with EDA funds.

SUPPLEMENTAL GENERAL CONDITIONS

S-1

DEFINITIONS

The following terms as used in these Supplemental General Conditions are respectively defined as follows:

- a. "Contractor": A person, firm, or corporation with whom this Contract is made by the Owner.
- b. "Subcontractor": A person, firm, or corporation supplying labor and materials or only labor, for work at the site of the project, for and under separate contract or agreement with the Contractor.
- c. "Work on (at) the project": Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the Contractor and any subcontractor.
- d. "Apprentice": (1) A person employed and individually registered in a bona fide apprenticeship program registered with the U. S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau; or (2) a person in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship council (where appropriate) to be eligible for probationary employment as an apprentice.
- e. "Trainee": A person receiving on-the-job training in a construction occupation under a program which is approved (but not necessarily sponsored) by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training, and which is reviewed from time to time by the Manpower Administration to insure that the training meets adequate standards.

S-2 REQUIRED PROVISIONS DEEMED INSERTED

Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and the contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party the contract shall forthwith be physically amended to make such insertion of correction.

S-3 INSPECTION BY ECONOMIC DEVELOPMENT REPRESENTATIVES

The authorized representatives and agents of the Economic Development Administration shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials and other relevant data and records.

S-4 CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES

Immediately after execution and delivery of the contract, and before the first partial payment is made, the Contractor shall deliver to the Owner an estimated construction progress schedule in form satisfactory to the Owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the progress schedule. The Contractor also shall furnish the Owner (a) a detailed estimate giving a complete breakdown of the contract price and (b) periodic itemized estimates of work done for the purpose of making partial payments thereon. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

S-5 CONTRACTOR'S TITLE TO MATERIAL

No materials or supplies for the work shall be purchased by the Contractor or by any subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The Contractor warrants that he/she has good title to all materials and supplies used by him/her in the work, free from all liens, claims or encumbrances.

S-6

INSPECTION AND TESTING OF MATERIALS

All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Owner. The Owner shall pay for all laboratory inspection service direct, and not as a part of the contract.

Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to establish conformance with specifications and suitability for intended users.

S-7

"OR EQUAL" CLAUSE

Whenever a material, article or piece of equipment is identified on the Plans or in the Specifications by reference to manufacturers' or vendors' names, tradenames, catalogue numbers, etc., it is intended merely to establish a standard; and, any material, article or equipment of other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article or equipment so proposed is, in the opinion of the Architect/Engineer, of equal substance and function. It shall not be purchased or installed by the Contractor without the Architect/Engineer's written approval.

S-8

PATENTS

The Contractor shall hold and save the Owner and its officers, agents, servants and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article or appliance manufactured or used in the performance of the contract, including its use by the Owner, unless otherwise specifically stipulated in the contract documents.

License or Royalty Fee: License and/or Royalty Fees for the use of a process which is authorized by the Owner of the project must be reasonable, and paid to the holder of the patent, or his authorized licensee, direct by the Owner and not by or through the Contractor. If the Contractor uses any design, device or materials covered by letters, patent or copyright, he/she shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device or material. It is mutually agreed and understood that, without exception, the contract prices shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The Contractor and/or his/her Sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract, and shall indemnify the Owner for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

S-9 CLAIMS FOR EXTRA COSTS

No claim for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Architect/Engineer approved by the Owner.

S-10 CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE

The Contractor shall not commence work under this contract until he/she has obtained all the insurance required under this paragraph and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his/her subcontract until the insurance required of the subcontractor has been so obtained and approved.

- a. Compensation Insurance The Contractor shall procure and shall maintain during the life of this contract Workmen's Compensation Insurance as required by applicable State or Territorial law for all of his/her employees to be engaged in work at the site of the project under this contract and, in case of any such work sublet, the Contractor

shall require the subcontractor similarly to provide Workmen's Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor's Workmen's Compensation Insurance. In the case where any class of employees engages in hazardous work on the project under this contract and is not protected under the Workmen's Compensation Statute, the Contractor shall provide and shall cause each subcontractor to provide adequate employer's liability insurance for the protection of such of his/her employees as are not otherwise protected.

- b. Contractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance The Contractor shall procure and shall maintain during the life of this contract: Contractor's Public Liability Insurance, Contractor's Property Damage Insurance and Vehicle Liability Insurance in the amount of not less than \$200,000 for Bodily Injury, including accidental death, to any one person and an amount not less than \$500,000 on account of any one occurrence; Property Damage in an amount not less than \$100,000 per occurrence and \$200,000 aggregate; and Vehicular Liability of \$100,000 for any one person or \$200,000 for each occurrence.
- c. Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance The Contractor shall either (1) require each of his/her subcontractors to procure and to maintain during the life of his/her subcontract, Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified in subparagraph b. above or, (2) insure the activities of his/her subcontractors in his/her policy specified in Subparagraph b. above.
- d. Scope of Insurance and Special Hazards The insurance required under Subparagraphs b. and c. above shall provide adequate protection for the Contractor and his/her subcontractors, respectively, against damage claims which may arise from operations under this contract, whether such operations be by the insured or by any one directly or indirectly employed by him/her and also against any of the special hazards which may be encountered in the performance of this contract.

- e. Builder's Risk Insurance (Fire and Extended Coverage) Unless otherwise provided by the Owner, the Contractor shall procure and shall maintain during the life of this contract Builder's Risk Insurance (Fire and Extended Coverage) on a 100 percent (100%) completed value basis on the insurable portion of the project. The Owner, the Contractor, and subcontractors (as their interests may appear), shall be named as the Insured.
- f. Proof of Carriage of Insurance The Contractor shall furnish the Owner with certificates showing the type, amount, class of operations covered, effective dates and dates of expiration of policies. Such certificates shall also contain substantially the following statement: "The insurance covered by this certificate will not be cancelled or materially altered, except after ten (10) days written notice has been received by the Owner."

S-11

CONTRACT SECURITY

The Contractor shall furnish a performance bond in an amount at least equal to one hundred percent (100%) of the contract price as security for the faithful performance of this contract and also a payment bond in an amount equal to one hundred percent (100%) of the contract price or in a penal sum not less than that prescribed by State, Territorial or local law, as security for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract. The performance bond and the payment bond may be in one or in separate instruments in accordance with local law. Before final acceptance each bond must be approved by the Economic Development Administration.

S-12

CERTIFICATION OF NONSEGREGATED FACILITIES

- a. A certification of nonsegregated facilities as required by 41CFR 60-1.8, must be submitted prior to the award of federally assisted construction contracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause. (see Form ED-120, Item 3)

- b. Contractors receiving federally assisted construction contract awards exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause shall be required to provide for the forwarding of the following notice to prospective subcontractors for supplies and construction contracts where the subcontracts exceed \$10,000 and are not exempt from the provisions of the Equal Opportunity clause:

Notice to Prospective Subcontractors of
Requirement for Certifications of Nonsegregated
Facilities

- (1) A certification of nonsegregated facilities as required by the 32CFR 7439, May 19, 1967, must be submitted prior to the award of a subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity clause.
- (2) Contractors receiving subcontract awards exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause shall be required to provide for the forwarding of this notice to prospective subcontractors for supplies and construction contracts where the subcontractors exceed \$10,000 and are not exempt from the provision of the Equal Opportunity clause.

S-13

SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

In order to protect the lives and health of his/her employees under the contract, the Contractor shall comply with all pertinent provisions of the Contract Work Hours and Safety Standards Act, as amended, commonly known as the Construction Safety Act as pertains to health and safety standards; and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under the contract.

The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his/her plan, appliances, and methods, and for any damage which may result from their failure or their improper construction, maintenance, or operation.

S-14

MINIMUM WAGES

All mechanics and laborers employed or working on the site of the work, or under the United States Housing Act of 1937, or under the Housing Act of 1949 in the construction or development of the project will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amounts due at time of payment computed at wage rates not less than those contained in the wage determination decision of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and subcontractor and such laborers and mechanics; and the wage determination decision shall be posted by the Contractor at the site of the work in a prominent place where it can be easily seen by the workers. For the purpose of this clause, contributions made or costs reasonably anticipated under Section 1 (b) (2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5 (a) (1) (iv).

Also for the purpose of this clause, regular contributions made or costs incurred for more than a weekly period under plans, funds, or programs, but covering the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

The Owner shall require that any class of laborers and mechanics, including apprentices and trainees, which is not listed in the wage determination and which is to be employed under the contract, shall be classified or reclassified conformable to the wage determination and a report of the action taken shall be sent by the Federal agency to the Secretary of Labor. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers

and mechanics, including apprentices and trainees, to be used, the questions accompanied by the recommendation of the contracting officer shall be referred to the Secretary of Labor for final determination.

Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly wage rate and the Contractor is obligated to pay a cash equivalent of such a fringe benefit, the owner shall require an hourly cash equivalent to be established. In the event the interested parties cannot agree upon a cash equivalent of the fringe benefit, the question, accompanied by the recommendation of the Owner, shall be referred to the Secretary of Labor for determination.

If the Contractor does not make payments to a trustee or other third person, he/she may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing benefits under a plan or program of a type expressly listed in the wage determination decision of the Secretary of Labor which is a part of this contract; provided, however, the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

S-15

WITHHOLDING OF PAYMENTS

The Economic Development Administration may withhold or cause to be withheld from the Contractor as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices and trainees, employed by the Contractor or any subcontractor on the work, the full amount of wages required by the contract in accordance with the Davis-Bacon Act. In the event of failure to pay any laborer or mechanic, including any apprentice or trainee employed or working on the project site or under the United States Housing Act of 1937 or under the Housing Act of 1949, in the construction or development of the project, all or part of the wages required by the contract, the Economic Development Administration may, after written notice to the Contractor, sponsor, applicant, or Owner, take

action as may be necessary to cause the suspension of any further payment, advance, or guaranty of funds until such violations have ceased.

S-16

PAYROLLS AND BASIC RECORDS

Payrolls and basic records relating thereto will be maintained during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the EDA project site, or under the United States Housing Act of 1937 or under the Housing Act of 1949, in the construction or development of the project. Such records shall contain the name and address of each employee, his/her correct classification, rate of pay (including contributions or costs anticipated of the types described in Section 9 (b) (2) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5 (a) (1) (iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan program described in Section 1 (b) (2) (B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, plus records which show the costs anticipated or the actual cost incurred in providing such benefits.

The Contractor shall submit weekly a copy of all payrolls to the Owner on DOL Form WH-347 or equivalent. The copy shall be signed on the reverse side by the employer or his/her agent indicating that the payrolls are correct and complete, that the wage rates contained therein are not less than those determined by the Secretary of Labor and that the classifications set forth for each laborer or mechanic conform with the work he/she performed. This submission is required under this contract and the Copeland regulations of the Secretary of Labor (29 CFR Part 3) and the filing with the initial payroll or any subsequent payroll of a copy of any findings by the Secretary of Labor under 20 CFR 5.5 (a) (1) (iv) shall satisfy this

requirement. The Prime Contractor shall be responsible for the submission of copies of payrolls of all subcontractors. The Contractor shall make the records required under the labor standards clause of the contract available for inspection by authorized representatives of the Economic Development Administration and the Department of Labor, and shall permit such representatives to interview employees during working hours on the job.

S-17

APPRENTICES AND TRAINEES

Apprentices will be permitted to work as such only when they are registered, individually, under a bona fide apprenticeship program registered with a State apprenticeship agency which is recognized by the Bureau of Apprenticeship and Training, U. S. Department of Labor; or, if no such recognized agency exists in a State, under a program registered with the Bureau of Apprenticeship and Training, U. S. Department of Labor. The allowable ratio of apprentices to journeymen in any craft classification shall not be greater than the ratio permitted to the Contractor as to his/her entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not a trainee as defined in Section S-1e herein and is not registered as above, shall be paid the wage rate determined by the Secretary of Labor for the classification of work he actually performed. The Contractor or subcontractor shall be required to furnish to the Owner written evidence of the registration of his/her program and apprentices as well as of the appropriate ratios and wage rates, for the area of construction prior to using any apprentices on the contract work.

Trainees will be permitted to work as such when they are bona fide trainees employed pursuant to a program approved by the U. S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training, and when the subparagraph below is applicable, in accordance with the provisions of Part 5, Subpart A, Title 29, Code of Federal Regulations.

On contracts in excess of \$10,000, the employment of all laborers and mechanics, including apprentices and trainees, as defined in Section 29 CFR 5.5 shall also be subject to the provisions of Part 5, Subpart A, Title 29, Code of Federal Regulations. Apprentices and trainees shall be hired in accordance with the requirements of Part 5, Subpart A.

The provisions of Sections S-14, S-15, and S-17 shall be applicable to every invitation for bids, and to every negotiation, request for proposals, or request for quotations, for an assisted construction contract, and to every such contract entered into on the basis of such invitation or negotiation. Part 5, Subpart A, Title 29, Code of Federal Regulations shall constitute the conditions of each assisted contract in excess of \$10,000, and each Owner concerned shall include these conditions or provide for their inclusion, in each such contract. These "Supplemental General Conditions" shall also be included in each such contract.

S-18 COPELAND "ANTI-KICKBACK" PROVISIONS

The Contractor shall comply with the Copeland Regulations (29 CFR Part 3) of the Secretary of Labor which are herein incorporated by reference.

S-19 SUBCONTRACTS

The Contractor shall insert in any subcontracts these same "Supplemental General Conditions".

S-20 TERMINATION AND DEBARMENT

A breach of any one of the Sections S-15 through S-19 may be considered by the Owner and by the Economic Development Administration as grounds for termination of the contract and for debarment as provided in 29 CFR 5.6.

S-21 OVERTIME REQUIREMENTS

No Contractor nor any subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any laborer or mechanic in any workweek in which he/she is employed on such work to work in excess of eight hours in any calendar day or in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his/her basic rate of pay for all hours in excess of eight hours in any calendar day or in excess of forty hours in such workweek, as the case may be.

In the event of any violation of the clause set forth in the subsection above, the Contractor and any subcontractor responsible therefor, shall be liable to any affected employee for his/her unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violation of the clause set forth above in the sum of \$10.00 for each calendar day on which such employee was required or permitted to work in excess of eight hours or in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth above.

The Economic Development Administration may withhold or cause to be withheld, from any monies payable on account of work performed by the Contractor or subcontractor, such sums as may administratively be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth above.

The Contractor shall insert in all subcontracts the clause set forth above in this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made.

S-22

EQUAL EMPLOYMENT OPPORTUNITY

No person in the United States shall, on the grounds of race, color, national origin, or sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance; Reference Title VI of the Civil Rights Act of 1964 (42 USC 2000d) and Section 112 of Public Law 92-65.

Form ED-503 The Owner and all Contractors, subcontractors, suppliers, lessees and other parties directly participating in the Recipient's project agree that during and in connection with the associated agreement relating to the federally assisted program, (i) they will comply, to the extent applicable, as Contractors, subcontractors, lessees, suppliers, or in any other capacity, with the applicable provisions of 13 CFR 311 and the Regulations of the United States Department of Commerce (Part 8 of Subtitle A of Title 15 of the Code of Federal Regulations) issued pursuant to Title VI of the Civil Rights Act of 1964 (P. L. 88-352), and will not thereby discriminate against any person on the grounds of race, sex, color, or national origin in their employment practices, in any of their own contractual arrangements, in all services or accommodations which they offer to the public, and in any of their other business operations, (ii) they will provide information required by or pursuant to said Regulations to ascertain compliance with the Regulations and these assurances, and (iii) their non-compliance with the nondiscrimination requirements of said Regulations and these assurances shall constitute a breach of their contractual arrangements with the Owner whereby said agreements may be cancelled, terminated or suspended in whole or in part or may be subject to enforcement otherwise by appropriate legal proceedings.

Executive Order 11246, 3CFR 339 (1965) (Equal Opportunity Clause). During the performance of this contract, the Contractor agrees as follows:

- a. The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor shall take affirmative action to ensure the applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

- b. The Contractor agrees to post in conspicuous places available to employees and applicants for employment, notices to be provided by the Grantee/Borrower setting forth the provisions of this nondiscrimination clause.
- c. The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants shall receive consideration for employment without regard to race, color, religion, sex, or national origin.
- d. A notice to be provided by the Grantee/Borrower shall be sent to each labor union or representative of workers with which he/she has a collective bargaining agreement or other contract of understanding, advising the labor union or workers' representative of the Contractor's commitment under Section 202 of Executive Order No. 11246 of September 24, 1965, and copies of the notice shall be posted in conspicuous places available to employees and applicants for employment.
- e. The Contractor shall comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of rules, regulations, and relevant orders of the Secretary of Labor.
- f. The Contractor shall furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his/her books, records, and accounts by the Economic Development Administration and the Secretary of Labor for purpose of investigation to ascertain compliance with such rules, regulations, and orders. Each Contractor and subcontractor of federally financed construction work is required to file an Equal Employment Opportunity Employer Information Report (EEO-1) on Standard Form 100, annually on March 31. Forms and instructions are available at the EDA Regional Offices.

- g. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any such rules, regulation, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, and such other sanctions may be imposed (and remedies involved) as provided in Executive Order No. 11245 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- h. The Contractor shall include the provisions of paragraphs a. through g. in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 203 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor shall take such action with respect to any subcontractor or purchase order as the Economic Development Administration may direct as a means of enforcing such provisions including sanctions for noncompliance; provided, however, that in the event the Contractor becomes involved in, or is threatened with litigation with a subcontractor or vendor as a result of such direction by the Grantee/Borrower, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.
- i. Exemptions to Above Equal Opportunity Clause (41 CFR Chap. 60):
- (1) Contracts and subcontracts not exceeding \$10,000 (other than Government bills of lading) are exempt. The amount of the contract, rather than the amount of the Federal financial assistance, shall govern in determining the applicability of this exemption.
 - (2) Except in the case of subcontractors for the performance of construction work at the site of construction, the clause shall not be required to be inserted in subcontracts below the second tier.
 - (3) Contracts and subcontracts not exceeding \$10,000 for standard commercial supplies or raw materials are exempt.

STANDARD FEDERAL EQUAL EMPLOYMENT
OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS
(EXECUTIVE ORDER 11246 et seq)

1. As used in these specifications:
 - a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
 - b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
 - c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U. S. Treasury Department Form 941.
 - d. "Minority" includes:
 - (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
 - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands);
 - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
2. Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or subcontractor's failure to make good faith efforts to achieve the Plan goals and timetables.
4. The Contractor shall implement the specific affirmative action standards provided in Paragraphs 7a through p of these specifications. The goals set for the Contractor in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to take substantially uniform progress toward its goals in each craft during the period specified.
5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
- a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all superintendents and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
 - b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
 - c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.
 - d. Provide immediate written notification to the Regional Director when the union or unions, with which the Contractor has a collective bargaining agreement, have not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

- e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under Paragraph 7b above.
- f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents, Supervisors, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
- h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, and providing written notification to, and discussing the Contractor's EEO policy with, other Contractors and subcontractors with whom the Contractor anticipates doing business.
- i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and

employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

- j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after-school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.
- k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
- l. Conduct, at least annually, an inventory and evaluation of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
- m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment-related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
- n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
- o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
- p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (Paragraph 7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under Paragraph 7a through p of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's, and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.
9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and nonminority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).
10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
11. The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.
12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts

as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in Paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
14. The Contractor shall designate a responsible official to monitor all employment-related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application or requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).
16. The goals for minority and female participation in each trade will be furnished by the Economic Development Administration of the U. S. Department of Commerce.

S-23

OTHER PROHIBITED INTERESTS

No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part hereof. No officer, employee, architect, attorney, engineer, or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

S-24

EMPLOYMENT OF LOCAL LABOR

The maximum feasible employment of local labor shall be made in the construction of public works and development facility projects receiving direct Federal grants. Accordingly, every Contractor and subcontractor undertaking to do work on any such project which is or reasonably may be done as on-site work, shall employ, in carrying out such contract work, qualified persons who regularly reside in the designated area where such project is to be located, or in the case of Economic Development Centers, qualified persons who regularly reside in the center or in the adjacent or nearby redevelopment areas within the Economic Development District, except:

- a. To the extent that qualified persons regularly residing in the designated area or Economic Development District are not available.
- b. For the reasonable needs of any such Contractor or subcontractor, to employ supervisory or specially experienced individuals necessary to assure an efficient execution of the contract.

- c. For the obligation of any such Contractor or subcontractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that in no event shall the number of non-resident persons employed under this subparagraph exceed twenty percent of the total number of employees employed by such Contractor and his/her subcontractors on such project.

Every such Contractor and subcontractor shall furnish the United States Employment Service Office in the area in which a public works or development facility project is located with a list of all positions for which it may from time to time require laborers, mechanics, and other employees, the estimated numbers of employees required in each classification, and the estimated dates on which such employees will be required.

The Contractor shall give full consideration to all qualified job applicants referred by the local employment service, but is not required to employ any job applicants referred whom the Contractor does not consider qualified to perform the classification of work required.

The payrolls maintained by the Contractor shall contain the following information: The employee's full name, address, and social security number and a notation indicating whether the employee does, or does not, normally reside in the area in which the project is located, or in the case of an Economic Development Center, in such center or in an adjacent or nearby redevelopment area within the Economic Development District, as well as an indication of the ethnic background of each worker.

The Contractor shall include the provisions of this condition in every subcontract for work which is, or reasonably may be, done as on-site work.

SIGNS

The Contractor shall supply, erect, and maintain a project sign (Exhibit I) according to the specifications set forth below:

EDA SITE SIGN SPECIFICATIONS

Size: Sign A: 4' x 8' x 1 7/8" Sign B: 4' x 8' x 3/4"

Materials: Face: Sign A - 1/4" tempered Masonite
Sign B - 3/4" or greater shop sanded
(exterior) plywood (one
side only)

Framing: Sign A - 2" x 4" nominal on four sides and center cross bracing
Sign B - 2" x 4" center cross bracing only

Supports: 4" x 4" x 12' nominal post

Assembly: Sign A: 2" x 4" frame to fit 4' x 8' board with
2" x 4" cross braces - -
Sign B: To be mounted directly to the 4" x 4"
post, with cross bracing

Mounting: Signs A and B are to be mounted to the 4" x 4" post with a 3/8" minimum bolt and nut, four on each side of the sign. Each bolt is to have two washers, one between the sign and the head of the bolt and the other between the post and the nut.

Erection: 4" x 4" posts are to be set three to four feet deep into concrete 12" in diameter.

Paint: Face: Three coats outdoor enamel (sprayed)
Rear: One coat outdoor enamel (sprayed)

Colors: Crimson Red, Stark White and Royal Blue. Specifically, white background; "JOBS" in red; "for your community" in blue; "EDA" logo and "PROVIDED BY EQUAL OPPORTUNITY EMPLOYERS, in partnership with the U. S. DEPARTMENT OF COMMERCE - Economic Development Administration" in black.

Lettering: Silk screen enamels.
Lettering sizes and positioning will be as illustrated.

Project signs will not be erected on public highway rights-of-way.

Location and height of signs will be coordinated with the agency responsible for highway or street safety in the area, if any possibility exists for obstruction to traffic line of sight.

If, at the end of the project, the sign is reusable, it shall be disposed of as directed by the EDA Regional Office.

Whenever EDA Site Sign specifications conflict with State law or local ordinances, the EDA Regional Director may modify such conflicting specifications so as to comply with that State law or local ordinance.

S-26 HISTORICAL AND ARCHEOLOGICAL DATA PRESERVATION ACT
OF 1974

The Contractor agrees to facilitate the preservation and enhancement of structures and objects of historical, architectural or archaeological significance and when such items are found and/or unearthed during the course of project construction, to consult with the State Historic Preservation Officer for recovery of the items. Reference: National Historic Preservation Act of 1966 (80 Stat 915, 16 USC 470) and Executive Order No. 11593 of May 31, 1971.

CLEAN AIR ACT OF 1970, ET SEQ. AND FEDERAL WATER
POLLUTION CONTROL ACT AS AMENDED BY THE CLEAN
WATER ACT OF 1977

The Contractor agrees to comply with Federal clean air and water standards during the performance of this contract and specifically agrees to the following:

- a. The term "facility" means (a) any building, plant, installation, structure, mine, vessel or other floating craft, location or site of operations; (b) owned, leased, or supervised; (c) by the Contractor and the subcontractors; (d) for the construction, supply and service contracts entered into by the Contractor;
- b. that any facility to be utilized in the accomplishment of this contract is not listed on the Environmental Protection Agency's List of Violating Facilities pursuant to 40 CFR, Part 15.20;
- c. that in the event a facility utilized in the accomplishment of this contract becomes listed on the EPA list, this contract may be cancelled, terminated, or suspended in whole or in part;
- d. that it will comply with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Water Pollution Control Act relating to inspection, monitoring, entry, reports, and information, as well as all other requirements specified in Section 114 and Section 308, respectively, and all regulations and guidelines issued thereunder;
- e. that it will promptly notify the Government of the receipt of any notice from the Director, Office of Federal Activities, Environmental Protection Agency, indicating that any facility utilized or to be utilized in the accomplishment of this contract is under consideration for listing on the EPA List of Violating Facilities;

- f. that it will include the provisions of Paragraphs a. through g. in every subcontract or purchase order entered into for the purpose of accomplishing this contract, unless otherwise exempted pursuant to the EPA regulations implementing the Air or Water Acts above (40 CFR, Part 15.5), so that such provisions will be binding on each subcontractor or vendor;
- g. that in the event that the Contractor or the subcontractor for the construction, supply and service contracts entered into for the purpose of accomplishing this contract were exempted from complying with the above requirements under the provisions of 40 CFR, Part 15.5 (a), the exemption shall be nullified should the facility give rise to a criminal conviction (see 40 CFR 15.20) during the accomplishment of this contract. Furthermore, with the nullification of the exemption, the above requirements shall be effective. The Contractor shall notify the Government, as soon as the Contractors' or the subcontractors' facility is listed for having given rise to a criminal conviction noted in 40 CFR, Part 15.20.

S-28

USE OF LEAD-BASED PAINTS ON RESIDENTIAL STRUCTURES

If the work under this contract involves construction or rehabilitation of residential structures, the Contractor shall comply with the Lead-based Paint Poisoning Prevention Act (see 42 U.S.C. 4831). The Contractor shall assure that paint used on the project on applicable surfaces does not contain lead in excess of the percentages set forth in Paragraphs (a) and (b) of this section. In determining compliance with these standards, the lead content of the paint shall be measured on the basis of the total nonvolatile content of the paint or on the basis of an equivalent measure of lead in the dried film of paint already applied.

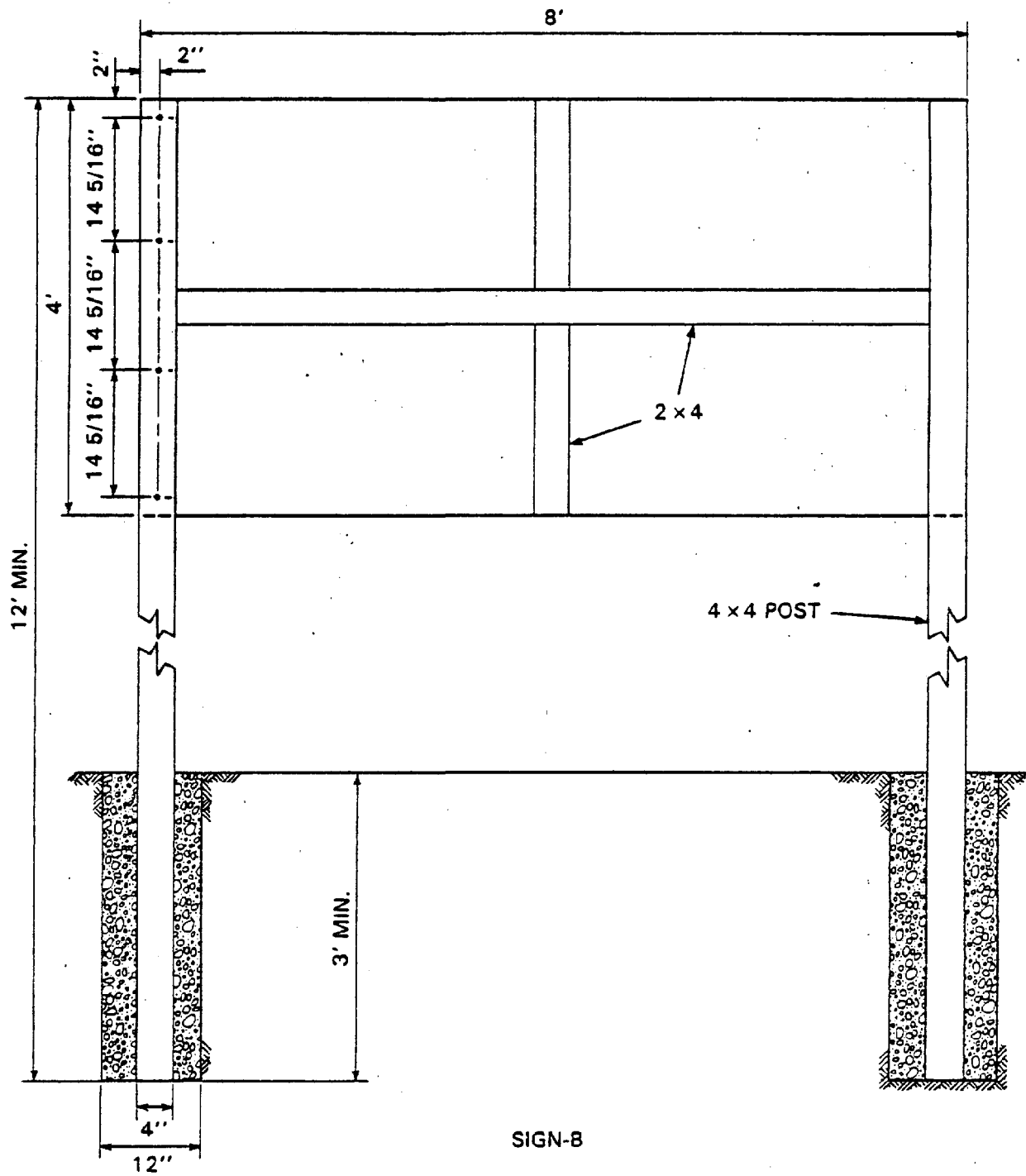
- (a) For paint manufactured after June 22, 1977, paint may not contain lead in excess of 6 one-hundredths of 1 percent (.0006) lead by weight.
- (b) For paint manufactured on or before June 22, 1977, paint may not contain lead in excess of five-tenths of 1 percent lead by weight.

As a condition to receiving assistance under the Act, recipients shall assure that the restriction against the use of lead-based paint is included in all contracts and subcontracts involving the use of Federal funds.

Definitions

- (1) "Applicable surfaces" are those exterior surfaces which are readily accessible to children under 7 years of age.
- (2) "Residential structures" means houses, apartments, or other structures intended for human habitation, including institutional structures where persons reside, which are accessible to children under 7 years of age, such as day care centers, intermediate and extended care facilities, and certain community facilities.

ASSEMBLY OF MASONITE SIGN



SIGN-B

ASSEMBLY OF PLYWOOD SIGN

JOB for your community

PROVIDED BY EQUAL OPPORTUNITY EMPLOYERS

In partnership with the

U.S. DEPARTMENT OF COMMERCE

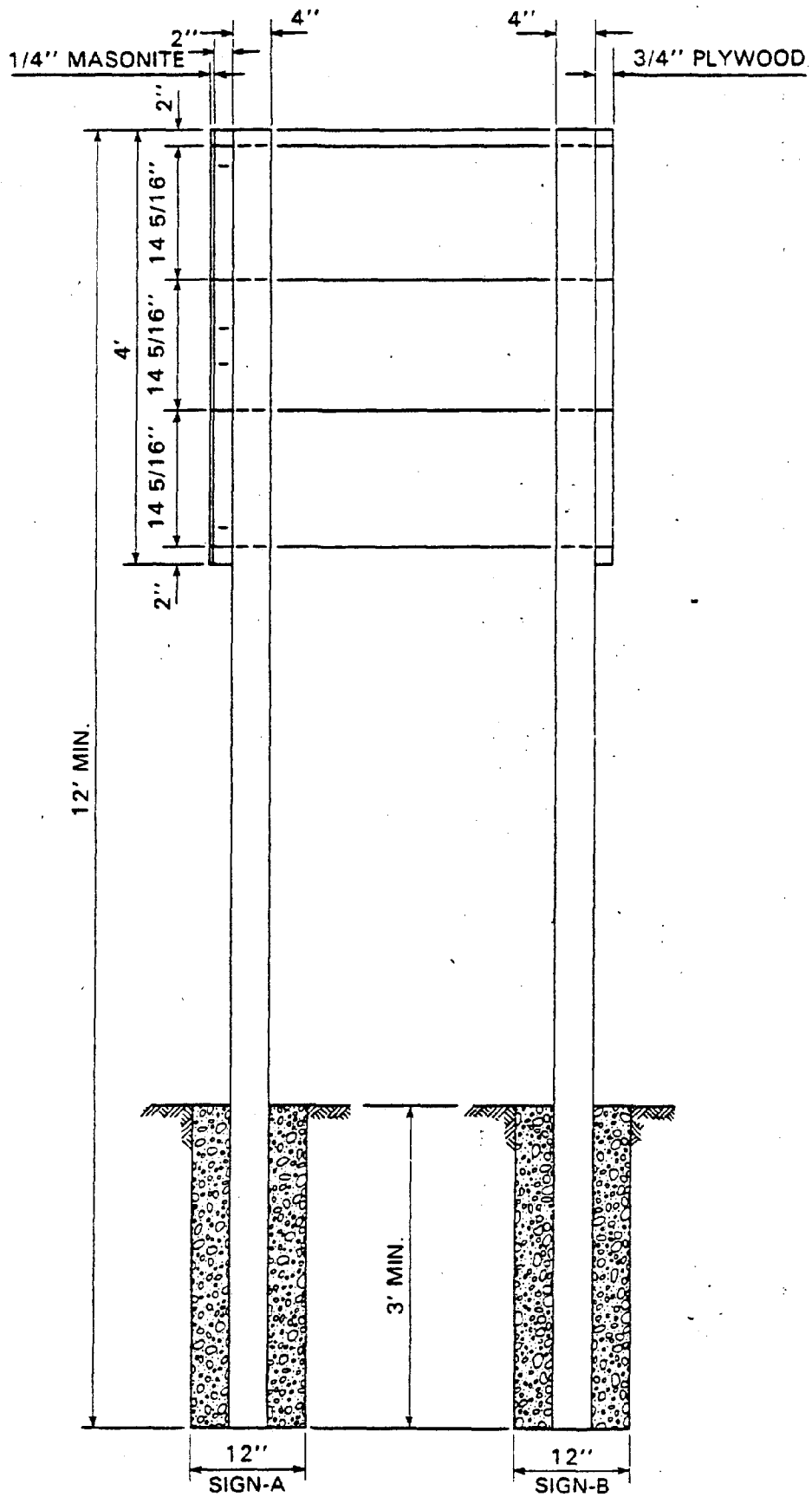
Economic Development Administration

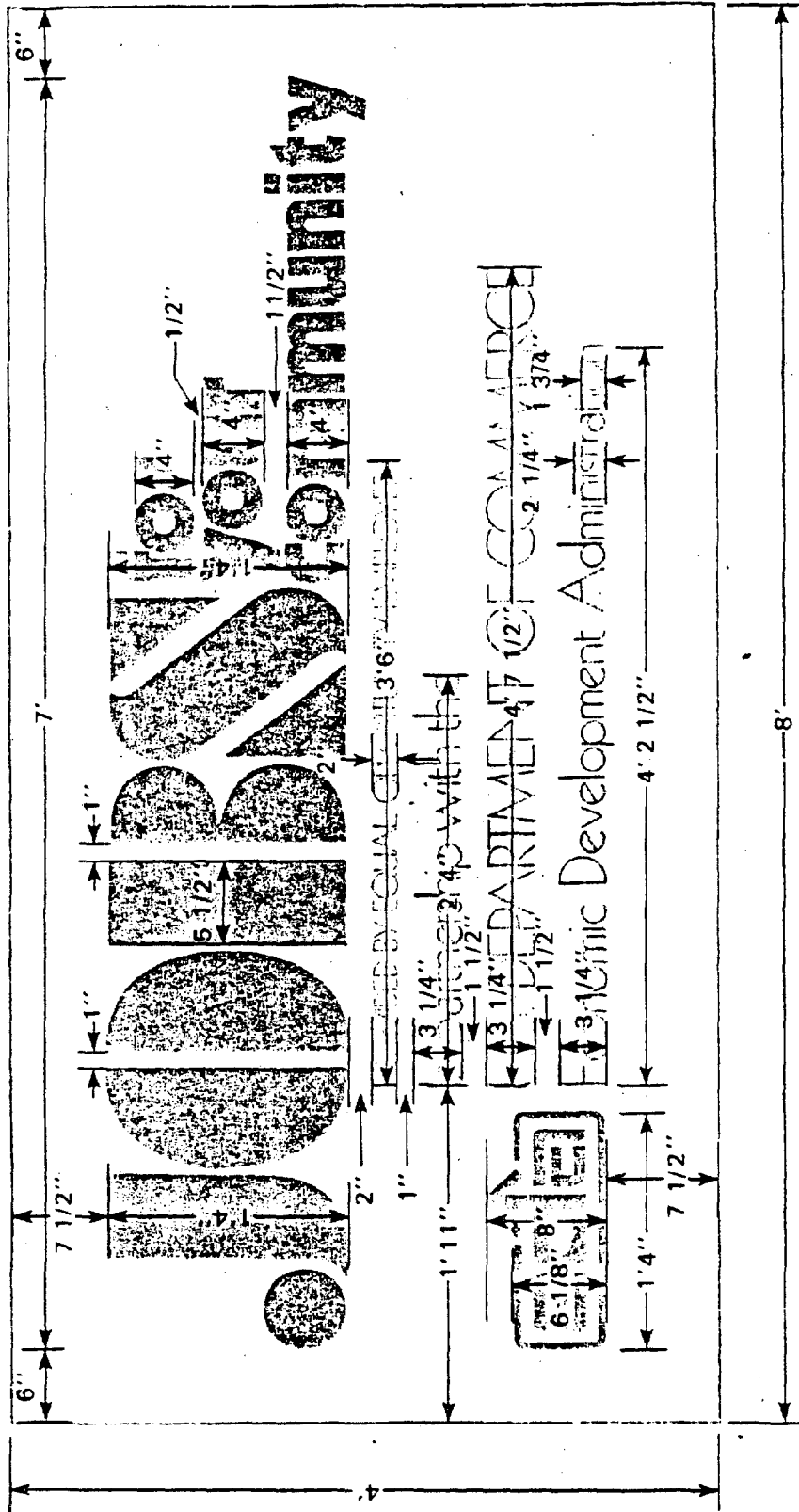


4'

8'

SCALE 1" = 1'





SCALE 1" = 1'

SPECIFICATIONS

DIVISION I -- GENERAL REQUIREMENTS
(SPECIAL CONDITIONS)

01010	Summary of the Work
01020	Mobilization
01100	Alternatives
01200	Progress and Payment
01300	Submittals
01500	Temporary Facilities & Controls

01010 GENERAL

The work covered by these specifications consists of the construction of water supply and treatment facilities and the rehabilitation of portions of the existing water supply system to achieve an operational water supply system for the City of Seldovia.

Major items of work include:

- 1) Mobilization;
- 2) Soil and rock excavation (for tank site and for water lines);
- 3) Backfill to 5' minimum cover for waterlines;
- 4) Installation of approximately 3250 linear feet of ductile iron water main, (less deductive alternate if not awarded) including appurtenances;
- 5) Construction of an approximate capacity 500,000 gallon water storage tank;
- 6) Construction of a chlorination and valve house for the water supply including chlorinator, piping valves, water supply, electric and heating.
- 7) Construction of filter house complete, including the installation of strainers, filters, all piping, vent, wiring, finishing and incidental items;

All in accordance with the contract documents.

01011 PROTECTION AND COOPERATION

The Contractor shall provide devices for the protection of all new construction and materials during the course of construction.

01013 CLEAN-UP

After all other work embraced in the contract is completed and before final acceptance of the work, the Contractor shall clean all construction areas and all structures constructed to

standards considered acceptable for the construction industry and to the complete satisfaction of the Contracting Officer or his duly authorized representative. All excess material and debris shall be removed from the site. Ground surface over trenches shall be restored to original grade and bladed to uniform grades.

01014 MEASUREMENT AND PAYMENT

Full payment to compensate the Contractor for all work required by these plans and specifications is provided for in the Unit Price Schedule. No separate payment will be made for work required by Sections 01011 and 01013 hereinbefore. The performance of the work shall be considered as a subsidiary obligation or is covered under the contract items set forth in the "Bid for Unit Price Contracts".

END OF SECTION 01010

01020 GENERAL

This work shall consist of preparatory work and operations, including, but not limited to those necessary for the movement of personnel, equipment, supplies and incidentals to the project site; for the establishment of all offices, buildings and other facilities necessary for the work on the project, and for all other work and operations which must be performed, or costs incurred, prior to beginning work on the various items on the project site. It shall be understood that the Contractor's fixed expenses (otherwise chargeable to individual items) are compensated for in full under the mobilization item and that no adjustments will be made in the contract prices for other items due to underruns or overruns in quantity.

Fixed expenses shall include the costs involved in preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies and incidentals to the project site; for the establishment of all offices, buildings and other facilities necessary for work on the project.

01021 MEASUREMENT AND PAYMENT

Bid item 100 is the mobilization item, paid for in lump sum and no measurement is required. Payment for mobilization under bid item 100 will be made in Partial Payments as follows:

- 1) When 5 percent of the original contract amount is earned from other bid items, 50 percent of the amount of mobilization, or 7.5 percent of the original contract amount, whichever is lesser, will be paid.
- 2) When 10 percent of the original contract amount is earned from other bid items, 100 percent of the amount for mobilization, or 15 percent of the original contract amount, whichever is lesser, will be paid.
- 3) Upon completion of all work on the project, payment of any amount bid for mobilization in excess of 15 percent of the original contract amount will be paid.

Nothing herein shall be construed to limit or preclude partial payments such as payment for materials delivered on site otherwise provided for in the contract.

END OF SECTION 01020

01100 ALTERNATIVES

Items of equipment are specified by description, by performance or by naming at least one model and manufacturer of equipment of suitable characteristics and/or performance. Regardless of the method of specifying items, the Contractor shall furnish seven copies of complete catalog data for each component in all manufactured items and equipment used in the work, including brand names, catalog number, type, performance data, description, rating, capacity, voltage, amperage, pressures, material, gauges, etc. This submission shall be compiled and submitted by the Contractor and approved by the Engineer before any of the equipment is ordered by the Contractor. After approval, this catalog data shall become a part of the Contract and may not be deviated from except upon specific and written approval of the Engineer. Such approval will not relieve the Contractor from the responsibility for deviation from Drawings or Specifications, unless, at the time of submission, he has called the Engineer's attention to such deviation in writing; nor shall it relieve him from responsibility for errors of any sort in the equipment or components. The Contractor shall check the work described by the catalog data with the contract documents for deviations and errors.

The Engineer shall be the sole judge of whether or not a proposed manufactured item submitted by the Contractor as an alternate to the specified item is acceptable.

It shall be the responsibility of the Contractor to insure that items to be furnished fit the space available and the connections being provided. The Contractor shall make necessary field measurements to ascertain space requirements, including those for connections, and shall order such sizes, shapes and connection arrangements of equipment that the final installation shall suit the true intent and meaning of the Drawings and Specifications. In cases in which connections, anchor bolts, etc., must be modified to conform with the equipment the Contractor proposes to furnish, he shall submit complete drawings of the proposed modification for review and approval of the Engineer. If the Contractor's selection of equipment requires revisions in structural supports, floor loadings, etc., complete design computations shall accompany drawings of the modifications proposed to accommodate the equipment.

It shall be the responsibility of the Contractor to insure that equipment which he proposes to furnish meets the weights, sizes loadings, voltages, or other requirements of equipment specified and in the event that proposed equipment does in any way exceed those requirements, it shall be the responsibility of the Contractor to call this to the Engineer's attention in writing at the time catalog data is submitted for approval.

01101 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor covered under other contract items.

END OF SECTION 01100

01200 PROGRESS AND PAYMENT

The Contractor shall, within 15 days of the date of contract award, furnish the Engineer with a detailed schedule of work, showing time of beginning and completion of all identifiable tasks required to complete the work and a cost breakdown assigning proportions of the contract price to each task.

This schedule shall be subject to approval of the Engineer. Upon the Engineer's approval, this cost breakdown shall become the basis for progress payments during the construction period.

01201 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation, or is covered under other contract items.

END OF SECTION 01200

01300 GENERAL

-1 DESCRIPTION

A. WORK INCLUDED

1. Wherever possible throughout the contract documents the minimum acceptable quality of workmanship and materials has been defined either by manufacturer's name and catalog number or by reference to recognized industry standards.
2. To insure that the specified products are furnished and installed in accordance with design intent, procedures have been established for advance submittal of design data and for its review and approval or rejection by the Engineer.

B. RELATED WORK DESCRIBED ELSEWHERE

- | | |
|--|--|
| 1. Contractual requirement
for submittals: | General Conditions and
Supplemental General
Conditions |
| 2. Individual submittals
required: | Pertinent Sections of
these specifications |

-2 PRODUCT HANDLING

Make all submittals of shop drawings, samples, requests for substitutions, and other items in strict accordance with the provisions of this section of these specifications.

01301 PRODUCTS

-1 SHOP DRAWINGS

A. SCALE REQUIRED

Unless otherwise specifically directed by the Engineer, make all shop drawings accurately to a scale sufficiently large to show all pertinent features of the item and its method of connection to the work.

B. TYPE OF PRINTS REQUIRED

Unless otherwise specifically directed by the Engineer, make all shop drawing prints in blue or black line on white background.

C. NUMBER OF PRINTS REQUIRED

Submit seven copies of all shop drawings.

-2 SAMPLES

A. ACCURACY OF SAMPLE

Unless otherwise specifically directed by the Engineer, all samples shall be of the precise article proposed to be furnished.

B. NUMBER OF SAMPLES REQUIRED

Submit all samples in the quantity which is required to be returned plus one which will be retained by the Engineer.

-3 COLORS

A. GENERAL

Unless the precise color and pattern is specifically described in the contract documents, whenever a choice of color pattern is available in a specified product submit accurate color charts and pattern charts to the Engineer for his review and selection.

B. COMPARATIVE ANALYSES

Unless all available colors and patterns have identical costs and identical wearing capabilities, and are identically suited for the installation, completely describe the relative costs and capabilities of each.

-4 SUBSTITUTIONS

A. ENGINEER'S APPROVAL REQUIRED

1. The contract is based on the materials, equipment, and methods described in the contract documents.

SECTION 01300 PAGE 3
SUBMITTALS

2. The Engineer will consider proposals for substitution 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.
3. Do not substitute materials, equipment, or methods unless such substitutions have been specifically approved for this work by the Engineer.

B. "OR EQUAL"

1. 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 been specifically approved for this work by the Engineer.
2. The decision of the Engineer shall be final.

C. AVAILABILITY OF SPECIFIED ITEMS

1. Verify prior to bidding that all specified items will be available in time for installation during orderly and timely progress of the work.
2. In the event specified item or items will not be so available, so notify the Engineer prior to receipt of bids.
3. Costs of delays because of non-availability of specified items, when such delays could have been avoided by the Contractor, will be back-charged as necessary and shall not be borne by the Owner.

-5 MANUALS

A. GENERAL

Where manuals are required to be submitted covering items included in this work, prepare all such manuals in durable plastic binders approximately 8-1/2 by 11 inches in size with at least the following:

1. Identification on, or readable through, the front cover stating general nature of the manual.

2. Neatly typewritten index near the front of the manual, furnishing immediate information as to location in the manual of all emergency data regarding the installation.
3. Complete instructions regarding operation and maintenance of all equipment involved.
4. Complete nomenclature of all replaceable parts, their part numbers, and name and address of nearest vendor of parts.
5. Copy of all guarantees and warranties issued.
6. Copy of the approved shop drawings with all data concerning changes made during construction.

B. EXTRANEEOUS DATA

Where contents of manuals include manufacturer's catalog pages, clearly indicate the precise items included in this installation and delete, or otherwise clearly indicate all manufacturer's data with which this installation is not concerned.

C. NUMBER OF COPIES REQUIRED

Unless otherwise specifically directed by the Engineer, deliver seven copies of the manual to the Engineer.

01302 EXECUTION

-1 IDENTIFICATION OF SUBMITTALS

Completely identify each submittal and re-submittal by showing at least the following information.

- A. Name and address of submitter, plus name and telephone number of the individual who may be contacted for further information.
- B. Name of project as it appears on each page of these specifications.
- C. Drawing number and specifications section number to which the submittal applies.

D. Whether this is an original submittal or re-submittal.

-2 COORDINATION OF SUBMITTALS

A. GENERAL

Prior to submittal for Engineer's review, use all means necessary to fully coordinate all material, including the following procedures:

1. Determine and verify all field dimensions and conditions, materials, catalog numbers, and similar data.
2. Coordinate as required with all trades and all public agencies involved.
3. Secure all necessary approvals from public agencies and others and signify by stamp, or other means, that they have been secured.
4. Clearly indicate all deviations from the contract documents.

B. GROUPING OF SUBMITTALS

Unless otherwise specifically permitted by the Engineer, make all submittals in groups containing all associated items; the Engineer may reject partial submittals as not complying with the provisions of the contract documents.

-3 TIMING OF SUBMITTALS

A. GENERAL

1. Make all submittals far enough in advance of scheduled dates of installation to provide all required time for reviews, for securing necessary approvals, for possible revision and re-submittal, and for placing orders and securing delivery.
2. In scheduling, allow at least three full working days for the Engineer's review following his receipt of the submittal.

B. DELAYS

Costs of delays occasioned by tardiness of submittals may be back-charged as necessary and shall not be borne by the Owner.

01500 GENERAL

-1 SCOPE

This section includes all temporary facilities and controls, complete.

-2 RELATED WORK IN OTHER SECTIONS

Refer to General Conditions and Supplementary General Conditions for additional items of temporary construction and facilities.

01501 DETAILED REQUIREMENTS

-1 TEMPORARY AND PERMANENT UTILITIES

All electrical power required by the Contractor to accomplish his construction work shall be provided by the Contractor at his expense. The Contractor shall make all arrangements necessary for electrical power requirements for this contract at his expense, including the necessary conduit and cable required. This contractor shall make whatever arrangements are necessary and pay any expenses required to Homer Electric Association to extend the power line to provide power service to the new chlorination station.

-2 TEMPORARY HEAT

Furnish by methods approved by the Engineer temporary heat as required to protect materials and work from dampness and cold.

-3 DRINKING WATER

Drinking water shall be provided by the Contractor at his expense for all workmen associated with this project.

-4 TEMPORARY TOILETS

The Contractor shall provide temporary toilet facilities for personnel during construction in accordance with State and local sanitation codes. Any temporary enclosures shall be removed prior to final acceptance.

-5 JOB TELEPHONE

No telephone service will be available at the site. The Contractor shall make whatever provisions are possible for communications at this remote location to meet his requirements.

-6 TEMPORARY DRAINAGE

Temporary drainage shall be provided and maintained by the Contractor to keep trenches and foundation excavation essentially free of standing water. Temporary drainage shall also be provided wherever necessary to drain the graded site.

-7 HOUSING FOR WORKMEN

Housing is limited at Seldovia. The Contractor shall make all arrangements and pay for housing and subsistence, if required, of the Contractor's employees working on the project.

-8 SITE ACCESS

A. CITY OF SELDOVIA

This semi-remote site will require careful attention to material and personnel logistics. It is particularly important that the Contractor coordinate well in advance his materials shipping schedule with Sea-Land Service, Inc., and the Alaska State Ferry System, if commercial carriers are to be utilized by the Contractor.

-9 CONTRACTOR PROVIDED FUELS

The Contractor shall provide all fuels required for the execution of his work in connection with this project.

-10 SUBSURFACE INVESTIGATION

Only nominal subsurface exploration has been conducted for this contract. The Contractor shall perform all necessary subsurface exploration deemed necessary for bidding this contract. It is known that excavation for the tank site and chlorination building pipelines to the tank and chlorination site will be in rock. Approximately 50% of the piping from the connection near the airport to the connection near the Seldovia Bridge is expected to encounter rock excavation.

-11 MAINTAINING WATER SUPPLY

The existing Fish Creek pump station is the emergency supply for Seldovia. That station and the emergency supply line from that station shall be maintained to receive intake water or to discharge pumped water to the new filter station piping until the new filter station has been fully tested and proven to be operational.

The filter station shall be installed and be fully operational prior to cutting the water supply piping into the new piping.

A maximum period of interruption of the gravity water supply shall be 10 hours to allow for the final cut in at the filter station and for the cut in at the water supply tank.

The emergency pump station water supply shall be fully operational during the 10 hour cut over period.

The 10 hour period shall include time for pouring and setting of concrete thrust blocks, securing piping by tie rods and other blow out prevention procedures. As soon as the permanent ties are made, the tank and filtration system shall be tested to assure successful operation.

All materials shall be on-site and checked before any interruption of water supply is commenced. Only two 10 hour interruptions of gravity supply to Seldovia will be allowed and each interruption shall be scheduled so as not to interfere with fish processing operations and at a time most suitable to Seldovia as determined by the Seldovia City Manager. Careful placement of thrust blocks and restraining tie rods shall be accomplished to prevent blowout of any of the piping installed.

The new 8" and 10" ductile iron lines are intended to follow along the approximate location of the 10" gravity supply steel line supplying Seldovia. An additional separation of the new lines (up to 20' more) will be allowed if the Contractor is concerned about damage to the existing gravity supply line caused by blasting for new trenches.

Any revisions in alignment required shall be proposed by the Contractor, subject to the approval of the Engineer. No disruption of this existing 10" steel line shall occur during construction of the new lines.

-12 SURVEYS

The Contractor shall accomplish the detailed layout for facilities required by these plans and specifications, except as follows:

The Engineer has provided, as shown on the plans, the horizontal control monuments and a bench mark for vertical control. Elevations of the filter building is determined by the existing floor levels. Elevation of the new tank and chlorination building is as required by the plans.

01502 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation, or is covered under contract items set forth in the "Bid for Unit Price Contracts".

TECHNICAL SPECIFICATIONS

DIVISION 2 -- SITE WORK

02110	Demolition & Blasting
02210	Earthwork

02110 GENERAL

-1 SCOPE

This section includes all labor, materials and equipment necessary to complete all site grading, filling, excavation, etc., for the facilities to be constructed under this contract, and demolition work and rock excavation as specified herein and shown on the drawings.

-2 RELATED WORK IN OTHER SECTIONS

A. Earthwork Section 02210

02111 DEMOLITION

-1 MONUMENTS

Carefully maintain bench marks, monuments and other reference points. If disturbed or destroyed, replace as directed by the Engineer.

-2 DELETED.

-3 Excavated materials shall be removed as required. Excess excavated materials shall be disposed of adjacent to the site to fill in low areas.

02112 BLASTING-EXPLOSIVES

The handling, storing, transporting and using of explosives shall be in strict accordance with all local and State ordinances and regulations. Particular reference is made to the General Safety Code of the State of Alaska. All blasting charges in populated areas or along thoroughfares shall be covered by mats and heavy timber and other precautions shall be taken to protect adjacent buildings, life, property, the work, sub-surface structures and pavements. Caps and exploders shall not be stored in the same building with dynamite and powder. The approval of the Engineer must be obtained before any blasting is done. The Contractor shall station flagmen along adjacent thoroughfares when blasting, and shall take other safety precautions as the Engineer may direct. Breaking up boulders or rock masses shall be done employing the method of "plastering" and "mudcapping". "Coyote" or "gopher" hole methods of blasting in the open or on sidehills will not be permitted. It is anticipated that carefully controlled blasting may be

required adjacent to the existing gravity waterline to accomplish excavation. The Contractor shall be responsible for and repair any damage to the 10" steel gravity waterline.

02113 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation, or is covered under bid items set forth in the "Unit Price Schedule".

END OF SECTION 02110

02210 GENERAL

-1 SCOPE

This work includes the furnishings of all plant, labor, equipment, supplies and materials and performing all operations pertaining to:

- A. Excavation
- B. Shoring and Water Control
- C. Backfill
- D. Utility Trenches (water and drainage)

-2 RELATED WORK IN OTHER SECTIONS

- A. Piping and Installation Section 17100

-3 APPLICABLE DOCUMENTS

The latest revision of the following specifications and standards of the American Society for Testing and Materials (ASTM) and the American Association of State Highway Officials (AASHTO) (including amendments, addenda and errata), but referred to hereinafter by basic designation only, form a part of this specification to the extent required by the references thereto:

- | | |
|------------|--|
| ASTM C-29 | Test for Unit Weight of Aggregate |
| ASTM C-88 | Test for Soundness of Aggregates by use of Sodium Sulfate or Magnesium Sulfate |
| ASTM C-117 | Test for Materials Finer than No. 200 Sieve in Mineral Aggregates by Washing |
| ASTM C-127 | Test for Specific Gravity and Absorption of Coarse Aggregates |
| ASTM C-128 | Test for Specific Gravity and Absorption of Fine Aggregates |
| ASTM C-131 | Test for Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine |
| ASTM C-136 | Test for Sieve Analysis of Fine and Coarse Aggregates |
| ASTM D-423 | Test for Liquid Limit Soils |
| ASTM D-424 | Test for Plastic Limit and Plasticity Index of Soils |

ASTM D-1140	Amount of Material in Soils Finer than the No. 200 Sieve
ASTM D-1556	Test for Density of Soil in Place by the Sand Cone Method
AASHTO T-180-D	Test for Moisture-Density Relations of Soils (Modified Hereinafter)
AASHTO T-205	Test for Field Determination of Density of Soil In-Place

-4 DEFINITIONS

- A. Subgrade: The subgrade is that material below the leveling course or crushed base course which forms the foundation for slabs, pavement, sidewalks, curbs and gutters, etc.
- B. Non-Frost Susceptible Materials: Non-organic soil containing less than 3% by weight of grains smaller than 0.02 mm.
- C. Fill: Fill is considered to be material placed above the original or natural ground line.
- D. Backfill: Material placed in an excavated area.
- E. Unclassified Material: Material consisting of soils composed of gravels, sands, silty sands and poorly graded sand-silt mixtures which are capable of being satisfactorily compacted. All unclassified material should be smaller than 3 inches.
- F. Unsuitable Material: Soils material in the trench which, when excavated and properly protected from the effects of the weather, cannot be satisfactorily used as backfill shall be classified as unsuitable and removed. Unsuitable material includes sand-clay mixtures, clays, plastic silts, soils with high organic content, brush, stumps, trash, debris, large rocks and boulders and frozen material.
- G. Suitable Material: Suitable material consists of soils composed of gravels, sands, silty sands, and poorly graded sand-silt mixtures or well graded shot rock which are capable of being satisfactorily compacted.
- H. Compaction: Tamping by hand or machine to achieve required density in soils.
- I. Disposal Site: Any area where waste from construction is placed.
- J. Excavation: Area or material removed to provide a suitable base for improvement.

K. Trench: Any excavation for a utility.

M. Bedding: Ground or supports in which pipe is laid.

-5 REQUIREMENTS

A. GENERAL

Bids shall be based on the following:

1. That the surface elevations are as indicated and suitable bearing material lies at the bottom of excavation elevation shown on the drawings and noted herein.

B. VARIATIONS

1. In the event suitable bearing material is not encountered as anticipated, the provisions of the contract respecting an adjustment for changed conditions shall apply, subject to the notification requirement.

02211 SURVEY AND SUBSURFACE INVESTIGATION

-1 SURVEY

The site drawings are as a result of:

- A. Spot check survey completed early in June 1979 by Tryck, Nyman & Hayes.
- B. Only minor subsurface investigation was conducted. However, previous projects in the area have identified the general characteristics of the soils and the rock. The 1979 surveys have shown that except for a 2' to 4' mantle of soil overburden the tank and chlorination building site requires rock excavation. The filter building site subsurface is silty gravel.

02212 EQUIPMENT

All equipment, tools and machines used in the performance of the work covered by these specifications shall be subject to the approval of the Engineer, shall comply with applicable provisions of the safety requirements and shall be maintained in satisfactory working conditions at all times. All state

- 2 Provide sumps at perimeter of excavation with pumps as required. Remove all soft mud or debris before placing backfill, leveling courses, or pouring concrete. Keep all water out of excavations during pouring of concrete.

02215 WEATHER LIMITATIONS

Unless otherwise authorized by the Engineer, fill or backfill material, base course and leveling course shall not be placed when the atmospheric temperature is below 35 degrees Fahrenheit, it shall be the responsibility of the Contractor to protect all areas of completed work against any detrimental effects. Any areas of work not completed in accordance to the plans and specifications that are damaged by weather shall be reconditioned, reshaped and recompacted by the Contractor in conformance with the requirements of these specifications without additional cost to the Owner.

02216 FILLING AND BACKFILLING

-1 MATERIALS

- A. The source of materials shall be approved by the Engineer. Any change in source of material during construction will require written approval of the Engineer.
- B. Fill and/or backfill shall contain no muck, frozen material, lumps, roots, sod, organic matter or other deleterious matter or debris deemed unsuitable by the Engineer. It shall have a plasticity index not greater than 6 as determined by ASTM-D424; liquid limit shall not exceed 35. It shall be well graded, non-frost susceptible material consisting of sand, gravel, broken stones or other approved material. It shall contain no stone measured in its maximum dimension larger than 2/3 of the compacted thickness of the lift in which it is to be placed.
- C. Select backfill shall conform to the above material requirements except that:
 - 1. Gravelly material shall have a coefficient of uniformity greater than four (4) and a coefficient of curvature between one (1) and three (3).

2. Sandy material shall have a coefficient of uniformity greater than six (6) and a coefficient of curvature between one (1) and three (3).
3. It shall contain no stone larger than three (3) inches in its maximum dimension.

-2 COMPACTION STANDARDS

- A. The required density of fill or backfill shall be 90% of maximum density to within 12" of the bottom of footing or slab and to 95% of the maximum density for the top 12".

Pipe trenches in roadways shall be compacted to 90% of maximum density except for the pipe bedding material and the backfill zone within 12" above the top of the pipe. The areas immediately adjacent to all pipes shall be tamped to provide safe support for the pipe.

- B. A separate batch of soil shall be used for each compaction test specimen. No material shall be reused. All testing shall be performed by the Contractor in accordance with the current requirements of AASHTO Standard Method T-180-D.

-3 CONSTRUCTION

- A. The ground surface shall be cleared of all debris and organic material. All depressions or holes below the bottom of footing or slab level, whether caused by removal of debris or unacceptable material, or otherwise, shall be backfilled with approved material and compacted to specified density and to a level, uniform surface before the placement of other layers. Prepared surfaces shall be wetted and compacted.
- B. The specified material shall be constructed at the locations and to the lines and grades indicated on the plans. The material shall be placed and spread uniformly in successive layers not exceeding twelve (12) inches in loose thickness. The layers shall be carried up full width from the bottom of the fill to avoid the necessity of widening the edges after the center has been brought to grade.

Reasonable time shall be provided to the Engineer to make field density determinations prior to placement of successive layers of material.

- C. Blading, rolling and tamping shall continue until the surface is smooth, free from waves and irregularities, and conforms to elevations shown on the plans. If at any time the material is excessively wet by rain, it shall be aerated by means of blade graders, harrows, or other suitable equipment until the moisture content is satisfactory. The surface shall then be compacted and finished as specified above.
- D. Control moisture content to provide optimum compaction.
- E. Compact fill at exterior walls with mechanical hand tampers to avoid lateral displacement of exterior walls.

02217 UTILITY TRENCHES (WATER AND DRAINAGE)

-1 BEDDING MATERIAL

Bedding material shall be furnished and placed by the Contractor in accordance with the plans and specifications and shall consist of well-graded sand and gravel such that material adjacent to ductile iron pipe shall not contain rocks larger than 3" in greatest dimension.

02218 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

-1 BENCH MARKS

Maintain all bench marks, monuments, and other reference points; if disturbed or destroyed, replace as directed at no cost to the Owner.

-2 DELETED.

-3 DELETED.

02219 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation or is covered under bid items 101 through 105 and 201 through 205 of the Unit Price Schedule.

02220 GENERAL

The access road to the proposed filter building is a good all-weather road and shall be graded to all-weather driving after the new filter station is constructed. The existing switchback road to the new water storage tank and chlorinator building site is a minimum quality road that, because of steepness, is well-drained and can be considered accessible for 4-wheel drive vehicles. Grades on this access road range between 10 and 15 percent. After construction of the water tank and chlorinator building, this contractor will be required to restore this road to a driving condition at least equal to that before his construction commenced. This restoration may require several loads of gravel to firm up soft areas. Placement of this gravel shall be considered a subsidiary obligation, the payment for which is included in the unit bid under Items 102 and 105 of the Unit Price Schedule.

02221 MEASUREMENT AND PAYMENT

No separate payment shall be made for restoring the access road to the tank and chlorinator building to original all-weather surface since only minor graveling is anticipated. Payment for that work required shall be considered as paid for under bid item 102 and 105 of the Unit Price Schedule. Maintenance of the access road to the filter station shall be paid for as a subsidiary obligation under the unit price bid item 101 of the Unit Price Schedule. No additional compensation to the contractor resulting from maintenance of this road and the driveway will be allowed.

END OF SECTION 02220

DIVISION 3 -- CONCRETE

03100	Concrete Formwork
03200	Concrete Reinforcement
03300	Cast In Place Concrete

03100 GENERAL

-1 SCOPE

This section includes all labor and materials to complete construction of concrete forms, complete.

-2 RELATED WORK IN OTHER SECTIONS

A. Cast in Place Concrete: Section 03300.

-3 APPLICABLE DOCUMENTS

The following specifications and standards of the issues listed in this paragraph (including the amendments, addenda, and errata designated), but referred to hereinafter by basic designation only, form a part of this specification to the extent required by the references thereto.

A. AMERICAN CONCRETE INSTITUTE (ACI)

ACI 347 Recommended Practice for Concrete Formwork

B. DOUGLAS FIR PLYWOOD ASSOCIATION (DFPW)

Bulletin 19-F Performance Data for Structural Plywood

C. U.S. PRODUCT STANDARDS

U.S. Products Standard PS-1-66 for Softwood Plywood -
Construction and Industrial.

-4 REQUIRED SUBMITTALS

A. MANUFACTURER'S SUBMITTALS

Submit literature describing form ties, form tape, plugs, cones, form release, and form construction for Engineer's approval prior to ordering.

B. SHOP DRAWINGS

1. Submit complete shop drawings for formwork for all concrete exposed to the weather and all interior exposed concrete. Show detailed layout of form dimensions, form joint fitting, form sealing and placement, location of openings, dimensioned location of form ties. Include detailed description of

construction method proposed for use, sealing forms between construction joints and finishes of the form surfaces.

-5 DELIVERY AND STORAGE

A. DELIVERY

Deliver materials in unopened, undamaged containers bearing brand and manufacturer's names.

B. STORAGE

Store materials in manner that will preclude any damage or deterioration and afford easy access for inspection and identification of each item.

03101 MATERIALS

-1 PLYWOOD FORMS

Exterior grade BB Class 1 plywood panels conforming to PS 1-66 and grade stamped by American Plywood Association. Minimum thickness: 3/4 inch.

-2 METAL FORMS

Panels shall have equivalent stiffness to plywood forms and shall be free from surface defects.

-3 DIMENSION LUMBER

Douglas Fir Coast Region, "Construction" grade.

-4 FORM TIES

Metal snap-off type acting as spreaders and leaving no metal within 1-1/2" of concrete face. Ties shall have a minimum working strength of not less than 3000 pounds when fully assembled. No wire ties permitted.

-5 FORM COATINGS AND PARTING COMPOUNDS

Non-grained raising and non-staining type leaving no residual matter on face of concrete or adversely affecting proper bond

or other finish. Form coatings containing mineral oils or other non-drying materials will not be permitted. Use specifically formulated coatings for metal forms, to prevent rust stains on concrete. Federal Specification TT-3-001657.

03102 INSTALLATION

-1 FORMWORK CONSTRUCTION

A. GENERAL

The Contractor shall be responsible for engineering design and performance of all formwork. Design formwork for the loads and lateral pressures outlined in "Recommended Practice for Concrete Formwork", ACI-347, and all other loading conditions that may be reasonably imposed. Approval of forms and/or drawings in no way relieves the Contractor of his responsibility for adequately designing, constructing and maintaining the forms so that they will function properly. Construct formwork to shape, lines and dimensions of concrete members, arranged to allow erection in proper sequence and to permit removal without damage to concrete finish.

B. SHORING

Design and place shoring so the load from successive parts of the structure will be transmitted directly through the false-work to adequate support, without creating bending or shearing stresses in the concrete.

C. DELETED.

D. DELETED.

E. TOLERANCES

Construct forms and place concrete to maintain the following tolerances in the finished concrete work:

Variation in plumb: 1/4 inch in 10 feet
 3/8 inch in 20 feet
 3/4 inch in 40 feet or more

Local deviation of surface: 1/8 inch $\pm$ in 10 feet.

Non-accumulative variation from line in horizontal direction: 1/4 inch in 10 feet.

Variation in cross-sectional dimensions:

For slabs and other members 6" or less in thickness:
Minus 1/8 inch, plus 1/4 inch.

For all other members: Plus or minus 1/4 inch.

F. DELETED.

G. DELETED.

H. JOINTS AT PLYWOOD FORMS

Construct joints to be tight and smooth, in alignment to avoid formation of fins. Apply vinyl form tape to all panel joints. Arrange joints as shown on approved shop drawings.

I. CORNERS

All corners of exposed concrete shall have forty-five degree 3/4" face dimension, smooth chamfered corners unless indicated otherwise.

-2 PREPARATION OF FORM SURFACES

A. GENERAL

Construct forms tight to prevent leakage of grout or cement paste. Coat plywood forms with approved form sealer. Do not use material which will prevent bond of subsequent work, or adversely affect bonding agents, foundation coatings, plaster application, or adhesives used for other work of this contract.

B. RELEASE AGENT

Apply immediately prior to erection. Release agent to be completely dry before erection.

C. CLEANING FORMS

Clean forms before reuse. Withdraw projecting nails. Obtain Engineer's approval after each use, and before reusing any form materials.

-3 REMOVAL OF FORMS

- A. The sole responsibility for removal of forms and for any resulting structural or finish damage rests with the Contractor.
- B. Minimum time for forms to remain in place shall be 7 days. Removal of forms shall not be considered before the Engineer receives results of 7-day concrete testing report.
- C. Shoring for cast in place beams, slabs and retaining walls, shall remain in place until the concrete 28-day design strength has been developed.
- D. Exercise care in removing forms to avoid damaging corners and edges of exposed concrete.
- E. Forms may be reused, unless otherwise specified, provided they are in good condition, thoroughly cleaned and acceptable to the Engineer.

03103 QUALITY ASSURANCE PROVISIONS

-1 TEST REPORTS

The testing requirements stated herein or incorporated in referenced documents may be waived, provided certified copies of reports of tests from approved laboratories performed in previously manufactured materials are submitted and approved. Test reports shall be accompanied by notarized certificates from the manufacturer certifying that the previously tested material is of the same type, quality, and manufacture as that proposed for the project.

-2 NOTIFICATION

Notifying Engineer one normal working day (24 hours) before closing up forms.

03104 MEASUREMENT AND PAYMENT

No separate payment shall be made for work this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor covered under other contract items.

03200 GENERAL

-1 SCOPE

This section includes all labor and materials necessary to complete the installation of concrete and masonry reinforcement.

-2 RELATED WORK IN OTHER SECTIONS

- A. Cast in Place Concrete: Section 03300
- B. Unit Masonry: Section 04200

-3 APPLICABLE DOCUMENTS

The following specifications and standards of the issues listed in this paragraph (including amendments, addenda, and errata designated), but referred to hereinafter by basis designation only, form a part of this specification to the extent required by the references thereto.

A. AMERICAN CONCRETE INSTITUTE (ACI)

ACI-315 Manual of Standard Practice for Detailing
Reinforced Concrete Structures.

ACI-318 Building Code Requirements for Reinforced
Concrete.

B. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)

A Manual of Standard Practice.

C. AMERICAN WELDING SOCIETY (AWS)

Code D12.1: Recommended Practices for Welding
Reinforcing Steel, Metal Inserts and
Connections in Reinforced Concrete Const-
ruction.

D. AMERICAN SOCIETY FOR TESTING & MATERIALS (ASTM)

A-615 Specifications for Deformed Billet Steel
Bars for Concrete.

A-185 Specifications for Welded Steel Wire
Fabric for Concrete Reinforcement.

A-82 Specifications for Cold Drawn Steel
Wire for Concrete Reinforcement.

-4 DELETED.

-5 DELIVERY AND STORAGE

A. DELIVERY

Materials are to be delivered bundled with identification marking tags attached thereto. Do not remove tags until reinforcing is in place.

B. STORAGE

Store materials under cover, off ground on timbers or platforms. Keep various shapes and sizes separate.

03201 MATERIALS

-1 REINFORCING STEEL

Unless otherwise noted, all reinforcing steel shall be deformed bars in accordance with ASTM A-615, Grade 40, of the sizes shown on the drawings. Reinforcing steel shall be free from flaking rust, loose scale or coating of any kind.

-2 TIE WIRE

Reinforcing steel shall be tied in place with #16 double annealed iron wire.

-3 WELDED WIRE FABRIC

Welded wire fabric shall comply with ASTM A-185, shall be spot welded at all intersections and shall be furnished in flat sheets. Size as shown on drawings.

-4 DELETED.

-5 DELETED.

03202 FABRICATION

-1 GENERAL

A. DELETED.

- B. Fabricate all reinforcing steel in accordance with CRSI handbook, "Reinforcing Concrete; a Manual of Standard Practice", and ACI-315, "Manual of Standard Practice of Detailing Reinforced Structures".

03203 INSTALLATION

-1 GENERAL

Accurately place and securely support all reinforcing steel to prevent deflection or motion of reinforcing bars during or before casting of concrete. Wire bars at splices and cross points and elsewhere as required to hold them in place with 16 gauge black annealed wire. Reinforcement shall be maintained in proper position by chairs, bar supports or other approved devices.

-2 DELETED.

-3 DELETED.

-4 RUST PROTECTION

Contractor's attention is directed to problem of rust stains on exposed concrete or other surfaces; a condition which will be rejected by the Engineer as unsatisfactory work. It is suggested that reinforcement, located where it could rust stain other surfaces, be wrapped in impervious tape. Protective tape materials shall be completely removed and reinforcement cleaned as required, prior to proceeding with concrete work.

-5 WELDING

Welding shall be performed by shielded arc method using coated electrodes. Both method of welding and qualifications for welders shall conform with AWS D12.1. Equipment shall supply proper current and voltage and shall be adjustable to suit arrangement and thickness of base metal. Electrodes shall be of size and type recommended by manufacturer for welds required, and as classified and recommended per AWS D12.1.

-6 DELETED.

-7 BENDING

Bars damaged by field bending shall be exposed and cleaned beyond the damaged area as required to provide a Class C lap splice or tension coupler splice designed for 125% fy.

03204 QUALITY ASSURANCE PROVISIONS

-1 INSPECTION

Before any concrete is placed in any given portion of the structure, the placing of reinforcing steel shall be checked. Any errors or discrepancies shall be corrected before concrete is placed.

03205 MEASUREMENT AND PAYMENT

No separate payment shall be made for work this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor covered under other contract items.

END OF SECTION 03200

03300 GENERAL

-1 SCOPE

This section includes cast in place concrete construction, complete.

-2 RELATED WORK IN OTHER SECTIONS

- A. Concrete Reinforcement: Section 03200
- B. Earthwork: Section 02200
- C. Miscellaneous Metal: Section 05500
- D. Waterproofing: Section 7100

-3 APPLICABLE DOCUMENTS

The following specifications and standards of the issues listed in this paragraph (including the amendments, addenda, errata designated), but referred to hereinafter by basic designation only, form a part of this specification to the extent required by the references thereto.

A. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- C-94 Ready Mixed Concrete
- C-33 Concrete Aggregates
- C-150 Portland Cement
- C-260 Air Entraining Admixtures for Concrete
- D-1850 Concrete Joint Sealer, Cold Application Type
- C-494 Chemical Admixtures for Concrete

B. AMERICAN CONCRETE INSTITUTE (ACI)

- ACI-301 Specifications for Structural Concrete for Buildings
- ACI-318 Building Code Requirements for Reinforced Concrete

ACI-613 Recommended Practice for Selecting Proportions
for Concrete

ACI-614 Recommended Practice for Measuring, Mixing
and Placing Concrete

-4 DELETED.

-5 DELIVERY AND STORAGE

A. DELIVERY

Deliver all small items and cement in manufacturer's unopened containers with manufacturer's labels attached thereto. Handle materials to avoid damage or deterioration or breaking of containers.

B. STORAGE

All containerized materials and cement shall be stored to avoid deterioration and damage which might be caused by freezing, moisture or other conditions. Store bagged cement on platforms off ground. Handle and store coarse and fine aggregate separately in a manner to prevent intrusion of foreign material.

03301 MATERIALS

-1 CEMENT

Cement shall be Type I, conforming with ASTM C150. Cement for exposed concrete surfaces shall be from the same mill. One brand shall be used for all work. Brand shall have a proven history of successful use with proposed aggregates.

-2 AGGREGATE

Aggregate for exposed concrete surfaces shall conform to ASTM C-33 as herein modified. Approved aggregates shall be used throughout the work and no substitution shall be made without written approval from the Engineer.

A. COARSE AGGREGATE

Coarse aggregate shall consist of clean hard, durable particles of close grained crushed rock, gravel, or crushed gravel and shall be free from injurious amounts of soft friable, thin, elongated, or laminated particles, loam, organic or other deleterious matter and shall have a specific gravity of not less than 2.65. Two sizes of coarse aggregate shall be used, namely 1/4 inch to 3/4 inch, and 1/4 inch to 1-1/2 inches. These aggregates shall be sorted separately at the mixing plant. Coarse aggregates shall be durable and well graded between size limits as required by ASTM C-33.

B. FINE AGGREGATES

Fine aggregates shall be a natural sand consisting of well shaped hard durable grains. It shall contain not more than 2% of silt and clay by weight and be free of detrimental amounts of alkali, mica, weak particles, injurious organic matter, or other deleterious material. Fine aggregates shall be well graded within the following limits:

<u>Sieve</u>	<u>% Passing</u>
1/4 inch screen	100
No. 8 sieve	75 - 95
No. 16 sieve	45 - 75
No. 30 sieve	25 - 45
No. 50 sieve	10 - 25
No. 100 sieve	2 - 9
No. 200 sieve	2% maximum

Fineness modulus shall not be greater than 3.1. The average of the quantities passing the No. 8 and No. 16 sieves shall be not less than 63 percent. The use of bank sand, fine river sand or any other uniformly graded sand will not be permitted. Specific gravity shall be not less than 2.60.

-3 ADMIXTURES

A. AIR ENTRAINING ADMIXTURE

An approved retarding admixture conforming with ASTM C-260 shall be used in all cast in place concrete. (Grace Construction Material's Darex or equal).

8. Admixtures may be used to improve concrete workability and/or reduce water quantities below the specified maximum of 6 gallons per sack of cement.

Acceptable admixtures include Pozzolith 300N by Master Builders, Inc., or WRDA with HYCOL by W. R. Grace & Company. A maximum of 3 ounces per sack of cement shall be added to maintain specified maximum water quantities and/or to improve workability.

Increases in maximum water amounts per sack of cement will not be permitted to improve workability.

Decreases in minimum cement content will not be permitted in any case.

-4 BONDING AGENT

Conrad Sovig Co., Inc.'s "Cemlok" 'Grace Construction Materials "Daraweld-C'", or approved equal.

-5 EPOXY NON-STAINING CEMENT GROUT

Master Builder's "Embeco", Sonneborn "Ferrolith" or approved equal.

-6 WATER

Water shall be clean, fresh, free from acid alkali, organic matter and other injurious impurities detrimental to concrete.

-7 MISCELLANEOUS STEEL INSERTS

ASTM A-36, Structural Steel.

03302 PROPORTIONING AND MIXING

-1 CONCRETE MIXES

- A. Cast in place concrete shall be regular weight concrete (approximately 150 lb/cu.ft.) with the following requirements.

<u>Min. 28 Day</u> <u>Strength</u> (psi)	<u>Min. Cement</u> <u>Content</u> (sacks)	<u>Max. Size</u> <u>Aggregate</u> (inch)
3,000	6	1-1/2

- B. Slump Limits: 2 inches to 4 inches. [Two (2) inches maximum for slabs]. Per ASTM C-143 Test Method.
- C. Air Entrainment: $5\% \pm 1\%$.
- D. Admixtures shall be strength recommended by approved manufacturer but shall not cause retardation greater than 1-1/2 hours considering atmospheric conditions at time of placing concrete.
- E. Water content shall not exceed 6 gallons per sack of cement used.

-2 GROUT

Cement grout shall be proportioned by volume: 1 part sand, 1 part portland cement and minimum of water, consistent with placing requirements. Minimum strength 4000 psi at 28 days.

-3 CONCRETE MIXING

All concrete mixes shall be proportioned by the methods given in ASTM 613, Recommended Practices for Selecting Proportions for Concrete. Proper adjustments shall be made when the aggregates are dry or inundated. The cement and aggregate shall be mixed in such proportions as to be sufficiently workable, to produce a uniform dense concrete without segregation and to be of the minimum strength specified. The approved proportions as determined by the Engineer shall be maintained throughout the project unless variations in aggregate shall vary sufficiently to affect the proportions, then additional tests shall be made and new proportions determined.

03303 PLACING CONCRETE

-1 PREPARATION FOR PLACING

- A. Cold Weather Requirements: In cold weather, reinforcing, forms or ground which concrete will contact must be completely free of frost. Do not mix or place concrete

temperature is below 40°F. nor when
site temperature will fall below 40°F.
Maintain concrete temperature, when
it less than 60°F. The use of Calcium
not be permitted.

of depressed conditions for suitability
method of surfacing to be applied over

and debris from places to receive concrete.

nt for mixing and transporting concrete.

shed surfaces adjacent to areas where concrete
ired.

e to membranes and moisture barriers.

wet subgrade under slabs on grade where no
iers occur prior to pouring, do not puddle.

ieer at least 48 hours notice before each pour
ction.

ITE

concrete in a continuous operation between
mined construction joints. Transport rapidly to
f deposit, avoiding separation, displacement of
cing, damage to membranes, rehandling, flowing or
up in forms. Do not drop freely when reinforcing
segregation. Use elephant trunks or other devices
proved when free fall is 8 feet or greater. Chuting
: permitted. Do not support runways on reinforcing
. Make slabs level except where specifically noted
sloped; in all cases, make slabs true to plane.

Contractor shall exercise caution when placing
rete for slabs with welded wire fabric. The fabric
gment and position shall be maintained by both supports
by continual adjustment of depressed portions caused
concrete placement or Contractor operations.

- B. Thoroughly tamp and mechanically vibrate with approved tools or machines. Do not spread concrete with vibrator or attach vibrators to forms or reinforcing. Augment vibrating in walls to prevent formation of honeycombing. Keep surface of all concrete level while depositing.
- C. Do not place retempered concrete or concrete that is partially hardened or has been contaminated by form materials.
- D. Depositing under water will not be permitted.
- E. Keep record of concrete placing including date and time of placing, location in structure, type of mix and quantity of concrete placed.
- F. Construction joints shall be cleaned and roughened by sandblasting with coarse silica sand. Wire brush adjacent interior surfaces of forms to remove splashed concrete and retighten forms as necessary. Saturate surface of horizontal construction joints with water and cover with layer of grout 4" thick in walls and columns. Slush surface of vertical construction joints with coating of grout. Use grout which contains same proportion of sand and cement as used in concrete plus maximum of 50% of coarse aggregate. Grout shall have maximum slump of 6". Place new concrete not more than 15 minutes after grout has been placed.
- G. Construction Tolerances:
 - Linear Dimension: 1/4 inch.
 - Local Deviation in Surface: Not more than 1/8 inch
plus or minus 10 feet
from true plane.

All others per ACI-347.

03304 CURING

-1 GENERAL

Keep all slab surfaces continuously damp for a period of 7 days after depositing. Concrete shall be protected adequately

from injurious action by the sun, rain, flowing water, and mechanical injury, and shall not be allowed to dry out from the time it is placed to the expiration of the minimum curing periods specified hereinafter. Water curing shall be accomplished by keeping the surface of the concrete continuously wet by covering with water or with an approved water saturated covering, by leaving the forms in place, or by spraying. All water used for curing shall be clean, fresh water. Where wood forms are left in place for curing, they shall be kept sufficiently damp at all times to prevent opening at the joints and drying out of the concrete. All portions of the structure shall be kept moist for the full curing period specified. Provide for curing on weekends and holidays.

-2 CURING MATS

Install curing mats, consisting of a 10 ounce layer of burlap on each face and a 12 ounce per square yard center padding, meeting the requirements of ASTM C-440 as soon as the concrete is hardened sufficiently to prevent marking of the surface during the installation. Soak the curing mats frequently with water.

-3 DELETED.

-4 COLD WEATHER REQUIREMENTS

Provide adequate equipment for heating the concrete materials and protecting the concrete during freezing or near-freezing weather. Do not use frozen materials or materials containing ice. All concrete materials and all reinforcement, forms, fillers and ground with which the concrete is to come in contact, shall be free from frost. All concrete placed in forms shall have a temperature of between 50°F. and 70°F. and adequate means shall be provided for maintaining this temperature for as much more time as is necessary to insure proper curing of the concrete. The housing, covering or other protection used in connection with curing shall remain in place and intact at least 24 hours after the artificial heating is discontinued. No salt or other chemicals shall be used for the preventing of freezing.

03305 DEFECTIVE WORK AND CRACK REPAIR

-1 DEFECTIVE WORK

Under-strength concrete, concrete out of line, level, or plumb or showing objectionable cracks, honeycomb rock pockets, voids, spalling, exposed reinforcing, etc., shall be repaired or removed and replaced as directed by the Engineer at no expense to the Owner.

03306 CONCRETE FINISHES

- 1 All concrete floors shall receive a steel trowel finish. The slab is to be compacted, screeded, tamped and floated. After floating to a true surface, the slab shall be steel trowelled to a uniform, true, smooth surface.

03307 EMBEDDED ITEMS

All miscellaneous items shall be installed as recommended by their respective manufacturer or as shown on the drawings.

03308 CLEANING

At the completion of concrete work remove all debris and rubbish resulting from work under this Section from the site.

03309 QUALITY ASSURANCE PROVISIONS

-1 CONCRETE TESTS

- A. Contractor will furnish molds for testing by the Engineer.
- B. Cylinders will be stored at job site 24 hours in a specially prepared wooden storage box before delivery to testing laboratory or to the engineer for on-the-job test breaks. Contractor to provide wooden box and a safe storage area.

- C. Tests will be taken at the rate of not more than one test for each 50 cubic yards of concrete, or fraction thereof. In any event, not less than one test for each individual pour unless requirement is waived by the Engineer.

03310 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor covered under other contract items.

END OF SECTION 03300

DIVISION 4 -- MASONRY

04100

Mortar

04200

Unit Masonry

04100 GENERAL

-1 SCOPE

The work covered by this section of the specifications consists of furnishing all labor, materials, equipment, supplies and performing all operations necessary to complete application of mortar work as shown on the drawings or specified herein.

-2 RELATED WORK IN OTHER SECTIONS

- | | |
|-------------------|---------------|
| A. Unit Masonry: | Section 04200 |
| B. Painting: | Section 09900 |
| C. Vapor Barrier: | Section 07100 |
| D. Installation: | Section 04203 |

-3 APPLICABLE DOCUMENTS

The following specifications and standards of the issues listed below (including the amendments, addenda, and errata) but referred to thereafter by basic designation only, form a part of this specification to the extent required by the references thereto.

A. Federal Specifications

SS-C-192 Cement, Portland

SS-A-281B(1) Aggregate for Portland Cement Concrete

B. American Society for Testing & Materials (ASTM)

C-5 Quicklime

C-207 Hydrated Lime

-4 DELETED.

-5 DELIVERY AND STORAGE

A. DELIVERY

Deliver manufactured materials in unopened containers with manufacturer's labels attached thereto.

B. STORAGE

Store packaged materials above ground in a dry location to prevent intrusion of water. Store bagged cement on platforms off ground. Handle aggregates separately to prevent intrusion of foreign or deleterious materials.

04101 MATERIALS

-1 LIME

Quicklime shall conform with ASTM Spec. C-5. Hydrated lime shall conform with ASTM Spec. C-207. Lime shall be Type 5.

-2 PORTLAND CEMENT

Portland Cement shall conform with ASTM C-150 and shall be Type I non-staining, without air entrainment and of natural color or white to produce the required color of grout. Cement shall conform with Federal Specification SS-C-192. Type III high early strength Portland Cement may be used to reduce portection requirements for laying masonry in cold weather.

-3 WATER

Water shall be clear, fresh, free from acid, alkali, organic matter or other injurious impurities detrimental to concrete.

-4 FINE AGGREGATE

Fine aggregate shall be natural sand or prepared stone sand complying with Federal Specification SS-A-2188, Class I, suitable for intended use. Fine aggregate shall conform to the following sieve analysis by weight. The use of local sand of suitable gradation shall be subject to the approval of the Engineer.

PERCENTAGE OF WEIGHT PASSING SQUARE MESH SIEVE

Sieve Designation

#4	#16	#50	#100
95 to 100%	45 to 80%	10 to 30%	2 to 10%

Aggregate shall be free from salts, alkali, organic or harmful materials.

-5 MASONRY CEMENT

Cement shall comply with ASTM C-91, Type II, non-staining, with 12% maximum air content by volume.

-6 DELETED

-7 ADDITIVE FOR DIRT AND MOISTURE RESISTANCE OF MORTAR

Additives shall be ammonium stearate, aluminum ni-stearate or calcium stearate.

-8 ADDITIVE FOR NON-SHRINK GROUT

Additive shall be metallic aggregate prepared and graded to counteract shrinkage and reduce permeability of Portland Cement grout. Material shall be "vibrafoil" as manufactured by W. R. Grace or approved equal.

-9 COMMERCIAL CEMENT GROUT

Material shall be compound of Portland Cement and additives factory blended to decrease shrinkage and increase moisture resistance. Material shall be "Hydroment Joint Filler" as manufactured by the Upco Company or approved equal.

-10 GENERAL

Changes in source or brands of masonry mortar or grout materials or mix designs during the course of the work shall not be made. Freezing point of mortar shall not be lowered by use of admixtures or antifreeze agents. Calcium chloride shall not be used.

04102 MIXES

-1 MORTAR MIXES

A. MORTAR FOR UNIT MASONRY

Comply with ASTM C-270 Proportion Specifications, except limit materials to those specified herein, and limit cement/lime ratio (by volume) as follows:

Type M: Not more than 1/4 part lime per part of Portland cement.

Type S: Not more than 1/2 part lime per part
of Portland cement.

Type N: Not more than 1 part lime per part
of Portland cement.

In lieu of above, Type II masonry cement may be used.
Grout shall have a 28 day strength of 2000 psi.

B. STEARATE ADDITIVE

Add to mix in amount equal to not more than 3% of the
cement weight.

-2 GROUT AND SETTING BED MIXES

A. CEMENT SETTING BED

Mix one part of Portland cement with 2 parts of damp
setting bed sand. Use water to dampen sand, if required,
but do not add to the mix.

B. NON-SHRINKING GROUT FOR FLOORS AND PAVEMENTS

Proportion and mix Portland cement, non-shrink grout
additive and sand to comply with the requirements of the
additive manufacturer's printed instructions.

C. COMMERCIAL CEMENT GROUT FOR FLOORS AND PAVEMENTS

Mix in accordance with manufacturer's printed instructions,
adding only those ingredients specifically required in
the instructions.

04103 INSTALLATION

Refer to Section 04200 for installation.

04104 QUALITY ASSURANCE PROVISIONS

-1 TEST AND TEST REPORTS

The testing requirements stated herein or incorporated in

referenced documents may be waived, provided certified copies of reports of tests from approved laboratories performed in previously manufactured materials be submitted and approved. Test reports shall be accompanied by notarized certificates from the manufacturer certifying that the previously tested material is of the same type, quality, and manufacture as that proposed for the project.

-2 TESTS AND INSPECTIONS

The Contractor shall furnish cylinder forms and other necessary tools for testing and sampling. Under the supervision of the Owner's representative, he shall take test cylinders and make slump tests. For each grout pour or each day's pour, whichever is less, there shall be a minimum of three cylinders taken and cured for breaking after seven days and 28 days. The Contractor at his expense shall cure, crate and transport all test cylinders to an approved laboratory. The Contractor shall pay all laboratory costs for breaking test cylinders or for mailing any other laboratory tests or analysis. Two certified copies of each test or analysis shall be furnished to the Engineer. The same laboratory shall be used throughout the project. Contractor shall be entirely responsible for obtaining strengths indicated and shall guarantee that concrete will be of suitable density and meet minimum strength requirements.

Number each cylinder set, 1A, 1B, 1C and 2A, 2B, 2C, etc.; date each set and keep accurate records of extent of pour represented by each set.

Cure and test cylinders per ASTM C31. Compression tests shall be made in accordance with ASTM C39. Shrinkage tests shall be made in accordance with ASTM 157.

If laboratory tests of specimen cylinders show compressive stresses below the minimum, core samples shall be taken at the Engineer's direction and shall be paid for by the Contractor. If test indicates core specimen is below the specified strength, remove all defective masonry work and replace with new work meeting required strength, including repair or replacement of other work damaged by correcting defective concrete at contractor's expense.

-3 NOTIFICATION

Notify Engineer 48 hours prior to pouring grout.

04105 MEASUREMENT AND PAYMENT

No separate payment shall be made for work this section.
The performance of this work shall be considered as a
subsidiary obligation or is covered under bid items 101
101 and 102 of the Unit Price Schedule.

END OF SECTION 04100

04200 GENERAL

-1 SCOPE

The work covered by this section consists of furnishing all labor, materials, equipment, supplies, and performing all operations necessary to complete the masonry work as shown in the drawings and specified herein.

-2 RELATED WORK IN OTHER SECTIONS

- | | |
|-------------------------------|---------------|
| A. Mortar: | Section 04100 |
| B. Concrete Reinforcement: | Section 03200 |
| C. Painting: | Section 09900 |
| D. Cast-in-Place Concrete: | Section 03300 |

-3 APPLICABLE DOCUMENTS

The following specifications and standards of the issues listed below (including amendments, addenda, and errata) but referred to thereafter by basis designation only, form a part of this specification to the extent required by the references thereto.

- A. American Society for Testing & Materials (ASTM)
- | | |
|-------|---|
| C-90 | Hollow Load-Bearing Concrete Masonry Units |
| C-140 | Sampling and Testing Concrete Masonry Units |

-4 DELETED

-5 DELIVERY AND STORAGE

A. DELIVERY

Deliver materials suitably protected to avoid damage.

B. STORAGE

Store materials off ground to avoid damage and keep covered to maintain materials dry. Segregate different unit masonry types. Protect materials from wetting by snow, rain or ground water and against soilage or intermixture with earth or other types of materials.

04201 MATERIALS

-1 CONCRETE BLOCK

Concrete masonry wall units shall be sand and gravel block 8" x 16" nominal face dimension by the thickness necessary to carry loads. Units shall comply with ASTM C-90 Specifications Type A Grade block. Blocks shall also comply with ASTM C-140-56, Sampling and Testing Concrete Masonry Units for a minimum 30% retained moisture when laid. The manufacturer shall provide certification of moisture content of block when delivered. Exposed faces shall be free from chips, cracks or other imperfections. Not more than 5% of a shipment may contain slight cracks or small chips larger than 1/2". Provide bond beam block, corner units, ends, etc., as detailed and required.

-2 GROUT

Grout: Class B concrete, coarse aggregate, size 7, ASTM C-33, with maximum slump of 8" - f'c=2000 psi.

04202 PROTECTION AND SELECTION

-1 COLD JOB PROTECTION

Protect in-place masonry construction when the temperature of the surrounding air is below 40°F (4°C) as follows:

- A. Average daily air temperature 40° to 32°F (4° to 0°C):
Protect masonry from rain or snow for 24 hours after erection.
- B. Average daily air temperature 32° to 25° (0° to -4°):
Cover masonry for 24 hours after erection.
- C. Average daily air temperature 25° to 20°F (-4° to -7°C):
 - 1. Provide heat sources on both sides of masonry construction.
 - 2. Provide wind breaks for wind velocity in excess of 15 mph.

3. Cover masonry with insulating blankets for 24 hours after erection.

D. Average daily air temperatures below 20°F (-7°C):

1. Provide enclosures and heat to maintain air temperature above 32°F (0°C).
2. Maintain constructed masonry temperature above 32°F (0°C) for 24 hours after erection with enclosures and supplemental heat.

-2 FROZEN WORK

Do not build on frozen subgrade or setting beds. Remove and replace masonry work damaged by frost or freezing. Normal weathering of masonry will be acceptable, provided other conditions and activities do not interfere and result in an unacceptable condition.

-3 FROZEN MATERIALS

Do not use frozen materials or materials mixed or coated with ice or frost.

-4 PROTECTION

Protect partially completed masonry against weather when work is not in progress, by covering top of walls with strong, waterproof, non-staining membrane. Extend membrane at least 2'-0" down both sides of walls and anchor securely in place.

-5 SELECTION

Do not use metal reinforcing or ties having loose rust or other coating including, i.e., which will reduce or destroy bond. Use no masonry units with chips, cracks, voids, discolorations or other defects which might be visible or cause staining in the finished work.

04203 INSTALLATION

-1 GENERAL

A. CONSTRUCTION TOLERANCES

1. VARIATION FROM PLUMB

For lines and surfaces of columns, walls and/or rises do not exceed 1/4" in 10'.

2. VARIATION OF LINEAR LINE

For position shown in plan, do not exceed 1/2" in 20' maximum, nor 3/4" in 40' or more.

3. VARIATION IN CROSS SECTIONAL DIMENSIONS

For thickness of walls from dimensions shown do not exceed minus 1/4" nor plus 1/2".

B. WETTING OF MASONRY UNITS

Do not wet concrete masonry units.

C. CUTTING MASONRY UNITS

Cut masonry units with motor driven saw equipment designed to cut masonry with clean, sharp unchipped edges. Cut units as required to provided pattern shown and fit adjoining work neatly. Use full units without cutting wherever possible. Where cutting is required use the largest size masonry units possible and avoid the use of small pieces of masonry or large mortar areas.

D. MORTAR AND GROUT

Use Type S mortar only. Do not use mortar or grout which has begun to set or if more than 2-1/2 hours has elapsed since initial mixing. Retemper mortar during the 2-1/2 hour period as required to restore workability.

-2 CONCRETE BLOCK

A. LAYING OUT WALLS

Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to properly

locate openings, movement-type joints, returns and off-sets. Avoid the use of less than half size units at corners, jambs and wherever possible at other locations. Lay up walls plumb and true to comply with tolerances specified above and with courses level, accurately spaced and coordinated with other work. Reinforce partitions and anchor to structure as shown on the structural drawings.

B. MORTAR BEDDING AND JOINTING

Lay concrete block units with full mortar coverage on all horizontal and vertical face shells and also bed all webs in mortar. Maintain joint widths shown except for minor variations required to maintain bond alignment if not otherwise shown lay walls with 3/8" joints. Tool exposed joints with a raked joint. Rake out mortar in preparation for application of caulking or sealants where shown. Remove masonry units disturbed after laying; clean and relay in fresh mortar. If adjustments are required, remove all units, clean off mortar, and reset in fresh mortar.

C. STOPPING AND RESUMING WORK

Rack back block length in each course; do not tooth. Clean exposed surfaces of set masonry units and mortar prior to laying fresh masonry.

D. BUILT IN WORK

As the work progresses, build in items specified under this and other sections of these specifications. Fill in solidly around built in items. Fill space between hollow metal frames and masonry solidly with mortar. Where built-in items are to be embedded in coves of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into cove.

E. REINFORCING AND GROUT

Place reinforcing as detailed. Grout full all cells containing bars and as noted or detailed. Compact grout by shaking the bars. Maximum height of grout pour shall be 4' without prior approval.

-3 REPAIR POINTING AND CLEANING

A. REPAIR

Remove and replace all concrete block units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. POINTING

During the tooling of joints, enlarge any voids or holes, and completely fill with mortar. Point up all joints at corners, openings and adjacent work to provide a neat, uniform appearance, properly prepared to receive water proofing or paint as scheduled and specified.

C. CLEANING

1. CONCRETE MASONRY

After mortar is thoroughly set and cured, clean sample wall area of concrete masonry of approximately 20 square feet as specified below. Obtain Engineer's approval of sample cleaning prior to proceeding to clean the rest of the masonry work. Approved sample section shall serve as a standard for remainder of cleaning work.

2. DRY CLEAN

Dry clean to remove large particles of mortar using wood paddles and scrapers. Use chisel or wire brush as required.

3. WASHING

Presoak wall by saturating with water and flush off loose mortar and dirt. Scrub down wall with stiff fiber brush and solution of 1/2 cup of trisodium phosphate and 1/2 cup of household detergent dissolved in one gallon of water. Rinse walls by washing off all cleaning solution dirt and mortar crumbs using clean, pressurized water.

04204 QUALITY ASSURANCE PROVISIONS

-1 TEST REPORTS

Certified copies of reports of tests from approved laboratories performed in previously manufactured materials shall be submitted and approved. Test reports shall be accompanied by notarized certificates from the manufacturer certifying that the previously tested material is of the same type, quality, and manufacture as that proposed for the project.

04205 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor, or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 04200

DIVISION 5 -- METALS

05100	Structural Metal
05500	Miscellaneous Metals

05100 GENERAL

-1 SCOPE

The work includes the furnishing of all plant, labor, equipment, supplies and materials, and performing all operations necessary to complete structural metal work as shown on the drawings or noted herein.

-2 RELATED WORK IN OTHER SECTIONS

- | | |
|----------------------------|---------------|
| A. Concrete Reinforcement: | Section 03200 |
| B. Cast-in-Place Concrete: | Section 03300 |
| C. Miscellaneous Metal: | Section 05500 |
| D. Painting: | Section 09900 |

-3 APPLICABLE DOCUMENTS

The following specifications and standards of the issues listed below (including the amendments, addenda, and errata) but referred to thereafter by basic designation only, form a part of this specification to the extent required by the references thereto.

A. FEDERAL SPECIFICATIONS

- | | |
|----------|-----------------------------------|
| TT-P-645 | Zinc Chromate Primer |
| TT-P-86 | Paint, Red-Lead-Base, Ready-Mixed |

B. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

Manual of Steel Construction, Latest Edition

C. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- | | |
|------|--|
| A6 | Delivery of Steel |
| A36 | Structural Steel |
| A53 | Welded and Seamless Steel Pipe |
| A123 | Zinc (hot galvanized) coatings on products. Fabricated, rolled, pressed and forged steel shapes, plates, bars and strip. |

- A307 Bolts, Nuts and Washers
- A328 Steel Sheet Piling
- A386 Zinc coatings on assembled steel products
- A325 High Strength Bolts for Structural Steel Joints
- A490 Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints

D. AMERICAN WELDING SOCIETY (AWS)

AWS D1.0 Welding in Building Construction

-4 SUBMITTALS

A. SHOP DRAWINGS

Submit complete drawings for Engineer's approval for all items. Show dimensions, details, and necessary accessory items. Verify dimensions, correlate with adjoining work. Fabrication shall not commence until approval has been received.

-5 DELIVERY AND STORAGE

A. Provide necessary support while transporting and handling to prevent damage.

B. STORAGE

Store on supports above ground to prevent bending and rusting. Structural metal to be exposed as a finished material shall be stored in a dry, well ventilated space.

05101 MATERIALS

-1 STRUCTURAL STEEL

Structural steel shall be ASTM A-36. Design, fabrication and erection shall be in accordance with the latest edition of AISC Specifications for Design, Fabrication and Erection of Structural Steel. Pipe columns shall conform with ASTM A-53, Grade B, yield stress 35,000 psi.

2. All surfaces of structural steel shall be given one shop coat of paint immediately after cleaning except those completely buried in concrete or galvanized.
3. Paint shall be applied in a full heavy coat, evenly applied and well worked into joints and open spaces. Surfaces to receive paint must be dry. Paint shall be zinc chromate primer per TT-P-645.
4. Parts inaccessible after assembly shall be given a second coat of shop paint. Tint the second coat a slightly different shade to distinguish from the first.
5. Exposed parts of bolts used in assembly shall be prime coated.

B. TOUCH-UP PAINTING

After erection, prime coat all field bolt heads, nuts and washers, field welds, and touch up all abrasions in the shop coat. Use same paint as used for shop coat.

-3 GALVANIZING

Comply with ASTM A-123 for zinc coatings applied on products fabricated from rolled or pressed steel shapes, plates, bars and strips. ASTM A-386-65 for zinc coatings on assembled steel products. Weight of coatings per Table 1 for class and thickness of material to be coated. Except for bolts, nuts, galvanize after fabrication. Coat all steel items where indicated on the drawings and all exposed exterior structural steel unless otherwise noted.

-4 FABRICATION

- A. Anchor bolts, plates, grillage, and other items of miscellaneous steel furnished under this section and scheduled for embankment in concrete or masonry shall be furnished to the respective trades for installation at the proper time. Include instructions and/or templates for installation of all such items.
- B. Where required or advisable, field measurements shall be taken to verify the work of others.
- C. Fabricate and assemble structural steel in shop to greatest extent possible without detriment to handling, transporting, and erection.

-2 BOLTS

Bolts shall conform to ASTM A-307. Where expansion bolts and anchors are shown, the Contractor shall submit to the Engineer a sample of the anchor to be used with laboratory data of pullout and shear strength. Where specifically shown use bolts conforming to ASTM A-325 and tighten as noted on drawings.

-4 WELDING

All welding operations shall conform with American Welding Society Code D1.0 for Arc and Gas Welding in Building Construction.

05102 FABRICATION, ERECTION AND WORKMANSHIP

-1 CONNECTION

Make connections by methods indicated on drawings. Field connections not shown shall be bolted or welded frame beam connections per the American Institute of Steel Construction Manual, latest edition.

-2 PAINTING

A. SHOP COATING

1. Steel shall be cleaned by power wire brush, or blasted, to remove all dirt, rust, mill scale, splatter, slag or flux deposit, oil or other foreign matter.

2. All surfaces of structural steel shall be given one shop coat of paint immediately after cleaning except those completely buried in concrete or galvanized.
3. Paint shall be applied in a full heavy coat, evenly applied and well worked into joints and open spaces. Surfaces to receive paint must be dry. Paint shall be zinc chromate primer per TT-P-645.
4. Parts inaccessible after assembly shall be given a second coat of shop paint. Tint the second coat a slightly different shade to distinguish from the first.
5. Exposed parts of bolts used in assembly shall be prime coated.

B. TOUCH-UP PAINTING

After erection, prime coat all field bolt heads, nuts and washers, field welds, and touch up all abrasions in the shop coat. Use same paint as used for shop coat.

-3 GALVANIZING

Comply with ASTM A-123 for zinc coatings applied on products fabricated from rolled or pressed steel shapes, plates, bars and strips. ASTM A-386-65 for zinc coatings on assembled steel products. Weight of coatings per Table 1 for class and thickness of material to be coated. Except for bolts, nuts, galvanize after fabrication. Coat all steel items where indicated on the drawings and all exposed exterior structural steel unless otherwise noted.

-4 FABRICATION

- A. Anchor bolts, plates, grillage, and other items of miscellaneous steel furnished under this section and scheduled for embankment in concrete or masonry shall be furnished to the respective trades for installation at the proper time. Include instructions and/or templates for installation of all such items.
- B. Where required or advisable, field measurements shall be taken to verify the work of others.
- C. Fabricate and assemble structural steel in shop to greatest extent possible without detriment to handling, transporting, and erection.

- D. Provisions for field connections shall be as detailed on the drawings and specified herein.
- E. Holes, as required, in plates or other shapes shall be drilled or punched and reamed as required. Burning of holes shall not be permitted.
- F. Steel shapes used as exposed architectural surfaces shall be continuous lengths along entire line of contact unless otherwise noted on the drawings. (Two or more pieces shall be butt welded with exposed welds ground smooth). All corners shall be mitered, welded, and ground smooth. There shall be no bolted or overlapping connections on surfaces exposed to view, unless indicated otherwise on the drawings. Exposed welds shall be ground smooth.

-5 ERECTION

- A. Erection equipment shall be suitable and safe for workmen and capable of accommodating construction requirements of this project.
- B. Erect to allowable tolerances. Steel shall be plumb and level before final welding or bolting.
- C. Errors in shop fabrication or deformation resulting from handling or transportation that prevent proper assembly and fitting of parts shall be corrected by methods meeting the approval of the Engineer.
- D. Provide adequate bracing and shoring during erection to maintain members in position and prevent overloading.

05103 QUALITY ASSURANCE PROVISIONS

-1 INSPECTION AND TESTING

The Contractor shall supply the Engineer with triplicate copies of mill reports and tests before any material is installed.

A. INSPECTION

Shop welding shall be inspected by a qualified welding

inspector engaged by the steel fabricator at his expense. To determine the quality of welds, the welding inspector may utilize x-ray or gamma-ray tests, ultrasonic testing, and any other aid to visual inspection which he may deem necessary to assure himself of the adequacy of the welding.

The fabricator shall submit a certificate of conformance or test reports to the Contractor, who shall forward it to the Engineer for approval. The affidavit shall state that all miscellaneous steel has been fabricated in strict accordance with the standards specified and in accordance with these contract documents.

05104 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor, or is covered under bid items 101, 102 and 105 of the Unit Price Schedule.

END OF SECTION 05100

05500 GENERAL

- 1 SCOPE
See drawings and schedules for type, location, quantity and details of metal items required to complete work. Anchor bolts and other incidental items of miscellaneous metals required to be built into concrete shall be furnished to respective trades, at proper time and shall include instructions or templates for their installation.
- 2 RELATED WORK IN OTHER SECTIONS
 - A. Galvanizing: Section 05100
 - B. Welding: Section 05100
- 3 SUBMITTALS
 - * A. MANUFACTURER'S LITERATURE
Submit manufacturer's literature for all products detailing installation, sizes and dimensions. Literature shall list salient features of all products. Order no materials until approval is received.
 - B. SHOP DRAWINGS
Submit for approval of all items. Such approval is for sizes of material and for design; it shall in no way relieve the Contractor of responsibility for furnishing all material required by the drawings and specifications, although not shown on shop drawings. No material shall be fabricated before the Engineer's approval has been received.

05501 MATERIALS

- 1 GENERAL
All metals shall be new, and shall be free from defects impairing strength, durability and appearance. Metals shall conform to the requirements of the Standard Specifications of the American Society for Testing Materials and the Federal Specifications under the following serial designations and numbers:
- 2 STRUCTURAL STEEL
All structural steel shall conform to ASTM A-36. Dimensional tolerances and product quality shall comply with ASTM A-6.
- 3 COMMON BOLTS AND NUTS
Bolts and nuts shall conform to the requirements for regular hexagon bolts and nuts in accordance with ANSI B18.2.1 and ANSI B18.2.2. Material shall conform to ASTM A-307.

-4 WASHERS

Circular washers shall be flat and smooth and shall conform to requirements for type A washers in ANSI B27.2, unless otherwise shown on the drawings.

-5 WELDING ELECTRODES

Welding electrodes for steel shall conform to AWS A5.1, E60 series.

-6 ANCHORS AND BOLTS

The Contractor shall furnish and install anchors, bolts, straps, brackets, and other steel and iron fastenings not specified under other parts of these specifications. Furnish such items as shown, and where necessary for securing work in place in a rigid and durable manner. Sizes, types and spacing of anchors and/or bolts not indicated and specified, shall be as directed by the Engineer.

Heavy duty concrete anchors shall have removable studs to present a surface free of obstructions and studs shall be movable 1/2" in any direction when installed. Studs and couplings shall have a yield strength of 90 ksi minimum. Contract drawings indicate required locations. The anchors shall be Deco or approved equal as manufactured by Decatur Engineering Company, Box 643, Decatur, Illinois 62525.

05502 DESIGN AND DETAILING

-1 FABRICATION

All details and fabrication in accordance with industry standards unless shown differently on the drawings.

-2 CASTINGS

Castings to be free of defects, with smooth finish, and sharp defined lines and arrises.

-3 FASTENINGS

Fastenings shall be hidden where possible. Joints exposed to weather to be watertight. Provide holes and connections for the work of other trades.

05503 WORKMANSHIP

-1 METALS

All metals shall be well formed to shape and size with sharp lines. Weld permanent connections. Screws or bolts where possible shall have heads countersunk.

-2 CASTINGS

Castings to be free of defects, with smooth finish, and sharp defined lines and arrises.

-3 FASTENINGS

Fastenings shall be hidden where possible. Joints exposed to weather to be watertight. Provide holes and connections for the work of other trades.

05504 INSTALLATION

-1 GENERAL

Install plumb and true where shown on the drawings in strict accordance with manufacturer's printed instructions where applicable.

-2 VERIFICATION OF MEASUREMENTS

Take field measurements before fabrication when possible.

-3 ANCHORAGE

Anchor to concrete with expansion bolts where built in anchorage is not provided.

-4 HARDWARE

Bolts, screws, etc., for field connections: same material, finish as base material.

05505 QUALITY ASSURANCE PROVISIONS

-1 TESTS AND TEST REPORTS

The testing requirements stated herein or incorporated in referenced documents may be waived, provided certified copies of reports of tests from approved laboratories performed in

previously manufactured materials are submitted and approved. Test reports shall be accompanied by notarized certificates from the manufacturer certifying that the previously tested material is of the same type, quality, and manufacture as that proposed for the project.

05506 MEASUREMENT AND PAYMENT

No separate payment shall be made for work this section. The performance of this work shall be considered as a subsidiary obligation or is covered under bid items 101, 102 and 105 of the Unit Price Schedule.

END OF SECTION 05500

DIVISION 6 -- WOOD

06100 Rough Carpentry

06200 Finish Carpentry

06100 GENERAL

-1 SCOPE

Finish all material, labor and equipment to complete rough carpentry work as required in conformance with applicable drawings, and as hereinafter specified.

-2 RELATED WORK IN OTHER SECTIONS

A. Finish Carpentry: Section 06200

B. Hollow Metal Doors & Frames: Section 08100

-3 APPLICABLE DOCUMENTS

The following specifications and publications listed below of the issues currently in effect and referred to by basic designation only, form a part of this specification to the extent required by the references thereto (including the amendments, addenda and errata designated).

A. GOVERNMENT DOCUMENTS

1. Federal Specifications

FF-B-571A	Bolts; Nuts; Studs; and Tap Rivets (and materials for same)
FF-N-105A	Nails, Wire, Brads and Staples
FF-A-325	Shield, expansion, nail expansion; nail drive screw devices, anchoring, and masonry
FF-N-103C	Nails (small) and tacks; cut
FF-B-588b(2)	Bolts, Toggle & Expansion Sleeve, screw
FF-B-571a(1)	Bolts, hexagon and square
PS-20-70	Lumber-American Lumber Standards for Softwood Lumber

B. NON-GOVERNMENT DOCUMENTS

1. National Forest Product Association, 1971 and Supplement

National Design Specification for Stress-Grade Lumber and its Fastenings

2. Western Wood Products Association

WWPA Grading Rules Book

-4 DELIVERY AND STORAGE

A. DELIVERY

Materials shall be delivered to the site in an undamaged condition.

B. STORAGE

Materials shall be carefully stored off the ground to provide proper ventilation, drainage, and protection against dampness. Defective or damaged materials shall be replaced by the Contractor at no expense to the Owner.

06101 MATERIALS

-1 LUMBER

A. GENERAL

Lumber shall conform with the Federal Specifications designated above. Lumber for the various usages, unless otherwise indicated on the drawings, shall be of the specie and grade permitted in the schedules hereunder. Species and grades of lumber shall conform with the Association rules hereinbefore designated.

1. GRADE MARKING

Each piece shall bear the official grade mark of the appropriate inspection bureau or association, or other agency approved as competent by the Engineer.

2. SIZES AND PATTERNS

Lumber shall be surfaced on four sides and dressed sizes of yard and structural lumber shall conform to the Department of Commerce Simplified Parctice Recommendation PS-20-72.

B. MOISTURE CONTENT

All boards and dimension lumber shall be kiln dried or air dried, and the moisture content shall not exceed 19%. Moisture content of lumber over 2 inches in nominal thickness shall conform with the rules of the association under which grading was made and may be placed into the structure without further seasoning.

C. SPECIES GROUPS

Softwoods are arranged in species groups hereinafter for the purpose of scheduling acceptable grades of the various species to be used in the construction and/or milled items to be provided under this project. All specie group reference hereunder for lumber shall be in parallel with groups established in the National Design Specification, lumber for use other than structural and/or framing lumber shall also conform with the following specie grouping:

<u>GROUP NO.</u>	<u>SOFTWOOD SPECIES</u>
I	Douglas Fir, Western Larch and Western Hemlock
II	White Fir, Engleman Spruce, Ponderose Pine and Lodgepole Pine
III	Western Red Cedar and Incense Cedar
IV	Idaho White Pine, Sugar Pine, Norway Pine and Sitka Spruce

D. USE, GRADE AND SPECIES OF FRAMING LUMBER

2 inch by 2 inch and larger shall be stress graded species with minimum allowable stress values of 1450 psi in repetitive bending; 95 psi in horizontal shear; 385 psi in compression perpendicular to grain; 1050 psi in

compression parallel to grain and 1,700,000 psi in modulus of elasticity.

<u>USE</u>	<u>GRADE</u>	<u>SPECIES GROUP</u>
Backing, Blocking, Cants Bridging, Buck, Firestop Battens, Nailers	No. 2	All groups
Collar, Girt, Ledger	No. 2	I, II and III
Misc Framing, Nailer, Plate, Ribbon, Sill, Stud		

-2 ROUGH HARDWARE

A. GENERAL

Unless otherwise indicated or specified shall be of the type and size necessary for project requirements. Sizes, types and spacing of fastenings of manufactured building materials shall be as recommended by the product manufacturer unless otherwise noted. Rough hardware exposed to the weather or embedded in or in contact with exterior concrete shall be galvanized.

B. NAILS, WIRE, BRADS AND STAPLES

Impact driven fasteners shall conform with Federal Specification FF-N-105A.

C. WOOD SCREWS

Screws shall conform with Federal Specification FF-S-118.

E. CLAMPS, EXPANSION BOLTS AND SCREWS

Clamps, Expansion Bolts, Expansion Screws, clamps and fastening devices shall be of steel and iron, and of standard type and manufacture.

F. ATTACHMENTS FOR WOOD ENGAGING CONCRETE

Attachments shall be approved type metal plugs or inserts spaced as directed. Wood plugs embedded in concrete will not be permitted.

G. POWER ACTUATED FASTENERS

Power actuated fastening of approved type, size and holding power may be used only if approved by the Contracting Officer.

06102 INSTALLATION

-1 TEMPORARY WORK

A. SHORING, BRACING AND CENTERING

Temporary bracing, centering and shoring of adequate size shall be provided for the support and protection of the structures where required during construction, shall be strong, rigid, properly placed and firmly secured in place to function for the intended purposes.

B. CLOSURES

As project construction advances and the need for safety protection and protection against intrusion arises the Contractor shall provide temporary barricades, enclosures, and suitable hinged and padlocked doors for exterior openings. Each temporary closure shall be maintained in a serviceable condition at all times.

-2 GENERAL

Cutting, notching, boring, and reinforcing of framing members shall be subject to the approval of the Engineer. The installation of bowed or warped framing members or other lumber not in conformance with standard practices will not be accepted.

-3 NAILERS, CURBS AND BLOCKING

Nailers, curbs, cants and blocking of sizes indicated on the drawings, or required, shall be installed where shown for the attachment of Carpentry and the work of other trades. Material shall be set rigid, in perfect alignment and shall be trued with a long straightedge.

-4 NAILING SCHEDULE

Framing Members

<u>Connection</u>	<u>Box or Common</u>
Stud to plate -end nail	2-16d
Stud to plate -toe nail	4-8d
Corner studs and angles	16d at 30" o.c.

-5 LOCATION OF ANCHORING DEVICES

Special fabricated or standard anchoring devices for the attachment of carpentry work and framing shall be installed where detailed or otherwise required on the plans, and as specified herein. Anchoring devices, unless otherwise shown, shall be installed in accordance with the following.

PARTITIONS	Bolts or Power Actuated Fasteners to Concrete Slab 4' o.c. max. spacing.
PLATE, BLOCKING & CURB ANCHORS	See Drawing for Spacing Unless otherwise noted use power actuated fasteners 4' o.c. maximum spacing.

-6 PARTITIONS

Partitions shall be framed with one piece 2 x 4 inch studs spaced 16 inches on centers, unless otherwise shown on the drawings. All studs shall have full bearing on sills, and provide full bearing for plates, shall be one piece except at openings, and no splices will be allowed. All studs around openings, and at corners or intersections shall be selected for straightness. Frame intersections with three studs and nails with sixteen-penny nails at 16 inch centers. All plate joints shall be made directly over studs. Plates shall be nailed to each other with ten-penny nails staggered and spaced 16 inches around each edge. Studs shall be framed as shown or required for proper installation of trim, plumbing and fixture anchorage, and other work to be concealed. Nailing strips and backing shall be notched or cut in where necessary for surface mounted items.

06103 QUALITY ASSURANCE PROVISIONS

-1 TESTS AND TEST REPORTS

The testing requirements stated herein or incorporated in referenced documents may be waived provided certified copies of reports and tests from approved laboratories performed on previously manufactured materials are submitted and approved. Test reports shall be accompanied by notarized certificates from the manufacturer certifying that the previously tested material is of the same type, quality and manufacture as that supplied for the project.

-2 STAMPS AND MARKINGS

Refer to specifications for individual materials for requirements for stamp and markings.

06104 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 06100

06200 GENERAL

-1 SCOPE

Installation of all wood trim and other items not specifically described as being installed under other sections of these specifications.

-2 RELATED WORK IN OTHER SECTIONS

- | | |
|---------------------|---------------|
| A. Rough Carpentry: | Section 06100 |
| B. Painting: | Section 09900 |

-3 QUALITY ASSURANCE

A. QUALIFICATIONS OF WORKMEN

For actual cutting and fitting of trim and finish material, use only journeyman finish carpenters who are thoroughly trained and experienced in the skills required, who are completely familiar with the materials involved and the manufacturers' recommended methods of installation, and who are thoroughly familiar with the requirements of this work.

B. REJECTION

In the acceptance or rejection of finish carpentry, no allowance will be made for lack of skill on the part of workmen.

-4 APPLICABLE DOCUMENTS

The latest editions of the following specifications and standards (including the amendments, addenda, and errata designated), form a part of this specification to the extent required by the references thereto.

A. GOVERNMENT DOCUMENTS

1. Federal Specifications

- | | |
|-----------|--------------------------------|
| FF-N-105A | Nails, Wire, Brads and Staples |
| FF-S-111B | Screws, Wood, Slotted Head |

MM-L-00751F Lumber and Timber, Softwood

MMM-A-100B Adhesive, Animal Glue

FF-N-103C Nails (small) and Tacks; Cut

U.S. Department of Commerce

PS-20 Lumber-American Lumber Standards
for Softwood

S-251 Hardboard

B. NON-GOVERNMENT DOCUMENTS

1. Western Wood Products Association

Grading Rules for Western Lumber latest edition

2. Western Pine Association

Western Moulding Patterns - WP Series

3. Architectural Woodwork Institute

Quality Standards of the Architectural Woodwork
Industry

-5 SUBMITTALS

MANUFACTURER'S LITERATURE

Submit, for standard stock manufactured items.

-6 PRODUCT HANDLING

A. PROTECTION

Use all means necessary to protect the materials of this section before, during, and after installation and to protect the installed work and materials of all other trades.

B. REPLACEMENTS

In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

06201 MATERIALS

-1 LUMBER

A. GENERAL

Lumber shall conform with the Federal Specifications designated above. Lumber for the various usages, unless otherwise indicated on the drawings, shall be of the specie and grade permitted in the schedules hereunder. Species and grades of lumber shall conform with the Association rules designated above.

1. GRADE MARKING

Each piece of yard and structural lumber shall bear the official grade mark of the appropriate inspection bureau or association, or other agency approved as competent by the Engineer.

2. SIZES AND PATTERNS

Lumber shall be surfaced on four sides unless otherwise noted and the dressed sizes of yard and structural lumber shall conform to the Department of Commerce Simplified Practice Recommendation PS-20-72. Lumber shall be worked to such patterns as are indicated on the drawings or specified. Worked materials, except as otherwise indicated on the drawings, shall conform to the standard patterns of Department of Commerce Simplified Practice Recommendation PS-20. Millwork and trim may be finger jointed if jointed with waterproof glue. Finger jointed material shall be considered as a solid piece and shall be graded under the rules applying to lumber without finger joints. Finger jointed millwork and trim shall be provided only for opaque paint finished applications.

B. MOISTURE CONTENT

Finish Lumber: Finish lumber shall be kiln-dried, and when delivered to the project site, the moisture content shall not exceed 12% for material 1 inch or less in thickness, and shall not exceed 14% for material over 1 inch in thickness. Millwork which is assembled or built-up or more than one piece of the mill shall have a moisture content not in excess of 12%.

C. SPECIES GROUPS

Softwoods are arranged in species groups hereinafter for the purpose of scheduling acceptable grades of the various speices to be used in the construction and/or milled items to be provided under this project. All specie group reference hereunder shall be in parallel with groups established in the National Design Specification, and shall conform with the following specie grouping:

<u>GROUP NO.</u>	<u>SOFTWOOD SPECIES</u>
I	Douglas Fir, Western Larch and Western Hemlock
II	White Fir, Englemann Spruce, Ponderosa Pine and Lodgepole Pine
III	Western Red Cedar and Incense Cedar, Redwood
IV	Idaho White Pine, Sugar Pine, Norway Pine and Sitka Spruce

D. USE, GRADES AND SPECIES FOR EXTERIOR FINISH

<u>USE</u>	<u>GRADE</u>	<u>SPECIES GROUP</u>
Stained Trim	Clear-Vertical Grain	III - Redwood

E. USE, GRADES AND SPECIES FOR INTERIOR SOFTWOOD MILLWORK

<u>USE</u>	<u>GRADE</u>	<u>SPECIES GROUP</u>
Interior Trim	C Select	I & II
Base, Shelving, and millwork not otherwise specified	C Select	I & II

-2 HARDWARE

Unless otherwise indicated or specified shall be of the type and size necessary for project requirements. Sizes, types and spacing of fastenings of manufactured building materials shall be as recommended by the product manufacturer unless otherwise noted. Hardware exposed to the weather or embedded in or in contact with exterior concrete shall be galvanized.

A. POWDER ACTUATED FASTENERS

Approved powder actuated fasteners may be used only with approval of the Contracting Officer for the specific use intended.

B. NAILS, WIRE, BRADS AND STAPLES

Impact driven fasteners shall conform with Federal Specification FF-N-105A.

C. WOOD SCREWS

Screws shall conform with Federal Specification FF-S-118 and shall be suitable for attachment of stud framing and blocking.

-3 GLUE

A. For exterior Buildup Millwork, water resistant casein or other moisture resistant type.

B. For Interior Buildup Millwork, glue shall conform with Federal Specification MMM-A-100, grade best suited for each purpose.

See Section 07400

-4 PRE-FINISHED WALL PANEL

See Section 09950

-5 PLYWOOD

All stud walls shall be covered with 1/2 inch AC exterior grade plywood. No joint finishing is required prior to painting.

06202 INSTALLATION

-1 GENERAL

A. INSPECTION

1. Prior to all work of this section, carefully inspect

the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

2. Verify that finish carpentry may be completed in strict accordance with the original design and all pertinent codes and regulations.

B. DISCREPANCIES

1. In the event of discrepancy, immediately notify the Engineer.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

-2 WORKMANSHIP

A. GENERAL

All finish carpentry shall produce joints true, tight, and well nailed with all members assembled in accordance with the drawings.

B. JOINTING

1. Make all joints to conceal shrinkage; miter all exterior corners; cope all interior corners, miter or scarf all end-to-end joints.
2. Install all trim in pieces as long as possible, jointing only where solid support is obtained.

C. FASTENING

1. Install all items straight, true, level, plumb, and firmly anchored in place; where blocking or backing is required, coordinate as necessary with other trades to ensure placement of all required backing and blocking in a timely manner.
2. Nail trim with finish nails of proper dimension to hold the member firmly in place without splitting the wood.

3. Nail all exterior trim with galvanized nails, making all joints to exclude water and setting in waterproof glue or the caulking described in section 07900 of these specifications.
4. On exposed finish work, set all nails for putty.
5. Screw, do not drive, all wood screws except that screws may be started by driving and then screwed home.

-3 INSTALLATION OF OTHER ITEMS

Install all other items in strict accordance with the drawings and the published recommendations of the manufacturer of the item, anchoring firmly in place at the prescribed location, straight, plumb, level, and anchored for long life under hard use.

-4 FINISHING

Sandpaper all finished wood surfaces thoroughly as required to produce a uniformly smooth surface, always sanding in the direction of the grain, except do not sand wood which is designed to be left rough; no coarse grained sandpaper mark, hammer mark, or other imperfection will be accepted.

-5 CLEANING UP

Keep the premises in a neat, safe, and orderly condition at all times during execution of this portion of the work, free from accumulation of sawdust, cut-ends, and debris.

06203 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 06200

07100 GENERAL

-1 SCOPE

This section covers all materials and labor necessary for the complete installation of the polyethylene vapor barrier.

-2 RELATED WORK IN OTHER SECTIONS

A. Rough Carpentry Section 06100

B. Insulation Section 07200

-3 SUBMITTALS

A. MANUFACTURER'S LITERATURE

Submit manufacturer's literature concerning products and installation of all materials, adhesives and fastenings.

07101 MATERIALS

A. POLYETHYLENE SHEET VAPOR BARRIERS

A single sheet of polyethylene film 4.0 mil thickness with a vapor transmission rating of 0.20 perms or less.

B. ADHESIVES

Provide the types of adhesives recommended by the vapor barrier manufacturer.

C. VAPOR BARRIER TAPE

Aluminum foil 1.0 mil thick laminated between two sheets of polyester film, with a vapor transmission of 0.015 perms or less with permanent pressure sensitive adhesive on one face.

07102 INSTALLATION

A. Comply with the manufacturer's written instructions for the types of installation required.

8. Seal joints in vapor barriers, and seal to other surfaces at extremities of coverage by lapping 6" and bonding with adhesives or tape as recommended by manufacturer. Where nails or staples are used, seal with vapor barrier tape. Use vapor barrier tape to seal all punctures, tears and penetrations.

07103 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 07100

DIVISION 7 -- THERMAL AND MOISTURE PROTECTION

07200	Insulation
07400	Preformed Metal Roof
07900	Calking and Sealants

07200 GENERAL

-1 SCOPE

This section includes insulation with integral vapor barrier, and its installation complete.

-2 WORK IN OTHER SECTIONS

A. Rough Carpentry Section 06100

B. Vapor Barrier Section 07100

-3 DELETED.

-4 SUBMITTALS

A. MANUFACTURER'S LITERATURE

Submit manufacturer's literature concerning products and installation for all materials, adhesives and fastenings.

-5 DELIVERY AND STORAGE

A. DELIVERY

Deliver in unbroken packages with manufacturer's original labels thereon, where materials are covered by a referenced specification number, type and class as applicable.

B. STORAGE

Materials shall be delivered, stored, handled and installed to protect them from damage during the construction period.

07201 MATERIALS

-1 RIGID INSULATION

A. Typical rigid insulation at masonry block walls: Included are all locations where rigid insulation is indicated on the contract drawings. Insulation to be expanded polyurethane.

Minimum thickness 1-1/2", R value not less than R=7.
Insulation Material to meet the requirements of UBC
Standard No. 42-1-67 and shall have a Class I flamespread
rating (0-25).

- B. Perimeter insulation: To be Styrofoam SM, 1-1/2" thick.
- C. Mastic for installation of rigid board-type insulation on concrete or masonry block walls: Material to be combined adhesive-vapor barrier material equal to "Insulastic No. 100" as manufactured by Western Insulfoam Corporation. Shall have a water vapor permeance of .01 to .09 perms.

-2 SILL SEALER

Sealer shall be compressible rigid fiberglass insulation 1" nominal thickness by 4" nominal width as manufactured by Owens Corning, or approved equal.

-3 ROOF INSULATION

Roof insulation shall be glass fiber batts complying with the applicable requirements of Federal Specifications HH-15210, Class A, Size 6" thick with R value of 19.

-4 ATTACHMENTS

A. ADHESIVES

Adhesives for rigid insulation board shall be as recommended by the insulation manufacturer for the uses intended. Adhesives need only be applied where necessary to secure to walls.

B. MECHANICAL FASTENERS

Mechanical attachments for rigid insulation shall be as recommended by the manufacturer for the uses intended.

07202 INSTALLATION

-1 GENERAL

All surfaces on which insulation is to be applied shall be clean, smooth, dry and free of any projections. The condition

of surfaces shall be inspected and approved by the Engineer immediately before work is started. Insulation shall be carefully installed and tightly cut around steel clips, pipes, conduits, etc., so as not to leave any location void of insulation.

-2 BUILDING INSULATION

Building insulation shall be installed in strict accordance with the manufacturer's written instruction. The Engineer shall be provided with a copy of the manufacturer's installation instructions and notified 48 hours prior to the installation.

-3 FOUNDATION INSULATION

Insulation shall be applied to walls and footings as indicated on the drawings. The insulation shall be fastened to the wall with mechanical fasteners or adhesives as recommended by the manufacturer.

-4 ROOF INSULATION

Per manufacturer's instructions.

07203 QUALITY ASSURANCE PROVISIONS

-1 TESTS AND TEST REPORTS

The testing requirements stated herein or incorporated in referenced documents may be waived, provided certified copies of reports of tests from approved laboratories performed in previously manufactured materials are submitted and approved. Tests reports shall be accompanied by notarized certificates from the manufacturer certifying that the previously tested material is of the same type, quality and manufacturer as that proposed for the project.

-2 GRADEMARKS

In addition to marking instructions hereinbefore specified, the insulation manufacturer's certified installed "R" factor designation shall be shown on the products or on the packages containing said products.

07204 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section.
The performance of this work shall be considered as a subsidiary
obligation of the Contractor or is covered under bid items 101
and 102 of the Unit Price Schedule.

END OF SECTION 07200

07400 GENERAL

1 SCOPE

Work included:

Roofing and sheel metal required for this work is indicated in the drawings and includes, but is not necessarily limited to, preformed metal roofing, trim and accessories. Also included is removal and disposal of roofs on existing pumphouse and pressure reducing station.

2 RELATED WORK IN OTHER SECTIONS

A. Rough carpentry Section 06100

3 SUBMITTALS

A. Shop Drawings and Samples

After award of contract, and before any materials have been delivered to the job site, submit complete shop drawings showing details of installation, attachment, sealing, flashing and trim; manufacturer's literature describing the products and recommended installation methods and procedures and a detailed list of all proposed products. Upon the Engineer's request, provide representative samples of the products proposed. Submit color samples of metal roofing, flashing and trim for selection by the Engineer. Selection will be for one color only from manufacturer's range of a minimum of ten choices.

B. Manufacturer's Certification

Accompanying the materials and shop drawings submittal, and as a condition of the acceptance of the work, provide a certificate from the manufacturer of the roofing system certifying that the system complies in all respects with the specified design criteria.

-4 DELIVERY AND STORAGE

A. Storage and Protection

Provide an area away from traffic for the exclusive storage of roofing materials. Use all means necessary to protect roofing materials before, during and after installation to protect the installed work and materials of all other trades.

B. Replacement

In the event of damage, immediately make all repairs and replacements necessary at no additional cost to the Owner. Remove all damaged material from the job site and do not allow any damaged material to be incorporated into the work.

07401 MATERIALS

-1 PREFORMED METAL ROOFING

A. System

Design is based on the use of Alcoa "Bold Rib 1" System and the drawings reflect installation methods and practices recommended by that manufacturer. Alternate systems by other manufacturers will be given consideration upon submittal to the Engineer for review and evaluation of complete design analysis and shop drawings establishing their equality with the specified system and complete conformance with the design criteria herein specified.

B. Design Criteria

Roofing system shall be fitted tightly and installed to withstand uplift component of 120 mph winds of any direction, shall prevent water infiltration from the exterior surface to the interior surface of the roof in test conditions of rainfall rate of 8" per hour, and shall allow for a free longitudinal movement to eliminate thermal stresses.

C. Roofing Sheet

Roofing shell shall be Alcoa panels, 44-5/8" wide, formed from 0.032" thick stucco embossed alclad aluminum alloy 3004, with Alumalure Finish Coating on exterior; or equal approved by the Engineer.

D. Accessories

Attachments, flashing, trim, closures, sealants, and other accessories or products required shall be as furnished or recommended by the roofing manufacturer and shall be compatible in texture and color.

07402 INSTALLATION

-1 SURFACE CONDITIONS

A. Inspection

1. Prior to all work of this Section, carefully inspect the surface to which the roofing is to be applied and verify that all such surfaces are satisfactory for commencement of the roofing operations.
2. Verify that the roofing system may be installed in strict accordance with the original design, the manufacturer's recommended methods and practices, and all pertinent codes and regulations.

B. Discrepancies

In the event of discrepancy, immediately notify the Engineer, and do not proceed with installation in areas of discrepancy, until all questions in regard thereto have been fully resolved.

-2 ATTACHMENT

Secure roofing to supporting structure with concealed anchor clips and fasteners of design, material and fabrication approved by the manufacturer of the roofing for the specific application, load requirements, and necessary provision for thermal movement. Apply roofing anchor clips to the structure at each panel joint (12" o.c.) at longitudinal spacing shown in the approved shop drawings. Do not perforate roofing panels by fasteners except as shown for flashing, closures, or trim. Assure proper engagement of anchor clips with bulb rib before positioning hook rib of next panel. Use only tools approved by roofing manufacturer to close the interlocking seam between adjoining panels and between ridge and roofing panels as indicated in the drawings.

-3 SEAM SEALING

To prevent water infiltration under weather conditions causing ice dam build up at eave, seal seam between panels with caulking, sealant, or gasket as recommended by the roofing manufacturer.

-4 DISSIMILAR METALS

Where aluminum is in contact with other metals, provide electrolytic protection by painting contact surface with two coats of bituminous paint, American Tar Company's No. 2221 Farwest "Vitamix" or approved equal.

-5 MISCELLANEOUS FLASHING ITEMS

Provide and install all miscellaneous flashing items as required by the drawings and necessary for a complete watertight installation. Materials shall be minimum .040 gauge aluminum or 22 gauge galvanized steel sheet. All materials and work to be in full accordance with best practices of the trade and compatible with adjacent materials. All ferrous metal shall be galvanized.

07403 QUALITY ASSURANCE

-1 WORKMANSHIP

For actual cutting, fitting and installation of the preformed metal roofing and associated accessories, employ only qualified personnel who are experienced in the speciality. Provide one person who shall be present at all times during the installation of the roofing, who is thoroughly familiar with the products, the manufacturer's recommended installation methods and practices, and who shall direct all roofing operations. In the acceptance or rejection of Work under this Section, no allowance will be made for inexperience or lack of skill on the part of the installers.

-2 GUARANTEE

Upon completion of this portion of the Work, and as a condition of its acceptance, deliver to the Owner a written guarantee signed by the installer and endorsed by the manufacturer of the roofing system guaranteeing that the installed roofing system will remain intact and free from leaks for a period of at least five years following date of acceptance.

07404 MEASUREMENT AND PAYMENT

No specific payment shall be made for work in this section.
The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 07400

07900 GENERAL

-1 SCOPE

This Section includes caulking, sealing and accessories complete.

-2 RELATED WORK IN OTHER SECTIONS

- | | |
|----------------------------|---------------|
| A. Insulation | Section 07200 |
| B. Preformed Metal Roof | Section 07400 |
| C. Painting | Section 09900 |

-3 APPLICABLE DOCUMENTS

The following Specifications and Standards of the issues listed in this paragraph (including the amendments, addenda, and errata designated), but referred to hereinafter by basic designation only, form a part of this Specification to the extent required by the references thereto.

A. GOVERNMENT DOCUMENTS

1. Federal Specifications

- | | |
|----------------|--|
| TT-S-227B(1) | Sealing Compound; Rubber Base |
| TT-S-230A(1) | Sealing Compound; Synthetic Rubber Base, Single Component, Chemically Curing |
| TT-S-00230C(2) | Sealing Compound; Elastomeric Type, Single Component |
| TT-S-00227E(3) | Sealing Compound; Elastomeric Type, Multi-Component |
| TT-S-001543A | Sealing Compound; Silicone Rubber Base |

TT-P-320C Pigment, Aluminum; Powder and Paste
for Paint

UU-P-270E Paper, Wrapping, Waxed

2. Military Specifications

MIL-A-148E Aluminum Foil

B. NON-GOVERNMENT DOCUMENTS

Standards of Thiokol Chemical Corporation.

-4 SUBMITTALS

A. MANUFACTURER'S LITERATURE

Submit manufacturer's literature for approval describing product and application for each type of sealant and caulking used.

B. SAMPLES

Submit color samples for Engineer's selection. Colors may or may not match adjacent surfaces. As many as two colors of each type of product will be selected.

-5 DELIVERY AND STORAGE

A. DELIVERY

Materials shall be delivered to the job in the manufacturer's original unopened containers, with the brands, date of manufacture and name clearly marked thereon. Where specifications are referenced, the number, type and class of referenced specification shall appear on the label.

B. STORAGE

All material shall be carefully handled and stored to prevent inclusion of foreign materials or subjection to temperatures exceeding 90°F, or below 32°F.

07901 MATERIALS

-1 CAULKING

A. CAULKING

Caulking shall be either synthetic rubber base, two component, type conforming to Federal Specification TT-S-00227E(3) or synthetic rubber base, one component, nonsag type, chemically curing, conforming to Federal Specification TT-S-00230C(2). The two component compound shall be supplied in premeasured kit form, for on the job mixing. The entire portion of the accelerator or smaller unit shall be added to the entire portion of the compound or larger unit. The container shall have sufficient space at the top to allow for addition of the accelerator and for mixing. The one component compound shall be supplied in a ready to use form. Under normal application conditions including adequate ventilation compounds shall be non-toxic.

B. PRIMER

Primer shall be as specified hereinafter. Where a primer is specified or recommended by the caulking manufacturer for a specific surface material, tests related to that material shall include primer.

1. Primer for use with synthetic rubber base two component caulking compound shall be a quick drying colorless, non-staining sealer, of type and consistency recommended by the caulking manufacturer, as approved.
2. Primer for use with synthetic rubber base one component caulking compound shall be a non-staining sealer, of type and consistency recommended by the caulking manufacturer.

C. BACKSTOPS

Backstops shall be glass fiber topping, or closed cell neoprene, butyl, polyurethane, vinyl or polyethylene foams free from oil or other staining elements. Oakum, and other types of absorptive materials, shall not be used as backstops.

D. BOND PREVENTIVE MATERIAL

Shall be either polyethylene tape with pressure sensitive adhesive, aluminum foil conforming to MIL-A-148E, or waxed paper conforming to UU-P-270E.

-2 SEALANT

A. SEALANT

Sealant shall be a synthetic silicone rubber base one component type conforming to Federal Specification TT-S-001543A. Sealant shall be supplied in ready to use form. Sealant shall be specifically designed for application to the surfaces it is used on. Sealant shall be nonsag with integral nonfading colors.

B. PRIMER

Primer shall be as recommended by the sealant manufacturer for the surfaces involved. Primer shall be quick drying, colorless, nonstaining.

C. BACKUP MATERIAL

Backup material shall be polyethylene foam backup rod as recommended by the sealant manufacturer. Jute, vinyl and rubber rod shall not be used. Non-adhesive tape may be used for shallow joints.

D. BOND PREVENTIVE MATERIAL

Bond preventive material shall be as specified for caulking above.

07902 INSTALLATION

-1 JOINT DIMENSIONS

The minimum joint width shall be 1/4 inch, and the depth shall be approximately one half the width, but in no case less than 1/4 inch.

-2 SURFACE PREPARATION

Surfaces against which primer, caulking and sealant are to be applied shall be clean, dry to the touch, free from frost, moisture, grease, oil, wax, lacquer, paint, or other foreign matter. All joints shall be enclosed on three sides. Grooves for caulking shall be cleaned out to the depth specified and ground to the minimum width specified without damage to the adjoining work. No grinding shall be required on metal surfaces.

-3 PRIMER

Primer shall be provided on masonry, concrete, and wood surfaces, and other surfaces as recommended by the caulking or sealant manufacturer. Primer shall not be applied to surfaces which will be exposed after caulking or sealant is completed.

-4 BACKSTOPS

The back or bottom of joints over 3/8 inch in depth for synthetic rubber base type caulking and sealant shall be packed tightly with an approved backstop material to the depth specified from the surface at joint opening.

-5 BOND PREVENTIVE MATERIAL

Material shall be provided at back or bottom of joint cavities in which no backstop material is required; it shall cover the full width and length of the joint cavities.

-6 PROTECTION AND CLEANING

Areas adjacent to joints to receive caulking or sealant shall be protected from smearing; paper masking tape may be used for this purpose if removed 5 to 10 minutes after the joint section is filled. Fresh compound that has accidentally been smeared on the concrete or masonry shall be scraped off immediately and rubbed clean with methyl-ethyl-ketone-toluene, or a similar solvent. Upon completion of application or sealant caulking, all remaining smears, stains, and other soiling resulting therefrom shall be removed and work left in a clean and neat condition, satisfactory to the Engineer.

-7 CAULKING AND SEALANT

Material shall be applied in accordance with the manufacturer's printed instructions, using a gun with nozzle of proper size to fit the joint width. The compound shall be forced into grooves with sufficient pressure to fill the grooves solidly. Caulking shall be uniformly smooth and free of wrinkles, and unless indicated otherwise, shall be tooled and left sufficiently convex to result in a flush joint when dry. Where the use of gun is impracticable, approved hand tools may be used. The compound shall not be applied to joints when the air temperature is below 50°F. or when it appears probable that temperatures below 50°F. will be encountered before the material has set. The compound shall not be used when it becomes too jelled to be discharged in a continuous flow from the gun. Modification of the compound by addition of liquids, solvents, or powders shall not be permitted. Only the amount of material which can be installed within four hours shall be mixed, but at no time shall this amount exceed 5-gallon unit increments. Installation around openings shall include the entire perimeter of each opening.

07903 QUALITY ASSURANCE PROVISIONS

-1 TESTS AND TEST REPORTS

The testing requirements stated herein or incorporated in referenced documents may be waived, provided certified copies of reports of tests from approved laboratories performed in previously manufactured materials are submitted and approved. Test reports shall be accompanied by notarized certificates from the manufacturer certifying that the previously tested material is of the same type, quality and manufacture as that proposed for the project.

07904 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under bid items 101 and 102 of the Unit Price Schedule.

DIVISION 8 -- DOORS AND WINDOWS

08100	Metal Doors and Frames
08600	Wood Windows
08700	Hardware
08720	Protection Screens
08750	Louvers

08100 GENERAL

-1 SCOPE

This section covers all ferrous metal doors, door frames and door louvers complete.

-2 WORK IN OTHER SECTIONS

- | | |
|------------------------|---------------|
| A. Finish Hardware | Section 08700 |
| B. Painting | Section 09900 |
| C. Finish Carpentry | Section 06200 |

-3 APPLICABLE DOCUMENTS

The following specifications and standards of the issues listed in this paragraph (including the amendments, addenda, and errata designated), but referred to hereinafter by basic designation only, form a part of this specification to the extent required by the references thereto.

A. GOVERNMENT DOCUMENTS

1. Federal Specifications

- | | |
|----------|--|
| QQ-S-775 | Steel Sheets, Carbon, Zinc Coated |
| TT-C-494 | Coating Compound, Bituminous, Solvent Type, Acid Resistant |
| TT-C-598 | Compound, Caulking; Plastic (for Masonry and Other Structures) |
| TT-P-31C | Paint, Oil, Iron Oxide, Ready Mixed |

2. Military Specifications

- | | |
|-------------|---|
| MIL-C-18480 | Coating Compound, Bituminous Solvent, Coal Tar Base |
| MIL-P-21035 | Paint, High Zinc Dust Content, Galvanizing Repair |

3. Naval Facilities Engineering Command Specification

- | | |
|-----|-------------|
| 32Y | Metal Doors |
|-----|-------------|

B. NON-GOVERNMENT DOCUMENTS

1. American Society for Testing and Materials

A 386 Zinc Coating (hot dip) on Assembled Steel Products.

A 525 General Requirements for Delivery of Zinc Coated (Galvanized) Iron or Steel Sheets, Coils and Cut Lengths Coated by Hot Dip Method.

E 152 Fire Tests of Door Assemblies

2. United States of America Standards Institute

A 115 Specifications for Door and Frame Preparation

A 123.1-1967 Nomenclature for Steel Doors and Frames

3. National Fire Protection Association

Standard No. 80 Fire Doors and Windows
(Current Issue)

Code No. 101 Life Safety Code (Current Issue)

-4 SUBMITTALS

A. SHOP DRAWINGS

Submit complete working shop drawings for Engineer's approval. Show all features of construction and anchorage. Show locations and details of all field splices. Obtain hardware templates from hardware supplier.

B. MANUFACTURER'S LITERATURE

Submit manufacturer's literature describing materials, fabrication, finish, details and the like.

-5 DELIVERY AND STORAGE

A. PROTECTION

1. Deliver, store, and handle all metal doors and frames in a manner to prevent damage and deterioration.

2. Provide packaging such as cardboard or other containers, separators, banding, spreaders, and paper wrappings as required to completely protect all metal doors and frames during transportation and storage.
3. Store doors upright, in a protected dry area, at least one inch off the ground and with at least 1/4 inch air space between individual pieces; protect all prefinished and hardware surfaces as required.
4. Use all means necessary to protect the installed work and materials of all other trades.

B. REPLACEMENTS

In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

08101 MATERIALS

-1 METAL DOORS

A. GENERAL

1. All metal doors and frames shall be the product of one manufacturer.
2. Design is based on the referenced products of the Ceco Corporation; equal products will be acceptable as substitutes providing the shop drawings required prove the equality of the substitute.

B. TYPE AND DESIGN

All metal doors shall be full-flush design, in the dimensions and types shown on the drawings, as indicated on the Door Schedule in the drawings, in 18 gage for interior doors and 16 gage for exterior doors, and shall be properly reinforced for the finish hardware described in Section 08700 of these specifications.

C. FINISHES

Pre-clean and shop prime each door for finish painting which will be performed at the job site under Section 09900 of these specifications.

D. FINISH HARDWARE

Secure templates from the finish hardware supplier and accurately install, or make provisions for, all finish hardware at the factory.

-2 METAL FRAMES

A. GENERAL

All metal frames shall be accurately fabricated to match the doors to be installed in them.

B. TYPE AND DESIGN

All metal frames shall be compatible to the doors indicated on the Door Schedule in the drawings, in 18 gage for interior doors and 16 gage for exterior doors, and shall be properly reinforced in the finish hardware described in Section 08700 of these specifications.

C. FINISHES

Pre-clean and shop prime each frame for finish painting which will be performed at the job site under Section 09900 of these specifications.

08102 INSTALLATION

-1 GENERAL

A. INSPECTION

1. Prior to installation of metal doors and frames, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

2. Verify that metal doors and frames may be installed in strict accordance with all pertinent codes and regulations, the original design, approved shop drawings, and manufacturer's recommendations.

B. DISCREPANCIES

1. In the event of discrepancy, immediately notify the Engineer.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

-2 INSTALLATION

A. METAL DOORS AND FRAMES

Install all metal doors and frames in strict accordance with all pertinent codes and regulations, the approved shop drawings, and the manufacturer's recommendations, anchoring all components firmly in position for long life under hard use.

B. FINISH HARDWARE

Install all finish hardware in strict accordance with the manufacturers' recommendations, eliminating all hinge-bound conditions and making all items smoothly operating and firmly anchored into position.

08103 QUALITY ASSURANCE PROVISIONS

-1 TESTS AND INSPECTIONS

Unless otherwise specified, factory tests and inspections for materials and equipment for which inspections and for tests as specified herein or in referenced documents may be waived, provided certified copies of test reports performed on previously manufactured materials are approved by the Engineer. Test reports shall be accompanied by notarized statements from the manufacturer certifying that the previously tested material is of the same type, quality, manufacture and make as that proposed for this project.

08104 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under Bid Items 101 and 102 of the Unit Price Schedule.

END OF SECTION 08100

08600 GENERAL

-1 SCOPE

This section covers all material and labor necessary to complete the furnishing and placement of wood windows.

-2 RELATED WORK IN OTHER SECTIONS

- | | |
|--------------------------|---------------|
| A. Rough Carpentry | Section 06100 |
| B. Finish Carpentry | Section 06200 |
| C. Protection Screens | Section 08720 |

-3 QUALITY ASSURANCE

A. QUALIFICATIONS OF INSTALLERS

For actual installation of wood windows use only skilled carpenters who are completely familiar with recommended methods of installation and the requirements of this work.

B. CODES AND STANDARDS

In addition to complying with all pertinent codes and regulations, comply with the pertinent portions of "Industry Standard for Wood Windows" I.S. 2-71 by the National Woodwork Manufacturer's Association.

-4 SUBMITTALS

A. MANUFACTURER'S LITERATURE

Submit catalog cuts for all manufactured items. A completely detailed schedule shall be submitted to the Engineer for approval.

-5 PRODUCT HANDLING

A. PROTECTION

Use all means necessary to protect wood windows before, during and after installation and to protect the installed work and materials of all other trades.

8. REPLACEMENTS

In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the City.

08601 MATERIALS

-1 FRAME

Frame shall be constructed with water repellent preservative treated wood sub-frame. Exterior exposed surfaces shall be covered with white rigid vinyl PVC.

-2 SASH

Sash shall have water repellent preservative treated wood core covered with white rigid vinyl PVC. Sash to provide for insulating glass glazing complete with all weatherstrip applied.

-3 HARDWARE

Provide for gliding windows concealed two-way spring loaded locking mechanism with steel golden dichromate plate locking rods applied steel gliders. Zinc die-cut lock handle in stone color.

-4 GENERAL

A. Vinyl covered wood windows shall be Anderson, Perma-Shield picture windows and gliding windows as manufactured by Anderson Corporation, Bayport, Minnesota, or approved equal.

B. Plastic used for frame and sash shall be rigid polyvinyl chloride. The PVC material shall meet the requirements of ASTM Specification D-1784-60T for a Type 1 -- grade 2 compound.

Thickness:

PVC-Sash .045" (plus-minus 10 percent)
PVC-Frame .025" to .040"

- C. The treated wood frame shall be provided with continuous rigid vinyl sheath and flashing over all exterior parts. Continuous rigid vinyl covering on frame forms perimeter flashing and anchoring fin.
- D. The corner seal shall be vacuum-formed vinyl frame sheath eliminating corner joints. Sash corners shall be welded to form leak-proof joint.
- E. Except as designated otherwise, frames and sash shall be assembled at the plant and shipped as a unit with hardware.

-5 GLASS AND GLAZING

A. INSULATING GLASS

Double pane insulating window glass (by window manufacturer) shall be 5/8-inch thick metal edge, insulating glass. All insulating glass shall be Libby Owens Ford "Thermopane" or Pittsburgh Plate Glass Company "Twindow".

-6 FINISHES

All finishes shall be as provided by the manufacturer in his standard factory fabrication process. Standard colors shall be used with White being first option.

-7 TRIM

The Contractor shall provide all required wood trim to provide a tight weathertight fit of the windows to the frame structure. All trim shall be painted to match the supplied window colors.

08602 INSTALLATION

-1 SURFACE CONDITIONS

- A. Prior to installation of windows, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that windows may be installed in accordance with the original design, the referenced standards, and all pertinent codes and regulations.

- C. In the event of discrepancy, immediately notify the Engineer.
- D. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

-2 PLACEMENT

- A. Install all wood windows in strict accordance with all pertinent codes and regulations, the original design, and the referenced standards, hanging square, plumb, and straight and firmly anchored into position for long life under hard use.
- B. Install all finish hardware in strict accordance with the manufacturers' recommendations, eliminating all hinge-bound conditions and making all items smoothly operating and firmly anchored into position.
- C. Windows shall be erected in prepared openings in accordance with instructions furnished by the window manufacturer. They shall be set plumb and true, properly aligned and securely anchored as shown on detail drawings, with all ventilators correctly adjusted before glazing. Joints at mullions between contacts of windows with masonry sills shall be bedded in mastic supplied and applied by the window erection contractor. Seat window assembly to provide weathertight installation in mastic sealant of type recommended by the window manufacturer. Remove excess mastic before it hardens.
- D. Anchor window units to adjacent construction as recommended by manufacturer details and approved shop drawings. Anchors and fastenings shall be built into, anchored, or bolted to the jambs of openings, and shall be fastened securely to the windows or frames, and to the adjoining construction. All anchors shall have sufficient strength to hold the member firmly in position. After windows have been installed, all ventilators and hardware shall be adjusted to operate smoothly and to be weathertight when ventilators are closed and locked. Hardware and parts shall be lubricated as necessary.
- E. Experienced glazers shall install all glass. Fully and evenly bed all glass, finish putty and back putty or set with other materials as applicable to the type of installation involved.

- F. Glass shall float in frame and be entirely free of any contact therewith, on edges or faces. Use setting blocks or shims with heavy lights to center glass in frame. Set sheet glass so that any waves are horizontal and convex side of glass is to the exterior. Glazing stops shall be carefully handled to prevent damage or marking and shall be accurately secured in place.
- G. The installation of insulating glass shall be in strict accordance with manufacturer's printed instructions and as shown on the drawings.

Remove improperly set, damaged or broken glass and replace with material acceptable to Engineer before final acceptance, at no additional cost to Owner.

-3 TOUCHING UP

- A. As soon after installation of each pane of glass as permitted by the Engineer, all markings and labels of whatever sort shall be carefully and completely removed from each pane, and the glass washed clean as recommended by the glass manufacturer, after which no markings or labels of any sort shall be placed directly on the glass. Take care during cleaning to avoid scratching glass surfaces by grit particles.
- B. Identify glazed openings with suitable warning flags of cloth or paper attached diagonally to the opening frame with adhesive tape or similar approved means. Do not attach tape directly to the glass.
- C. Screen all glass from plaster, concrete, paint, welding splatter, alkaline masonry washes, construction scum and the like. Any such soiling occurring on glass shall be promptly and completely washed off as specified above.
- D. After painting has been completed, clean all window surfaces with soap and clean water. Abrasive cleaning agents and lacquer thinner not permitted for cleaning. Leave all surfaces free from stains, marks or other defects of any kind.

08603 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 08600

08700 GENERAL

-1 SCOPE

This Section covers all finish hardware locations, and application herein specified exclusive of installation.

-2 WORK IN OTHER SECTIONS

- A. Finish Carpentry Section 06200
- B. Metal Doors and Frames Section 08100

-3 APPLICABLE DOCUMENTS

The following Specifications and Standards of the issues listed in this paragraph (including the amendments, addenda, and errata designated), but referred to hereinafter by basic designation only, form a part of this Specification to the extent required by the references thereto.

A. FEDERAL SPECIFICATIONS

- FF-H-106 Hardware, Builders' Locks and Door Trim
- FF-H-111 Hardware, Builders'; Shelf and Miscellaneous
- FF-H-116 Hinges, Hardware, Builders

B. NON-GOVERNMENT DOCUMENTS

- 1. Underwriters' Laboratories, Inc.
 Building Materials List
- 2. National Builders Hardware Association
 "Recommended Locations for Builders Hardware"

-4 SUBMITTALS

A. MANUFACTURER'S LITERATURE

Submit catalog cuts for all manufactured items. A completely detailed schedule shall be prepared and submitted to the Engineer for approval.

B. SHOP DRAWINGS

Immediately after the award of the hardware contract, it shall be the duty of the hardware supplier to request approved shop drawings from such trades with which the hardware must be coordinated. After checking approved shop drawings, he shall supply promptly such template information, template drawings, approved hardware schedule, etc., as may be required to facilitate the progress of the job.

C. SAMPLES

If requested by the Engineer, samples of the exact hardware to be furnished shall be submitted for approval.

-5 DELIVERY AND STORAGE

A. DELIVERY

Tag each item or package separately, with identification related to the final hardware schedule. Basic installation instructions shall be included in the packages. Deliver all finish hardware to the job site complete with all necessary parts and proper fastening as required except the portion which goes to other subcontractors for final fitting, such as metal door manufacturers.

B. STORAGE

Provide a secure area at the job site for the storage of the hardware.

08701 MATERIALS

-1 GENERAL

As far as practicable, all locks shall be of one lock manufacturer's make and all hinges and pivots shall be of one hinge and/or pivot manufacturer's make. Except as specified otherwise herein, types, finishes, and trim specified are based upon applicable Federal Specifications. Hardware to be applied to metal and to prefinished doors shall be made to template. Templates shall be furnished promptly to the metal door, frame, and prefinished door manufacturers in order to avoid

delay in door and frame manufacture.

All modifications to hardware that are necessary to conform to the construction shown or specified shall be provided as required for the specified operative and functional features. All door openings shall be weathertight upon completion of the hardware installation for winds pressure of approximately 50 pounds per square foot.

-2 FINISH

All hardware shall be U.S. 100-dull bronze unless specified otherwise.

-3 CATALOGS

The numbers used are from the catalogs of:

LA	Lawrence Brothers
SL	Schlage Lock Company
LCN	LCN Closers Company
PE	Pemko Weatherstrip
GS	Glen Johnson
CI	CIPCO

-4 DETAILS

- A. The hardware supplier shall consult the project drawings and details and thoroughly familiarize himself with work to the end that all items of hardware furnished shall conform to units which it is applied.
- B. He shall coordinate the hardware and other trades such as millwork, metal doors and frames, steel channel frame, etc.

-5 HARDWARE TYPES

A. BUTT HINGES

- 1. The number of hinges per door leaf shall conform to the applicable Federal Specification. Lawrence listed, acceptable substitutions: McKinney, Stanley, Hager.

construction master keying system shall be incorporated for interim use during construction. All pertinent keying requirements not specified herein shall be as directed. All locks to be masterkeyed into one system.

<u>Lock, Group or Set of Locks</u>	<u>Quantity of Keys</u>
Each Master Keyed Set	8
Construction Master Key	6
Key Extractors	2

All keys shall be properly tagged in envelopes with door number, item number and keying information. The lock manufacturer shall have all other keys delivered to the Project Inspector on the job site.

Each change key shall be stamped with change number and set symbol, and each master key shall be stamped with set symbol as applicable.

08702 APPLICATION

-1 LOCATIONS OF HARDWARE ON HINGED DOORS

Shall be as indicated in NBHA Publication "Recommended Locations for Builders Hardware" unless indicated or specified otherwise herein.

A. LOCKS

Knobs shall be located so that the centerline of the strike is 40-5/16 inches (nominal) above the finished floor.

08703 QUALITY ASSURANCE PROVISIONS

-1 TESTS AND TEST REPORTS

The testing requirements stated herein or incorporated in referenced documents may be waived, provided certified copies

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08703 QUALITY ASSURANCE PROVISIONS

-1 TESTS AND TEST REPORTS

The testing requirements stated herein or incorporated in referenced documents may be waived, provided certified copies

of reports of tests from approved laboratories performed in previously manufactured materials are submitted and approved. Test reports shall be accompanied by notarized certificates from the manufacturer certifying that the previously tested material is of the same type, quality, and manufacturer as that proposed for the project.

-2 QUALIFICATION

The hardware supplier shall in the opinion of the Engineer have sufficient experience in an organization consisting of members of the American Society of Architectural Hardware Consultants to properly handle, detail and service the hardware in a satisfactory manner.

08704 MEASUREMENT AND PAYMENT

No separate payment shall be made for this item of work. The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 08700

08720 GENERAL

-1 SCOPE

This section covers all screening for windows complete.

-2 WORK IN OTHER SECTIONS

A. Finish Carpentry Section 06200

B. Wood Windows Section 08600

-3 DELETED.

-4 SUBMITTALS

Submit catalog cuts for all manufactured items.

-5 DELIVERY AND STORAGE

A. PROTECTION

Deliver, store and handle all screens in a manner to prevent damage.

B. REPLACEMENT

In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

08721 MATERIALS

-1 GENERAL

All materials shall be manufactured by the Chamberlin Bernhart Company, Inc., or approved equal.

-2 MAIN FRAMES

Shall be open channel type shaped from 6063-T6 aluminum alloy and is to have a minimum wall thickness of 1/8" and weight of .844 pounds per foot. Removable concealment plates shall also be of extruded aluminum alloy 6063-T6, with a retaining flange and secured with steel screws at 8" on center maximum to the

exterior side of the main frame to conceal the locking mechanism and wire cloth support assembly, with a weight of .218 pounds per foot. The corners of the frame shall be mitered, continuous welded and ground smooth.

-3 SUBFRAMES

Shall be aluminum reinforced channel type shape at both head and jambs and have a minimum wall thickness of 1/8" and 5/32" and a weight of .549 pounds per foot. All shapes shall be extruded from 6063-T6 aluminum alloy. Each member shall have an integral groove to retain a continuous vinyl sealer and subframe shall be mitered and welded on all exposed welds to be ground smooth.

-4 SCRIBE ANGLES

Adjustable scribe members of 6063-T6 aluminum alloy shall be provided at jambs and head as required. Installation shall be executed in a manner which will not interfere with the proper operation of the existing window operators.

-5 WIRE CLOTH

Wire cloth shall be .028" diameter 12 mesh to the inch with 43% open area and woven from 18/8 type 302 corrosion resistant steel wires having a minimum tensile strength of 175,000 pounds per square inch before weaving. The wire shall have double crimped crossings with a minimum crimp ratio of 45% and a woven wire tensile strength of not less than 800 pounds per linear inch of width in both warp and filler wires. Wire cloth shall be folded over edge of hinged unit and held securely in place by means of retainer clips. Retainer clips shall be designed to interlock with removable cover plate and shall be spaced on approximately 8" centers.

-6 HARDWARE

Lock: Each screen shall be provided with a concealed lock with case hardened steel bolts (2) sliding in cadmium plated housing. Bolts to operate simultaneously from (1) Bitt Key Station with a special key.

Hinges: Each screen shall be provided with concealed type 11 gauge cadmium plated steel as shown on contract drawings with 1/4" diameter loose brass pins: two (2) butts for 4'-0" high screens and smaller.

-7 FINISH

All exposed surfaces of aluminum shall be cleaned to give uniform color and be free from scratches and other surface defects.

Welded joints shall be dressed smooth and finish to match adjacent surfaces. Welding flux shall be immediately removed when welding is completed.

08722 INSTALLATION

All units shall be installed plumb and true, properly shimmed and anchored to prevent any movement. Exterior wood trim to be set in continuous bead of caulking for an airtight installation. After window has been firmly set in place and secured, all voids between window unit and adjacent framing members to be completely filled with insulation prior to installation of wood trim.

08723 QUALITY ASSURANCE PROVISIONS

-1 TESTS AND INSPECTIONS

Except as otherwise specified, factory tests and inspections for materials and equipment for which inspections and for tests are specified herein or in referenced documents may be waived, provided certified copies of test reports performed on previously manufactured materials are approved by the Engineer. Test reports shall be accompanied by notarized statements from the manufacturer certifying that the previously tested material is of the same type, quality, manufacture and make as that proposed for this project.

08724 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under bid items 901 and 902 of the Unit Price Schedule.

101 102

END OF SECTION 08720

08750 GENERAL

-1 SCOPE

This section covers all aluminum louvers complete.

-2 WORK IN OTHER SECTIONS

A. Finish Carpentry Section 06200

B. Metal Doors and Frames Section 08100

-3 DELETED.

-4 SUBMITTALS

Submit manufacturer's literature describing materials, fabrication, finish and details.

-5 DELIVERY AND STORAGE

A. PROTECTION

Deliver, store, and handle all louvers in a manner to prevent damage.

B. REPLACEMENT

In the event of damage, immediately make all repairs and replacement necessary to the approval of the Engineer and at no additional cost to the Owner.

08751 MATERIALS

-1 GENERAL

Materials for overdoor louvers shall be model L-40F manufactured by the Carnes Corporation, or equal. The frame and blocks shall be of extruded aluminum 6063-T5. The unit shall be complete with backdraft damper. Sizes are as shown on drawings. Louvers and the exhaust cooling system shall be extruded aluminum of such design as to motor control the cooling system to meet the requirements for cooling as set forth in the manufacturer's recommendations.

08752 INSTALLATION

All units shall be installed plumb and true, properly shimmed and anchored to prevent any movement.

08753 QUALITY ASSURANCE PROVISIONS

-1 GENERAL

Unless otherwise specified, requirements for inspection, sampling, testing, approval, authorizing, and other requirements of similar import included herein shall be subject to the Engineer's approval.

-2 TESTS AND INSPECTIONS

Except as otherwise specified, factory tests and inspections for materials and equipment for which inspections and for tests are specified herein or in referenced documents may be waived, provided certified copies of test reports performed on previously manufactured materials are approved by the Engineer. Test reports shall be accompanied by notarized statements from the manufacturer certifying that the previously tested material is of the same type, quality, manufacture and make as that proposed for this project.

08754 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under bid items 101 and 102 of the Unit Price Schedule.

DIVISION 9 -- FINISHES

09900

Painting

09900 GENERAL

-1 SCOPE

This section covers all materials, and labor required to complete the painting.

-2 RELATED WORK IN OTHER SECTIONS

A. Miscellaneous Metals Section 05500

B. Metal Doors and Frames Section 08100

-3 APPLICABLE DOCUMENTS

The following specifications and standards of the issues listed in this paragraph (including the amendments, addenda, and errata designated), but referred to hereinafter by basic designation only, form a part of this specification to the extent required by the references thereto.

A. Federal Specifications

TT-E-489F	Enamel, Alkyd, Gloss (for Exterior and Interior Surfaces)
TT-P-25c	Primer Coating, Exterior (undercoat for wood, ready mixed, white and tints)
TT-P-57b	Paint, zinc yellow iron oxide base, ready mixed
TT-P-86e	Paint, ready lead base, ready mixed
TT-P-00641e	Primer coating; zinc dust zinc oxide (for galvanized surfaces)
TT-P-645	Primer, paint, zinc chromate alkyd type
TT-V-51e	Varnish, asphalt

B. Military Specification

MIL-P-52324	Paint, Oil, Alkyd, Exterior, White and Light Tints.
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C. Military Standard

MIL-STD-1018 Color Code for Pipelines and for Compressed Gas Cylinders

-4 SUBMITTALS

A. MANUFACTURER'S LITERATURE

Submit complete catalogs describing material, conformance to specifications, application instructions, coverage requirements for Engineer's approval.

B. SCHEDULES

Contractor shall submit within 60 days after construction is started a complete paint materials schedule for the Engineer's approval. The following information shall be submitted:

1. Type of surface or use
2. Type of material, description, application method
3. Brand name, exact identification
4. Manufacturer

C. SAMPLES

Submit complete selection of color chips for each material for the Engineer's selection. No limit shall be placed on the number of colors selected. Submit stencil coding designations as specified hereinafter. Order no material until color selection has been completed by the Engineer.

-5 DELIVERY AND STORAGE

A. DELIVERY

Paints and paint materials shall be delivered in original sealed containers that plainly show the designated name, specification number, batch number, color, date of manufacture, manufacturer's direction, and name of manufacturer.

Surfaces in spaces above suspended ceilings, furred spaces, attic spaces, crawl spaces, and chases are not required to be painted unless specifically so stated. Surfaces of steel to be embedded in concrete shall not be painted.

Succeeding coats of the same type and/or color of paint shall vary sufficiently from the color of the preceding coat to permit ready identification. Damaged painting shall be retouched before the succeeding coat is applied. Reduction of paints to proper brushing consistency shall be accomplished by adding fresh paint except when thinning is mandatory for the type of paint being used. Permission to use thinners shall be obtained from the Engineer. The permission shall include quantities and types of thinners to use. Thinners shall not be permitted upon the job site unless permission for thinning has been given by the Engineer.

Thinning shall not relieve the Contractor from obtaining complete hiding. Finished surfaces shall be smooth, even, and free from defects. The number of paint coats specified shall be in addition to the shop priming coats. Cleaning and painting shall be so programmed that dust and other contaminants from the cleaning process will not fall on wet paint.

09902 PREPARATION OF SURFACES

-1 GENERAL

All dirt, rust, scale, splinters, loose particles, disintegrated paint, grease, oil and other deleterious substances shall be removed from all surfaces that are to be painted or otherwise finished. Putty and caulking compounds shall be allowed to set one week before painting. All unpainted surfaces shall be cleaned and finished as stated for painted surfaces except puttying, filling and etching.

-2 WOOD SURFACES

Wood surfaces to be painted or otherwise finished shall be free from dust and other contaminants. Wood to be painted shall have an instrument measured moisture content no greater than 12%. The use of water on unpainted wood shall be avoided. Prior to application of paint, knots and resinous wood shall be treated with an application of known sealer conforming to

B. STORAGE

Paint proposed for use shall be stored at the project site in sealed and labeled containers. Containers shall not be opened until after inspection and acceptance by the Engineer. Oily rags, waste, empty containers shall be removed from the building each night and destroyed. Contractor shall take all precautions necessary to safeguard against fires. Storage of paint and painting materials shall be restricted to the location directed by the Engineer.

09901 GENERAL REQUIREMENTS

Hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in contact with painted surfaces and not to be painted shall be removed, masked, or otherwise protected prior to surface preparation and painting operations.

Following completion of painting, removed items shall be reinstalled. Such removal and reinstalling shall be done by workmen skilled in the trades involved. Exposed nails and other ferrous metal on surfaces to be painted with water thinned paints shall be spot primed with red lead, zinc chromate, basic lead silicon chromate, or zinc dust zinc oxide primer. Surfaces to be painted shall be thoroughly cleaned and shall be dry when the paint is applied. Paint shall not be applied to surfaces upon which there is frost, ice, or snow. Interior areas shall be broom clean and dust free before and during the application of any painting materials.

Surfaces concealed by portable objects and by articles mounted on the surfaces and readily detachable by removal of fasteners such as screws and bolts are included in the work. Surfaces concealed and made inaccessible by panelboards, machinery, and equipment fixed in place are not included. Articles obstructing access to those surfaces specified to be included in the work shall be removed for access and restored to their original position on completion.

09903 WORKMANSHIP

Workmanship shall be first class in every respect. Paint and enamel finishes shall be applied carefully with good clean brushes, approved rollers, or approved spraying equipment. The work shall be so conducted as to avoid damage of other surfaces and public and private property in the area; any damage thereto shall be made good by the Contractor at his expense. Sufficient time shall be allowed between coats to assure thorough drying, and each coat shall be in proper condition before the next coat is applied. Sanding and dusting, as necessary to produce finishes free of visible defects when viewed from a distance of 5 feet, shall be performed. The finished surfaces shall be free from runs, drops, ridges sags, waves, laps, brush marks and variations in colors. Each coat of paint shall be of sufficient thickness to cover completely the previous coat or surface.

Exterior paint shall not be applied during foggy, damp or rainy weather; the temperature shall be above 45°F., and not over 95°F. Interior paint may be applied at any time provided the surfaces to be painted are dry and the temperature can be kept above 45°F., during the application of ordinary paints, and between 65°F., and 95°F. during the application of enamels and varnishes. Paint shall not be applied when the surfaces are not in proper condition for painting. Overall coverage per coat shall be as recommended by the material manufacturer or shall be as hereinafter specified.

09904 MATERIAL

Unless specified otherwise use the highest quality material manufactured by Pittsburgh or approved equal. Acceptable substitutes are Glidden, Sherman-Williams, Dunn Edwards, Kelly Moore, Pratt & Lambert, Shorn, Fuller, Preservative. No other substitutes will be accepted. All specification numbers listed refer to the Pratt & Lambert coding unless otherwise noted. (Abbreviated "P&L") All paint shall contain less than 1 percent lead.

MIL-S-12935. Puttying of cracks and nailholes shall be done after the priming coat has been applied and has dried properly. Sandpapering, when required, shall be done after the undercoats are dry. Wood trim shall be given the priming coat immediately following delivery to the job site; wood trim shall be primed on all surfaces; rabbets shall be primed prior to glazing.

-3 CONCRETE AND MASONRY SURFACES

Surfaces shall be repaired before painting. Surfaces to be painted shall be clean and free from dirt, fungus, grease, oil, efflorescence, asphalt, tar, and other foreign substances. Mortar droppings, glaze, and scale shall be removed before application of paint. Clean mold release with Xyol. Large voids and cracks shall be patched. Level any surface projections and mortar spatters by grinding, stoning or scraping. If surface is smooth, etch for better adhesion with a solution of 1 part 26% muriatic acid to 10 parts water. Allow to etch 15-20 minutes. Rinse thoroughly with water and allow to dry.

-4 METAL SURFACES

Metal surfaces to be painted, including unprimed aluminum, brass, copper, zinc coated surfaces, steel and iron surfaces, except surfaces subject to temperatures in excess of 350°, immediately after being cleaned, shall be given one coat of pretreatment coating conforming to MIL-P-15328 or MIL-P-14504 applied to a dry film thickness of 0.3 to 0.5 mil. Unprimed zinc coated surfaces to be painted shall be cleaned with mineral spirits and wiped dry with clean, dry cloths prior to application of pretreatment coating. Unprimed aluminum surfaces to be painted shall be solvent cleaned prior to application of the pretreatment coating. Primer paint shall be applied over the pretreatment coating as soon as practicable after the coating has dried.

-5 FERROUS SURFACES

Ferrous surfaces to be painted shall be solvent cleaned to remove oil and grease, and mechanically cleaned by powered wire brushing or surface blasting to remove rust, mill scale, and other foreign substances. Minor amounts of residual rust that cannot be removed except by thorough blast cleaning will be allowed to remain. Primer paint shall be applied as soon as practicable after cleaning. Pipe and tank surfaces within the existing pressure reducing station will require sand blasting because of severe rust conditions.

-6 SHOP PRIMED EXTERIOR FERROUS METAL SURFACES

A. PRIMER

Abraded and corroded areas on shop primed items shall be cleaned and touched up with a primer of the same type and quality as that used for the shop coat. After touch up, the item shall be given one field applied coat of P&L noxide one day primer at 600 square feet per gallon. Primed surfaces shall be finished as specified for exterior metal surfaces not shop primed.

-6 EXTERIOR FERROUS METAL SURFACES, NOT SHOP PRIMED

Exterior unprimed metal surfaces shall be primed with one coat of zinc yellow iron oxide primer conforming to TT-P-568, Type I. Primer shall be P&L zinc chromate primer at 600 square feet per gallon. Finish shall be two coats of P&L Effecto Enamel applied at a rate of 650 square feet per gallon per coat. Galvanized surfaces shall be primed with P&L galvanized metal primer, white, at a coverage of 350 square feet per gallon. Finish shall be two coats of P&L Effecto Enamel applied at a rate of 650 square feet per gallon per coat.

-7 CONCRETE FLOORING

A. Chlorine Room

Two coats green Sika Colma-Sol epoxy protection coating, applied per manufacturer's recommendation.

B. All Other

Two coats of TNEMEC Diamond-Gloss polyurthene, or equal; color red.

-8 MECHANICAL AND ELECTRICAL ITEMS

A. GENERAL

Pipe hangers, structural supports, conuity and conduit fittings, air grilles, pipe coverings, insulation, and all metal surfaces associated with mechanical and electrical equipment including zinc coated steel ducts shall be painted. Interior pipe and pipe fittings shall be painted with the following color code: gas and fuel lines-red; potable water-blue; non-potable water-green; chlorine lines-yellow.

Zinc coated steel ducts in unpainted areas shall not be painted. Uncoated ferrous piping in unpainted areas

09905 PAINTING AND FINISHING

-1 EXTERIOR WOOD FOR PAINT FINISH

Siding, Fascia and Building Trim Boards

Two coats: Olympic Stain either clear or pigmented
as selected by the Engineer.

-2 Windows and Trim, and Exposed Members of Roof Soffits and
Trusses.

1st coat: #1851 Exterior Wood Primer

2nd coat: #1801 Endurance house paint

3rd coat: #1801 Endurance house paint

Note: PVC vinyl on windows not to be painted.

-3 EXTERIOR MASONRY

1st Coat: 8.0 mills "Tneme-crete"

2nd Coat: 8.0 mills "Tneme-crete"

Repaint existing building being added to match new construction

-4 INTERIOR WOOD

A. PRIMER

Primer shall be one coat of interior primer, applied at a
rate of not less than 700 square feet per gallon.

B. FINISH

Finish shall be two coats of P & L Cellu-tone Satin
applied at a rate of not less than 450 square feet per
gallon.

-5 MASONRY INTERIOR

Finish: Use Sand-textured alkyd-epoxy system equal to Pittsburgh
"Speedhide" Textured Masonry Coating. One coat of off-white
flat shall be used, using manufacturer's recommended spread
rate.

09906 QUALITY ASSURANCE PROVISIONS

-1 INSPECTION

Surface preparation, application procedures, and material selection shall be examined by the Contracting Officer's representative to determine conformance with the requirements specified. Each separate operation shall be approved prior to initiation of subsequent operations.

-2 TESTS

Samples may be tested in accordance with the requirements of the applicable material specifications. The cost of the first test will be borne by the Owner. If a sample fails to meet specification requirements, the material represented by the sample shall be replaced and the cost of retesting will be borne by the Contractor.

-3 CERTIFICATION

Submit affidavit for each manufacturer certifying that all materials conform with referenced specifications and standards.

09907 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 09900

shall be given one coat of asphalt varnish conforming to TT-V-51e. Buried steel and ductile or wrought iron pipe which has an undamaged factory applied bituminous varnish protective coating shall require no further protection. All exposed pipes and pipe where factory applied protective coating is damaged and the pipe surface shows rusting shall be cleaned to bare metal then painted with a coat of pretreatment coating and conforming to MIL-P-15328 applied to a dry film thickness of 0.3 to 0.5 mil, and two coats of zinc chromate primer conforming to TT-P-645, each coat applied to a minimum dry film thickness of 1.0 mil. Zinc coated and copper pipe under insulation shall not be painted. Equipment shall be finished in accordance with the specification for the particular item. Surfaces on factory finished equipment that are damaged during installation shall be restored to their original condition.

Piping and conduit identification shall conform to the requirements of MIL-STD-101. Stenciling shall be placed in clearly visible locations. All piping and conduits not covered by the aforementioned standard shall be stenciled with names or code letters approved by the Engineer, not less than 1" high for piping and not less than 2" high elsewhere. Arrow shaped markings shall be painted on the lines to indicate the direction of flow. Two copies of the complete color and stencil codes used shall be provided; they shall be framed under glass and shall be installed as directed by the Engineer.

B. METAL WORK WHERE PAINTING IS REQUIRED

1. PRIMER

Primer shall be an appropriate primer as specified above. Coverage shall be as specified for exterior metal work.

2. FINISH

Finish shall be two coats of P&L Cellu-tone Satin applied at a rate of 450 square feet per gallon per coat.

-9 MISCELLANEOUS

Other surfaces for which the type of paint has not been specified shall be painted as specified for surfaces having similar conditions of exposure.

DIVISION 10 -- SPECIALTIES

10250

Firefighting Devices

SECTION 10250 PAGE 1
FIREFIGHTING DEVICES

10250 GENERAL

-1 SCOPE

This section covers all requirements for firefighting devices by Contractor.

-2 DELETED.

-3 SUBMITTALS

Submit manufacturer's information for all manufactured items for Engineer's approval, including size, weight, rating and other pertinent information.

10251 MATERIALS

Provide two U.L. listed tri-class fire extinguisher and wall mount bracket, weight approximately 30 pounds, for each building constructed this contract at location indicated on drawings, Model 20 TAS, as manufactured by Kidde, or equal. One extinguisher to be located just inside of door to furnace room and other extinguisher near exterior door of building.

10252 INSTALLATION

Install extinguishers on wall after walls have been painted at location indicated on drawings, three feet above floor. Utilize manufacturer supplied wall mount bracket and appropriate wood screws for secure mount.

10253 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered a subsidiary obligation of the Contractor or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 10250

DIVISION 12 -- FURNISHINGS

12300

Cabinets and Fixtures

12300 GENERAL

-1 SCOPE

The intent of this section is to provide for one undersink cabinet and fixtures for each building (the pumphouse and the filter house), plus a six gallon hot water heater for both buildings, plus all incidental items, complete.

-2 RELATED WORK IN OTHER SECTIONS

A. Plumbing Section 15400

-3 SUBMITTALS

Submit manufacturer's information for all manufactured items for Engineer's approval, including sizes, finish, and other pertinent information.

12301 MATERIALS

-1 CABINET

The cabinet shall be metal finish size 22 x 24 x 35-3/4 inches, single door, model VL1H-24, as manufactured by VWR, or equal.

-2 SINK

The stainless steel sink shall be 16-7/8 x 14-1/8 x 7-1/2 inches, as manufactured by VWR, model VL7070, or equal.

-3 COUNTER TOP

The cabinet counter top shall be Vanrock, as manufactured by VWR, or equal.

-4 PLUMBING AND FIXTURES

A. Plumbing

1. Hot and Cold Water Piping - standard galvanized steel pipe and galvanized malleable iron screwed fittings or type "K" copper pipe and wrought copper high temperature solder joint fittings.

2. Waste Pipe - PVC rigid pipe.

B. Fixtures

Chrome plated faucet, dual control, single spigot with aerator for above sink, as approved by Engineer.

-5 WATER HEATER

Heater shall require no outside venting, and have adjustable thermostat and high limit switch, 120 V, with single heating element, model No. NSG 1-1/2 gallon capacity National, or equal. The water heater shall be mounted under the sink in a specified cabinet.

12302 INSTALLATION

Installation shall follow accepted practices. The units shall be located as shown on the drawings. The units shall be securely fastened to the wall and floor.

12303 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 12300

DIVISION 15 -- MECHANICAL

15150	Heating
15160	Ventilation
15400	Plumbing
15900	Controls and Instrumentation

15151 HEATING

-1 GENERAL

Heating units, thermostats, and fuel supply systems are to be installed and connected complete. All work and incidental work is included herein.

-2 SUBMITTALS

Submit literature for all manufactured items including all features, sizes, specifications, methods of attachments and installation instructions for Engineer's approval.

15152 MATERIALS

-1 FURNACE

Provide furnaces as shown on drawings.

-2 ELECTRIC BASEBOARD RADIATION

Berko MCB3-712-L, three foot long commercial baseboard unit, 2,560 BTUH, 750 watt heating capacity, enclosure to have minimum 22 gauge body wrap, 18 gauge front cover, end plates and terminal box with 16 gauge front cover supports built in every 6 inches, tamperproof single pole thermostat. Wired for 120 volt, single phase power.

-3 THERMOSTATS

Thermostats shall have temperature selector and thermometer scale combined in easy-to-read dial. A mercury switch shall be employed to insure dust free contact operation. The temperature range shall be 35 to 65 degrees F., model T86A, as manufactured by Honeywell, or equal for both the filter house and the pump station.

15153 INSTALLATION

-1 GENERAL

All units and accessories shall be located in the approximate location shown on the contract drawings. Installation is to

be done by accepted standard procedures. All units shall be tested and adjusted according to manufacturer's instructions.

15154 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 15150

15160 GENERAL

-1 SCOPE

Exhaust fans, duct work, roof caps and furnace vent are to be fabricated and installed complete including all incidental items.

-2 SUBMITTALS

Submit literature for all manufactured items and shop drawings for all fabricated items to be approved by the Engineer.

15161 MATERIALS

-1 EXHAUST FANS

A. CHLORINATOR BUILDING

Exhaust fan for Chlorinator Room shall have acoustically insulated housing. Fan capacity shall be 805 cfm at 0.25 inch s.p., 1050 rpm, model Z-12 as manufactured by the Penn Ventilator Company, Inc., or equal.

-2 LOUVERS

A. Refer to Metal Door Section 08100 and Overdoor Louver Section 08750.

B. Louvers as shown on contract plans.

-3 ROOF CAP

A. FILTER STATION BUILDING

Flat roof caps shall be leakproof, rust proof, one piece, seamless vent, molded of weatherproof plastic, model 14-FR, as manufactured by the Penn Ventilator Company, or equal.

-4 DUCTWORK

A. Exhaust ductwork shall be fabricated from fiberglass duct board. Vapor barriers shall be installed as indicated on the contract drawings.

B. SUPPLY AIR (S/A) AND RETURN AIR (R/A) DUCTWORK

1. All runs of ductwork, and all ductwork in mechanical rooms and fan rooms constructed of galvanized steel sheets and in accordance with the following.
2. Ducting in accordance with low velocity duct construction standards, Fourth Edition - 1969, as published by SMACNA. Supply and return air plenums 16 gauge. Fiberglass duct installed in accordance with "Fibrous Glass Duct Construction Standards, Third Edition - 1972" as published by SMACNA.
3. Rectangular Ducts: Where special rigidity or stiffness is required, ducts constructed of metal two (2) gauge numbers heavier. Other joint construction of equivalent mechanical strength and air tightness may be used. Recommend methods of fastening bracing to ductwork including riveting, bolting, and tack welding.
4. Duct 24" and Less: Provide with 1" x 18 gauge straps fastened to ductwork and to building construction. Spaced not more than 4 feet on center.
5. Ducts 25" through 42": Provide mild steel rods fastened to angle iron stiffeners with nuts and to building construction with appropriate inserts, flanges or clamps. Spaced not more than 4 feet on center.
6. Fibrous Glass Duct: At contractor's option, the duct system Underwriters' Laboratories, Inc. Class K Air Duct listing, so labeled. The product made of glass fibers with a foil reinforced flame retardant vapor barrier on the exterior surface. The product to have a facing which has a mullen burst strength of not less than 150 psi., which is an indication of puncture resistance. Duct 1" thick.

- C. Volume Damper: Duct depth greater than 6" a multi-blade damper. Blades mounted in a separate channel frame which is installed in duct. Equal to Ruskin CD-35 opposed blade damper with operator as required. Operator accessible without demolition for adjustment, where shown on plans.

- D. Backdraft Dampers: Where required, or indicated on plans, provide backdraft dampers, counter balanced to desired static pressure setting, felt applied to top of blades. Neoprene edge blades in rigid metal frame where exposed to outside temperature, bronze bearings, rigid frame Ruskin CBS-4, CBS-7 or CBS-8, as applicable.
- E. Turning Vanes: In all 90 degree turns in ducts where one and one half (1-1/2) radius elbows are not used, single radius turning vanes installed.
- F. Flexible Fan Connectors: Flexible duct connection material suitable to withstand the pressure encountered and "Durodon" as manufactured by Durodyne Corporation, or equal.
- G. Registers, Grilles and Diffusers: Grilles, registers, and diffusers of types and sizes called for on plans.

15162 INSTALLATION

All ductwork and vents shall be installed utilizing accepted standard procedures. Installation of equipment shall include all framing, forming, supports, electrical, and labor for complete installation.

15163 PERFORMANCE

All exposed work shall be capable of withstanding 125 mph winds for the life of the building.

15164 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 15160

15400 GENERAL

-1 SCOPE

This section covers all work required for the plumbing of one sink in each building. Both buildings will have hot water.

-2 RELATED WORK IN OTHER SECTIONS

A. Cabinets and Fixtures Section 12300

-3 SUBMITTALS

Submit literature and shop drawings for all items supplied for Engineer's approval.

15401 MATERIALS

-1 WATER PIPING

Water piping shall be 1/2 inch copper pipe with copper fittings of suitable size for sweating, or standard galvanized steel pipe and galvanized malleable iron screw fittings.

-2 WASTE PIPE

Waste pipe shall be two inch PVC rigid pipe.

15402 INSTALLATION

Installation shall conform to Contractor's shop drawings and utilize accepted practices.

15403 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 15400

15900 CONTROLS AND INSTRUMENTATION

-1 SCOPE

Temperature control subcontractor furnish all labor, equipment and material necessary for the proper installation of an electric system of automatic temperature controls as manufactured by Honeywell, Barber-Coleman or Johnson Controls, Inc. Temperature controls installed by the manufacturer of the controls. Manufacturer maintain a service office in the State of Alaska, a complete stock of replacement parts and remain on 24 hour call for emergency service.

-2 CONTROL EQUIPMENT

- A. Thermostats have locking metal covers, (plastic covers not acceptable), and possess the capability of locking the setting at a fixed temperature.
- B. Relays and Switches: Provided as required for the successful operation of the control system. All switches include suitable indicating plates. All relays mounted inside locking metal local control cabinets.
- C. Damper Motors: Capable of providing smooth, stable, proportioning control under the design conditions, fully modulating. Undersized, "competitive" type operators not acceptable.
- D. Installation
 - 1. Wiring: All control wiring in conjunction with the electric control system the responsibility of the temperature control subcontractor. All wiring in accordance with the electrical specifications and comply with the governing national, state and local electrical codes. All wiring in conduit.
- E. Drawings and Layouts
 - 1. The temperature control contractor submit to the architect or engineer for approval, a shop drawing of each entire control system including piping, wiring and control system sequence on one sheet before starting work. Upon completion of the work, this contractor show all control equipment and the function of each item indicated, in an as-built condition.

F. Service and Guarantee

1. Upon completion of work, the control contractor provide job site instruction for the operating personnel. The control system free from defects in workmanship and material under normal use and service. If within twelve (12) months from date of acceptance by the architect or engineer any of the equipment herein described is proved defective in workmanship or material, replaced or repaired free of charge.
2. After completion of the installation, the automatic control contractor regulate and adjust all thermostats, control valves, motors and other equipment provided under his contract. Place them in complete operating condition subject to the approval of the architect or engineer and provide any service incidental to the proper performance of the temperature control system for the guarantee period of one (1) year.

15901 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 15900

DIVISION 16 -- ELECTRICAL

16010	General Provisions
16100	Basic Materials and Methods

16010 GENERAL PROVISIONS

-1 SCOPE

Furnish all labor, material and equipment required for installation of complete workable electrical system as indicated by contract drawings and the electrical specifications.

-2 DEFINITIONS

- | | | |
|----|--------------------|---|
| A. | Engineer | Owner's representative. |
| B. | Approved | As specified, or having received approval of the Engineer. |
| C. | Provide | Furnish, install and leave electrically ready for use. |
| D. | Furnish | Pay for and deliver to job site. |
| E. | Install | Fix permanently in place and connect electrically. |
| F. | Contractor | The electrical contractor. |
| G. | Trade | The electrical trade. |
| H. | Work | Labor and/or material accruing in the provision of an electrical system as defined by the drawings and these specifications |
| I. | General Contractor | Contractor for the general construction work. |

-3 DRAWINGS AND SPECIFICATIONS

Specifications and drawings are complimentary each to the other; what is specified on one is as binding as if called for on both; do not scale drawings for exact equipment location; verify measurements on site; install material and equipment not dimensioned on drawings in manner to provide pleasing and symmetrical appearance; drawings are partly diagrammatic, not intended to show all features of work; mention of items does not imply omission of other necessary items not mentioned; cost resulting from non-conformance with specifications is Contractor's responsibility.

-4 COMPLY WITH

General Provision, Instructions to Bidders, and other provisions as outlined in previous or other sections of specifications affecting this work; applicable provisions, latest edition, National Electrical Code; local codes governing electrical work; secure and pay for all necessary permits.

-5 LABOR

Employ only mechanics skilled in the electrical trade on this project; workmanship subject to approval.

-6 COORDINATE WORK BY

Reporting in writing to Engineer before scheduled bid opening: contradictions or discrepancies between specifications and drawings; conflicts between electrical work and work of other trades. Planning and scheduling with general contractor for minimum interference with other trades; verifying, by plans or specifications, equipment furnished by others, but installed by him; installing and connecting electrical equipment furnished by others; connecting electrical equipment installed by others; providing: liberal notice to other trades of work required by them; exact location and dimensions of electrical equipment affecting work of others; materials furnished by him but installed by others. Refer to drawings and specifications for work of other trades.

-7 CHANGES

Not allowed without prior written approval of the Engineer; approved only at no extra cost to the Owner; requested in writing.

-8 EXISTING FACILITIES

Maintained and protected; repairs, if damaged during construction, by competent mechanics, to the satisfaction of the Engineer at no extra cost.

-9 DRILLING, NOTCHING AND SLEEVING

Contractor's responsibility; drilling, notching of joists, beams and columns subject to approval.

-10 CUTTING AND FRAMING OF OPENINGS

By general contractor.

-11 EXCAVATION AND BACKFILL FOR ELECTRICAL WORK

By electrical contractor.

-12 RECORD DRAWINGS

Corrections, changes during course of job marked clearly on prints; submitted in duplicate to Engineer at completion of job.

-13 TESTS AND INSPECTION

Schedule and pay for all inspections required by local authorities; request inspection by Engineer prior to installing fixtures, outlets and panel covers, and before covering buried cable; test grounding system with grounding megger; submit certified log of reading to Engineer; test all feeders, sub-feeders, and branch wiring installed under this contract with megger, per N.E.C. Submit certified log readings to Engineer; perform other tests required elsewhere in these specifications; after all items are in place, request inspection by Engineer and demonstrate to his satisfaction that electrical system complies with plans and specifications; immediately correct all deficiencies noted during test and inspection; furnish all personnel and equipment required.

-14 CLEAN-UP

Remove all scraps, tools, surplus material and temporary wiring immediately upon completion, or as otherwise directed by the Engineer.

-15 NOTICE OF COMPLETION

Notify Engineer upon completion; certify that installation is complete in conformance with contract documents, authorized adjustments, changes, tests and inspections; submit in duplicate.

-16 GUARANTEE

All work executed under this contract to be free from defects in materials or workmanship for a period of one year from acceptance; promptly replace or repair faulty materials or workmanship to satisfaction of Owner during guarantee period; include cost of guarantee in contract price; no separate payment will be made.

16011 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section.
The performance of this work shall be considered as a subsidiary obligation or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 16010

16100 BASIC MATERIALS AND METHODS

-1 SPECIFIED

Manufacturers and catalog numbers, specified only as indication of quality and/or size and capacity; base bid on specified materials; material other than specified will be considered only after award of contract and allowed only upon approval of Engineer; material installed which has not been approved shall be removed and replaced with approved material at no cost to Owner.

-2 APPROVAL OF SUBSTITUTE MATERIALS AND EQUIPMENT

The net cost of which is less than that of item specified, is contingent on credit to Owner of net difference per item, times number of items; agree on price adjustment before approval; not considered before award of contract; constitutes nothing more than authorization for use in lieu of specified; subject to Contractor assuming responsibility for physical dimensions suiting space limitations, cost of installation guarantee; not considered without four copies of data pertinent to cost, quality, application and availability; indicate material substitute item replaces; purchase no substitute material until approved; submit requests and date in time to prevent delay of work.

-3 MATERIAL AND EQUIPMENT SCHEDULE

Submit to Engineer, after award of contract; submitted complete; partial submittals will not be considered; include applicable catalog numbers, cuts, diagrams and performance data for all material installed.

-4 ALL MATERIAL

New, as specified, unless otherwise approved; reputable and standard manufacture of latest design; bear label of Underwriters' Laboratories, Inc., where applicable; as shown on plans or specifications, or approved equal; installed in compliance with applicable manufacturer's directions; installed in best practice of trade; replaced or repaired to satisfaction of the Engineer, if damaged during installation or test.

-5 SHOP DRAWINGS

Submitted in quadruplicate when Contractor fabricates material

in his shop or has material fabricated by others, and when shop drawings are called for elsewhere in the specifications.

-6 SERVICE AND METERING

Electrical characteristics as indicated on the drawings.

-7 TYPE OF WIRING INSTALLATION

Insulated conductors in metallic raceway system.

-8 GROUNDING

Conduit and neutral conductor of system to be solidly grounded; connect ground conductor to incoming water line; resistance to ground shall not exceed 25 ohms for electrical system grounding; test and report to the Engineer.

-9 INDIVIDUAL FEEDER CIRCUIT BREAKERS

Correct enclosure for installed locations; trip free operating mechanism; provision for locking operating handle on open position; handle to clearly indicate whether breaker is "on", "off", or "tripped"; trip set as indicated on drawings, or as directed; provide with engraved phenolic name plate stating designation and purpose.

-10 SAFETY SWITCHES

Correct enclosure for installed location; externally operated; quick make, quick break; horsepower rated when used on motor circuits; lockable operating handle; provide with engraved phenolic name plate stating designation and purpose; fused as indicated on drawings, or required by code for apparatus connected.

-11 POWER PANELS

Code requirements governing panel and switch gears; fabrication, partitioning, gutter space and construction is manufacturer's responsibility. Branch breakers to have trip free operating mechanism; mounted maximum of 60 inches from finish floor to center; provide neatly typed circuit index under glass or plastic inside door; provide with engraved phenolic name plate indicating designation and purpose; tie bars converting

single-pole breakers to multi-pole breakers not permitted; square D Type NQ08 for 120/208V panels: unless otherwise specified, panel finish to be manufacturer's standard; circuit connections as indicated on drawings, report in writing to any deviations and reasons therefore.

-12 CONDUIT

Use schedule 40 PVC for all interior runs, rigid steel for underground and exterior applications; conduit runs as indicated are generally diagrammatic; exact routing shall suit job conditions and shall be routed so as to not obstruct passages, floors, etc.; all conduit installed exposed, unless otherwise noted on drawings; sheradized, hot-dipped galvanized; bent only with approved bender; exposed runs parallel to walls and floors and bent symmetrically; adequately supported and secured by appropriate straps and fittings; nails or sheet metal screws not satisfactory for fastening supports, without approval; installed in manner to prevent accumulation of condensation; all conduit stubbed up out of floor inside of equipment shall have insulating bushings installed.

-13 CONDUCTORS

A. SYSTEMS 600 VOLTS AND BELOW

600 volt, Type THW insulation, unless otherwise noted on drawings, or in this specification; type USE for direct bury. Not smaller than No. 12 AWG, unless noted; No. 10 AWG for branch circuit runs longer than 100 feet for 120 volt circuits: neatly grouped and formed in panels and gutters; lugs used at all terminals for all conductors larger than No. 10 AWG.

B. SYSTEMS OVER 600 VOLTS

Primary cable shall be single conductor aluminum, 15 KV, shielded, grounded neutral, cross linked polyethylene insulation, suitable for direct burial, and sized as indicated on drawings. No splices shall be permitted. All transformer connections shall be made with load break elbows, similar to ELASTIMOLD #163LR with shielded cable adapter. Terminals and connections shall be made in accordance with manufacturer's recommendations. Submit for approval. Test insulation resistance with Hypot tester, Associated Research, Inc., or equal. Follow instrument manufacturer's instructions.

-14 OUTLET BOXES

Schedule 40 PVC, type and size to suit device and conditions; sized according to code, to accommodate number of conductors; for ceiling fixtures, minimum of 4 inch octagonal with 3/8 inch fixture stud; nails not satisfactory for fastening; where conduit is exposed on walls or stubbed up through floor, screw hub type; blank covers installed when outlet box is not utilized for mounting purposes.

-15 RECEPTACLES

Mounted 18 inches from finish floor to center, unless noted otherwise; in concrete block constructions, at bottom of second course of block and at junction with adjoining block. Duplex receptacles, grounding type; ASA and NEMA standard twin grounding outlet, rated 15 amperes at 125 volts, Arrow Hart 5252-1, Bryant 5242-1.

-16 SWITCHES

Mounted 48 inches from finish floor to center; concrete block to corner of block in course nearest 48 inches height; on door striking side of entrances, verify from architectural drawings; provide with pilot light when device or fixture operated in not visible from switch; of following manufacture, or approved equal; single pole toggle, AC-DC AH & H #1541, 20A, 125 volt, with weather proof cover.

-17 FIXTURES

As noted on drawings or approved equal; furnish and install new lamps, cleaned before leaving job.

-18 DEVICE PLATES

To suit device, installed flush, installed plumb, 1/16 inch tolerance; mats or plaster fillers not permitted; stainless steel, unless otherwise noted; sectional plates not permitted.

-19 EQUIPMENT CONNECTIONS

Flexible conduit, not over 24 inches long, may be utilized; proper flexible conduit fittings used; sealtight, or approved equal; use approved bonding jumper to extend equipment ground from conduit to equipment.

-21 MULTI-SERVICE EQUIPMENT

Motorized equipment except as specifically noted to the contrary per drawings will be: furnished and fixed in place by others; connected electrically at motor terminals by the Contractor,

thermal overload and disconnect switches, or circuit breakers, shown on electrical drawings, provided by the Contractor, Square D Class 2510 or equal. Pilot control devices, except line-voltage thermostats, i.e., push button stations, auxiliary relays, temperature and pressure flow relays, etc., provided by mechanical and general contractor.

Miscellaneous equipment furnished and installed by others, unless specifically noted otherwise on the drawings; connected by the Contractor when shown on the electrical plans, unless noted specifically otherwise.

-21 BATTERIES

Batteries shall be lead acid type, 120 volt, consisting of ten 12 volt units, minimum of 255 amp hour capacity based on 8 hour rate. Batteries shall be heavy duty commercial type with minimum positive plate thickness of .125". Battery rack shall be constructed of 2" x 2" x 1/8" angle iron frame with 2" wood plank decking, three tier, sized to suit batteries furnished. Provide rails to prevent displacement of batteries during earthquake and bolt frame to wall and floor. Paint entire rack with two coats of acid resistant paint. Batteries shall be shipped dry, with electrolyte shipped in separate containers. Provide one gallon spare electrolyte. Guarantee for one year, with pro-rated guarantee for seven additional years.

16101 TESTS AND FINAL INSPECTION

The Contractor shall call for the following inspections during the installation by notifying the Engineer in writing at least 48 hours in advance of the anticipated time that inspections will be required: before installing fixtures, outlet and panel covers; during the testing of cables and system ground; prior to final inspection.

Upon completion of the project, the Contractor shall call for final inspection of the installation. At such time as the Engineer may direct, the Contractor shall conduct an operating test for approval. The installation shall be demonstrated to operate in accordance with the requirements of these specifications and the contract drawings. Should any portion of the installation fail to meet the requirements of these specifications and/or applicable drawings, the Contractor shall, at the direction of the Engineer repair or replace the items failing to meet the requirements until such item, or items, can be demonstrated to comply.

16102 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section.
The performance of this work shall be considered as a subsidiary obligation or is covered under bid items 101 and 102 of the Unit Price Schedule.

END OF SECTION 16100

DIVISION 17 -- WATER PIPING AND TREATMENT

17100 Water Piping System

17200 Water Treatment

17100 GENERAL

-1 SCOPE

The scope of work covered by these specifications shall include the furnishing of all labor and equipment necessary to completely install the Seldovia water utility piping, and appurtenances in accordance with these specifications and the contract drawings.

-2 RELATED WORK IN OTHER SECTIONS

A. Demolition	Section 02110
B. Earthwork	Section 02210
C. Cast-in-Place Concrete	Section 03300
D. Painting	Section 09900

-3 APPLICABLE STANDARDS

Ductile-Iron Pipe	AWWA C 110-71 ANSI A21.51-73
Rubber Gaskets	AWWA C 111-72 ANSI A21.11-73
Thickness Design	ANSI A21.50-73
Fittings	ANSI A21.10-73
Cement-Mortar Lining	ANSI A21.4-73
Gate Valves	AWWA C 500-71
Fire Hydrant Assemblies	AWWA C 502-64
Butterfly Valves	AWWA C 504-66
PVC Commercial Standard Spec.	CS-256-63

-4 DEFINITIONS

Refer to Earthwork Section 02210.

-5 SUBMITTALS

Submit complete manufacturer information describing materials, conformance to specifications, special installation instructions, sizes and dimensions. Order no material until approval is received.

-6 DELIVERY AND STORAGE

A. PROTECTION

1. Deliver all materials to the job site in a safe area out of the way of other work and traffic.
2. Use all means necessary to protect the material before, during and after delivery and to protect the installed work of all other trades.
3. Protect all valves, fittings and piping meant for installation inside buildings with adequate weatherproof outer wrappings.

B. REPLACEMENT

In the event of damage, immediately make replacement as necessary to the approval of the Engineer and at no additional cost to the Owner.

17101 MATERIALS

-1 DUCTILE IRON PIPE

A. WALL THICKNESS

Wall thickness shall be thickness Class 52 for all diameter pipes.

B. LINING

Cement-mortar: unless otherwise called out on the plans, all piping shall have a cement-mortar lining followed by a seal coat of bituminous material.

C. EXTERIOR SURFACE

1. Underground Service

All piping designated for underground service shall receive an exterior bituminous coating approximately 1 mil thick.

2. All Other Service

Piping for all other service shall receive one coat of primer which shall be compatible with the finish coatings described in Section 09900 of these specifications.

D. JOINT TYPE

1. Underground Service

All piping designed for underground service shall have mechanical joints or push on joints.

2. All Other Service

Piping for all other service shall have flanged joints, Class 125.

E. FITTINGS

Fittings shall be ductile iron.

-2 STEEL PIPE

All steel pipe shall be Schedule 40 pipe conforming to AWWA C201 and C202. Flanges shall conform to AWWA C207. Field welding shall conform to AWWA C206. Cement-mortar lining shall conform to AWWA C205.

-3 POLYVINYL CHLORIDE PIPE

A. CLASS

Polyvinyl chloride (PVC) pipe shall be Schedule 40 for solvent-cement welding or Schedule 80 suitable for threading, Type I, Grade I PVC, NSF certified.

B. JOINTS

Joints shall be solvent cemented, unless otherwise noted on the plans.

-4 SOIL PIPE

All soil pipe shall be standard weight no-hub cast iron pipe.

-5 GATE VALVES AND VALVE BOXES

A. Gate valves shall be iron body, fully bronze mounted, double disc, parallel seat valves as manufactured by Mueller Company or approved equal, and in accordance with

AWWA Specification C 500-71. All valves shall have non-rising stem and open counter-clockwise. Valves shall have mechanical joint ends.

8. Valve boxes shall be cast iron of sliding adjustable height type with round bottom hood sections to fit over the top of valve. The top section shall be recessed to receive a closed fitting "eared" lid with the word "water" cast into it. Casting shall be smooth with a 5/16 inch minimum thickness and a minimum five (5) inch internal diameter. Valve box sections shall be dipped in coal-tar pitch.

-6 BUTTERFLY VALVES

A. UNDERGROUND BUTTERFLY VALVES AND VALVE BOXES

1. General

All butterfly valves shall be of tight closing, rubber seat type with rubber seats which are bonded to the valve body. No metal-to-metal sealing surfaces are permitted. Valves shall be bubble tight at 150 psi rated pressures with flow in either direction and shall be satisfactory for applications involving valve operation after long periods of inactivity. Valve discs shall rotate 90° from the full open position to the tight shut position. Valves shall meet the full requirements of AWWA Specification C504-66, Class 150-8. The manufacturer shall have manufactured tight closing AWWA rubber seated butterfly valves and buried service operators for a period of at least five years. All valves shall be Henry Pratt Company "Groundhog" or approved equal.

2. Valve Bodies and Flanges

Bodies shall be constructed of cast iron ASTM A-126 Class B and shall have integrally cast mechanical joint ends.

3. Valve Discs

Discs shall be constructed of ASTM A-436 Ni-Resist, Type 1.

4. Valve Shafts

Shafts shall be one piece Class 18-8 Type 304 extending full size through the valve disc and bearings; stub shafts not acceptable.

5. Valve Seats

Seats shall be a Buna N simultaneously molded in vulcanized and bonded to the valve body; seat bond must withstand 75 pounds pull under test procedure ASTM D-429-58 Method B; seats affixed to disc not acceptable and ring type rubber seats not permanently affixed to body not acceptable.

6. Valve Bearings

Bearings shall be sleeve type corrosion resistant and self lubricating with load not to exceed 2500 psi.

7. Valve Operators

Valve operator shall be traveling nut type designed to withstand 300 foot pounds of input torque at full open or closed positions without damage to the valve or operator; must be fully gasketed and grease packed and designed to withstand submersion in water to 10 psi; valves shall close with a clockwise rotation of the AWWA nut and shall require a minimum of 30 turns to move from fully open to fully closed.

8. Testing

Hydrostatic and leakage tests shall be conducted in strict accordance with AWWA C504-66, Section 13.

9. Valve boxes shall be cast iron of sliding adjustable height type with round bottom hood sections to fit over the top of valve. The top section shall be recessed to receive a closed fitting "eared" lid with the word "water" cast into it. Casting shall be smooth with a 5/16 inch minimum thickness and a minimum five (5) inch internal diameter. Valve box sections shall be dipped in coal tar pitch.

B. ALL OTHER BUTTERFLY VALVES

Butterfly valves shall be the lug type body type LLW-150 psi, as supplied by the Rockwell Manufacturing Company, or equal. The valve body shall be cast iron, the disc cast iron, the shaft type 17-4ph stainless steel, have snap liner and seats, it shall be supplied with enclosed gear and hand wheel operator.

-7 PRESSURE REDUCING VALVE

8" altitude and pressure sustaining valve shall be as manufactured by the Clayton Valve Mfg. Co., Model 210-01 equipped with additional pilots to sustain pressure on the upstream side at a minimum of 70 psi, or equal. The 8" valve shall control approximately 150'psig upstream. The valve shall be factory adjusted for these pressure reductions prior to shipment. The main body and cover shall be cast iron, ASTM A-48. The main valve trim bronze, ASTM B-61, the pilot control system cast bronze, ASTM B-62 with 303 stainless steel trim. The valve is to be capable of holding tank level to a predetermined level. It shall be a hydraulically operated pilot-control diaphragm valve.

-8 FIRE HYDRANT ASSEMBLIES

Fire hydrants shall be Mueller Improved Hydrants and shall conform to AWWA Specification C502-64, "Fire Hydrants for Ordinary Water Works Service". All hydrants shall be equipped with five (5) inch main valve openings and shall have six (6) inch ASA Class 125 standard mechanical joint hub ends for connecting to the auxiliary gate valve. All connections will be mechanical joint unless otherwise approved by the Owner. Fire hydrants shall be furnished as indicated on the drawings with the following types of hose connections:

- A. All hydrants shall have two, two and one-half (2-1/2") inch hose connections and one, four and one-half (4-1/2") inch pumper connection.
- B. All hose threads shall be National Standard threads. Standard fire hydrants shall be furnished with a 4-foot bury set to finish grade. The working parts of all hydrants shall be bronze or non-corrodible metal. Painting and coating shall be in accordance with the cited AWWA Specification. Color of paint shall be "red" Amortone #992.
- C. Fire hydrants are to be set to finish grade.

-9 FLEXIBLE COUPLINGS

Approved manufacturers of flexible couplings are Smith-Blair Series 400 and Series 900, Dresser Style 38 and Style 127 or an equal approved in advance by the Engineer.

-10 FLANGED COUPLINGS AND REDUCING ADAPTORS

Flanged coupling adapters and reducing flanged coupling adapters shall have a follower of ductile iron, in sizes up to and including 12", and rolled steel for larger sizes, the flange shall be AWWA Class D, the gasket shall be natural rubber, and nuts and bolts shall be high strength steel. All flange coupling adapters and all reducing flange coupling adapters shall be as manufactured by Smith-Blair Incorporated, Model 913 and 914, or equal.

-11 DRY CHLORINE GAS PIPE

A. PIPE

All piping carrying dry chlorine gas shall be carbon steel pipe, seamless, Schedule 80.

B. FITTINGS

All fittings (except unions) carrying dry chlorine gas shall be forged carbon steel, 2000# CWP, screwed.

-12 PIPE HANGERS

A. CEILING SUSPENDED

1. Spacing of supports, maximum

a. Nominal Pipe Size, Inches	Maximum Span, Feet
1/2	5
3/4	6
1	7
1-1/2	9
2	10
2-1/2	11
3	12
4	14
6	17
8	19
10	22
12	23
16	27
18	28

b. Additional supports

Supports shall be placed immediately adjacent to, and each side of, flexible couplings; maximum allowable distance from a support to any bend shall be 1/4 of that specified in 15 A.1.a. Pumps and other equipment shall not be utilized to support piping, valves or fittings.

2. Pipe Rings

Pipe rings shall be malleable iron, split ring type for 8-inch pipe and smaller and steel for larger.

3. Ceiling Supports

Ceiling supports shall be either the expansion case type for drilled holes, concrete inserts, or ceiling flanges.

B. FLOOR SUPPORT

1. Spacing of supports, maximum see 15 A.1.a. and b. of this section.
2. Attributes
 - a. Pipe saddle size as required.
 - b. Use an adjustable pipe support.
 - c. Bolt to floor with floor flagge.

C. WALL SUPPORT

1. Spacing of supports, maximum see 15 A.1.a. and b. of this section.
2. Assembly: wall supports shall be fabricated steel or cast iron with provision for strapping the pipe to the bracket.

D. HANGER DESIGN

1. Hanger structural members shall be cast iron, malleable iron or mild steel; structural dimensions shall conform to generally acceptable standards for thin design loadings. Design loading shall be based on pipe flowing full of water.

-13 CUT-OFF WALLS

Cut-off walls are to be fabricated from 14 gauge galvanized corrugated sheet steel, as shown in the contract drawings.

-15 PIPE ANCHORS

The pipe anchor shall be complete, including rock bolts and steel strap. The rock bolts shall be Williams, U.S.-5-LCS-114 solid bar rock bolts, or equal. The rock bolt shall be 5/8 inch in diameter and suitable for medium rock, with long cone and shell and require approximately 100 foot pounds torque to expand the shell. Refer to drawings for pipe anchor detail. Refer to drawings for concrete anchors at pipe bends.

-15 FILL AND GRAVEL

Refer to Earthwork Section 02210.

-16 CONCRETE

Refer to Division 3 - Concrete.

-17 PRIMER PAINT

All exposed valves and specials shall either have one coat of primer which is compatible with the finish coatings described

in Section 09900 of these specifications or shall be finish painted by the manufacturer.

-18 MAIN LINE METERS

Main line meters shall have a magnetic propeller drive to allow the gear box housing to be hermetically sealed. A 3-inch dial shall show flow rate indicated in gallons per minute and total flow as 6-digit read out. The meters shall be 150# flanged Sparling "Master-Flo" Main Line Meters, 8" for the Filter Station and for the chlorinator station. The chlorinator station meter shall be equipped with a Sparling 249E pulse transmitter compatible with the existing WET Model 86020 pulse frequency to Milliamp D.C. converter and WET Model 84100 strip chart recorder and variable vacuum output, which equipment is to be moved from the existing P.R. station to the new chlorination station.

17102 INSTALLATION

-1 UNDERGROUND PIPING

A. GENERAL

Line and grade as shown on the drawings. The line and grade are approximate only, except that it is necessary to keep within the designated easements. 5' bury at the pipeline shall be maintained. The actual line and gradient of the piping will be established in the field, as approved by the Engineer. This approved line and grade shall become part of the contract documents. The line and grade shall be recorded in field books by an experienced surveyor employed by this Contractor whose qualifications shall be registration as a surveyor or equivalent experience. It is the intention of the plans to construct the waterline and drain line adjacent to the existing 10" steel gravity waterline but sufficient separation will be maintained to avoid damage to the existing waterline.

B. LINE AND GRADE

The pipe shall be so laid in the trench that after the line is completed the interior surface thereof conforms accurately to the design grades and alignment. The pipe shall be straight to the eye, unless otherwise called for on the plans.

All adjustments to line and grade shall be done by scraping away or filling the earth under the body of the pipe and not by blocking or wedging up.

Any time pipe has to be deflected around curves where no fittings are used, the line and grade is to be staked at intervals of each length of pipe.

C.

C. EXISTING UTILITIES

The Contractor is responsible for the protection of all existing underground, surface or overhead utilities and for the protection of adjacent structures. Plan locations of existing underground facilities are to be considered approximate only and are to be verified by the Contractor. The methods used to protect existing utilities, appurtenances, structures, etc., shall be subject to the approval of the owning agency. In certain instances, piping will be relocated subject to the approval of the new location by the Engineer to avoid conflict with existing utilities. Such relocation will be at Contractor's expense for extra fittings and/or lost time, and no additional payment will be allowed to the Contractor for relocation expenses.

D. EXISTING PIPING

Prior to the ordering of any pipe and fittings for underground installation, the Contractor shall expose by excavating and he shall measure all critical connection pipes to determine fittings required, etc. Coordination with the City of Seldovia for use of City equipment and labor shall be by the Contractor. The City will make available to this Contractor, at standard "book" rental rate a rubber tired backhoe and operator, plus a laborer. An allowance of 10 hours is set forth in the bid for this work, the payment for which will not be exceeded, regardless of the actual time required by the Contractor to accomplish this "underground exploratory" work. When the pipe tie-ins are exposed, a record of depth below surface, and a 3-point survey tie to existing permanent surface features shall be recorded in a field book and copies furnished the engineer in order to facilitate future recovery of the same tie-in position. Payment for this "underground exploration" work shall be in accordance with the "allowance" set forth in the bid.

E. EXCAVATION

1. General

Contractor shall accomplish all excavation, including rock excavation, required by the contract drawings through whatever substances encountered. All excavation shall be accomplished in accordance with the State of Alaska safety code and the safety requirements of local agencies.

Unauthorized excavation below the required grade line shall be backfilled with approved material and mechanically compacted to 95% of maximum density at the expense to the Contractor.

In areas where large boulders, bedrock, or other unyielding material is encountered at the pipe bed elevation, the trench shall be overexcavated six inches (6") and backfilled to the proper bedding elevation with minus two inches (2") granular material. Payment for required separation of materials shall be included in the unit price bid for the pipe.

In areas where overburden material is not of sufficient quality to be mixed with other more suitable material during backfill, the Contractor may be required to separate the two qualities of material during excavation to preclude subsequent undesirable mixing. The method of separation could include but may not be limited to, placing the materials on opposite sides of the trench. Payment for required separation of materials shall be included in the unit price bid for "Provide and Install Water Main" as set forth in the Unit Price Schedule and no separate payment will be made for excavation and backfill, the payment for which is included in the unit price for the various size pipes, complete in place.

In the situation of excavation in roadways and traveled ways, after completion of installations, streets shall be restored to original surface condition, which may include hauling and spreading some gravel. Payment for this work shall be included in the Contractor's price for the pipe installations.

F. CLEARING AND OBSTRUCTIONS

To prevent such materials from being utilized in the trench backfill, the Contractor shall remove from the site all root material, trash, etc., as directed by the Owner. Such materials shall be placed in a Contractor furnished disposal site approved by the Owner.

Fences, culverts and small movable structures shall be removed as necessary for the installation of the water system and replaced in a manner that will provide a fence, culvert or structure of, as a minimum, equal construction and quality of that removed.

In the case of obstructions to be removed and replaced, the Contractor shall provide photographs of "before" and "after" to show that properties were restored to equal conditions.

G.

G. WATER REMOVAL

The Contractor shall remove by pumping or other approved means, all water which is detrimental to the installation of the water lines and appurtenances.

H. LIMITS ON OPEN TRENCH

Unless otherwise approved by the Engineer, the maximum length of open trench shall be three hundred feet (300'); however, should this maximum length be considered detrimental to public safety, it may be reduced at the discretion of the Engineer.

I. PIPE INSTALLATION

1. Ductile Iron Pipe

- a. All pipe shall be laid to true line and grade with the spigot end fully seated into the adjacent bell. Backfill under and around the pipe shall be fully tamped so that no voids exist that will allow bridging or settlement of the pipe.
- b. All faulty workmanship and all materials found to be defective before or after installation shall be replaced, repaired or corrected to meet the specification requirements without additional expense to the Owner.
- c. Cutting of pipe shall be done in a workmanlike manner as recommended by the manufacturer and approved by the Owner.
- d. Open ends of pipe and appurtenances shall be protected with an approved plug at all times to prevent earth or other substances from entering the pipe. The entire system shall be flushed clean of all debris, tested and sterilized prior to being placed in service.

2. Joints

- a. All joints for ductile iron pipe shall be either approved standard mechanical or a push on joint (i.e., "Tyton" or equal). All jointing shall be accomplished in accordance with the manufacturer's recommendations as approved by the Engineer.
- b. To assure electrical continuity, two electrical conductivity strips of not less than 550 amp capacity shall be installed on all mechanical

joints and push on joints. The conductivity strips shall be U.S. Pipe "Electro-Bond for 'Tyton Joint' Pipe" and mechanical joint pipe and fittings, or approved equal. Installation shall be in accordance with the manufacturer's instructions.

3. Thrust Blocks

Concrete thrust blocks shall be installed in accordance with the standard details shown on the plans at all tees, crosses and bends, or combination of bends, 22-1/2° or greater in deflection except that precast blocks may be used where approved by the Owner.

4. Flushing

Before the pressure or leakage tests are performed and before the system is sterilized, all newly laid mains shall be thoroughly flushed to remove all foreign material. The Contractor shall provide for "open bore" flushing and shall be accomplished by utilizing the blow off line for this purpose.

5. Connect to Existing Water Line

Connections to existing water lines shall be coordinated with the Owner before any shutdown of existing water facilities. Maximum allowable shutdown time shall be ten (10) hours and shutdowns shall be limited as described in Section 01500.

6. Valves

- a. Valves and valve boxes shall be installed where shown on the plans. Valves shall have the interiors cleaned of all foreign matter before installation. If the valve is at the end of the line, it shall be plugged prior to backfilling. The valve should be inspected in the open and closed position to insure that all parts are in working condition.
- b. Stuffing boxes shall be tightened prior to installation. The base of the hood section shall rest on compacted fill and should be

approximately two (2) inches above the flanged joints of the valve dome.

- c. The valve box assembly shall be plumb and accurately centered over the valve operating nut. The top section shall be so set as to permit vertical adjustment above or below finished grade. On gravel streets the top of the valve box shall be set three (3) inches below the surface. Earth fill shall be carefully compacted around each valve box. Burlap or rubber will be wrapped around the base of the valve box when required by the Owner.

7. Fire Hydrants

- a. Fire hydrant assemblies shall be installed where shown on the plans. Hydrant barrels shall be installed plumb.
- b. The Contractor shall install hydrants in accordance with the standard details. Hydrants installed but not available for use shall be covered with burlap or equal material and securely wired or tied down. Backfill along the hydrant lead shall be in accordance with the section covering pipe backfill and compaction.

J. BACKFILL

1. Backfill Outside Roads

- a. Backfill to one (1) foot above top of pipe with original material, if suitable, otherwise bring in suitable material from other sources. Material to be two (2) inches maximum size, free from frozen clods. Carefully place and thoroughly compact around and above pipe to not less than eighty-five (85%) percent of maximum density. The remainder of the backfill shall be original material, provided it is free of all extraneous material such as organic material, brush, trash and large boulders. Additional backfill, if required, from suitable material.
- b. Restore surface to its original contour and elevation, or in areas of new grading, to the new design grade.

2. Backfill Under Roads and Around Hydrants

- a. Backfill to one (1) foot above top of pipe with original material, if suitable, otherwise bring in suitable material from other sources. Materials to be two (2) inch maximum size, free from frozen lumps. Carefully place and thoroughly compact around to three (3) foot above the pipe to not less than ninety (90) percent of maximum density. The remaining backfill to be suitable material, pit-run material, compacted to not less than ninety-five (95) percent density. Material to be compacted in maximum one (1) foot lifts.
- b. Compact backfill sufficiently to avoid noticeable settlement and soft spots. Soft spots or settled areas to be corrected at Contractor's expense. The Contractor shall be responsible to maintain, at no expense to the Owner, all settlement.

K. TESTING

1. General

Prior to installing water service connections and after backfilling, all newly laid water mains and appurtenances shall be subjected to pressure and continuity and, if applicable, leakage tests.

2. Pressure Test

Before applying the specified test pressure, all air shall be expelled from the pipe. If permanent air vents are not located at all high points, the Contractor shall install corporation cocks at such points so that air can be expelled as the line is filled with water. The newly laid piping, or any valved section thereof, shall be subjected to a hydrostatic pressure test of 150 pounds per square inch.

After the required test pressure has been reached, the pumping will be terminated. If the pressure (150 psi) remains constant for fifteen (15) minutes without the aid of a pump, the waterline will not be subjected to any further hydrostatic test. If the pressure (150 psi) does not remain constant for

fifteen (15) minutes, a leakage test will follow. All valves within the section of line being tested will be closed and reopened as directed by the Owner, after the required pressure (150 psi) has been obtained and prior to the fifteen (15) minute constant pressure test.

3. Leakage Test

- a. The duration of each leakage test shall be at least two (2) hours and during the test the main shall be subjected to a constant pressure of 150 pounds per square inch for two (2) hours. Leakage for any newly laid pipe or any valved section thereof is defined as the quantity of water that is necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air is expelled.
- b. The allowable leakage per 100 feet of main at 150 psi is as follows:

<u>Pipe Diameter (Inches)</u>	<u>Gallons Per Hour</u>
6	0.1191
8	0.1588
10	0.1986
12	0.2383
16	0.2940

- c. Cracked or defective pipe, gaskets, mechanical joints, fittings, valves or hydrants discovered as a consequence of the hydrostatic tests shall be removed and replaced with sound material at the Contractor's expense. The test shall then be repeated until the results are satisfactory.

4. Sterilization

- a. General. After pressure, leakage and continuity tests and before being placed into service, all newly laid water mains shall be thoroughly sterilized.
- b. Method of Sterilization on Water Tank Mains. Chlorine shall be used for sterilization. Chlorine may be applied by any of the following methods: (1) liquid chlorine

gas-water mixture; (2) direct chlorine gas feed; or (3) calcium hypochlorite and water mixture. The chlorinating agent shall be applied at the beginning of the section adjacent to the feeder connection and shall be injected through a corporation cock, hydrant storage tank, or other connection insuring treatment to the entire system. Water shall be fed slowly into the new tank and lines with chlorine applied in amounts to produce a dosage of 40 ppm to 50 ppm. Mains previously filled shall be treated to a concentrated dosage at intervals along the line and retained for a period of twenty-four (24) hours or more.

A residual of not less than 5 ppm chlorine shall be produced in all parts of the line. During the chlorination process, all intermediate valves and accessories shall be operated. Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water. After chlorination, all water with a higher chlorine content than that at the permanent source of supply shall be thoroughly flushed from all parts of the new system. The Contractor shall adjust his discharge rate as necessary to prevent high chlorine content in the receiving stream or waters so as not to harm any fish or marine life in the receiving waters.

5. Continuity

The continuity test will be taken with a gasoline or diesel powered welder. The continuity will have to register a minimum load of 500 amperes. The test will be conducted by the Contractor and shall be observed by the Engineer or by a representative authorized by the City to certify this test.

-2 PIPING IN BUILDINGS

A. SHOP CLEANING AND PRIMING

All finished surfaces requiring painting shall be cleaned and either given one coat of primer or finish painted by the manufacturer.

B. INSPECTION

Prior to installation of the work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

C. ERECTION

1. General

Install all piping, fittings, valves and specials in strict accordance with the drawings, the approved shop drawings, and all pertinent standards.

2. Touch-Up

After installation is complete, power wire brush all scratches and abrasions to the shop primer damaged during transportation and installation and prime these areas using the priming paint specified for shop priming.

3. Finish Paint

Finish coats are described in Section 09900 of these specifications.

17103 QUALITY ASSURANCE

-1 GENERAL

Furnish all required personnel and equipment and make all tests required to receive the approval of the Engineer and all agencies having jurisdiction.

-2 CLOSING IN UNINSPECTED WORK

A. GENERAL

Do not cover up or enclose work until it has been properly and completely inspected and approved.

B. NON-COMPLIANCE

Should any of the work be covered up or enclosed prior to all required inspections and approvals, uncover the work as required and, after it has been completely inspected and

approved, make all repairs and replacements with such materials as are necessary to the approval of the Engineer and at no additional cost to the Owner.

17104 MEASUREMENT AND PAYMENT

-1 MEASUREMENT

- A. Bid price measured for payment as a complete item. Bid price for fire hydrant assembly shall include the auxiliary gate valve and valve box.
- B. Linear foot basis measured distance of complete in-place work for payment.
- C. No measurement, not measured work for payment.

-2 PAYMENT

The quantities, determined as provided above, shall be paid for at the contract price per unit of measurement, respectively, for each of the pay items that is shown in the bid schedule. Payment will be full compensation for all bid items complete and in operation. Refer to the specifications and contract drawings for details, requirements, and location of individual items. Bid item 001 provides for the work required to measure and locate existing piping, required prior to the ordering of any pipe or fittings. Bid items 103, 104, 201, 202, 203, 204 and 205 provide for the construction of all water mains and appurtenances and drain line and appurtenances, as shown on these plans and as described in these specifications, including trenching, backfill, insulated pipe, bleeder installation, rock excavation where required and all work required to provide a complete and operating water piping system, including continuity tests, whether or not a particular element of work required to complete the functional system is specifically mentioned.

No separate payment will be made for restoring to at least an equivalent condition the access road to the tank and chlorination building site. Such restoration shall be included in the Contractor's unit bid price under bid items 103 and 104.

All piping associated with the filter station and the chlorination building, including connection to existing mains and furnishing and installing temporary by-pass piping and including stubbing the drain line out from under the filter house and chlorination building, is a subsidiary obligation of the filter house, bid item 101, or the chlorinator building, bid item 102.

SECTION 17100 PAGE 20
WATER PIPING SYSTEM

All piping associated with the tank construction to a point 5' outside the tank shall be included in the Contractor's bid item 105.

END OF SECTION 17100

17200 GENERAL

-1 SCOPE

This section covers all materials and labor necessary for the installation of the water treatment system, including the strainers, filters, and chlorination systems. Maximum operating pressure for the filters is approximately 80 psig. Maximum allowable head loss through the filters and strainer is approximately 15 psig.

-2 RELATED WORK IN OTHER SECTIONS

- | | |
|---------------------------|---------------|
| A. Electrical | Section 16100 |
| B. Water Piping System | Section 17100 |

-3 APPLICABLE DOCUMENTS

Standards of the Chlorine Institute, Inc.

-4 SUBMITTALS

Submit manufacturer's literature concerning products and installation for all materials.

17201 MATERIALS

-1 STRAINER

The strainer unit shall be of the vertical automatic backwash type, 10-VWS-13, 2800 gallons per minute, as manufactured by the R. P. Adams Company, Inc., Buffalo, New York, or equal. The strainer shall be furnished complete to include all controls, pressure gauges, wiring and instrument panels, including, in addition to pressure loss gauge for the strainer, a gauge for upstream and downstream pressure to and from the strainer. The unit shall have 0.005 inch slot widths. The 10-VWS-13 unit for the Filter Station shall be wired for 120 volts DC. A spare parts inventory of all moving parts plus an extra set of screens and gauges for each strainer shall be included with each unit. Manufacturer shall prime and finish all equipment supplied.

-2 FILTER UNIT

Filter unit shall be a model B-316-MXB Ronnigen-Petter internal backwashing back to back design multiplex filter. The model B-316-MBX filter shall be equipped with manual backwash. Unit shall include operators on 3-way ball valves. Filter units shall consist of a minimum of 16 individual filters valved to operate and backwash in parallel on a common inlet, outlet and drain header. Filter service connections shall be quick disconnect couplers. Piping connections shall be 8" lap-joint flanged, drain shall be 4" slip-on (FF) flanged. All flanges shall be drilled to ANSI 150# standards. The Contractor is responsible for furnishing and installing a completely operable unit fully operating and processing water at a minimum rate of 2000 gpm. Three spare 10 to 20 micron polypropylene screens for each filter shall be supplied with the installation plus the screens included in the installed unit. Manufacturer shall prime and finish all equipment supplied. All units shall be one color as approved by Engineer.

-3 CHLORINATION EQUIPMENT

A. DESCRIPTION

The existing WET Model 731 chlorinator shall be re-installed from the existing location to the new chlorination building location provided under this contract. The existing chlorine strip flow chart and vacuum control unit shall be moved to the new chlorine room shown. The new meter to be supplied for the chlorination building in this contract shall, in addition to producing an indicating and totalizing dial (in gallons) be equipped with a Sparling 249E Pulse Transmitter compatible with existing WET Model 86020 Pulse Frequency to Milliamp D.C. converter and Wallace E. Tiernan Model 84100 strip chart recorder and variable vacuum output, which units will be moved from their present location in the pressure reducing station to their new location in the chlorination room of the new chlorination building. This contractor shall be responsible for moving the existing chlorinator and placing the new chlorinator in operation including adjusting feed rates to provide chlorine feed to the water supply with variable adjustment capability to feed between 0.3 ppm and 1.0 ppm. Since the existing chlorinator has not been operating recently, some repairs and additional replacement parts may be required. In that event, the engineer will issue a change order for replacement parts and equipment required but no additional cost will be allowed for labor for installation unless it is determined by the engineer that complete replacement is required. Included in the Contractor's bid for the chlorination building

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shall be two trips to Seldovia by an authorized representative of the chlorinator manufacturer. The first trip will be to initiate operation of the chlorination system and the second trip will be to return with replacement parts required and place the system in final operation.

B. GAUGES

Gauges indicating gas pressure and gauges indicating water pressure both upstream and downstream from the filter unit and upstream and downstream from the pressure reducing valve shall be included with equipment furnished this contract. A spare gauge for each gauge required shall also be supplied this contract.

C. VACUUM REGULATION AND AUTOMATIC SHUT-OFF

Included with moving the existing chlorinator to the new location is a gas solenoid valve to be furnished and installed this contract which solenoid valve shall positively provide a tight shut-off of chlorine gas flow to the chlorinator with a loss of vacuum due to any cause such as interruption of water supply.

D. AUXILIARY EQUIPMENT AND SPARE PARTS

1. Two instruction books covering installation, operation and maintenance of equipment furnished under this section.
2. One extra unit of each glass part.
3. One complete set of spare parts for each piece of equipment including gaskets and valve packing.
4. Y-type water strainer for water supply line to injector.
5. Manual gate valves in water supply line to isolate the system.
6. One 5-ounce bottle of ammonia solution.
7. One chlorine gas mask with cannister and carrying case. (Mount in case outside door to chlorinator room).
8. Hilage aquatester and orthotolodine.

E. BOOSTER PUMP

The booster pump shall be a turbine type, bronze fitted, single state, extended shaft, graphited asbestos packing, 3500 rpm, delivering 7 gpm at 150 ft. TDH. Motor shall be 1 hp. Pump and motor shall be frame mounted. Pump shall be an Aurora Model A4, size 1-1/4 x 1-1/4, 120V single phase, or approved equal. Contractor to verify booster pump characteristics with chlorinator manufacturer for suitability of supplying required injector water supply before ordering pump. The booster pump is to be started manually.

F. CHLORINE PIPING

Chlorine solution piping and water piping shall be Schedule 80 PVC and sized as shown on the drawings. Chlorine gas piping shall be carbon steel, seamless, Schedule 80. Fittings, valves, unions, etc., for gas piping shall be as recommended by the Chlorine Institute.

17202 INSTALLATION

-1 GENERAL

All equipment installation shall be coordinated with other trades after notification of Engineer of schedule for installation. The Contractor shall be responsible for any lost time of this or other work due to conflicts of work between trades.

-2 EQUIPMENT

All equipment to be installed in strict accordance with the drawings, approved shop drawings, pertinent standards, and manufacturer's recommendations. All equipment shall be secure, properly connected to piping, and plumb and true.

17203 TESTING

-1 STRAINER

The Contractor shall test the strainer to insure satisfactory operation of straining and backwashing, and shall operate this installation satisfactorily for one week prior to acceptance by the City for operation.

-2 FILTER UNITS

The Contractor shall run water through each filter unit to check for leaks and operation and shall operate for one week prior to release to the City for operation.

-3 CHLORINATION EQUIPMENT

The Contractor shall test and adjust the altitude and pressure sustaining valve, the PRV on the water supply to the chlorinator, and the chlorine feed rate to provide a chlorine residual of approximately 0.1 mg/l when measured in town. The Contractor shall provide a manufacturer's representative to place the chlorinator system in operation.

17204 QUALITY ASSURANCE PROVISIONS

Certified copies of reports of tests from approved laboratories performed on previously manufactured materials shall be submitted and approved. Test reports shall be accompanied by notarized certificates from the manufacturer certifying that the previously tested materials are of the same type, quality, and manufacture as that proposed for the project.

17205 MEASUREMENT AND PAYMENT

No separate payment shall be made for work in this section. The performance of this work shall be considered as a subsidiary obligation of the Contractor or is covered under bid item 102 of the Unit Price Schedule. However, if additional repairs are required to the existing equipment to make it operational (exclusive of spare parts solenoids, valves, piping, etc., that is to be provided in this contract), such repair parts will be paid for via a change order to this contract. Payment for repair parts shall be based upon manufacturer's invoices.

END OF SECTION 17200

DIVISION 18 - WATER STORAGE TANK

Section 18100 - Water Storage Tank

18100 GENERAL

-1 SCOPE

The Contractor shall furnish all plant, electricity, compressed air, water, fuel, labor, tools, equipment and materials for fabricating, erecting, and insulating a steel water storage tank, complete with all connections and accessories as specified herein and as shown on the accompanying plans. It is the intent of these specifications to provide a tank complete and ready for use. All items of work or materials considered necessary and in accordance with good practice shall be considered a part of these specifications, whether or not specifically mentioned herein.

18101 FOUNDATION

The tank subbase is rock, except that a small portion of the tank will be constructed over solid rock fill not exceeding 3' depth of fill, a 6" crushed rock leveling course topped by 3" of oiled sand will be provided for the tank base as is shown on the drawings. Crushed rock base shall be uniformly graded non-frost susceptible crushed rock aggregate not exceeding 3/4" sized stones. Sand shall be clean, non-frost susceptible uniformly graded sand.

18102 TANK DESIGN AND ACCESSORIES

-1 GENERAL DESIGN

All general design, materials, design loads, unit stresses, combined stresses, minimum thicknesses, shop fabrication, erection, inspection, and testing shall be in accordance with "Standard Specifications for Steel Tanks, Standpipes, Reservoirs, and Elevated Tanks for Water Storage," Standard D100-73 of the American Water Works Association (AWWA). Environmental design factors shall be: Snow Load 40 psf, Wind Velocity 100 mph, and Seismic Zone as shown on the plans. The plans show size and dimensions of the tank and the location and spacing of the required piping and appurtenances. The tank shall be provided with a watertight, standard-supported, conical steel roof of proportions as shown on the plans. A tank hold-down system shall be included utilizing rock bolt anchors. The rock underlying the site may be considered capable of resisting 10 K uplift per expansion type pack bolt anchor set 6 ft. into the rock base or as an alternate, the Contractor may install a test rock anchor bolt and thus determine the uplift resistance valve to use for design of the overturning resistance anchor system.

Appendix C of AWWA D100-73 shall not apply.

All shell joints shall be butt welded. The roof and bottom plates shall be lap welded. Fillet welds shall be acceptable for joining horizontal surfaces to vertical surfaces. All vertical joints shall be welded in the up-hand direction.

The Contractor shall submit shop drawings and design calculations covering the details of the tank construction. The submitted drawings shall include a general plan of the structure, giving principal dimensions of the water reservoir, and design details, dimensions, and locations of all appurtenances. The design calculations shall be performed and stamped by a registered professional engineer. The design calculations shall be written out in a legible style and shall meet all calculation requirements established by AWWA Standard D100-73.

A list of the required submittal literature, materials, schedules and certifications is contained in Section 01300 of these specifications. No shop fabrication or work on any parts of the tank or appurtenances shall begin until all submittals have been received, reviewed, and approved in writing by the Engineer. Once approved, any deviations from the approved submittals or schedules shall require written approval from the Engineer.

-2 ROOF SUPPORT COLUMNS

Where roof support columns are used, they shall be structural steel pipe, sized to meet all design loads.

Column base plates and load distributing braces or supports shall be provided such that no loads in excess of 4,000 pounds per square foot shall be imposed on the tank floor plate. There shall be no joints in the floor plate located beneath column base plates.

The bottom of the column base plates and top of the floor plates shall be painted with one coat, 3 mil dry film thickness, of the interior epoxy paint prior to placement of the columns.

-3 SHELL MANHOLES

Two 24" hinged manholes shall be installed at locations as shown on the plans. The manholes shall be supplied with galvanized bolts, washers and nuts, and with rubber gaskets. The manholes shall swing freely on the hinges, and shall open and close without damage to the insulation.

-4 ENTRANCE HATCH

A square entrance hatch shall be located in the roof near the outside tank ladder as shown on the plans. The hatch cover shall

overlap the curb at least 2", and shall be provided with suitable hinges and a hasp for locking. The hatch shall have a clear opening of at least 24" square, and shall be designed and installed to provide adequate clearance between hinges, insulation and hasp for smooth opening and closing of the hatch cover. The hatch cover shall swing toward the tank center, and shall be able to rotate a full 180 degrees. The hatch cover shall be sealed with a minimum 1/4" rubber or neoprene gasket to produce an air-tight fit. The inside of the hatch curb and underside of the cover shall be painted with the interior paint system.

-5 VENT HATCH

A 12" diameter, bolted cover vent hatch shall be provided at the location as shown on the plans. It shall be gasket-sealed and painted in the same manner as specified for the entrance hatch. The vent opening shall be fitted with a threaded ring mounting, a 16-mesh bronze or copper screen, and shall terminate 1 foot above the top of the insulation on the reservoir. The vent opening shall be protected during the insulation and coating process to prevent contamination or clogging of the screen. The screen shall be removed and cleaned after the Contractor has completed the coating system.

-6 TANK LADDER(S) AND SAFETY APPURTENANCES

A 16" wide steel exterior ladder shall be provided, extending from 8 feet above the tank floor, up to the tank roof. The ladder shall be vertical, with no backward slope at any point. the sides of the ladder shall be constructed of rectangular bars not less than 2" by 3/8" in size, and the rungs constructed of round bars not less than 5/8" in diameter, placed on 12-inch centers. The ladder shall be attached to the shell of the reservoir with brackets placed at intervals not to exceed six feet. The ladder shall extend far enough from the tank wall to provide at least 8" clearance between the tank covering and the ladder rungs. The ladder shall be provided with a safety cage complying with the latest OSHA standards. The cage shall have a hinged entry gate equipped with a hasp for locking. The ladder safety cage shall be extended, and hard railings provided to enclose the ladder top and entrance hatch area.

An interior ladder shall be required and provided only if shown on the plans. It shall be constructed in the same manner as the exterior ladder, but shall extend from floor to roof, and shall not be provided with a safety cage.

-7 PIPES AND FITTINGS

The Contractor shall furnish and install all pipes, fittings, valves, supports and appurtenances as shown on the plans.

18104 WELDING AND WELD TESTING

-1 GENERAL

All welding shall be done by operators holding a current qualification certificate. Equipment used shall be new or in good state of repair. All equipment and materials shall be intended for and suited to the conditions of use. The Contractor shall provide all labor and equipment, and perform all weld tests as herein specified. Weld tests shall be performed only in the presence of the Government Inspector.

-2 VACUUM TESTS

The Contractor shall perform vacuum tests on all floor plate welds.

-3 PENETRATING OIL TESTS

The Contractor shall perform penetrating oil tests on all wall-to-floor perimeter welds. Upon completion of the tests, the Contractor shall completely remove with solvents all traces of the penetrating oil.

-4 DEFECTIVE WELDS

Any welds not acceptable to the Engineer shall be cut or gouged out, replaced, and retested by the Contractor at his expense. Retests shall be conducted in the same manner and to the same specifications as the initial tests.

18105 FIELD SURFACE PREPARATION AND PAINTING

-1 GENERAL

After completion of field erection and welding, all sharp edges, spot welds, weld seams and bare steel areas shall be ground smooth, and cleaned of all scale, slag, weld spatter and rust in accordance with SSPC Surface Preparation No. 6, commercial blast cleaning. All exposed surfaces of the entire tank interior, exterior and appurtenances shall then be cleaned in accordance with SSPC Surface Preparation Specification No. 7, brush-off blast cleaning. The blast cleaning shall only be done when the steel surface temperature is at least 5°F. above the ambient air dew point. The sandblasted surfaces shall then be brushed and vacuum cleaned to remove all dirt, sand and debris. The first coat of field-applied paint must be applied within one day of blast cleaning, and before rust bloom occurs.

All paint to be applied in the field shall be delivered to the job site in the original containers marked with the name of the

manufacturer and the specification number of the paint contained therein, and shall comply with all established specifications and the paint schedule as approved by the Engineer.

Testing of the applied paints shall be in accordance with AWWA D102-78, and SSPC-PA2-73T "Measurement of Dry Paint Thickness with Magnetic Gauges." Minimum dry film thicknesses shall be as herein specified. Overthickness of paint shall not exceed the manufacturer's recommendations for application thickness per coat.

All paints shall be applied in accordance with these specifications and the manufacturer's recommendations regarding application rates and methods, and curing time and conditions. Paint shall be applied only to clean surfaces free from dirt, rust, scale, grease oil and moisture. The finished paint coatings on all surfaces shall be free from cracks, runs, blisters, crazing and other defects. All defects shall be corrected by the Contractor, at his expense, by applying additional coats or by grinding down and recoating, until all requirements of these specifications are met.

If paint is applied by spraying, it shall be brushed out where necessary and worked into all corners and crevices. If paint is diluted, it shall be built up to the same dry film thickness as to be achieved with undiluted material. At no time shall a thinner or diluting agent be added to paint in a proportion greater than 10% by volume of paint. No thinners or solvents shall be allowed to be used with primer paints.

-2 INTERIOR PAINTING

All surfaces exposed to the interior of the tank shall be painted with a two-coat epoxy paint system in accordance with AWWA D102-78 Inside Paint System No. 1. The paint shall meet the following specifications.

Finish: Semi-gloss
Vehicle: Epoxy resin and amine adduct curing agent
Dry Film Thickness: 4-8 mils per coat

Total finished dry film thickness shall be a minimum of 12 mils for the two coats. The two coats shall have different color tone, with colors to be selected by the Engineer.

The tank ladder, safety cage, handrails and floor grate frame shall be painted in the same manner as the tank interior.

Forced air ventilation shall be required during all interior painting. Forced air drying and/or heat curing shall be required after the final interior coat has been applied, in accordance with the methods and length of time recommended by the coating manufacturer.

-3 EXTERIOR PAINTING

After surface preparation, all exterior surfaces, including steel appurtenances not coated with the interior paint system, shall

receive one coat, minimum 2 mil dry film thickness, of primer paint. The paint to be used shall be the same heavy duty, rust-inhibiting inorganic zinc prime paint used for exterior shop priming. No thinners or solvents shall be used with this paint.

The manholes, pipe necks, flanges and other exterior steel appurtenances not coated with the interior paint system and not to be insulated shall receive a second field-applied coat, 2 mil dry film thickness, of the same prime paint.

Exterior painting shall not be allowed when wind, rain, snow, fog, mist or extreme temperatures exist unless an adequate enclosure is provided. Painting of surfaces covered by dew or moisture condensation shall be prohibited. All surfaces must be completely dry before paint is applied. In addition, all painting shall be completed sufficiently in advance of expected condensation in order to permit the required film drying time prior to the presence of moisture.

18106 INSULATION, COATINGS AND COVERING

-1 GENERAL

The Contractor shall insulate the tank walls, roof and appurtenances, apply protective coatings, and furnish and install aluminum covering, all in accordance with the plans and these specifications.

-2 INSULATION

The Contractor shall insulate the tank using the spray urethane method. The insulation shall be applied in a manner that insures complete coverage, and that the insulation is secure and sound, without cracks, voids, bulges or other defects.

The required minimum insulation thickness shall be as shown on the plans. The maximum thickness shall be as shown on the plans. The maximum thickness at any point shall not exceed the indicated minimum thickness by more than 1/2". Thin areas shall receive additional spray insulation, and overthick areas shall be planed or shaved, until insulation thickness conforms to the required minimum and maximum thickness limitations.

The in-place density of the insulation shall be a minimum of 2 pounds per cubic foot and maximum of 3 pounds per cubic foot. Tensile strength shall be a minimum of 35 psi, and compressive strength a minimum of 25 psi. Closed cell content shall be in excess of 90%. Two insulation samples shall be cut out at locations selected by the Engineer and these areas refoamed by the Contractor at no cost to the Owner. Failure to meet specifications shall constitute grounds for Engineer rejection of affected areas, and further sampling and corrective action by and at the expense of the Contractor.

Prior to insulation application, manholes, pipe flanges, ladder, csge, and other equipment not to be insulated shall be wrapped with suitable coverings and secured. This covering shall be removed after the polyurethane foam and protective coating application is complete.

Manholes, pipe necks, vent, hatches, and other appurtenances shall be insulated as shown on the plans. The applied insulation shall not interfere with the function or accessibility of the appurtenances. All surfaces must be properly primed, the primer fully cured, and free from rust, grease, oil, loose particles, moisture, and dirt before foam is applied. No insulation shall commence until all steel surfaces and welds have been thoroughly inspected and approved for insulation covering.

Spraying shall not be allowed to proceed in the presence of water, rain, fog, condensation, or wind velocities above 15 miles per hour, unless the work area is protected with a wind and weather-proof enclosure. The foam shall be applied in strict accordance with the manufacturer's recommendations.

Standard commercial spray equipment specifically designed for two component polyurethane foam spray systems shall be used. The equipment shall provide thorough component mixing. It must be maintained and capable of delivering liquids within 5% of the specified component ratio. No work shall commence until the equipment is calibrated for the specified component ratio. A preheater shall be used and adjusted to achieve the hose temperature recommended by the polyurethane foam manufacturer. Solvents used for cleanup shall not be allowed to come in contact with the insulation or substrate.

Unless the work area is protected in a weathertight enclosure, the substrate area to be insulated each day shall be limited by the applicator's ability to apply the first coat of the protective coating to the foam and protect it from precipitation.

The finished foam surface shall be as smooth as possible, with an "orange-peel" type surface desired. A "popcorn" type surface with irregularities greater than 1/2" will not be permitted, and shaving of these areas to acceptable smoothness will be required before application of the protective coatings.

-3 PROTECTIVE COATINGS

Foam surfaces shall receive the first coat of protective coating as soon as possible after foam application.

The coating for the polyurethane foam shall perform three major functions:

- a. Keep ultraviolet (UV) light from reaching the insulation;
- b. Act as an exterior vapor barrier; and
- c. protect the insulation from wind blown snow, ice crystals and debris.

The coating system shall consist of a two-coat liquid spray coating of two-part, low molecular weight butyl membrane to be applied to all insulated areas, followed by a third colored topcoat of polyurethane paint to be applied only on the roof area. The butyl membrane shall remain flexible over extended periods of time and exposure to saltwater, acids and caustics, and shall exhibit the following properties:

- a. Average Solids Content: 45-50%
- b. Dry Time to Touch: 4 - 8 hrs.
- c. Dry Film Thickness: 12 - 15 mils per coat
- d. Service Temperature: -80 to +200°F.
- e. Avg. Water Vapor Permeability: 0.02 perms @ 20 mil DFT, 100°F. and 90% R.H.

The schedule of coatings shall be as follows:

	<u>First Coat</u>	<u>Second Coat</u>	<u>Third Coat</u> (Roof Only)
Generic Type	low molecular weight butyl	low molecular weight butyl	polyurethane
Minimum Dry Film Thickness	15	15	3
Color	Black	Black	Engr. Selects

The total minimum finished dry film thickness shall be 30 mils in two coats on the side walls, and 33 mils in three coats on the roof. Each coat shall have a different color or tint so that all coats are discernable from each other.

The coat(s) manufacturer's recommendations for thinning, mixing, handling, application and curing shall be strictly adhered to. The coatings shall be applied in a cross-hatch technique to obtain complete and consistent coverage. The finished coatings shall be free from runs, cracks, pinholes, blisters and voids, and shall be of uniform thickness. Any repairs shall be done by and at the expense of the Contractor.

84 TANK SIDEWALL COVERING

After application of the urethane foam and butyl protective

coating to the walls of the tank, the sidewalls shall have an aluminum siding applied as a protective covering. The butyl coating shall be fully cured before the siding is applied.

The aluminum siding shall be of angular rib design, minimum 0.032" sheet thickness, with rib pitch of 4" to 6", and rib depth of 1-3/4" to 2". It shall be finished one side with a factory applied paint system with a minimum 20-year guarantee. The siding shall be similar and equal to Colorweld 200 V-Beam siding as manufactured by Reynolds Metals Company.

The siding shall be applied directly against the butyl covering, with ribs running vertically. A 2" minimum overlap shall be provided at all joints. Only one horizontal joint shall be allowed, with the upper sheet overlapping the lower sheet.

Aluminum blind-side pop rivets shall be used at all joints to secure adjacent sheets, with rivet spacing to be approximately 2" O.C.

The siding shall be secured to the tank by 3/4" wide stainless steel bands spaced at 2 foot intervals and to 1/8" x 2" angles as shown on the plans. Additional bands shall secure the siding at horizontal joints in the siding, at the base of the tank shell, and at the shell wall/roof intersection. The bands shall be thoroughly tightened and secured with stainless steel clips. The banding shall be held in place by stainless steel "belt loops".

The siding shall be cut and installed to fit snugly around manholes, pipes, ladder supports and other projections.

18107 SUBMITTALS

The Contractor shall submit to the Engineer four (4) copies of the following drawings, calculations, literature, materials, schedules and certifications. The Contractor shall not proceed with preparation or fabrication of the tank or appurtenances until written approval of all submittals has been received from the Engineer. Once approved, any deviations from the approved submittals or schedules shall require written approval from the Engineer.

-1 TANK DESIGN AND ACCESSORIES

The shop drawings shall show all principal dimensions of the tank structure, along with details and locations of all appurtenances. Shell plate thicknesses and welding details shall be included. The design calculations shall substantiate all principal aspects of the structural design, including shell plate thicknesses, and sizing and design of roof support beams, rafters, columns and base plates, shell plate reinforcing, and the floor grate and frame assembly.

-2 STEEL PREPARATION AND PAINTING SCHEDULE

This shall include a list of proposed surface preparation methods, both for shop steel preparation and for surface preparations after

field fabrication and welding. The paint schedule shall include, for all primers and paints: manufacturer, trade name, spreading rates, dry film thicknesses per coat, drying time prior to recoat, method of application, method of thinning and mixing, and curing methods and conditions or restrictions. The paint schedules shall be in accordance with the manufacturer's written recommendations. The submittals shall include all manufacturer's technical specification sheets for their respective products. The manufacturer of each product shall certify in writing that their product is suitable for the intended use and method of application and cure, and that the product is compatible with the undercoat and/or overcoat material with which it is proposed to be used. A color selection chart shall be submitted for the interior epoxy paint system.

-3 INSULATION AND COATINGS

Submittal information shall be the same as for the paint schedule (18106, -2). A color selection chart shall be submitted for the polyurethane roof topcoat.

-4 ALUMINUM COVERING

The Contractor shall submit manufacturer's descriptive literature on the aluminum siding he proposes to use, including a color selection chart. Literature and/or samples shall also be submitted for the stainless steel banding and clips, and for the aluminum pop rivets.

END OF SECTION 18100

