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DEPARTMENT OF THE INTERIOR
UNITED STATES HOUSING AUTHORITY
WASHINGTON, D. C.

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UNITED STATES HOUSING AUTHORITY

222

BULLETIN NO._____ ON POLICY AND PROCEDURE

SUGGESTED SPECIFICATIONS

(For procedure and instructions see Bulletins Nos. 9 and 13 - Policy and Procedure).

FOREWORD

This bulletin deals with the final specifications for a low-rent housing project. The suggested specification has been prepared by the United States Housing Authority to assist architects and engineers in preparing specifications for their projects.

The materials specified may or may not be required in every project; local architects and engineers are not under compulsion to use this exact form or language. Local practice, consideration of cost, and the special requirements of each problem should govern the architects and engineers in the preparation of the specification for their project; it is expected that preference will be given to local materials and methods that will tend to reduce costs, improve construction, facilitate the procurement of of materials, and be of design to conform to local tastes and customs.

The suggested documentary order and procedure will simplify the assembly and checking of the many factors entering into the specification; it will also facilitate reviews and expedite final approval.

During the preparation of the contract documents and specifications, the assistance of the staff of the U.S.H.A. will be available to the Local Housing Authorities and their staffs; it is hoped that by such collaboration the specification of the local housing authorities when submitted will be in shape for approval without delay.

SUGGESTED SPECIFICATIONS

The suggested specifications are based on wide experience and research in low-cost Federal and private housing and are generally applicable to all sections of the United States.

Alternate materials and methods are specified in many instances; such alternates are designated by parenthesis; in other cases alternates are entire paragraphs.

Interspersed in the text are "NOTES TO ARCHITECTS" which are not a part of the specification but are intended to direct the attention of the specification writers to special items for adaptation to their project.

PROPRIETARY NAMES

The practice of specifying materials by trade names with or without "or equal" clauses should be avoided. When an article is specified by name alone the contractor has fulfilled his obligations by furnishing the brands described, and if they prove defective the owner has no remedy. Certain items of electrical and mechanical equipment may be specified by name in exceptional cases; it is far better, however, to describe the nature and qualities of the items and the performance required of them than to single out a certain make with "or equal". Differences of opinion will arise over what is "equal", but disputes are unlikely if a product must conform to certain standards of composition, and secure clearly defined results.

REFERENCE SPECIFICATIONS

Use of the following reference documents in the preparation of specifications is recommended:

Federal Specifications
(Federal Specifications Index, U. S. Government Printing Office, Sup't of Documents, Washington, D. C., Price 10¢).

Standard Specifications of American Standards Association.

Standard Specifications of American Society for Testing Materials.

Commercial Standards, U. S. Dep't of Commerce.

Standard Specifications of recognized Industrial Trade Associations.

INDEXING

Every specification should include a table of contents covering Bid and Contract Documents and all Divisions of the work.

COORDINATION OF SPECIFICATIONS WITH DRAWINGS

The drawings and schedules should cover as far as possible the locations and extent of the various materials and finishes. The specifications should include in detail the definite kind and quality of materials used and requirement of workmanship. A correct interpretation of contract requirements requires that all necessary construction details, schedules, notes of materials and finishes be included in the specifications or on the drawings or in both. Notations on drawings should, where practicable, avoid mention of quality or kinds of materials.

Coordination of specification and drawings is obviously vital to accuracy and completeness. Checking and re-checking specifications with the plans, including a final check after all detail drawings are complete, is urged. Final proofreading of the specification manuscript before printing is essential.

Specifications should be brief, concise, coherent and comprehensive; they should accurately describe all materials and construction methods applicable to the work covered, and be assembled in an orderly fashion. They should be prepared with careful attention to the necessity for using the most economical materials available, consistent with permanence, and should follow (in every instance) well known and customary construction methods considered good practice in the construction industry. Failure to give the most careful attention to these two factors will entail excessive cost of the project.

X X X

Project No. _____

222

_____
(City or State Authority)

_____ _____
(City) (State)

NOTE TO ARCHITECT:

Fill in one of the following:

FOUNDATION
- o -
SUPERSTRUCTURE
- o -
HOUSING PROJECT
- o -
LANDSCAPE WORK
- o -

SPECIFICATION

FOR THE CONSTRUCTION OF

_____

AT

_____
(Location of Housing Project)

_____ _____
(City) (State)

PROJECT NO. _____

X X X X

_____
(Architects)

_____
(Chief Architect)

_____
(Address)

_____ _____
(City) (State)

Date _____

9-1938
Rev. 10-1938

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PROJECT NO.
CITY - STATE

DEPARTMENT OF THE INTERIOR
UNITED STATES HOUSING AUTHORITY
WASHINGTON, D. C.

DATE
OCT.-1938

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PROJECT NO. _____
CITY - STATE

ADVERTISEMENT FOR BIDS

(Should be modified if law requires other form)

The (Name of Local Authority) will receive sealed bids for (Brief description of contract and project) until ____ M. (E.S.T.) (C.S.T.) (Daylight Savings Time) on the _____ day of _____, 193__, at (Address of Local Authority) (Name of city or town), State of _____, at which time and place all bids will be publicly opened and read aloud.

The successful bidder will be required to furnish satisfactory performance and payment bond or bonds.

Attention is called to the fact that not less than the minimum wage rates as set forth in the specifications must be paid on this project.

Proposed forms of contract documents, including plans and specifications, are on file at the office of the (Name of local Authority) at (Address of Local Authority).

Copies of the documents may be obtained by depositing $_____ with the (Local Authority) for each set of documents so obtained. The amount of the deposit will be refunded to each person who returns the plans and documents in good condition with 10 days after the opening of bids.

The (Name of Local Authority) reserves the right to reject any or all bids and to waive any informalities in bidding.

A certified check or bank draft payable to the (Name of Local Authority), U. S. Government Bonds, or a satisfactory bid bond executed by the bidder and a surety company, in an amount equal to _____ per cent of the bid shall be submitted with each bid.

No bid shall be withdrawn for a period of sixty (60) days subsequent to the opening of bids without the consent of the (Name of Local Authority).

_____
(Name of Local Authority)

_____
(Title of Officer)

_____
(Date)

9-1938

X X X

NOTE TO ARCHITECT:

The form and method of advertising should comply with State or local laws and should indicate the type of work, and clearly designate the place where and the time when bids are to be received and opened, and the address at which Contract Documents can be obtained. The period of advertising should be sufficient to allow prospective bidders ample time to visit the site and to examine the Contract Documents for the purpose of preparing their estimates.

X X X

PROJECT NO. _____
CITY - STATE

BID FORM

To the _____ (Name of Local Authority)
_____ (Address)

Gentlemen:

1. The undersigned, having familiarized _____ with the local conditions affecting the cost of the work and with the Drawings, the Specification (including the advertisement for bids, instructions to bidders, general conditions, the bid form, the form of contract, the form of bonds, and the detailed specifications) and Addenda Nos. ___, ___, and _____ thereto, as prepared by _____

_____

_____

_____

and on file in the office of _____, hereby proposes to furnish all labor, materials and equipment required for _____
(Description of Work)
all in accordance therewith, for the sum of _____ dollars ($_____) herein referred to as the "Base Proposal". The bidder has included the sum of _____ dollars ($_____) in the Base Proposal as the Cost of Site Improvements as defined in Section 19 of Instructions to Bidders.

2a. The Base Proposal may be decreased or increased in accordance with such of the following alternate proposals as may be selected:

Alternates:	Deductions	Additions
No. 1	Deduct $_____	Add $_____
No. 2	Deduct $_____	Add $_____
No. 3	Deduct $_____	Add $_____
No. 4	Deduct $_____	Add $_____

(Continue alternates as required or eliminate paragraph 2a if no alternates are included)

2b. The following unit prices will apply in the event additions to or deductions from the work required in the Base Proposal and accepted alternates are ordered.

Type of Work	Unit	Price
No. 1. _____	_____	_____
No. 2. _____	_____	_____
No. 3. _____	_____	_____
No. 4. _____	_____	_____

(2b. should be eliminated if unit prices are not requested)

3. The Bidder proposes to complete the work within _____ consecutive calendar days from the date stated in the notice from the Local Authority to proceed with the work*.

4. In submitting this bid it is understood that the right is reserved by (Local Authority) to reject any and all bids, and it is agreed that this bid may not be withdrawn for a period of (60) days from the opening thereof.

5. Security in the sum of _____ dollars ($____) in the form of _____ is submitted herewith in accordance with the Specification.

6. Attached hereto is an affidavit in proof that the undersigned has not entered into any collusion with any person in respect to this proposal or any other proposal or the submitting of proposals for the Contract for which this proposal is submitted. Also attached is a statement of Contractors' qualifications.

_____, 193__ FIRM NAME _____

_____

OFFICIAL ADDRESS BY _____

_____ TITLE _____

_____

X X X

NOTE TO ARCHITECT:

The bid form incorporated sets forth in general the matters which should be covered by the bidder in making his proposal. In order to secure the necessary information to allow a determination as to whether the cost of dwelling facilities per unit and per room will exceed the cost limitations placed thereon by the United States Housing Act of 1937, the bidder should be required to state in his bid, in addition to the lump sum price for all work included in the Specification, such amount as he has included therein for the Cost of Site Improvement as defined in Section 19 of the Instructions to Bidders and as distinguished from the Cost of Structures. Space should be left in the bid form for the insertion of this amount. (See sections 19 and 20 of the Instructions to Bidders for information as to the Cost of Site Improvement and the determination of the cost of dwelling facilities).

X X X

A F F I D A V I T

STATE OF _____)
ss.
COUNTY OF _____)

_____, being first duly sworn, deposes and says:

That he is _____ (a partner of the firm or etc.) _____, the party making the foregoing proposal or bid, that such bid is genuine and not collusive or sham; that said bidder has not colluded, conspired, connived, or agreed, directly or indirectly, with any bidder or person, to put in a sham bid or to refrain from bidding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person, to fix the bid price of affiant or any other bidder, or to fix any overhead, profit, or cost element of said bid price, or of that of any other bidder, or to secure any advantage against _____ _____ or any person interested in the proposed Contract; and that all statements contained in said proposal or bid are true.

_____
(Name of bidder if the bidder is an individual)
(Name of partner if the bidder is a partnership)
(Name of officer if the bidder is a corporation)

Subscribed and sworn to this
_____ day of _____, 193__.

X X X

NOTE TO ARCHITECT:

In order to effect the intent of Section 24 of the United States Housing Act, each bidder should be required to sign an affidavit in the form of that set forth in the Appendix. In addition, subcontractors and materialmen for the electrical, heating, and plumbing work will be required to furnish the affidavits and information as set forth in Section 17 of Instructions to Bidders. Some States have statutory requirements for affidavits that bids are not collusive; where prescribed by statute the State law should be followed.

X X X

STATEMENT OF BIDDER'S QUALIFICATIONS

To accompany bids submitted for _____

Name of Bidder _____
Business Address _____

When organized _____
Where incorporated _____
How many years have you been engaged in the contracting business under the present firm name? _____
Financial Statement _____

Credit available for this contract, $_____
Contracts now in hand. Gross amount, $_____
Plan of organization _____

Personnel of organization _____

Have you ever refused to sign a contract at your original bid? _____
Have you ever defaulted on a contract? _____
Remarks _____

The above statements must be subscribed and sworn to before a notary public.

Subscribed and sworn to before me this ____day of_____, 193__

_____
Notary Public

By _____

BID BOND

KNOW ALL MEN BY THESE PRESENTS, That we,

(See Instructions)

as PRINCIPAL, and

as SURETY,

(See Instructions)

are held and firmly bound unto (Name of Local Authority) hereinafter called the "Local Authority", in the penal sum of _____ Dollars, lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal has submitted the accompanying bid, dated _____ _____, 19__, for _____ _____.

NOW, THEREFORE, if the principal shall not withdraw said bid within the period specified therein after the opening of the same, or, if no period be specified, within sixty (60) days after said opening; and shall within the period specified therefor, or, if no period be specified, within ten (10) days after the prescribed forms are presented to him for signature, enter into a written contract with the Local Authority in accordance with the bid as accepted, and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract; or in the event of the withdrawal of said bid within the period specified, or the failure to enter into such contract and give such bond within the time specified, if the principal shall pay the Local Authority the difference between the amount specified in said bid and the amount for which the Local Authority may procure the required work or

supplies or both, if the latter amount be in excess of the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals this _____ day of _____, 193___, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body. In presence of--

_____ (Individual Principal) (SEAL)

(Address) _____ (Business Address) _____

_____ (Individual Principal) (SEAL)

(Address) _____ (Business Address) _____

_____ (Individual Principal) (SEAL)

(Address) _____ (Business Address) _____

_____ (Individual Principal) (SEAL)

(Address) _____ (Business Address) _____

Attest: (Corporate Principal)

(Business Address)

(Affix corporate seal)

By _____

_____ _____

Attest:

(Corporate Surety)

(Business Address)

(Affix corporate seal)

By_____

The rate of premium on this bond is _____ per thousand.
Total amount of premium charged, $_____.

(The above must be filled in by corporate surety)

X X X

NOTE TO ARCHITECT:

An investigation of the State Law governing the Local Authority should be made to determine whether any particular form of bid guaranty or bid bond is required. The bid guaranty should be in a sufficient sum to insure the bidder's financial responsibility and to protect the Local Authority against damage occasioned by the failure or refusal of the successful bidder to enter into a Contract. In general, where bids are anticipated to be in excess of One Million Dollars ($1,000,000), two and a half per cent (2½%) of the bid price is usually considered sufficient. Where the bid price is anticipated to be less than One Million Dollars ($1,000,000), the percentage of the bid price required as security should be increased.

X X X

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the _____ _____, secretary of the corporation named as principal in the within bond; that _____, who signed the said bond on behalf of the principal was then _____ of said corporation; that I know his signature, and his signature thereto is genuine; and that said bond was duly signed, sealed, and attested for and in behalf of said corporation by authority of its governing body.

_____ (CORPORATE SEAL)

AFFIDAVIT BY INDIVIDUAL SURETY

State of _____)
) ss:
County of _____)

I, _____, being duly sworn, depose and say that I am one of the sureties to the foregoing bond; that I am a citizen of the United States, and of full age and legally competent; that I reside at _____ and that I am worth in real estate and personal property the sum of ____ _____ dollars, over and above (1) all my debts and liabilities, owing and incurred, (2) any property exempt from execution, (3) and aggregate full penalties on all other bonds on which I am surety, and (4) any pecuniary interest I have in the business of the principal on said bond; that I own, unincumbered, real estate, the fee of which is in my name, worth _____ dollars, located in _____ _____ that said property is not exempt from seizure and sale under any homestead law, community, or marriage law, or upon any attachment, execution, or judicial process, and that I am not surety on any other bonds, except as follows:

(State character and amount of each bond. If not on other bonds, so state)

_____

(Surety's signature)

Subscribed and sworn to before me this ____ day of _____ _____, 193 ___, at _____.

_____

(Title of official administering oath)

(Official seal)

_____

CERTIFICATE OF SUFFICIENCY

I, _____ do hereby certify that _____ _____, one of the sureties named above, is personally known to me, and that, to the best of my knowledge and belief, the facts stated by such surety in the foregoing affidavit are true.

_____

_____
(address)

9-1938

INSTRUCTIONS TO BIDDERS

1. SPECIAL NOTICE TO BIDDERS:

Attention is directed to the fact that this Specification has bound hereto a complete set of bidding and contract forms; these are for the convenience, only, of bidders and are not to be detached from the Specification or filled out or executed. Separate copies of Bid Forms are furnished for that purpose, in quaduplicate, three to be submitted with bid and one to be retained by the bidder for his records.

2. BID FORM:

(A) All bids must be submitted in triplicate and shall be prepared in conformity with and shall be based upon and submitted subject to all requirements of the Specification and Drawings.

(B) Bid Documents shall be enclosed in envelopes (outer and inner), both of which shall be sealed and clearly labeled "Bid Documents" so as to guard against opening prior to the time set therefor. The Bidder shall be responsible for the placement of his firm name and the name and number of the project on the outside of both of such bid envelopes.

(C) The Local Authority may consider as informal any bid on which there is an alteration of or departure from the Bid Form hereto attached.

(D) The Bidder is required to bid on all Alternates. The term "No Bid" shall not be used but the Bidder shall set forth in the space provided therefor the amount to be added to or deducted from the Base Bid. In the event the Bidder does not desire to make a change from the Base Bid he shall so indicate by using the words "No Change."

(E) The Contract will be based upon the completion of the work according to the Drawings and the Specification together with all addenda thereto and any alternates which may be accepted by the Local Authority.

3. INTERPRETATIONS:

No oral interpretations will be made to any bidder as to the meaning of the Drawings and Specification. Every request for such an interpretation shall be made in writing and addressed and forwarded to the Local Authority at _____. No inquiry received

within_____days of the date fixed for opening of bids will be given consideration. Every interpretation made to a bidder will be in the form of an addendum to the Specification which, if issued, will be sent as promptly as is practicable to all persons to whom the Drawings and Specification have been issued. All such addenda shall become part of the contract documents. Failure of the Local Authority to send, or of any bidder to receive, any such interpretation shall not relieve any bidder from any obligation under his bid as submitted.

4. EXAMINATION OF SITE, DRAWINGS, ETC:

Each bidder shall visit the site of the proposed work and fully acquaint himself with conditions as they exist so that he may fully understand the facilities, difficulties and restrictions attending the execution of the work under his contract. Bidders shall also thoroughly examine and be familiar with the Drawings and the Specification. The failure or omission of any bidder to receive or examine any form, instrument or document or to visit the site and acquaint himself with conditions there existing shall in nowise relieve any bidder from any obligation with respect to his bid. By submitting a bid the bidder agrees that he has examined the site and the Specification and Drawings and, where the Specification requires in any part of the work a given result to be produced, that the Specification and Drawings are adequate and the required result can be produced under the Specification and Drawings. No claim for any extra will be allowed because of alleged impossibilities in the production of the results specified or because of inadequate or improper plans and specifications and whenever a result is required, the successful bidder shall furnish any and all extras and make any changes needed to produce, to the satisfaction of the Local Authority, the required result.

5. STATEMENT OF BIDDER'S QUALIFICATIONS:

Each bid must be accompanied by a statement, on the form furnished for that purpose, a copy of which is included in the Specification, of the bidder's financial resources, his construction experience, and his organization available for the work contemplated. The Local Authority shall have the right to take such steps as it deems necessary to determine the ability of the bidder to perform the work and the bidder shall furnish to the Local Authority all such information and data for this purpose as the Local Authority may request. The right is reserved to reject any bid where an investigation of the evidence or information

submitted by such bidder does not satisfy the Local Authority that the bidder is qualified to carry out properly the terms of the Contract Documents.

6. BID GUARANTY:

(A) The bid must be accompanied by a bid guaranty which shall not be less than _____percent (_____) of the amount of the bid, and at the option of the bidder may be a certified check, bank draft, U. S. Government Bond (at par value), or a bid bond in the form attached to the Bid Form. No bid will be considered unless it is so guaranteed. Certified check or bank draft must be made payable to the order of (Local Authority) _____. Cash deposits will not be accepted. The bid guaranty shall insure the execution of the contract and the furnishing of performance and payment bonds by the successful bidder as specified in the Contract Documents.

(B) Revised Bids, whether forwarded by mail or telegram, if representing an increase in excess of two percent (2%) of the original bid, must have the bid guaranty adjusted accordingly; otherwise the revision of the bid will not be considered and the original bid shall remain in force.

(C) In case Bid Guaranty is in the form of a certified check, bank draft, or U. S. Government Bonds, the Local Authority may make such disposition of the same as will accomplish the purpose for which submitted. Certified checks or bank drafts may be held uncollected at the bidder's risk. Certified checks or bank drafts, or the amount thereof, and U. S. Government bonds of unsuccessful bidders will be returned as soon as practicable after the opening of Bids.

7. ALTERNATIVE BIDS:

Alternative bids will not be considered unless called for.

8. CORRECTIONS:

Erasures or other changes in the bids must be explained or noted over the signature of the bidder.

9. TIME FOR RECEIVING BIDS:

(A) Bids received prior to the time of opening will be securely kept, unopened. The officer whose duty it is to open them will decide when the specified time has arrived, and no bid received thereafter will be considered; except

that when a bid arrives by mail after the time fixed for opening, but before award is made, and it is shown to the satisfaction of the officer authorized to make the award that the non-arrival on time was due solely to delay in the mails for which the bidder was not responsible, such bid will be received and considered. No responsibility will attach to an officer for the premature opening of a bid not properly addressed and identified. Unless specifically authorized, telegraphic bids will not be considered, but modifications by telegraph of bids already submitted will be considered if received prior to the hour set for opening: Provided, that such modifications are confirmed in writing over the signature of the bidder within 48 hours thereafter.

(B) Bidders are cautioned that, while telegraphic modifications of bids may be received as provided above, such modification, if not explicit and if in any sense subject to misinterpretation, shall make the bid so modified or amended subject to rejection.

(C) Bidders are cautioned to allow ample time for transmittal of bids by mail or otherwise. Bidders should secure correct information relative to the probable time of arrival and distribution of mail at the place where bids are to be opened; and, so far as practicable, make due allowance for possible delays in order to avoid the necessity for investigations of claims that such delays in receipt of bids were due solely to delay in the mails as provided in this section.

10. WITHDRAWAL OF BIDS:

Bids may be withdrawn on written or telegraphic request dispatched by the Bidder in time for delivery in the normal course of business prior to the time fixed for opening: Provided, that telegraphic withdrawal is confirmed in writing over the signature of the bidder within 48 hours thereafter. Negligence on the part of the bidder in preparing the bid confers no rights for the withdrawal of the bid after it has been opened.

11. BIDDERS PRESENT:

At the time fixed for the opening of bids, their contents will be made public for the information of bidders and others properly interested who may be present either in person or by representative.

12. AWARD OF CONTRACT; REJECTION OF BIDS:

The Contract will be awarded to the lowest responsible bidder complying with the conditions of the advertisement for bids, provided his bid is reasonable and it is to the interest of the Local Authority to accept it. The bidder to whom the award is made will be notified at the earliest possible date. The Local Authority, however, reserves the right to reject any and all bids and to waive any informality in bids received whenever such rejection or waiver is in the interest of the Local Authority. The Local Authority also reserves the right to reject the bid of any bidder who has previously failed to perform properly, or complete on time, contracts of a similar nature; who is not in a position to perform the contract; or who has habitually and without just cause neglected the payment of bills or otherwise disregarded his obligations to subcontractors, materialmen, or employees. In determining the lowest responsible bidder the following elements, in addition to those above mentioned, will be considered: whether the bidder involved (a) maintains a permanent place of business; (b) has adequate plant equipment to do the work properly and expeditiously; (c) has a suitable financial status to meet the obligations incident to the work; (d) has appropriate technical experience.

13. PERFORMANCE BOND, PAYMENT BOND, EXECUTION OF CONTRACT:

(A) The successful bidder shall furnish a Performance and Payment Bond in a penal sum of at least fifty percentum (50%) of the total amount payable by the terms of the contract. Such bond shall be in the form of Bond, a copy of which is included in the Specification.

(If a separate Payment Bond is required this provision should be modified.)

(B) The successful bidder shall execute the Contract with the Local Authority in the form of the Contract included in the Specification in such number of counterparts as the Local Authority may request.

(C) Such Performance and Payment Bond shall be furnished and such Contract shall be executed and delivered by the successful bidder within ten (10) days after the receipt by the successful bidder of notice of acceptance of his bid by the Local Authority.

14. TIME FOR COMPLETION:

The work shall be commenced at the time stated in the notice to the Contractor to proceed and shall be completed in_____consecutive calendar days from the date stated in said notice.

Bidders may state in their bids a fewer number of calendar days than the number of calendar days stated in the first paragraph of this Section for the completion of the work, in which event, the contract shall be completed in the number of calendar days so stated. In evaluating bids for the purposes of determining the low bidder, the bid of any bidder stating a fewer number of days will be reduced in the amount of $_____for each day less than the number of days specified in the first paragraph of this Section. Such deductions shall be made for the purpose of evaluating bids only and the contract price shall be the amount bid by the successful bidder without any deductions therefrom.

15. LIQUIDATED DAMAGES:

As actual damages for delay in completion are impossible of determination, the Contractor and his sureties shall be liable for and shall pay to the Local Authority the sum of $_____ as fixed, agreed and liquidated damages for each calendar day of delay (not beyond the control of the Contractor, see Section 12 of the General Conditions) until the work is completed or accepted.

16. UNIT PRICES:

If the Specification requires any bids on a unit price basis the quantities, if any, stated in any of the contract documents are approximate only, and each bidder is required to make his own estimate of amounts, and to calculate his unit price bid accordingly. The unit prices submitted shall be maintained without regard to the actual amounts encountered in the work.

17. COLLUSIVE AGREEMENTS:

Each Bidder is required to submit with his bid an affidavit in the form attached to the Bid Form to the effect that the bidder has not colluded with any other person in regard to any bid submitted.

The Contractor, after the execution of the contract, will be required to submit copies of all bids received by him for all electrical, heating, and plumbing work, together with figures for all such work used by the Contractor in

preparing his estimate. The Contractor shall in each contract with a subcontractor for any work in the trades enumerated require the subcontractor to execute an affidavit similar to that which he (the Contractor) is required to execute, and to furnish to the Contractor copies of all subbids or quotations received by the subcontractor where the amount of the subbid or quotation is in excess of $500, together with the figure or figures in connection with the work or materials covered by the subbid or quotation used by the subcontractor in making his proposal to the Contractor. All such affidavits, bids and figures shall upon their receipt by the Contractor be delivered to the Local Authority.

18. DISCRIMINATION:

For the purpose of determining whether discrimination has been made in regard to Negro labor in violation of the provisions of Section 43 of the General Conditions it is hereby provided that if the Contractor pays to the Negro skilled labor at least _____% of the total amount paid in any period of four weeks under the contract for all skilled labor (irrespective of individual trades) and pays Negro unskilled labor at least _____% of the total amount paid in any period of four weeks under the contract for all unskilled labor, it shall be considered as prima facie evidence that the Contractor has not discriminated against Negro labor. (For the information of the Contractor these percentages are based upon percentages of Negro skilled and unskilled building construction laborers employed in the City of _____, as reflected by_____ Census, 193___).

19. COST OF SITE IMPROVEMENT:

Bidders shall set forth in their bids the amount of the base bid that is applicable to the Cost of Site Improvement. For this purpose the term Site Improvement shall include all work to be done under this contract in connection with any of the following items, viz: (a) rough grading of land, except such grading as may serve in lieu of excavations for structures; (b) retaining walls and bulkheads, if any; (c) excess excavation and foundation costs in connection with buildings, utilities, or other site improvements; including piling, under-pinning, removal of rock, or excess depth of excavations or foundations above normal requirements; (costs of normal excavations and foundations for structures should not be included in the Cost of Site Improvement); (d) streets and sidewalks on public rights-of-way; (e) project driveways, parking spaces,

X X X

and interior walks; (f) playgrounds and similar surfaced areas; (g) utility mains, including storm and sanitary sewers, water, gas, and electricity; (h) utility branches and connections, up to but outside of building walls, including storm and sanitary sewers, water, gas, and electricity; (utility branches which for economy are carried through buildings enroute to other buildings should be included under this item, excluding, however, any connections to buildings through which such branches pass); (i) street and yard lighting systems, and fire and police alarm systems, if any; (j) fences, clothes poles, etc; (k) any landscaping or planting which may be included under this contract. The term Site Improvement shall not include any structures or normal excavations and foundations therefor, central heating plants or heating mains, or the equipment of structures. The information as to the Cost of Site Improvement is for statistical purposes only; the contract will be awarded for all of the work set forth in the Drawings and the Specification.

20. ESTIMATES OF COST OF DWELLING FACILITIES:

In addition to setting forth the amount of the bid applicable to the Cost of Site Improvement the successful bidder will be required to co-operate with the Local Authority and the Architect in the further breakdown of his bid price in order to show, more particularly, the division of costs between dwelling facilities and non-dwelling facilities, particularly in structures which contain both types of facilities. Definitions of dwelling facilities and non-dwelling facilities are set forth in USHA Bulletin No. 4 on Policy and Procedure, revised June 20, 1938, entitled "Development Cost of a Low-Rent Housing Project".

X X X

X X X

NOTE TO ARCHITECT:

1. GENERAL. The "Instructions to Bidders" should advise bidders as to any special conditions that might exist in connection with the work and set forth the time for completion and the amount of liquidated damages to be charged in the event the work is not completed within the specified time. It should also inform bidders as to the general requirements in regard to the preparation and submittal of bids, and should cover the issuance of any addenda that might be required for revisions in the plans and specifications.

2. TIME FOR COMPLETION. The Local Authority should give consideration to permitting the bidder to specify, within a restricted range, the number of days that will be required by him to complete the job. No bonus should be provided for completing ahead of time. If the bidder is asked to specify the number of days required to complete, provision should be made in the contract documents for the method of evaluating such bids. Section 14 of the Instructions to Bidders sets forth a suggested method for bidding in this manner. For the purpose of evaluating bids, it is suggested that the amount per day inserted in Section 14 be the same as that inserted in Section 15, so that the same amount be deducted for each day saved as is required by the Contract to be paid for liquidated damages for delay in completion.

   The Local Authority should set the amount of liquidated damages to be paid by the Contractor in such sum as will be in reasonable proportion to the actual loss that might be sustained by the Local Authority through the failure of the Contractor to complete on time. In this connection, consideration should be given to the loss that the Local Authority will sustain by virtue of a corresponding delay in receiving Federal annual contributions. The amount of liquidated damages, however, should not be fixed so high as to discourage the submittal of bids by responsible bidders.

3. ESTIMATES OF COST OF DWELLING FACILITIES. In addition to the breakdown required to be given by the bidder in his bid between the Cost of Site Improvements and the Cost of Structures, provision should be made in the Instruction to Bidders requiring the successful bidder to co-operate with the Local Authority and the Architect for the further breaking down, after the opening of bids, of the construction cost of the project, particularly the division of costs between dwelling facilities and nondwelling facilities in structures

which may contain both types. The USHA manual of Instructions of Accounting Procedure for Local Housing Authorities, Part I, and USHA Bulletin No. 4, revised June 20, 1938 set forth the ultimate breakdown of these costs that will be required of the Local Authority for the purpose of determining whether the costs of dwelling facilities come within the limitations prescribed by the United States Housing Act of 1937.

4. DISCRIMINATION. Paragraph 6, Part III, of the Terms and Conditions and Section 43 of the Suggested General Conditions provide that there shall be no discrimination because of race, creed, color, or political affiliations in the employment of persons for work on the project. Section 18 of the Instructions to Bidders sets forth a suggested method by which the Local Authority may give effect to these provisions with respect to Negro labor. The Local Authority should examine the State or local law (including laws with respect to competitive bidding) to ascertain whether or not Section 18 of the proposed Instructions to Bidders is in violation thereof.

5. TAXES. The Local Authority should ascertain whether or not State or local sales or business privilege taxes are applicable to the work to be performed by the Contractor. If the applicability of the law is not clear, every effort should be made by the Local Authority to obtain a ruling from the appropriate officer of the State or Locality, i.e., the Attorney General of the State, the Collector of Taxes, the State Tax Commission, etc. If it appears clear to the Local Authority that any such sales or public privilege taxes are not applicable to the work to be performed by the Contractor, an appropriate clause should be inserted in the Instructions to Bidders informing them of this fact and instructing them not to include in their bids any amounts to pay such sales or business privilege taxes. If, however, Contractors on work of this kind, are required to pay such sales or business privilege taxes, no reference to such taxes should be made in the Instructions to Bidders or in any other part of the Specification.

X X X

CONTRACT

THIS AGREEMENT made the _____ day of _____ in the year nineteen hundred thirty_____ by and between_____ _____ hereinafter called the "Contractor", and * _____ hereinafter called the "Local Authority".

WITNESSETH, That the Contractor and the Local Authority for the consideration stated herein agree as follows:

ARTICLE 1. Statement of Work. The Contractor shall furnish all labor and materials and perform all work required for

_____
(Description of Work)

in strict accordance with the Specification and the Drawings, all of which are made a part hereof and designated as follows:

_____
(Identify Specification and Drawings.)

ARTICLE 2. Time of Completion. The Contractor shall commence work under this contract on a date to be specified in a written order of the Local Authority and shall fully conplete all work thereunder within_____ consecutive calendar days from and including said date.

ARTICLE 3. The Contract Price. The Local Authority shall pay the Contractor for the performance of the Contract, subject to additions and deductions provided therein, in current funds as follows: _____

Base Proposal:_____ _____ Dollars ($_____).

Alternates:

No. 1 Deduct $	_____	Add $	_____
No. 2 Deduct $	_____	Add $	_____
No. 3 Deduct $	_____	Add $	_____
Subtotal $	_____	Subtotal $	_____

Deduct (Add) $ _____
Contract Price $ _____

*Note: The Local Authority should be identified in the opening paragraph by its official name, a designation of its corporate status and the law under which it was created, for example, "The Housing Authority of _____,
(a) (a public corporation);
(b) (a body politic and corporate);
(c) (a municipal corporation) etc.
created by the Housing Authorities Law of the State of _____."

The following unit prices will apply in the event additions to or deductions from the work required in the base proposal and accepted alternates are required:

	Type of Work	Unit	Unit Price
No. 1.	_____	_____	_____
No. 2.	_____	_____	_____
No. 3.	_____	_____	_____

ARTICLE 4. As actual damages for delay in completion are impossible of determination, the Contractor and his sureties shall be liable for and shall pay to the Local Authority the sum of $_____ as fixed, agreed and liquidated damages for each calendar day of delay (not beyond the control of the Contractor) until the work is completed or accepted.

ARTICLE 5. Contract Document. Contract Documents shall consist of the following component parts:

1. General Conditions.
2. Advertisement for Bids.
3. Instructions to Bidders.
4. The Detailed Specifications.
5. The Drawings.
6. Contractor's Bid as accepted by the Local Authority.
7. This Instrument.

This instrument together with the documents enumerated in this Article 5 form the Contract, and they are as fully a part of the Contract as if hereto attached or herein repeated. In the event that any provision in any of the component parts of this Contract conflicts with any provision of any other component part, the provision in the component part first enumerated in this Article 5 shall govern, except as otherwise specifically stated.

IN WITNESS WHEREOF, the parties have caused this Instrument to be executed in _____ original counterparts the day and year first above written.

Countersigned:

_____

_____

Title

_____
Contractor

_____

By

_____

_____
Title

Attest:

_____

_____

_____
Name of Local Authority

By_____

_____
Title

I, _____, certify that I am the _____ _____secretary of the corporation named as Contractor herein; that _____who signed this Contract on behalf of the Contractor, was then _____of said corporation; that the Contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

_____ Corporate Seal

_____

I HEREBY CERTIFY that, to the best of my knowledge and belief, based upon observation and inquiry,_____ who signed this Contract for the _____ had authority to execute the same, and is the individual who signs similar contracts on behalf of this corporation with the public generally.

_____

X X X

DIRECTIONS FOR PREPARATION OF CONTRACT

1. The blank space of article 1 is intended for the insertion of a statement of the work to be done, together with place of performance, or for the enumeration of papers which contain the necessary data.

2. All blank spaces must be filled in or ruled out. The Contract must be dated and the bond must bear the same or subsequent date.

3. An officer of a corporation, a member of a partnership, or an agent, signing for the principal shall place his signature and title after the word "By" under the name of the principal. A Contract executed by an attorney or agent on behalf of the Contractor shall be accompanied by two authenticated copies of his power of attorney or other evidence of his authority to act on behalf of the Contractor.

4. If the Contractor is a corporation, one of the certificates following the signatures of the parties must be executed. If the Contract is signed by the secretary of the corporation, then the first certificate must be executed by some other officer of the corporation under the corporate seal, or the second certificate executed by a representative of the Local Authority. In lieu of either of the foregoing certificates there may be attached to the Contract copies of so much of the records of the corporation as will show the official character and authority of the officer signing, duly certified by the secretary or assistant secretary, under the corporate seal, to be true copies.

5. The full name and business address of the Contractor must be inserted and the Contract signed with his usual signature. Typewrite or print name under all signatures to Contract and bond.

X X X

DIRECTIONS FOR PREPARATION AND EXECUTION OF BID, PERFORMANCE, AND PAYMENT BOND

1. The surety on the bond for any bid or for the performance of the contract may be any corporation authorized and qualified to act as surety in the State of _____, or two responsible individual sureties. Each individual surety shall justify in sum not less than the penalty of the bond.

2. A firm, as such, will not be accepted as a surety, nor a partner for co-partners or for a firm of which he is a member. Stockholders of a corporate principal may be accepted as sureties provided their qualifications as such are independent of their stock holdings therein. Sureties, if individuals, shall be citizens of the United States and residents of _____.

3. The name, including full Christian name, and residence of each individual party to the bond shall be inserted in the body thereof, and each such party shall sign the bond with his usual signature on the line opposite the scroll seal, and if signed in Maine, Massachusetts, or New Hampshire, an adhesive seal shall be affixed opposite the signature.

4. If the principals are partners, their individual names shall appear in the body of the bond, with the recital that they are partners composing a firm, naming it, and all the members of the firm shall execute the bond as individuals.

5. The signature of a witness shall appear in the appropriate place, attesting the signature of each individual party to the bond.

6. If the principal or surety is a corporation, the name of the State in which incorporated shall be inserted in the appropriate place in the body of the bond, and said instrument shall be executed and attested under the corporate seal as indicated in the form. If the corporation has no corporate seal the fact shall be stated, in which case a scroll or adhesive seal shall appear following the corporate name.

7. The official character and authority of the person or persons executing the bond for the principal, if a corporation, shall be certified by the secretary or assistant secretary, according to the form attached thereto. In lieu of such certificate there may be attached to the bond copies of so much of the records of the corporation as will show the official character and authority of the officer signing, duly certified by the secretary or assistant secretary, under the corporate seal, to be true copies.

8. Each individual surety shall justify, under oath, according to the form appearing on the bond, before some officer having authority to administer oaths generally. If the officer has an official seal it shall be affixed, otherwise the proper certificate as to his official character shall be furnished.

9. The certificate of sufficiency shall be signed by an officer of a bank or trust company, or by a judge or clerk of a court of record, or any other officer of the United States of the State of _____ acceptable to the Local Authority.

10. The date of the bond must not be prior to the date of the instrument for which it is given.

X X X

PROJECT NO._____
CITY - STATE

GENERAL CONDITIONS
(For use where the Architect is to supervise construction)

1. DEFINITIONS:

Wherever used in any of the contract documents, the following meaning shall be given to the terms herein defined:

(A) The "Contract" means the contract executed by the Local Authority and the Contractor of which these General Conditions form a part. The entire list of Contract Documents is set forth in the contract form.

(B) The terms "Local Authority" and "Contractor" mean the respective parties to the contract.

(C) The term "USHA" means the United States Housing Authority, an agency and instrumentality of the United States of America created by the United States Housing Act of 1937 (Public No. 412-75th Congress), which (subject to the provisions of a certain Loan Contract, dated _____, between the Local Authority and the USHA) has agreed to purchase certain obligations of the Local Authority to aid in financing the work to be performed under the Contract.

(D) The "Architect" is the person, firm or corporation under contract with the Local Authority for architectural services related to the work.

(E) The term "Construction Adviser" means the person designated by the Administrator of the USHA to perform certain functions in connection with the Loan Contract between the USHA and the Local Authority.

(F) The term "Project" means the housing project, the construction work for which is contemplated in whole or in part under this contract.

(G) The "Drawings" refer to the drawings enumerated in the Specification and the specifications refer to the detailed description of the work.

(H) The Specification is comprised of the following:

Advertisement for bids; bid form, together with forms of bid bond, affidavit, and statement of contractor's qualifications; instructions to bidders; contract form; the performance bond form; general conditions; schedule of drawings; alternates and detailed specifications.

2. CHANGES IN THE WORK:

The Local Authority may, at any time, without notice to the sureties and without invalidating the contract, make changes by altering, adding to or deducting from the work, the contract amount and time being adjusted accordingly. All such work shall be executed under the conditions of the original contract. Except for minor modifications in the work not involving extra cost or additional time and not inconsistent with the purposes of the Project and except in an emergency endangering life of property, no extra work or change shall be made unless in pursuance of a written order from the Local Authority countersigned by the Architect authorizing the extra work or change, and no claim for an addition to the contract amount shall be valid unless so ordered. No order for any changed or extra work involving more than One Thousand Dollars ($1,000) shall be valid unless, in addition to the countersignature of the Architect, the order is accompanied by evidence that it has been submitted to and approved by the Construction Adviser. In any change involving the substitution of one type, kind, or design of work for another or one material for another, the cost of the change shall be considered as involving more than One Thousand Dollars ($1,000), if either (a) the value of the work or materials omitted, or (b) the value of the work or materials substituted exceeds One Thousand Dollars ($1,000). In no event shall the Local Authority order changes or extras which will, together with the cost of all previous changes or extras increase the contract price in an aggregate amount exceeding 2% of the original contract price without the prior written approval of the Construction Adviser. Wherever possible, the value of any such extra or changed work shall be determined in advance and stated in the order to the Contractor. If it is impossible to determine the amount in advance, the Contractor shall proceed with the work upon receipt of the proper order and shall keep and present in such form as the Architect may direct a correct account of the cost of the extra or changed work, together with all vouchers therefor, and the Architect shall certify to the amount, including reasonable allowance for overhead and profit, due to the Contractor. Should the Contractor or the Local Authority encounter during the process of the work sub-surface or latent conditions at the site materially differing from those shown on the drawings or indicated in the Specification, the attention of the Architect shall be called immediately to such conditions before they are disturbed. If the Architect finds that they materially differ from those shown on the Drawings or indicated in the Specification, he shall at once make such changes in the drawings or specifications as he may find necessary and any increase or decrease in cost or extension of time resulting from such changes shall be adjusted in the same manner as provided for changed or extra work, provided the proper written order signed by the Local Authority and countersigned by the Architect (and if the amount involves more than One Thousand Dollars ($1,000), or if the change, together with all previous changes,

increases the contract price in an aggregate amount of 2% of the original contract price, evidence that the Construction Adviser has approved the same) has been received. In submitting estimates of cost for changed or extra work, the Contractor shall, in addition to the usual breakdown for the purposes of contract price adjustment, also breakdown his cost to show the amounts included therein for dwelling and nondwelling facilities as the same are defined in USHA Bulletin No. 4 on Policy and Procedure, revised June 20, 1938.

3. CLAIMS FOR EXTRA COST:

If the Contractor claims that any instructions by drawings or otherwise involve extra cost or an extension of time, he shall give the Local Authority written notice thereof within ten days after the receipt of such instructions and in any event before proceeding to execute the work. The procedure shall then be the same as provided for in Changes in the Work. No such claim shall be valid unless so made.

4. INSPECTION:

(A) All material and workmanship (if not otherwise designated by the specifications) shall be subject to inspection, examination, and test by the Local Authority and the Architect at any and all times during manufacture or construction and at any and all places where such manufacture or construction are carried on. The Local Authority shall have the right to reject defective material and workmanship or require its correction. Rejected workmanship shall be satisfactorily corrected. Rejected material shall be promptly segregated and removed from the premises and satisfactorily replaced with proper material without charge therefor. If the Contractor fails to proceed at once with the correction of rejected defective material or workmanship, the Local Authority may by contract or otherwise have the defects remedied or rejected materials removed from the site and charge the cost of the same against any moneys which may be due to Contractor, without prejudice to any other rights or remedies of the Local Authority in the premises.

(B) The Contractor shall furnish promptly without additional charge, all materials reasonably necessary for any tests that may be required. All tests by the Local Authority shall be performed in such manner as not to unnecessarily delay the work and unless otherwise provided for shall be made at the expense of the Local Authority. Special, full size, and performance tests shall be as described in the specifications. The contractor shall be charged with any costs of additional tests when the material tested does not meet specifications.

(C) If any work be covered up without approval or consent of the Architect or the Local Authority, it must, if requested by the Architect or Local Authority be uncovered at the expense of the Contractor. Should it be considered necessary or advisable by the Local Authority at any time before final acceptance of the entire work to make an examination of work already completed, by removing or tearing out same, the Contractor shall on request promptly furnish all necessary facilities, labor, and material. If such work is found to be defective in any material respect, due to fault of the Contractor or his subcontractors, he shall defray all the expenses of such examination and of satisfactory reconstruction. If, however such work is found to meet the requirements of the contract, the actual cost of labor and material necessarily involved in the examination and replacement, plus 15 per cent, shall be allowed the Contractor and he shall, in addition, if completion of the work has been delayed thereby, be granted a suitable extension of time on account of the additional work involved.

(D) Inspection of material and finished articles to be incorporated in the work at the site shall be made at the place of production, manufacture, or shipment, whenever the quantity justifies it, unless otherwise stated in the specifications; and such inspection and acceptance, unless otherwise stated in the specifications, shall be final, except as regards (i) latent defects, (ii) departures from specific requirements of the contract and the specifications and drawings made a part thereof, (iii) damage or loss in transit, or (iv) fraud or such gross mistakes as amount to fraud. Subject to the requirements contained in the preceding sentence, the inspection of material and workmanship for final acceptance as a whole or in part shall be made at the site.

5. FINAL INSPECTION:

When the work is substantially completed the Contractor shall notify the Local Authority (in writing) that the work will be ready for final inspection on a definite date which shall be stated in such notice. Such notice shall be given at least 10 days prior to the date stated for final inspection.

6. REVIEW BY USHA:

The USHA and its authorized representatives and agents shall, at all times, have access to and be permitted to observe and review all work, materials, pay rolls, records of personnel, conditions of employment, invoices of materials, and other relevant data and records; provided, however, that all instructions and approvals with respect to the work shall be given to the Contractor only by the Local Authority or the Architect.

7. GENERAL GUARANTY:

(A) Neither the final certificate of payment nor any provision in the Contract Documents nor partial or entire use or occupancy of the premises by the Local Authority shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom which shall appear within a period of one year from the date of final acceptance unless a longer period is specified. The Local Authority will give notice of observed defects with reasonable promptness.

8. DEDUCTION FOR UNCORRECTED WORK:

If the Local Authority deems it inexpedient to require the Contractor to correct work injured or not done in accordance with the Contract Documents, an equitable deduction from the Contract Price shall be made by agreement between the Contractor and the Local Authority subject to settlement, in case of dispute, as hereinafter provided.

9. MATERIALS AND WORKMANSHIP:

Unless otherwise specifically provided for in the specifications, all workmanship, equipment, materials, and articles incorporated in the work covered by this contract are to be of the best grade of their respective kinds for the purpose. Where equipment, materials, or articles are referred to in the specifications as "equal to" any particular standard, the Architect shall decide the question of equality. The Contractor shall furnish to the Architect for his approval the name of the manufacturer of machinery, mechanical and other equipment, which he contemplates installing, together with their respective performance capacities and other pertinent information. When required by the specifications, or when called for by the Architect, the Contractor shall furnish the Architect for approval full information concerning the materials or articles which he contemplates incorporating in the work. Samples of materials shall be submitted for approval when and as directed. Machinery, equipment, materials, and articles installed or used without such approval shall be at the risk of subsequent rejection.

The Local Authority or the Architect may require the Contractor to dismiss from the work such employee or employees as the Local Authority or Architect deems incompetent, careless, insubordinate, or otherwise objectionable.

10. SUPERINTENDENCE BY CONTRACTOR:

The Contractor shall give his personal superintendence to the work or have a competent superintendent, satisfactory to the Local Authority or the Architect, on the work at all times during progress with authority to act for him. The contractor shall also provide an adequate staff for the proper coordination and expediting of his work.

The Contractor shall lay out his own work and he shall be responsible for all lines, elevations, and measurements of the building, grading, paving and other work executed by him under the contract. He must exercise proper precaution to verify the figures shown on the drawings before laying out the work and will be held responsible for any error resulting from his failure to exercise such precaution.

11. RIGHT OF LOCAL AUTHORITY TO TERMINATE CONTRACT:

If the Contractor should be adjudged a bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he should persistently or repeatedly refuse or fail to supply enough properly skilled workmen or proper materials, or if he should fail to make prompt payment to his employees or his subcontractors, or persistently disregard instructions of the Local Authority or Architect or fail to observe or perform the provisions of the Contract Documents, or otherwise be guilty of a substantial violation of any provision of the Contract Documents, then the Local Authority may, by at least five days prior written notice to the Contractor, without prejudice to any other rights or remedies of the Local Authority in the premises, terminate the Contractor's right to proceed with the work. In such event, the Local Authority may take over the work and prosecute the same to completion, by contract or otherwise, and the Contractor and his sureties shall be liable to the Local Authority for any excess cost occasioned to the Local Authority thereby; and in any such case the Local Authority may take possession of and utilize in completing the work such materials, appliances, and plant as may be on the site of the work and necessary therefor. The foregoing provisions are in addition to, and not in limitation of the rights of the Local Authority under any other provisions of the contract documents.

12. DELAYS--DAMAGES:

If the Contractor refuses or fails to prosecute the work, or any separable part thereof, with such diligence as will insure its completion within the time specified or any extension thereof, or fails to complete said work within such time, the Local Authority

may, by written notice to the Contractor, terminate his right to proceed with the work or such part of the work as to which there has been delay. In such event the Local Authority may take over the work and prosecute the same to completion, by contract or otherwise, and the Contractor and his sureties shall be liable to the Local Authority for any excess cost occasioned by the Local Authority thereby. If the Contractor's right to proceed is so terminated, the Local Authority may take possession of and utilize in completing the work such materials, appliances, and plant as may be on the site of the work and necessary therefor. If the Local Authority does not terminate the right of the Contractor to proceed, the Contractor shall continue the work, in which event the actual damages for the delay will be impossible to determine and in lieu thereof the Contractor shall pay to the Local Authority as fixed, agreed, and liquidated damages for each calendar day of delay until the work is completed or accepted the amount as set forth elsewhere in the Contract Documents and the Contractor and his sureties shall be liable for the amount thereof: Provided, That the right of the Contractor to proceed shall not be terminated or the Contractor charged with liquidated damages because of any delays in the completion of the work due 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 Local Authority, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and inclement weather, or delays of subcontractors due to such causes: Provided further, That the Contractor shall within 10 days from the beginning of any such delay notify the Local Authority in writing of the causes of delay. The Architect shall ascertain the fact and the extent of the delay and the Local Authority shall extend the time for completing the work when in the judgment of the Architect the findings of fact justify such an extension. Where the cause of the delay is due to weather conditions which render the performance of work impossible, an extension of one work day will be given the Contractor for each work day lost by the Contractor because of said weather conditions.

13. PERMITS:

The Contractor shall, without additional expense to the Local Authority, obtain all required licenses and permits.

14. CARE OF THE WORK:

(A) The Contractor shall be responsible for all damages to persons or property that occur as a result of his fault or negligence in connection with the prosecution of the work and shall be responsible for the proper care and protection of all materials delivered and work performed until completion and final acceptance, whether or not the same has been covered by partial payments made by the Local Authority.

(B) The Contractor shall provide sufficient competent watchmen, both day and night, including Saturdays, Sundays, and Holidays, from the time work is commenced until final completion and acceptance.

(C) In an emergency affecting the safety of life or property, including adjoining property, the Contractor, without special instructions or authorization from the Local Authority, is authorized to act at his discretion to prevent such threatened loss or injury, and he shall so act, if instructed to do so by the Local Authority or the Architect. Any compensation claimed by the Contractor on account of such emergency work shall be determined by the Architect subject to arbitration in case of dispute, as provided in the Contract Documents.

(D) The Contractor shall take adequate precautions to protect existing sidewalks, curbs, pavements, utilities, adjoining property, etc., and to avoid damage thereto, and he shall at his own expense completely repair any damage thereto caused by his operations.

(E) Wherever required by law, the Contractor shall shore up, brace, underpin and protect as may be necessary, all foundations and other parts of all existing structures adjacent and adjoining the site which are in any way affected by the excavations or other operations connected with the completion of this project. Whenever any notice is required to be given by the Local Authority or the Contractor to any adjoining or adjacent landowner or other party before commencement of any work, such notice shall be given by the Contractor. The Contractor shall indemnify the Local Authority and save it harmless from any damages on account of settlements or the loss of lateral support of adjoining property and from all loss or expense and all damages for which the Local Authority may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

15. OTHER CONTRACTS:

The Local Authority may award other contracts for additional work, and the Contractor shall fully co-operate with such other contractors and carefully fit his own work to that provided under other contracts as may be directed by the Local Authority. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other contractors.

16. MUTUAL RESPONSIBILITY OF CONTRACTORS:

If, through acts of neglect on the part of the Contractor, any other contractor or any subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other contractor or subcontractor by agreement or arbitration, if such

other contractor or subcontractor will so settle. If such other contractor or subcontractor shall assert any claim against the Local Authority on account of any damage alleged to have been so sustained, the Local Authority shall notify the Contractor, who shall defend at his own expense any suit based upon such claims, and, if any judgment or claims against the Local Authority shall be allowed, the Contractor shall pay or satisfy such judgment or claim and pay all costs and expenses in connection therewith.

17. DISPUTES:

All disputes concerning questions arising under Sections 35 to 53, inclusive, of these General Conditions shall be decided by the Local Authority and the Local Authority's decision thereon shall be final and binding, except as otherwise specifically provided in this contract.

All other disputes arising under this contract shall be decided by the Architect subject to arbitration as hereinafter provided. If either the Local Authority or the Contractor shall request arbitration of any such dispute, notice of the demand for arbitration shall be filed in writing with the Architect and the other party to the contract. Such notice shall be filed within ten days from the decision or demand concerning which arbitration is requested. In the event no such request for arbitration is filed, the decision or demand shall be considered as final and binding upon the other party to the contract. One arbitrator shall be appointed by the Local Authority and one arbitrator shall be appointed by the Contractor, such appointments being made in writing and communicated to the other party, and, upon receiving such communication, the party receiving the same will appoint his arbitrator and notify the other party of such appointment within a period of five days. In the event the arbitrators so appointed shall not agree within a period of ten days, then a third arbitrator, who shall be a competent and disinterested person, shall be appointed, and the decision of any two of the three arbitrators shall be conclusive. The third arbitrator shall be appointed by the two arbitrators theretofore appointed and acting, or, in case they shall not agree on such third arbitrator within a period of three days, then such third arbitrator shall be appointed by the Construction Adviser. The Construction Adviser, however, shall in no case act as an arbitrator. Any decision of the arbitrators shall be in writing and shall be delivered to the parties immediately upon the making of such decision. The arbitrators shall have the right to retain and consult experts and competent authorities skilled in the matter or matters under arbitration. The fees, cost and expense of the arbitrators shall be borne by the party against whom the arbitration is determined, or partially by each party according to the determination if it is not entirely against one party, or, in the case of a determination by compromise by such party or parties as may be designated by the arbitrators.

Decisions on disputes arising under Sections 35 to 53, inclusive, of the General Conditions, or questions, the final determination of which are otherwise specifically provided for in the contract, shall not be subject to arbitration.

18. CONTRACTOR:

(A) Only one Contractor is recognized as a party to this Contract, and where the term "Contractor" is used the General Contractor is referred to. For convenience, the Specification has been divided into separate headings or divisions to cover the various trades represented in the work, and where subcontractors, such as "Mason Contractor", "Carpenter Contractor", and other subcontractors are referred to it has been for convenience only.

(B) 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, superintendence, temporary construction of every nature, all other services, facilities, and costs of every nature whatsoever necessary to execute and complete the entire work to be done under the Contract Documents and deliver it complete in every respect.

19. DRAWINGS:

(A) The general character of the detail work is shown on the Drawings, but minor modifications may be made in the full size drawings or models. The Contractor and the Architect shall from time to time prepare schedules showing the dates on which the various detail drawings will be required, and the Contractor shall not attempt to execute any part of the work requiring such drawings until he has received the same.

(B) Where the word "similar" occurs on the drawings, it shall be used in its general sense and not as meaning identical, and all details shall be worked out in relation to their location and their connection to other parts of the work.

(C) Where on any drawings a portion of the work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to all other like portions of the work. Where ornament or other detail is indicated by starting only, such detail shall be continued throughout the courses or parts in which it occurs and shall also apply to all other similar parts in the work, unless otherwise indicated.

(D) In case of differences between small and large scale drawings, the larger scale drawing shall take precedence.

20. OWNERSHIP OF DRAWINGS AND SPECIFICATIONS:

Except the Contractor's executed set, all drawings and the Specification are the property of the Local Authority. The Local Authority will furnish the Contractor without charge forty sets of the Drawings and Specifications. Additional sets will be furnished upon request, at a cost as determined by the Local Authority. Such drawings and specifications are not to be used on other work, and those sets in usable condition shall be returned to the Local Authority, upon request, at the completion or cessation of the work or termination of the contract.

21. SHOP DRAWINGS:

(A) Shop drawings of all fabricated work shall be submitted to the Architect for approval and no work shall be fabricated by the Contractor, save at his own risk, until approval has been given. The Contractor will be advised as to the exact procedure to be followed with respect to the number of prints required, where submitted, letters of transmittal, making corrections, etc. Five (5) prints of finally approved shop drawings will be required.

(B) The Contractor shall submit all shop drawings on dates sufficiently in advance of requirements to enable the Architect ample time for checking same, including time for correcting, resubmission, and recheck if necessary, and no claim for delay will be granted the Contractor by reason of his failure in this respect.

(C) All shop drawings submitted must bear the stamp of approval of the Contractor as evidence that the drawings have been checked by the Contractor. Any drawings submitted without this stamp of approval will not be considered and will be returned to the Contractor for resubmission. If the shop drawings show variations from the requirements of the Contract Documents because of standard shop practice or other reason, the Contractor shall make specific mention of such variation in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment; otherwise the Contractor will not be relieved of the responsibility for executing the work in accordance with the Contract Documents even though such shop drawings have been approved.

(D) Where a shop drawing as submitted by the Contractor indicates a departure from the Contract which the Architect deems to be a minor adjustment in the interest of the Local Authority not involving a change in Contract price or extension of time, the Architect will approve the drawing but the approval will contain, in substance, the following:

> The modification shown on the attached drawings is approved in the interest of the Local Authority to effect an improvement for the project and is ordered

with the understanding that it does not involve any change in the contract price or time; that it is subject generally to all contract stipulations and covenants; and that it is without prejudice to any and all rights of the Local Authority under the contract and bond or bonds.

(E) The approval of shop drawings will be general and shall not relieve the Contractor from the responsibility for adherence to the Contract, nor shall it relieve him of the responsibility for any error which may exist.

22. REFERENCE TO MATERIALS BY NAME:

Specific reference in the Specification to any article, device, product, material, fixture, form, or type of construction, etc., by name, make, or catalog number shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition.

23. COMMUNICATIONS:

(A) All notices, demands, requests, instructions, approvals, and claims must be in writing.

(B) Any notice to or demand upon the Contractor shall be sufficiently given if delivered at the office of the Contractor specified in the Bid (or at such other office as the Contractor may from time to time designate to the Local Authority in writing) or deposited in the United States mail in a sealed, postage-prepaid envelope, or if delivered, with charges prepaid, to any telegraph company for transmission, in each case addressed to such office.

(C) All papers required to be delivered to the Local Authority shall, unless otherwise specified in writing to the Contractor, be delivered to the

_____

_____

and any notice to or demand upon the Local Authority shall be sufficiently given if delivered to the office of said _____ _____, or deposited in the United States mail in a sealed, postage-prepaid envelope, or delivered with charges prepaid to any telegraph company for transmission, in either of said last two cases to said _____ at such address, or to such other representative of the Local Authority or to such other address as the Local Authority may subsequently specify in writing to the Contractor for such purpose.

(D) Any such notice shall be deemed to have been given as of the time of actual delivery or (in the case of mailing) when the same should have been received in due course of post or (in the case of telegrams) at the time of actual receipt, as the case may be.

24. TEMPORARY HEATING:

(A) The Contractor shall provide temporary heating, covering, and enclosures as necessary and to the satisfaction of the Local Authority to protect all work and material against damage by dampness and cold and facilitate completion of the work.

Temporary heating, covering, enclosures, and ventilation, shall be provided as required to dry out the buildings properly.

(B) The Contractor shall supply such heating equipment as may be required. He may utilize, with the approval of the Local Authority, the heating equipment to be installed under the Contract Documents, or such portions thereof as are ready and available, provided that he shall leave the same in proper and acceptable condition upon completion of the work. The fuel, equipment, and method of heating shall be at all times satisfactory to the Local Authority.

25. TEMPORARY TOILET ACCOMMODATIONS:

The Contractor shall furnish, install and maintain ample sanitary facilities for the workmen; toilets shall be placed at the time work starts. These temporary toilet facilities shall be placed where directed by the Local Authority and maintained as required by the local health ordinances. He shall provide the necessary temporary enclosures to accommodate the toilets. The toilets shall be maintained in a sanitary condition and contents removed from premises as often as required.

26. REMOVAL OF DEBRIS, CLEANING, ETC.:

The Contractor shall, as directed during the progress of the work, remove and properly dispose of the resultant dirt and debris, and keep the premises reasonably clear. Upon completion of the work he shall remove all equipment and unused materials provided for the work, and put the buildings and premises in a neat and clean condition, and do all cleaning and washing required by the Specification.

27. USE OF PREMISES:

(A) The Contractor shall confine his apparatus, storage of materials, and construction operations to the limits indicated by ordinances or permits, or as may be directed by the Local Authority or the Architect, and shall not unreasonably encumber the premises with his materials.

(B) The Contractor shall not load or permit any part of any structure to be loaded to such an extent as to endanger its safety.

(C) The Contractor shall enforce any instructions of the Local Authority or the Architect regarding signs, advertising, fires, danger signals, barricades, and smoking.

28. SUBCONTRACTS:

(A) The Contractor shall not award any work to any subcontractor without prior written approval of the Architect.

(B) Two facsimile copies of all subcontracts shall be delivered to the Local Authority.

(C) The Contractor shall be as fully responsible to the Local Authority for the acts and omissions of subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

(D) 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 General Conditions and other Contract Documents in so far as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Local Authority may exercise over the Contractor under any provisions of the Contract Documents.

(E) Nothing contained in the Contract Documents shall create any contractual relation between any subcontractor and the Local Authority.

29. FITTING AND CO-ORDINATION OF THE WORK:

The Contractor shall be responsible for the proper fitting of all work and for the co-ordination of the operations of all trades, subcontractors, or materialmen engaged upon the work. He shall be prepared to guarantee to each of his subcontractors the dimensions which they may require for the fitting of their work to all surrounding work and shall do, or cause his agents to do, all cutting, fitting, adjusting, and patching necessary to make the several parts of the work come together properly and to fit the work to receive, or be received by, that of other Contractors.

30. PATENTS:

The Contractor shall hold and save the Local Authority, its officers, and employees, harmless from liability of any nature or kind, including costs 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 Local Authority, unless otherwise specifically stipulated in the Contract Documents.

31. WARRANTY OF TITLE:

No material, supplies, or equipment for the work shall be purchased subject to any chattle mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. The Contractor warrants good title to all materials, supplies, and equipment installed or incorporated in the work and agrees upon completion of all work to deliver the premises together with all improvements and appurtenances constructed or placed thereon by him to the Local Authority free from any claims, liens, or charges and further agrees that neither he nor any person, firm or corporation furnishing any material or labor for any work covered by this contract shall have any right to a lien upon the premises or any improvement or appurtenance thereon. Nothing contained in this paragraph, however, shall defeat or impair the right of such persons furnishing materials or labor under any bond given by the Contractor for their protection or any rights under any law permitting such persons to look to funds due the Contractor in the hands of the Local Authority. The provisions of this paragraph shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing materials for the work when no formal contract is entered into for such materials.

32. CONSTRUCTION SCHEDULE AND PERIODICAL ESTIMATES:

Immediately after execution and delivery of the contract, the Contractor shall deliver to the Local Authority a building progress schedule in form satisfactory to the Local Authority 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 shall also furnish on forms to be supplied by the Local Authority, (1) a detailed estimate giving a complete breakdown of the contract price and (2) periodical itemized estimates of work done for the purposes of making partial payments thereon. The values 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.

33. PAYMENTS TO CONTRACTOR:

(A) Partial payments will be made as the work progresses on not later than the fifteenth day of each calendar month for work done during the preceding calendar month on estimates certified to by the Architect and signed by the Local Authority. In preparing estimates the material delivered on the site and preparatory work done may be taken into consideration. Estimates for monthly payments must be submitted at least ten (10) days in advance of the date set for payment.

(B) In making such partial payments for the work there shall be retained 10% of the estimated amount until final completion and acceptance of all work covered by the contract: Provided, however, that after 50% of the work has been completed, if the Architect certifies that satisfactory progress is being made, the Local Authority shall make the remaining partial payments in full for the work subsequently completed.

(C) All material and work covered by partial payments made shall thereupon become the sole property of the Local Authority, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the right of the Local Authority to require the fulfillment of all terms of the contract.

(D) Upon completion and acceptance of all work required hereunder, the amount due the contractor under this contract shall be paid upon certification by the Architect and approval by the Local Authority, after the contractor shall have furnished the Local Authority with a release, if required, of all claims against the Local Authority arising under and by virtue of this contract, other than such claims, if any, as may be specifically excepted by the Contractor from the operation of the release in stated amounts to be set forth therein, provided, the amounts of such excepted claims are not included in the voucher for final payment.

The Local Authority may before making any payment require the Contractor to furnish releases or receipts from all persons performing work and supplying material to the Contractor, if the Local Authority deems the same necessary in order to protect its interest. The Local Authority, however, may make payment in part or in full to the Contractor without requiring the furnishing of such releases or receipts and any payments so made shall in nowise impair the obligations of any surety or sureties on any bond or bonds furnished under this contract.

The Local Authority may withhold from any payment otherwise due the Contractor so much as may be necessary to protect the Local Authority against any claims that may be urged against the Local Authority and if it so elects may also withhold any amounts due from the Contractor to any subcontractors or materialmen for labor or material furnished by them. The foregoing provision shall be construed solely for the benefit of the Local Authority and shall not require the Local Authority to determine or adjust any claims or disputes between the Contractor and his subcontractors or materialmen, or to withhold any moneys for their protection unless the Local Authority elects so to do. The failure or refusal of the Local Authority to withhold any moneys from the Contractor shall in nowise impair the obligations of any surety or sureties under any bond or bonds furnished under this contract.

34. OFFICE FACILITIES:

The Contractor shall maintain during the construction of the Project adequate facilities at the site thereof for the use of the Local Authority's representatives, the Architect, the Construction Adviser and such other agents or representatives of the USHA as may be assigned to the review of the Project.

(There should be here specified in some detail the facilities required by the Local Authority, the Architect and the USHA.)

35. SIGNS:

The Contractor shall erect on the site of the Project at points and in positions to be designated by the Local Authority (with the concurrence of the Construction Adviser), _____ (number) signs bearing the following legend:

_____
(Name of Local Authority)

LOW RENT HOUSING PROJECT

UNITED STATES HOUSING AUTHORITY

PROJECT NO.

(The material, size, color, etc. and number of signs should be specified.)

36. CONVICT-MADE MATERIALS:

No materials manufactured or produced in a penal or correctional institution shall be incorporated in the project under this contract.

37. DOMESTIC AND FOREIGN MATERIALS:

Except for materials listed in this section, only such unmanufactured articles, materials, and supplies as have been mined or produced in the United States of America, and only such manufactured articles, materials, and supplies as have been manufactured in the United States of America substantially all from articles, materials, or supplies, mined, produced or manufactured, as the case may be, in the United States of America, shall be employed under this contract in the construction of the project.

The following materials have been exempted by the USHA from the foregoing provisions:

calk	hemp
jute	mica
rubber	flax
carnauba wax	asbestos
antimony	tungsten
tin	chromium
nickel	manganese ore, 35% and over
natural nickel alloys	titanium
sisal	

38. ACCIDENT PREVENTION:

Precaution shall be exercised at all times for the protection of persons and property. The safety provisions of applicable laws, building and construction codes shall be observed. Machinery, equipment, and other hazards shall be guarded in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, to the extent that such provisions are not in contravention of applicable law.

39. WAGE RATES:

(A) The Contractor and each Subcontractor shall pay to all architects, technical engineers, draftsmen, technicians, laborers and mechanics, engaged under this contract in work on or about the site of the project, not less than the wages or fees prevailing in the locality of the Local Authority, as determined or adopted [subsequent to a determination under applicable State (or territorial) law] by the USHA.

(B) A statement of all wages or fees so determined or adopted and all authorized deductions, if any, from unpaid wages or fees actually earned and the hours of work established pursuant to the provisions of Section 41, shall be posted at appropriate conspicuous points on the site of the Project. If any Contractor or Subcontractor finds it necessary or desirable to exceed the wage rates specified, any expense incurred by the Contractor or Subcontractor because of payment of wages in excess of those specified, shall not be cause for any increase in the amount payable under this contract The Local Authority will not consider any claim for additional compensation made by the Contractor or any Subcontractor because of such payments.

(C) The following minimum wage rates have been determined and adopted in accordance with the foregoing provisions and not less than the rates as listed herein shall be paid to the following trades and occupations.*

Classification:	Rate per hour
Air Compressor Operators	
Air Hammer Operators	
Asbestos Workers	
Asbestos Workers' Helpers	
Asphalt Rakers	
Asphalt Tampers and Smoothers	
Blacksmiths	
Blacksmiths' Helpers	
Boilermakers	
Boilermakers' Helpers	
Bricklayers	
Brick Pavers	
Brick Tenders	
Burners (Oxyacetylene)	
Carpenters	
Cement Finishers	
Curb Setters - Stone	
Dampproofers	
Electrical Linemen	
Electricians	
Electricians' Helpers (Apprentices)	
Elevator Constructors	
Elevator Constructors' Helpers	
Engineers	
Engineers' Apprentices	
Firemen	
Glaziers	
Granite Cutters	
Hod Carriers	

*This list must be amended to cover each particular contract.

Classification:	Rate per hour
Ironworker - Ornamental and Bronze	
Ironworker - Structural	
Ironworkers' Apprentices - Structural	
Laborers - Common (Paving)	
Laborers - Concrete (Paving)	
Laborers - Building	
Lathers - Metal	
Lathers - Wood	
Linoleum Layers	
Marble Masons, Slate and Structural Glass Workers	
Marble Masons, Slate and Structural Glass Workers' Helpers	
Mosaic and Terrazzo Workers	
Mosaic and Torrazzo Workers' Helpers	
Oilers and Greasers	
Operators - Cement and Concrete Mixer (Under 21E)	
Operators - Cement and Concrete Mixer (21E and Over)	
Operators - Crane, Clamshell, Drag Line	
Operators - Derrick	
Operators - Trenching Machine	
Operators - Backfilling Machine	
Operators - Bulldozer	
Operators - Hoist (Enginemen) - One Drum	
Operators - Hoist (Enginemen) - Two Drum	
Operators - Machine Road Grader	
Operators - Power Shovel (Enginemen)	
Operators - Trucks	
Operators - Pile Drivers	
Operators - Roller Road	
Operators - Pumps	
Operators - Tractor 50 H.P. and under	
Operators - Tractor over 50 H.P.	
Painters and Decorators	
Painters - Steel Painting	
Plasterers	
Plasterers' Laborers and Tenders	
Plumbers	
Plumbers' Apprentices	
Reinforcing Steel Setters - Building	
Reinforcing Steel Setters - Paving	
Rock Blasters	
Rock Drillers	
Rock Powdermen	
Roofers - Composition	
Roofers - Composition - Kettlemen	
Roofers - Composition - Apprentices	
Roofers - Slate and Tile	
Sewermen	
Sheet Metal Workers	
Sheet Metal Workers' Helpers	

Classification:	Rate per hour
Sprinkler Fitters	_____
Sprinkler Fitters' Helpers	_____
Steam Fitters	_____
Steam Fitters' Helpers	_____
Stone Masons	_____
Stone Masons' Helpers	_____
Teamsters	_____
Tile Layers	_____
Tile Layers' Helpers	_____
Watchmen	_____
Water Boys	_____

40. WEEKLY PAYMENTS:

Every employee of the contractor or a subcontractor shall be paid in full less deductions made mandatory by law not less often than once each week and in lawful money of the United States, or by check if the Contractor provides or secures convenient and satisfactory facilities approved by the Local Authority for the cashing of the same without cost or expense to the employee, in the full amount accrued to each individual at the time of closing of the pay roll, which shall be at the latest date practicable prior to the date of payment, and there shall be no deductions or rebates on account of goods purchased, rent, or other obligations, but such obligations shall be subject to collection only by legal process.

41. HOURS OF WORK:

Except in

(i) Emergencies, which are defined as unforeseen occurrences and combinations of circumstances infolving the public welfare or the protection of work already done on the Project or which endanger life or property and call for immediate action or remedy; or

(ii) Special and unusual circumstances rendering it infeasible or impracticable to require adherence to the applicable limitations of hours herein set forth,

skilled, semiskilled, and unskilled workers employed in the development of the Project shall not be permitted to work thereon more tha 8 hours per day nor more than 40 hours per week, nor shall clerical or other nonmanual workers be permitted to work thereon more than 48 hours per week: Provided, that the limitations herein set forth shall not apply to executive, supervisory and administrative employees, as such. Where emergencies or special and unusual circumstances exist, the Local Authority will require that at least time and a half be paid for hours of work in excess of the limits prescribed above.

42. CLAIMS AND DISPUTES PERTAINING TO CLASSIFICATION OF LABOR:

Where there is a State or Territorial law requiring the determination of claims and disputes pertaining to the classification of labor employed on the Project, such claims and disputes will be handled in accordance with such law. In the absence of such law, claims and disputes pertaining to the classification of labor employed on the Project will be decided by the Local Authority: Provided, that instead of such claims and disputes being decided by the Local Authority, both the parties concerned may, if they so agree and if the Local Authority also agrees, submit such claims and disputes to the USHA for decision.

43. QUALIFICATIONS FOR EMPLOYMENT:

No person under the age of sixteen (16) years and no convict labor shall be employed in the development of the Project. No person whose age or physical condition is such as to make his employment dangerous to his health or safety or to the health and safety of others shall be employed in the development of the Project: Provided, that this shall not operate against the employment of physically handicapped persons, otherwise employable, where such persons may be safely assigned to work which they can ably perform. There shall be no discrimination because of race, creed, color, or political affiliations, in the employment of persons for work on the Project.

44. COLLECTIVE BARGAINING:

All employees engaged in the development of the Project shall have the right to self-organization, to form, join, or assist labor organizations, to bargain collectively through representatives of their own choosing, and to engage in concerted activities, for the purpose of collective bargaining or other mutual aid or protection. The Contractor (including any Subcontractor and any person acting in his or their behalf, directly or indirectly) shall not interfere with, restrain or coerce such employees in the exercise of such rights; shall not dominate or interfere with the formation or administration of any labor organization or contribute financial or other support to it; shall not discharge or otherwise discriminate against any employee because he has filed charges or given testimony that the Contractor, or any subcontractor has violated any of the terms of their contracts; shall not refuse to bargain collectively with the representatives of their employees; shall not, by discrimination in regard to hire or tenure of employment or any term or condition of employment encourage or discourage membership in any labor organization: Provided, that nothing herein contained shall preclude the Contractor or any subcontractor from making an agreement with a labor organization to require, as a condition of employment, membership, therein, if such labor organization is the representative of the Contractor's or subcontractor's employees, and if the Contractor or subcontractor has not participated in its formation or administration or assisted it by financial or other support.

45. PERSONS ENTITLED TO BENEFITS OF LABOR PROVISIONS:

The contractor and each subcontractor shall extend to every person who performs for him the work of a laborer or a mechanic on the Project, or on any part thereof, the benefits of the labor and wage provisions of this contract regardless of any contractual relationship between the contractor and such laborer or mechanic, or between any subcontractor and such laborer or mechanic.

46. CONTRACT SECURITY:

The Contractor shall furnish a surety bond (form attached) in an amount at least equal to 50 per cent of the contract price as security for the faithful performance of this contract and for the payment of all persons performing labor and furnishing materials in connection with this contract.

46.(ALTERNATE) CONTRACT SECURITY:

The contractor shall furnish a surety bond (form attached) in an amount at least equal to 50 per cent of the contract price as security for the faithful performance of this contract and shall also furnish a payment bond in the amount of $_____ as required by law (form attached) as security for the payment of all persons performing labor and furnishing materials in connection with this contract.

47. INSURANCE:

(A) The Contractor shall provide adequate workmen's compensation insurance for all labor employed on the Project who may come within the protection of such laws and shall provide, where practicable, employers' general liability insurance for the benefit of his employees not protected by such compensation laws, and proof of such insurance satisfactory to the Local Authority shall be given. Said insurance shall be written with such company as may be acceptable to the Local Authority and the policy shall be submitted to the Local Authority for examination. Satisfactory certificates of said insurance shall be filed with the Local Authority in duplicate prior to the commencement of operations by the Contractor. The Contractor will be charged with the responsibility for proper and adequate workmen's compensation coverage for all his subcontract operations, and in the event the Contractor's policy does not cover each and every subcontractor, certificates of insurance issued on policies by companies that may be acceptable to the Local Authority covering each and every subcontractor shall be filed with the Local Authority prior to the commencement of such subcontract operations.

(A) (Alternate) The Contractor shall provide employers' liability insurance, supplemented by workmen's collective insurance, and proof of such insurance satisfactory to the Local Authority shall be given.

Said insurance shall be written with such company as may be acceptable to the Local Authority and the policy shall be submitted to the Local Authority for examination. Satisfactory certificates of said insurance shall be filed with the Local Authority, in duplicate, prior to the commencement of operations by the Contractor. The Contractor will be charged with the responsibility for proper and adequate workmen's coverage for all his subcontract operations, and in the event the Contractor's policy does not cover each and every subcontractor, certificates of insurance issued on policies by companies that may be acceptable to the Local Authority, covering each and every subcontractor shall be filed with the Local Authority, prior to the commencement of such subcontract operations.

(B) The Contractor shall also carry public liability insurance against injury to members of the public from accidents which may arise from operations performed under the Contract. Such insurance shall be in the amount of $_____ for the injury of one person in one accident, and $_____ to any number of persons in one accident. The insurance shall be placed with such company as may be acceptable to the Local Authority and shall name the Local Authority as an additional assured. The policy shall be submitted to the Local Authority for examination and satisfactory certificates of said insurance shall be filed with the Local Authority in duplicate prior to the commencement of operations by the Contractor. The Contractor will be charged with the responsibility for similar public liability protection for all his subcontract operations, and in the event that the Contractor's policy does not cover each and every subcontractor, certificates of insurance issued on policies by companies that may be acceptable to the Local Authority covering each and every subcontractor shall be filed with the Local Authority prior to the commencement of such subcontract operations.

(C) The Contractor shall effect and maintain insurance against loss by fire and tornado upon all work in place and all materials stored at the building site, whether or not covered by partial payments made by the Local Authority. This insurance shall be in an amount equal to the full insurable value thereof at all times and shall be for the benefit of the Local Authority, the Contractor, and each subcontractor as their interest may respectively appear. This insurance shall be placed with such company or companies and where practicable reinsured with such other company or companies as may be acceptable to the Local Authority. The Local Authority shall be furnished with a certified copy of the policy and with certificates of said insurance, in duplicate, as soon after the work has started as is practicable and in any event prior to the issuance of the first certificate for partial payment under the Contract. Each month, during the life of the Contract, the Contractor shall furnish, to the Local Authority certification in duplicate by the insurer evidencing the fact that the policy (or policies) remains in force and stating the basis upon which the monthly premiums are based.

(D) In the event the form of any policy or certificate, or the amount of the insurance or the companies writing same are not satisfactory to the Local Authority, the Contractor will secure other policies or certificates in form and amount, and with companies satisfactory to the Local Authority. The Contractor shall not cause any policies to be cancelled or permit them to lapse, and all insurance policies shall include a clause to the effect that the policy shall not be cancelled or changed until ten days after the Local Authority has received written notice as evidenced by return receipt of registered letter. All certificates of insurance shall contain true transcripts from the policy, authenticated by the proper officer of the insurer, evidencing in particular those insured, the extent of the insurance, the location and operations to which the insurance applies, the expiration date and the above mentioned notice of cancellation clause.

48. REPORTS TO U. S. DEPARTMENT OF LABOR:

The Contractor shall furnish to the United States Department of Labor, as early as practicable, the names and addresses of all of his subcontractors. The Contractor and each subcontractor shall report monthly to said Department no later than the 5th day following the close of each calendar month, on forms furnished by said Department, the number of persons on their respective pay rolls, the aggregate amount of such pay rolls, the total man-hours worked, and itemized expenditures for materials.

49. PAY ROLLS:

The Contractor and each subcontractor shall prepare his pay roll on forms prescribed by the USHA and in accordance with instructions to be furnished with these forms. The forms will be furnished by the USHA through the Local Authority. Not later than the 7th day following the payment of the wages, each such contractor shall submit to the Local Authority for transmittal to the USHA, a certified legible copy of each such pay roll duly sworn to in accordance with the "Regulations Issued Pursuant to So-Called Kick-Back Statute" which Regulations are set forth in the next following paragraph. An additional conformed copy of each such pay roll shall be furnished for the Local Authority's records.

50. KICK-BACK STATUTE AND REGULATIONS:

(1) The so-called Kick-Back Statute is Public, No. 324, Seventy-third Congress, approved June 13, 1934 (48 Stat. 948), and reads as follows:

AN ACT to effectuate the purpose of certain statutes concerning rates of pay for labor, by making it unlawful to prevent anyone from receiving the compensation contracted for thereunder, and for other purposes.

BE IT ENACTED BY THE SENATE AND HOUSE OF REPRESENTATIVES OF THE UNITED STATES OF AMERICA IN CONGRESS ASSEMBLED, That whoever shall induce any person employed in the construction, prosecution, or completion of any public building, public work, or building or work financed in whole or in part by loans or grants from the United States, or in the repair thereof to give up any part of the compensation to which he is entitled under his contract of employment, by force, intimidation, threat of procuring dismissal from such employment, or by any other manner whatsoever, shall be fined not more than $5,000, or imprisoned not more than five years, or both.

Section 2. To aid in the enforcement of the above section, the Secretary of the Treasury and the Secretary of the Interior jointly shall make reasonable regulations for contractors or subcontractors on any such building or work, including a provision that each contractor and subcontractor shall furnish weekly a sworn affidavit with respect to the wages paid each employee during the preceding week.

2. Regulations Issued Pursuant to So-Called Kick-Back Statute. Pursuant to the provisions of Public, No. 324, Seventy-third Congress, approved June 13, 1934 (48 Stat. 948), concerning rates of pay for labor, the Secretary of the Treasury and the Secretary of the Interior have jointly made the following regulations:

Section 1. (This section quotes the Kick-Back Statute.)

Section 2. Each contractor and subcontractor engaged in the construction, prosecution, or completion of any building or work of the United States or of any building or work financed in whole or in part by loans or grants from the United States, or in the repair thereof, shall furnish each week an affidavit with respect to the wages paid each employee during the preceding week. Said affidavit shall be in the following form:

State of_____

County of_____, ss:

I,_____(Name the party signing affidavit),

_____(Title), do hereby certify that I am the employee of_____(name of contractor or subcontractor), who supervises the payment of the employees of said contractor (subcontractor); that the attached pay roll is a true and accurate report of the full weekly wages due and paid to each person employed by the said contractor (subcontractor)

for the construction of _____(Project), for the weekly pay roll period from the _____day of _____, 193___, to the _____day of the _____, 193____; that no rebates or deductions from any wages due any such person as set out on the attached pay roll have been directly or indirectly made; and that, to the best of my knowledge and belief, there exists no agreement or undertaking with any person employed on the project, or any person whatsoever, pursuant to which it is contemplated that I or anyone else shall, directly or indirectly, by force, intimidation, threat or otherwise, induce or receive any deductions or rebates in any manner whatsoever from any sum paid or to be paid to any person at any time for labor performed or to be performed under the contract for the above named project.

Sworn to before me this____day of_____, 193_____.

Section 3. Said affidavit shall be executed and sworn to by the officer or employee of the contractor or subcontractor who supervises the payment of its employees.

Said affidavit shall be delivered, within seven days after the payment of the pay roll to which it is attached, to the Government representative in charge at the site of the particular project in respect of which it is furnished, who shall forward the same promptly to the Federal agency having control of such project. If no Government representative is in charge at the site, such affidavit shall be mailed within such seven-day period to the Federal agency having control of the project.

Section 4. At the time upon which the first affidavit with respect to the wages paid to employees is required to be filed by a contractor or subcontractor pursuant to the requirements of these regulations, there shall also be filed in the manner required by Section 3 hereof a statement under oath by the contractor or subcontractor, setting forth the name of its officer or employee who supervises the payment of employees, and that such officer or employee is in a position to have full knowledge of the facts set forth in the form of affidavit required by Section 2 hereof. A similar affidavit shall be immediately filed in the event of a change in the officer or employee who supervises the payment of employees. In the event that the contractor or subcontractor is a corporation, such affidavit shall be executed by its president or a vice president. In the event that the contractor or subcontractor is a partnership such affidavit shall be executed by a member of the firm.

Section 5. These regulations shall be made a part of each contract executed after the effective date hereof by the Government for any of the purposes enumerated in Section 2 hereof.

Section 6. These regulations shall become effective on January 15, 1935.

3. Construction of Regulations. The clause in the pay roll affidavit which reads "* * * that the attached pay roll is a true and accurate report of the full weekly wages due and paid to each person employed by the said contractor * * *" is construed to mean:

(a) Wages due are the wages earned during the pay period by each person employed by the contractor, less any deductions required by law.

(b) At the time of signing the affidavit, the wages due each employee have either been paid to him in full or are being held subject to claim by him.

(c) Such unpaid wages will be paid in full on demand of the employee entitled to receive them.

The clause "* * * that no rebates or deductions from any wages due any such person as set out on the attached pay roll have been directly or indirectly made" does not apply to any legitimate deductions mentioned above which enter into the computation of full weekly wages due.

The "Regulations Issued Pursuant to So-Called Kick-Back Statute" shall not be construed to prohibit deductions required by law.

51. WAGE CLAIMS AND ADJUSTEMENTS:

In cases of underpayment of wages by any contractor, the Local Authority will withhold from such contractor out of payments due an amount sufficient to pay persons employed on the work covered by his contract the difference between the wages required to be paid under the contract and the wages actually paid such employees for the total number of hours worked. The amounts withheld shall be disbursed by the Local Authority, for and on account of the contractor, to the respective employees to whom they are due.

52. INTEREST OF MEMBERS OF CONGRESS:

No member of or delegate to the Congress of the United States of America shall be admitted to any share or part of this contract or to any benefit to arise therefrom provided this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

53. ASSIGNMENT:

Neither this contract nor any part thereof shall be assigned by the Contractor to any person, firm or corporation without the prior written approval of the Local Authority to such assignment. This provision shall not preclude the Contractor from subletting parts of the work in accordance with the general practices of the building trades.

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NOTES TO ARCHITECT:
The paragraphs of this section are numbered in the same relation to their subject matter as are the sections in the Form of General Conditions.

1. DEFINITIONS. The definition of all terms which might not be familiar to the Contractor should be included in the contract documents.

2. CHANGES IN THE WORK. The amount (as contemplated by Paragraph 1 (a) (5) of Part III of the Terms and Conditions) to be fixed in the contract as the limit of the amount involved which should not be exceeded in any change without the submittal of the change to the USHA should, in general, be One Thousand Dollars ($1,000). This amount may in particular contracts be increased or decreased when the size of the contract or other circumstances would make some other amount more appropriate. Aside from the above this section should not be changed substantially.

PARAGRAPHS 3 to 6, inclusive, are suggested sections. It is believed that the substance in these sections, together with the other suggested sections, should be embodied in the contract documents for the protection of the Local Authority and for clearly setting out the general obligations and duties of the Contractor. In special instances, particularly where the contract is for supplemental work, some of these provisions, such as the one covering temporary heating, may not be applicable.

PARAGRAPH 7 should not be changed.

PARAGRAPHS 8 to 12, inclusive, are suggested sections.

13. PERMITS. In the event the Local Authority has made arrangements with the municipality to obtain, without cost, any permits or licenses which are necessary in connection with the construction of the project, an explanation to this effect should be incorporated in this section. Otherwise, bidders would include in their bids the estimated amount they would be required to expend to obtain such permits or licenses.

PARAGRAPHS 14, 15 and 16 are suggested sections.

17. DISPUTES. In this Section, provision is made for the settlement of certain disputes by the Architect with the right of either party to such dispute to appeal the decision of the Architect to arbitrators. This procedure is suggested as it follows the common practice of the building industry. Attention is called, however, to the possibility that, because of their public character, some Local Authorities may not have the legal authority to delegate to the Architect, a board of arbitrators, or other third parties the power to render decisions that are binding on the Local Authority. If such is the case, it is recommended that a procedure similar to that followed by the Federal Government in its construction contracts be followed, i. e., that an official or employee of the Local Authority be designated as its representative with power to settle all such questions subject to the right of the Contractor to appeal to the governing body of the Local Authority in the event the Contractor refuses to accept the decisions of such representative.

PARAGRAPHS 16 to 27 inclusive are suggested sections.

28. SUBCONTRACTS. This section should not be changed. One facsimile copy of each subcontract delivered to the Local Authority by the Contractor should be transmitted to the USHA. (See Terms and Conditions, Part III, 5 (a).

PARAGRAPHS 29 to 30 are suggested sections.

31. WARRANTY OF TITLE. The Local Authority should investigate State laws to determine whether the project is subject to mechanics' lien claims. As the Terms and Conditions require a bond for the protection of those furnishing labor and material, the Local Authority should, if possible under State or local law, prohibit the right of anyone to assert a mechanic's lien claim against the project. Some State Laws require either actual notice or recorded notice of contractual provisions prohibiting liens being filed against property. In the States where either actual or recorded notice is required, the provisions of the Statute should be followed and, if necessary, the contract should be recorded in the proper office.

PARAGRAPH 32 is a requirement of the Terms and Conditions and should not be changed.

33. PAYMENTS TO CONTRACTOR. (see also Paragraphs 2, 3 and 4 of Part II of Terms and Conditions). The section as set forth provides that payments shall be made on estimates certified by the Architect and signed by the Local Authority. The Local Authority should advise the Contractor the name of the person who has been designated by it to sign such certificates. If persons other than the Architect are to certify such estimates, the persons so designated should be clearly defined by the Local Authority. The Terms and Conditions require that payment be made not less than the 15th day of each calendar month for work done during the preceding month and that 10% of the estimated amount due be retained until final completion. After 50% of the work has been completed the USHA will not object to the making of the remaining partial payments for work subsequently completed without the 10% deduction, provided the work is proceeding satisfactorily. The suggested form so provides. While this section also provides for payment to the Contractor without requiring the estimates on which said payments are based to be submitted to the USHA, the Local Authority is referred to certain terms which will be found in the Development Fund Agreement or the Trust Indenture provided for by the Terms and Conditions, which provisions in general will require that in withdrawing funds the Local Authority must set forth the purposes for which siad funds are being withdrawn together with a certificate stating that the Local Authority is not in default under the Loan Contract with the USHA and that the funds previously withdrawn have been used in accordance with Certificates of Purposes filed with the USHA by the Local Authority.

34. OFFICE FACILITIES. This Section should be included if adequate facilities are not already on the site. The Local Authority should specify in sufficient detail the requirements for office facilities for the representatives of both the USHA and the Local Authority on the site. These facilities will differ on various projects depending on their size. See special conditions for office facility requirements for construction adviser.

35. PROJECT SIGNS. This section should be included unless signs complying with the Terms and Conditions have already been placed on the site by other contractors. In addition thereto, the materials, size and color of the signs should be specified and the number of signs to be placed on the project should be set forth; the Local Authority should consult with the USHA in this regard at the time the specifications are being drafted in order that it may be advised of the USHA's requirements.

PARAGRAPH 36 is a requirement of the Terms and Conditions and should not be changed.

37. DOMESTIC AND FOREIGN MATERIALS. The only foreign articles, materials or supplies that may be listed under this section are those which in fact have been exempted by the USHA because of findings made by the USHA that the use of domestic articles, materials or supplies is impractical or because the use of them would unreasonably increase the cost of the work. If the Local Authority desires to use foreign articles, materials or supplies which have not been so exempted by the USHA, application for such exemption should be made to the USHA. No change should be made in this section except to list such exempted materials.

PARAGRAPH 38 is a requirement of the Terms and Conditions and should not be changed.

39. WAGE RATES. The provisions of this section should not be changed, except as to the itemized classification of the workers on the project, which classification is necessarily dependent upon the type of work to be performed and the trades and occupations employed in such work. In the sample list included a classification is made of the mechanics and laborers ordinarily engaged in work on projects of the type contemplated. This list, however, does not include architects, technical engineers, draftsmen or technicians who might be employed by the Contractor. These and any other classes of workmen covered by the provisions of the United States Housing Act of 1937 may have to be added to the list. Classification or workers and prevailing wage rates should be investigated by the Local Authority as soon after the execution of the Loan Contract as possible, so that recommendations of wage rates may be submitted by the Local Authority to the USHA without undue delay.

If the State or local law makes provision for the determination of prevailing wages, the Local Authority should recommend to the USHA the prevailing wages so determined, and furnish evidence of the findings of the State or local body making such determination and a reference to the law under which such determination was made. The provisions of this section will be construed to apply only to those employees of the Contractor and his subcontractors who work on or about the project site.

PARAGRAPHS 40 to 45, inclusive are requirements of the Terms and Conditions and should not be changed.

46. CONTRACT SECURITY. (See Chapter II, Section C, paragraph 2 of this Bulletin under the heading Performance Bond). Alternative sections have been included in the suggested form of General Conditions. If the State law requires a separate payment bond in addition to the Performance Bond, Section 46, (Alternate) should be used. The furnishing of contract security is a requirement of the Terms and Conditions, but as State laws on this subject vary, these paragraphs will, in individual projects, have to be modified to meet the applicable provisions of State laws.

47. INSURANCE. Subsection A relating to workmen's compensation insurance is required by the Terms and Conditions and should not be changed unless there is no State Workmen's compensation statute applicable to the employees of the Contractor. In the latter event, employers' liability insurance supplemented by workmen's collective insurance should be required. An alternate subsection A providing for such form of coverage is included in the suggested form.

Subsection B relating to public liability insurance is required by the Terms and Conditions and should not be changed. It is believed that public liability insurance coverage with limits of $20,000/40,000 will be sufficient under most contracts.

In subsection C, it is suggested that fire insurance be carried by the Contractor, since construction contracts usually require the Contractor to be responsible for the project until its final completion, and in order to avoid conflict of interest during the construction period. Insurance carried by the Contractor during construction will, to the extent of such coverage,

satisfy the requirements of Paragraph 8 of Part I of the Terms and Conditions. If, however, the Local Authority carries fire insurance on its insurable interests during construction, this subsection of the General Conditions should be changed.

48. REPORTS TO THE U.S. DEPARTMENT OF LABOR. This Section should not be changed. The forms will be furnished by the Department of Labor. These forms will, after they have been filled out, be turned over to the Construction Adviser for transmittal to the Department of Labor.

PARAGRAPHS 49 to 53 inclusive, are required by the Terms and Conditions and should not be changed. Before approving any assignment of a contract all facts in connection with such assignment should be submitted to the USHA.

X X X

DEPARTMENT OF THE INTERIOR
UNITED STATES HOUSING AUTHORITY
WASHINGTON, D. C.

DATE
OCT.-1938

REVISIONS

SUGGESTED SPECIFICATIONS-DIVISION VIII

DIVISION VIII
SPECIAL CONDITIONS:

NOTE TO ARCHITECT:
The following SPECIAL CONDITIONS are suggested for inclusion in the specification modified to suit each project. Each heading should be carefully studied for applicability to the work. Additional items necessary to clarify the scope of the work and the requirements of the Drawings and Specification should be included.

1. GENERAL:

The provisions of this section are supplementary to the GENERAL CONDITIONS and apply to all work required under the contract.

2. THE PROJECT SITE:

The Site on which a housing project for the _____

_____(Name)_____ HOUSING AUTHORITY is to be erected

in the City of _____(Name)_____ is indicated on

_____ Drawing No. _____

designated as (PLOT PLAN) and known as _____

_____(Name of Site)_____ SITE

3. SCOPE OF WORK FOR BASE BID (CONTRACT PRICE):

Except as otherwise specified to be "OMITTED", or noted on the drawings as "NOT IN CONTRACT", or specified herein as an "ALTERNATE" the Contractor shall furnish all labor, transportation, materials, apparatus, equipment, fuel, power, light, scaffolding and tools necessary or required for proper and substantial completion of the entire work as shown on the Drawings and required by the Specification.

4. SCOPE OF WORK FOR ALTERNATE:

The bidder shall state in his proposal the amount that shall be deducted from or added to the Base Bid if

NOTE TO ARCHITECT:
Describe in detail under each alternate all material and labor that will be required in lieu of the material and labor specified in the work required in the Base Bid. All alternates should be stated under this heading.

5. OPTIONS:

Where optional materials or methods of constructions are shown on the Drawings or mentioned in the Specification, such options shall be of the Contractor, unless specifically noted as an option of the Local Authority.

6. OTHER CONTRACTS (See Paragraph 15 - GENERAL CONDITIONS):

The following work is not included under this Contract.

NOTE TO ARCHITECT:
List under this heading all items of work not included in this Contract.

7. EXISTING CONDITIONS:

NOTE TO ARCHITECT:
Describe in detail all existing conditions at the project site in order to clarify the work included under the requirements of the Contract Documents.

8. EXAMINATION OF PROJECT SITE:

Before submitting bids each bidder shall examine the premises and satisfy himself as to existing conditions under which he will be obliged to operate in performing the work.

9. RESPONSIBILITY FOR PREMISES:

The Contractor shall take over and assume all responsibility for the premises, contiguous sidewalks, and existing buildings. He shall provide and maintain all protections as required by the Local Authority and governing laws. He shall provide and maintain permanent or temporary sidewalks, covered passageways, fences, or other structures as required by law, so as not to obstruct or interfere with traffic and shall leave access to fire hydrants. He shall maintain from sunset to sunrise every night, on or near obstructions sufficient light and guards.

Should work be suspended the Contractor shall keep all roadways and sidewalks in proper condition and put and leave the same in such condition at the termination of the work. When so directed, he shall remove all temporary obstructions and equipment.

10. LAWS AND ORDINANCES:

The Contractor shall comply with State and local building laws, police, fire and all other regulations.

11. FENCING AND SAFEGUARDS:

The Contractor shall fence the site (describe) and maintain fencing until completion of the contract, or until order for removal is given by the Local Authority. Provide and maintain gates and locks as required. Temporary fences, walks and sidewalk enclosures shall conform to ordinances and all laws or directions of public authorities.

The Contractor shall take all necessary measures to prevent trespass on the project site and buildings thereon by the public during working hours and especially outside of working hours. He shall provide temporary doors and window enclosures necessary to prevent access to the buildings by unauthorized persons.

12. DUTIES OF INSPECTORS (See Paragraph 4 - GENERAL CONDITIONS):

Inspectors on the work have authority to reject material or workmanship which in any way do not meet contract requirements. They do not have the authority to make changes in the work and no orders given by them, either written or verbal shall be considered as a basis for any claim for extra compensation. It is not the duty of the Inspector to lay out any work for the Contractor and the Local Authority assume no responsibility or obligation in this connection.

13. THE SPECIFICATION:

Titles to Divisions and headings to paragraphs in the Specification are introduced for convenience and are not to be taken as complete segregation of the units of material and labor; the contractor may sub-divide the work as he sees fit.

Wherever the words "as shown", "as indicated", "where indicated" occur in the specification, the meaning shall be as "as shown, or as indicated, on the Contract drawings".

14. SAMPLES:

All approved samples shall be retained by the Authority on the site, in the building provided by the Contractor and available to the Construction Adviser, during the period of construction.

15. PHOTOGRAPHS:

Photographs showing the progress of the work shall be furnished by the Contractor to the Local Authority as follows:

> On the 1st of each month, until the work is 99 per cent complete, photographs in triplicate taken from four points selected by the Local Authority, showing as much as possible the work installed during the previous month. As these are intended as monthly records they shall be made the 1st of each month whether or not any work has been done during the preceding month. All to be 8 x 10 inches in size, and identified with name of building, contractor and date taken. Photographs shall be taken by a professional photographer.

Air View photographs also shall be taken at least 4 times during the construction period; one when construction starts, one when construction has been completed and two at intermittent stages of construction. Three copies of each shall be furnished.

16. LIGHT, POWER AND WATER:

During construction, the Contractor shall provide temporary electric light and power adequate for the proper execution of all work. Open lights, such as torches or flares will not be permitted in any of the buildings. He shall investigate the sources of electrical energy for these purposes, and provide means for securing same. The Contractor shall provide all necessary water for his own and all other operations in connection with the work and remove all temporary lines and connections at the completion of the work.

17. ORDER OF WORK:

If in the judgment of the Local Authority it becomes necessary at any time in order to accelerate the completion of certain portions of the work, the Contractor when directed by the Local Authority, shall supply sufficient materials and labor to execute such designated portions of the work with the utmost dispatch giving precedence to the work designated for immediate completion. Within three weeks after the Contractor has been notified that he has been awarded the Contract, he shall submit to the Local Authority, a schedule of operations giving the estimated dates that each part of the work will be started and finished. He shall also keep a record of progress, covering all parts of the work, and shall submit two copies of such progress records to the Local Authority each week. This schedule shall be made in form as approved by the Local Authority.

18. MEASUREMENTS:

The Contractor shall verify all measurements at the building and shall be responsible for their correctness. Any difference between actual dimensions and those shown on drawings shall be submitted to the Local Authority for consideration before proceeding with the work in question.

19. LOCATION OF PIPES, CONDUITS, EQUIPMENT AND MECHANICAL ITEMS:

In order to insure that pipes, radiators, plumbing, fixtures and items of electrical equipment, cabinets and other equipment furnished by the Contractor or by other contractors under separate

contracts, or by the Local Authority may be placed in the locations planned for them, without conflicts in location or encroachments on each other, the Contractor shall plan the placing of these pipes, conduits equipment, etc., establish their positions and obtain approval of their location before installing the work.

20. SHORING AND BRACING:

The Contractor shall provide all permanent and temporary bracing, shoring and anchoring that may be required for safety and stability; he will be held strictly accountable for any damage resulting from failure to furnish such shoring and bracing either through lack of proper judgment or any other cause.

21. BOXING TREES:

All trees and shrubs which may be endangered by operations under the Contract shall be carefully protected by boxing. This boxing and other protection necessary shall be maintained throughout the period of construction.

22. LINES AND LEVELS:

The Local Authority will establish lot lines and restrictions as matters of records. The responsibility for all other lines and levels necessary for proper location and erection of the buildings and appurtenances rests upon the Contractor. Points from which finished floors and wall surfaces in each room are determined shall be established and maintained by the Contractor, for coordinating the work of the various trades.

23. PRESERVATION OF MONUMENTS:

Bench marks, monuments and other reference points shall be carefully maintained; if disturbed or destroyed, they shall be replaced in the manner prescribed by the Local Authority.

24. PROVISIONS RELATIVE TO PARAGRAPHS 19 AND 20 IN "INSTRUCTIONS TO BIDDERS" AND THE REQUIREMENT IN THE "BID FORM" FOR THE SEPARATION OF THE AMOUNT BEING APPLICABLE TO THE "COST OF SITE IMPROVEMENTS".

This repeated explanation is made to clarify the object of this requirement.

> "Under Federal legislation establishing U. S. HOUSING AUTHORITY certain definite maximum expenditures were set up as being allowable for the construction of such

projects "Per Room." In order that the total cost of the project, including purchase of land and necessary installation of site improvements and site utilities which are not directly a part of the actual "Per Room Cost" not be charged against the so-called "Per Room Cost", the information required in Item 19 and in Bid Form is necessary.

It is to be clearly understood, however, that the base bid for the general construction covers every item of cost for all work whether in construction of buildings or general site improvements, which is shown on the plans or required in these specifications and it is to be further understood that the lump sum contract, which will eventually be awarded, will be for the completed work and that the information desired is merely for statistical purposes.

The same procedure will be followed with respect to mechanical contracts: namely, The Base Electric Bid will cover the entire cost of all electric work within or a part of the buildings and of all electric work forming a part of the electric distribution system and of the yard lighting system, and in the case of Plumbing, the Base Bid will consist of all sanitary plumbing, water, and gas work within or a part of each of the buildings and of the water, sewer, and the gas distribution systems of the site and extending as services to the various buildings."

25. OFFICE FACILITIES FOR CONSTRUCTION ADVISER:
(See Paragraph 34 - General Conditions)

PROJECT NO._____
SCHEDULE OF DRAWINGS-1

DEPARTMENT OF THE INTERIOR
UNITED STATES HOUSING AUTHORITY
WASHINGTON
SUGGESTED SPECIFICATIONS

DATE

REVISIONS

SCHEDULE OF DRAWINGS:

NOTE TO ARCHITECTS:
In listing the drawings in the specification, the following is a suggested form. All drawings should be dated alike and said date indicated where noted.

SCHEDULE OF DRAWINGS

Dated_____

ARCHITECTURAL

Drawing No.	Description
A-1	Site Plan
A-2	Block Plan A
A-3	Block Plan B
A-4	Street and Yard Work
A-5	Retaining Walls
A-6	Plans-Buildings Nos.___
A-7	Elevations-Buildings Nos.___
A-8	Wall Details
A-9	Details-Exterior
A-10	Details-Interior

STRUCTURAL

S-1	Foundation Plans
S-2	Typical Details

PLUMBING

P-1	Site Plan
P-2	Block Plan A
P-3	Block Plan B
P-4	Unit Plan
P-5	Details

HEATING

H-1	
H-2	
H-3	
H-4	
H-5	

ELECTRICAL

E-1 .....
E-2 .....
E-3 .....
E-4 .....
E-5 .....

LANDSCAPE

L-1 .....
L-2 .....
L-3 .....
L-4 .....
L-5 .....

X X X

PROJECT NO. _____
SHOP DRAWINGS

DEPARTMENT OF THE INTERIOR
UNITED STATES HOUSING AUTHORITY
WASHINGTON
SPECIFICATIONS

DATE

REVISIONS

SHOP DRAWINGS: 1. Shop drawings required by the specifications shall be submitted in ample time for proper consideration and action before fabrication is started.

2. The procedure with respect to shop drawings which are to be approved by the Local Housing Authority shall be as follows:

(a) The Contractor shall submit

X X X

NOTE TO ARCHITECTS:

The procedure will vary in each case; architects will fill in this paragraph

X X X

3. All shop drawings, submitted shall bear the stamp of approval of the Contractor as evidenced that the shop drawings have been checked by the Contractor; drawings submitted without this stamp of approval will not be considered and will be returned to the contractor for resubmission.

4. If shop drawings show variations from the contract requirements because of standard shop practices or other reasons, the Contractor shall make specific mention of such variations in his letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment; otherwise the Contractor will not be relieved of the responsibility for executing the work in accordance with contract requirements even though the shop drawings have been approved.

5. Where the Contractor submits, and the Local Housing Authority approves, shop drawings which incorporate desirable or necessary variations from, but without changes in the intent of the drawings and specifications, such approved modifications shall be construed as an interpretation of the drawings and specification involving no increase in contract price; it shall be distinctly understood that the Contractor shall not consider any such correction or modification of a shop drawing by the Local Housing Authority or its accredited agent as authority for a Contract change requiring a change order.

6. The approval of shop drawings will be general and shall not relieve the Contractor from the responsibility for proper fitting and installation of the work from furnishing materials and labor required under the contract which may not be indicated on the shop drawings when approved.

7. The approval of shop drawings shall not be construed as approving departures from full-sized drawings furnished during the progress of the work by the Local Housing Authority.

8. Each submittal of shop drawings shall be accompanied by a letter of transmittal giving a list of the drawings; all drawings shall be marked with an identifying number, the name of the project and the name of the Contractor. The drawings shall be complete showing all necessary and required information; the drawings shall bear cross-reference numbers referring to the drawing number of the contract drawings. The drawings shall be bound in sets when submitted.

SCHEDULE OF INTERIOR FINISHES

SPACES			FLOORS							WALLS							CEILINGS					FINISH				
NOTE TO ARCHITECT: This schedule should be included in the Specification and on the drawings.			Earth	Cement	Wood	Ceramic Tile	Asphalt Tile	Linoleum	Rubber Tile	Brick	T.C. Tile Unit	(1) Base	Painted	(2) Plaster	Ceramic Tile	Glazed Tile Unit	Concrete	(2) Plaster	Hung Ceiling	Painted	(3) Insulation	(4) Floors	(4) Walls	(4) Ceilings	(4) Trim	
APARTMENTS	Basement	Storage Rooms																								
		Laundries																								
		Incinerator Rooms																								
		Meter Rooms																								
		Tenant Lockers																								
		Toilets																								
	Super-Struct.																									
		Public Halls																								
		Living Rooms																								
		Bed Rooms																								
		Kitchens																								
		Bathrooms																								
		Closets																								
FLATS																										
		Basement Spaces																								
		Stair Halls																								
		Living Rooms																								
		Bed Rooms																								
		Kitchens																								
		Bathrooms																								
		Halls & Corridor																								
		Closets																								
		Attic Spaces																								
HOUSES																										
		Basement Spaces																								
		Stair Halls																								
		Living Rooms																								
		Bed Rooms																								
		Kitchens																								
		Bathrooms																								
		Halls & Corridor																								
		Closets																								
		Attic Spaces																								

(1) Legend
W - Wood
C - Cement
M - Metal
T - Ceramic Tile
R - Rubber
A - Asphalt

(2) Legend
G - Gypsum
L - Lime
C - Cement
K - Keene's

(3) Legend
L - Loose or semi-rigid
R - Rigid

(4) Legend
P - Painted
S - Stained
U - No Finish

PROJECT NO. _____
City State

9-1938
Rev. 10-1938

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DEPARTMENT OF THE INTERIOR
UNITED STATES HOUSING AUTHORITY
WASHINGTON, D. C.

SUGGESTED SPECIFICATION

DATE
SEPT.-1938

REVISIONS

SAMPLES, CERTIFICATES, TESTS.

The provisions of this section are applicable to all materials submitted or delivered for use on the project except as follows:

1. Items required under Mechanical Division of Specification.

2. Items required under Electrical Division of Specification.

3. Items required under Landscape Division of Specification.

4. Structural Tests on materials in place.

5. All Tests definitely specified in other sections of the Specification.

1. All material, equipment and accessories entering into the work are subject to the approval or disapproval of the Local Authority. No samples are required to be submitted with the bid documents.

2. The samples herein required shall be submitted after the award of the contract and acceptance of the Contractors' Bonds. All samples shall be delivered to a location designated by the Local Authority.

3. All transportation charges on samples shall be prepaid.

4. All samples shall be submitted in ample time for proper consideration and action. No material shall be delivered to the site for use until representative samples have been approved in writing by the Local Authority. The minimum time required for making tests is generally twenty days after receipt of the sample.

5. All samples shall be so packed as to reach their destination in good condition; samples in paste or liquid form shall be shipped in tight metal containers to prevent the loss of their reducing oils or solvents by absorption or evaporation.

6. Samples shall have affixed thereto a label, or shall otherwise be properly marked, indicating the material or product represented, its place or origin, the name of its producer, the name of the Contractor and the name of the project for which it is intended.

7. The contractor shall submit to the Local Authority, in triplicate, a certificate describing each sample submitted for approval, certifying that the material, equipment or accessory submitted complies with contract requirements. The certificate shall include the following information:-

   Statement giving name and brand of the product, name of manufacturer, and location of manufacturing establishment.

   Certificate giving name and location of at least two structures on which substantial quantities of the material represented by the sample were used.

   An outline giving pertinent chemical and/or physical data, showing chemical and/or physical properties of the material represented by the sample submitted and giving the name of the laboratory or testing authority which obtained the data, with the date of the tests.

If the statement originates with the producer, the Contractor shall endorse all claims and submit the statement in his own name; he shall also guarantee that all materials furnished for use on the project will be in compliance with the samples and certified statements.

Approval of any material shall be general only and shall not constitute a waiver of the Local Authority's right to demand full compliance with contract requirements. After actual deliveries the Local Authority will make such check tests

as it deems necessary in each instance and may reject materials, equipment, and accessories for cause, even though such materials and articles have been given general approval. Such samples as may be required for check tests are to be furnished by the Contractor. If materials, equipment, or accessories which fail to meet check tests have been incorporated in the work, the Local Authority shall have the right to cause their removal and replacement by proper materials or to demand and secure such reparation by the Contractor as it deems equitable. Except as otherwise specifically required by any of the divisions of the specification, the cost of all laboratory tests, including tests referred to in Federal Specifications or A.S.T.M. Standards, shall be borne by the Local Authority.

8. Wherever in the specification the phrase "shall conform to applicable requirements of A.S.T.M. Standards or Federal Specification" occurs, the A.S.T.M. Standard or Federal Specification listed as governing each material shall be accepted as establishing the technical qualities and testing methods which shall be complied with. They shall not govern the number of tests required to be made. The number of tests required on material delivered for use shall in all cases be left to the discretion of the Local Authority. They may require laboratory tests on samples submitted for approval or they may approve materials on the basis of data submitted in certificates with the samples. Tests will be made on materials delivered for use only as frequently as the Local Authority considers necessary to insure compliance of materials used with contract requirements.

In respect to all materials required, the Contractor shall have the option of furnishing materials meeting either A.S.T.M. or Federal Specifications.

(a) A.S.T.M. STANDARDS may be obtained at a nominal cost from the American Society for Testing Materials, 260 S. Broad St., Philadelphia, Pa.

(b) FEDERAL SPECIFICATIONS may be obtained at a nominal cost from the Superintendent of Documents, Washington, D. C.

9. Ordinarily tests will be made at the discretion of the Local Authority but they may also be made by the United States Housing Authority if deemed advisable.

10. The approval of any sample shall be only for characteristics, or for the use, specified in such approval and no other.

11. No approval of a sample shall be taken in itself to change or modify any contract requirement.

12. When a material has been approved, no change in brand or make will be permitted unless:

    (a) The manufacturer cannot make satisfactory delivery, or

    (b) The material delivered fails to comply with the contract requirements.

13. Samples of materials not subject to destruction tests when approved by the Local Authority, will be sent to the project and kept there until completion of the work.

14. Samples that are not approved will be returned to the Contractor only upon his request and at his expense; if the return of such samples is not requested within 90 days after rejection or disapproval, they will be treated as unclaimed material.

15. Failure of samples to meet contract requirements will be sufficient cause for refusal to consider, under this specification, any further samples from manufacturers whose materials have failed. The cost of additional tests, if material fails to meet contract requirements, will be charged to the Contractor.

16. The following samples and certificates related to them shall be submitted to the Local Authority,

    (a) The quantities stated are the least that can be considered.

SAMPLES TO BE SUBMITTED FOR APPROVAL

The quantities shown are twice that required for tests in order to provide for duplicate samples to be retained by the Local Authority.

ITEM	MATERIAL	APPLICABLE FEDERAL SPECIFICATION	SIZE OF SAMPLE
1.	Aluminum, Alloy	QQ-A-371	2 pieces - each 12" long preferably test coupon
2.	Anchors	- - - -	5 each kind
3.	Aluminum Rod or Wire	QQ-A-351	2 pieces - each 12" long preferably test coupon
4.	Aluminum Tubing	WW-T-788	8 pieces - each 18" long
5.	Asphalt, Emulsion, slow breaking type	SS-A-681	2 quarts
6.	Asphalt (Emulsion)	SS-A-676	2 quarts
7.	Asphalt Mastic to be used hot	SS-A-706	2 quarts
8.	Asphalt, Primer	SS-A-701	2 quarts
9.	Asphalt tile	SS-T-306	20 tile each color
10.	Asphalt cement	- - - -	2 quarts
11.	Asphalt: waterproofing and dampproofing and roofing (specify type, class and grade)	SS-A-666	2 quarts

ITEM	MATERIAL	APPLICABLE FEDERAL SPECIFICATION	SIZE OF SAMPLE
12.	Brass	QQ-B-611 QQ-B-621	2 pieces each 12" long preferably test coupons
13.	Brick (backup)	SS-B-656 Grade M or S	20 bricks
14.	Brick (facing)	SS-B-656 Grade M	20 bricks
15.	Brick (Fire Clay)	HH-B-671A Specify class	16 brick, each class
16.	Brick (Paving)	A.S.T.M. C7-30	10 brick
17.	Brick (Radial)	- - - -	10 each kind
18.	Caulking Compound	- - - -	2 quarts, each kind
19.	Cement, Bituminous Plastic	SS-C-153 Type II	2 quarts
20.	Cement (Keene's)	SS-C-161	20 pounds
21.	Cement (Magnesia)	HH-M-61 Type 4	2 pieces, each not less than 2 pounds
22.	Cement, Cold setting or High Temperature	- - - -	10 pounds
23.	Cement, Masonry	SS-C-181a	30 pounds
24.	Cement, Portland	SS-C-191a	20 pounds
25.	Clay (Fire)	HH-C-451 Class C	10 pounds
26.	Cloth (Shade)	CCC-C-521	2 yards - full width
27.	Cloth (Wire)	RR-C-451a	2 pieces - 2 ft. long by width of roll

ITEM	MATERIAL	APPLICABLE FEDERAL SPECIFICATION	SIZE OF SAMPLE
28.	Conduit	WW-C-581a	2 full length pieces
29.	Copper (Bars, plates, etc.)	QQ-C-501 (Specify Type)	4 pieces, each 18" long
30.	Cork, Compressed	HH-C-561 Grade A	2 specimens each Approximately 3 ft. square
31.	Cotton Fabric, woven asphalt - saturated	HH-C-581	2 pieces, each 1 sq. yard
32.	Expansion Joint Filler	- - - -	5 pieces, 18" long
33.	Felt (Asphalt saturated)	HH-F-191 Type 1	2 pieces, each 1 sq. yard
34.	Felt (Coal tar saturated)	HH-F-201	2 pieces, each 1 sq. yard
35.	Fiber Board (Insulating)	LLL-F-321a Grade B	6 pieces, 24" x 30"
36.	Flue Lining	- - - -	2 pieces
37.	Gratings, steel	RR-G-661a	2 pieces, each 3 ft. long by length of bearing bar
38.	Glass	DD-G-451	4 pieces (4" x 8"), each kind
39.	Gravel or Slag	SS-A-281	100 pounds
40.	Gutter	- - - -	2 pieces, 12" long
41.	Gypsum - Calcined	SS-G-901 Grade 1	20 pounds
42.	Hardware: Builders' Locks and Trim	FF-H-106	4 pieces, each item
43.	Hardware: Builders' Shelf and Miscellaneous	FF-H-111	4 pieces, each item

ITEM	MATERIAL	APPLICABLE FEDERAL SPECIFICATION	SIZE OF SAMPLE
44.	Hardware: Builders' Hinges	FF-H-116	4 pieces, each item
45.	Hardware: Builders' Door Closers	FF-H-121	4 pieces, each item
46.	Insulating Material	- - - -	4 pieces, (12" x 12") or 4 cu. feet
47.	Iron, Gray, castings	QQ-I-651 Class A	8 arbitration bars (4 from first of melt) (4 from last of melt)
48.	Iron, Malleable	QQ-I-666 Grade B	2 sets - 3 tonsile coupons 2 sets - 3 impact coupons
49.	Iron, Wrought	QQ-I-686 Class B	10 pieces, approximately 18" long, each size
50.	Iron & steel, sheet	QQ-I-696	2 pieces, approximately 12" long
51.	Kitchen Cabinet	- - - -	1 complete cabinet
52.	Lath: Metal, for plaster	QQ-B-101a	2 pieces, each 1 sq. yard
53.	Lime, Hydrated	SS-L-351	20 pounds
54.	Lime, Quicklime	SS-Q-351	20 pounds
55.	Linoleum	LLL-L-351	2 pieces, 14" wide by full width of roll
56.	Metal-Misc. and Ornamental	- - - -	2 small sections each item
57.	Metal Bucks, Base & Trim	- - - -	2 small sections each item

ITEM	MATERIAL	APPLICABLE FEDERAL SPECIFICATION	SIZE OF SAMPLE
58.	Metal Doors	- - - -	2 corner sections
59.	Metal Toilet Partitions	- - - -	2 corner sections
60.	Metal Window and Screen	- - - -	2 complete
61.	Paint, Aluminum-Powder	TT-A-476 Type H	2 quarts
62.	Paint, Casein	TT-P-23 Type II	2 quarts
63.	Paint, Dryer; liquid	TT-D-651	2 quarts
64.	Paint, Lampblack	TT-L-71	2 quarts
65.	Paint, oil linseed-boiled	JJJ-O-331	2 quarts
66.	Paint, oil linseed-raw	JJJ-O-336	2 quarts
67.	Paints, iron-hydroxide	TT-P-31	2 quarts
68.	Paint, Oil - interior	TT-P-51	2 quarts
69.	Paint, Oil - exterior	TT-P-36	2 quarts
70.	Paint, prussian blue	TT-P-691	2 quarts
71.	Paint, red lead	TT-R-191	2 quarts
72.	Paint, shellac	TT-S-271 Type A or B	2 quarts
73.	Paint, Shop Coat	- - - -	2 quarts
74.	Paint, turpentine Exterior use	LLL-T-792 Type II	2 quarts
75.	Paint, turpentine Interior use	LLL-T-791a Type I	2 quarts

ITEM	MATERIAL	APPLICABLE FEDERAL SPECIFICATION	SIZE OF SAMPLE
76.	Paint, Varnish, interior	TT-V-71	2 quarts
77.	Paint, Varnish, mixing (for) Aluminum paint	TT-V-81	2 quarts
78.	Paint, Varnish, spar	TT-V-121a 1935 Revision	2 quarts
79.	Paint, white-lead basic carbonate	TT-W-251a	2 quarts
80.	Paint, White-lead, basic sulphate	TT-W-261	2 quarts
81.	Paint, zinc-oxide	TT-Z-301	2 quarts
82.	Paint, zinc-oxide, leaded	TT-Z-321	2 quarts
83.	Paint, sample panels	- - - -	3 panels of each color
84.	Penetrating Oil	- - - -	2 quarts
85.	Pipe, brass	WW-P-351 Class A	2 pieces, each 36" long
86.	Pipe wrought iron	WW-P-441	2 pieces, each 36" long
87.	Pitch, coal tar	R-P-381	2 quarts
88.	Plaster, gypsum	SS-P-401 Type W or N	20 pounds
89.	Paint, putty	TT-P-791	2 pounds
90.	Reinforcing Bars	QQ-B-71	4 pieces approximately 18" long for each size
91	Safety treads	- - - -	3 - 12" pieces
92.	Sand, for concrete	SS-A-281	100 pounds

ITEM	MATERIAL	APPLICABLE FEDERAL SPECIFICATION	SIZE OF SAMPLE
93.	Sand, plastering	A.S.T.M. 635-36T	100 pounds
94.	Shades, window, roller	DDD-S-251	2 shades complete
95.	Solder, tin-lead	QQ-S-571	4 pounds
96.	Stone, cast	SS-C-721	2 sets each kind, a set being 3 - 12" x 12" pieces representative of full range of color and texture
97.	Stone, natural	- - - -	2 sets each kind, a set being 3 - 12" x 12" pieces representative of full range of color and texture
98.	Tile, structural, clay floor	SS-T-321	10 pieces, each size
99.	Tile, Ceramic floor and base	- - - -	2 panels (12" x 12") each color
100.	Tile, clay-load bearing	SS-T-341 Grade M	20 tiles, each size
101.	Tile clay, non-load bearing	SS-T-351	20 tiles, each size
102.	Tile, cement bond	SS-C-621 Type I	10 tiles
103.	Tile, glazed	- - - -	2 each kind
104.	Tubing, drawn copper	WW-T-799	2 pieces, each 36" long
105.	Weatherstripping	- - - -	3 pieces, 12" long each section
106.	Wood window with screen	- - - -	2 complete

ITEM	MATERIAL	APPLICABLE FEDERAL SPECIFICATION	SIZE OF SAMPLE
107.	Any material required under the contract and not listed above	Applicable A.S.T.M. or Federal specification	Double the quantity required for test

NOTE TO ARCHITECT:
This section should be written to conform to the requirements of individual projects. Federal Specifications have been designated for most materials in the list above. However, there are A.S.T.M. Specifications applicable to many of them and the architect should substitute A.S.T.M. Standards at his discretion.

The size of samples listed is, in general: the quantity listed is twice the required amount needed for test purpose. This will provide for sample to be retained by the Local Authority.

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SUGGESTED SPECIFICATION - DIVISION 1

DIVISION - 1
DEMOLITION AND CLEARING THE SITE:

NOTE TO ARCHITECTS:
This specification for demolition work is intended for use where demolition is to be included in the general contract. Where demolition work is a separate contract, suggested contract documents and specifications are contained in a separate bulletin.

SCOPE:

1-1 Demolish and remove from entire project area all buildings, sheds, fences and other structures.

1-2 Items not included: (Insert)

NOTE TO ARCHITECTS:
Specify in detail all exceptions.

DETAILED REQUIREMENTS:

1-3 Demolish structures to levels approximately 2 feet below rough grades; completely remove retaining walls, walks, porches, steps, piers and other miscellaneous construction as required.

1-4 Demolish masonry walls in small sections; structural steel and heavy timber members shall be individually removed and carefully lowered. Except as before specified, basement walls 2 feet below ground level, if constructed of masonry, shall not be removed.

1-5 Remove partitions, stairways, furnaces, piping, apparatus, and all debris within the basements.

1-6 Keep work thoroughly wetted down; provide water and all connections for this purpose.

1-7 All cisterns, wells, catch basins and cesspools shall be left as found by the Contractor unless specifically noted otherwise.

NOTE TO ARCHITECTS:
A thorough study of the site should be made to locate existing cisterns, wells, catch basins and cesspools, and such locations indicated on the drawings, together with information regarding new methods of covering same, should new covers be required.

FILLING AND GRADING:

1-8 Fill old basements outside of new building areas, to approximate rough grade levels. The top of fill from 18 inches below subgrade shall be of earth free from large rocks and debris.

CLEANING AND REMOVAL OF DEBRIS:

1-9 Upon completion, remove all building materials and debris, and leave the premises in a safe and clean condition.

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NOTE TO ARCHITECTS:
It may be possible to salvage old flagstones, brick, paving block or stone walls for reuse for stepping stones, sitting areas or retaining walls. If such materials are available and desirable for reuse, specifications should state what materials should be salvaged.

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PROJECT NO.
PILING (TIMBER) 2-1

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SUGGESTED SPECIFICATION - DIVISION - 2

DIVISION - 2
PILING (TIMBER):

SCOPE:

2-1 Include furnishing, installing, and cutting off of timber piling necessary to fully complete all timber piling and related work shown and specified.

(a) The number of piles shall be that shown on the drawings. The Contractor shall determine the proper lengths of piles to obtain the specified load bearing capacity.

(b) Sub-surface soil data is shown on the drawings, representing the best available information. The Local Authority assumes no responsibility as to their accuracy or comprehensiveness.

NOTE TO ARCHITECT:
The above scope and this specification are all inclusive for various types of timber piles, and any piling shown on the drawings but not to be included in the Contract, and any limitations as to type of timber piles, should be specifically noted in the scope and corrected in the specification.

PILES:

2-3 (a) All piles shall comply with the requirements of the "Tentative Specifications for Timber Piles, Serial Designation D-25-34T, Class of the American Society for Testing Materials," and shall be either Yellow Pine, Norway Pine, Spruce, Douglas Fir, Red Oak or _____.

(b) Before beginning the work, the Contractor shall submit for approval a description of his proposed method of installation and all driving equipment, including data required for driving formula, and shall specify the kind of wood pile he proposes to furnish.

DRIVING EQUIPMENT:

2-4 (a) Piles shall be driven by means of single-acting steam hammers, the striking part of which shall weigh not less than 5,000 pounds.-3,000 pounds. (NOTE: Delete weight not applicable.)

(b) If piles are to be jetted, the apparatus used to jet the pile in place shall be capable of delivering water continuously at a pressure of at least 100 pounds per square inch through a pipe or pipes of approved size and of such length as to extend to the depth to which piles are to be jetted.

DRIVING:

2-5 (a) Rough excavations shall be made to the pile cut-off elevation before piles are driven.

(b) Piles shall be driven to a final penetration as determined by the following formula:

$$P = \frac{2\,W\,H}{S \text{ plus } 0.1}$$

in which:
P (bearing capacity in pounds) shall be 25% more than the design bearing value shown on the drawings
W is the weight in pounds of striking parts of hammer
H is the height of fall in feet
S is the average penetration in inches per blow for the last six blows.

(c) Piles shall be driven with a variation of not more than 1/8 inch per foot from the vertical. Pile heads shall be within 3 inches of the locations and, except as may

otherwise be directed by the local Housing Authority, cut off within one inch of the elevations shown on the drawings.

(d) The above formula shall apply only when the hammer has a free fall, the head of the pile is free from broomed or crushed fibre, the penetration is at a reasonably quick and uniform rate, and there is no sensible bounce after the blow. The driving shall be continuous from the time of starting until the required bearing value has been reached. Collars, caps and bands of approved design shall be provided and used as necessary to protect the piles.

(e) In case obstructions are encountered in the ground not more than 6 feet below cut off elevation, and which interferes with the driving of piles in their proper location, such piles shall be withdrawn and redriven where directed by the local Housing Authority without extra payment therefor.

(f) A follower shall not be used except where specifically permitted by the local Housing Authority. When used, the safe bearing power of the pile shall be determined by making a proper allowance for reduced penetration caused by shock absorption of the follower.

(g) If piles are to be jetted, they shall be jetted in place to such elevation above the assumed depth of driving as approved by the local Housing Authority. The remaining distance of travel shall be accomplished by a final driving without jetting to the specified bearing capacity (P). Care must be used in jetting so as not to over jet the hole and reduce the fullbearing value of the piles.

CUTTING OFF:

2-6 (a) Cut off piles level and true within 2 inches of the cut-off

elevations indicated, unless the driving of any piles to specified bearing capacity necessitates lower cut-off levels.

(b) If cut-off of piles are made at levels lower than indicated, the Contractor shall redesign the concrete pile caps to the approval of the local Housing Authority.

PRESERVATIVE TREATMENT:

2-7 (Omit if not applicable.)

(a) All piles shall be treated, as specified in the American Wood Preserver's Association Standard specification for "Preservative Treatment of Piles by Pressure Process," with 15 pounds of creosote per cubic foot, using an EMPTY CELL PROCESS WITH INITIAL AIR, except for Douglas Fir, which shall be treated by the FULL CELL PROCESS. The creosote shall comply with the A.W.P.A. specification for "Grade 1 creosote oil for Ties and Structural Timbers."

(b) Certified copies of the creosoting plant's treatment charts in duplicate, showing a complete record of the treatment of all piles delivered, shall be furnished to the local Housing Authority.

(c) After the piles have been driven and cut off, the heads shall be given three coats of hot creosote oil and shall then be given one heavy coat of hot coal-tar pitch.

(d) The creosoting will be inspected at the plant unless the inspection is waived by the local Housing Authority. The Contractor shall inform the local Housing Authority of the name and location of the plant and shall give a reasonable notice as to when the work will start.

(e) The Contractor shall arrange with the officers of the plant to

render the local Housing Authority such assistance as may be required. They shall furnish samples for analysis and afford the use of their laboratory with sufficient and suitable material and appliances. Every detail of the method of treatment, gauging, etc. shall be made plain and access shall be provided to all records of the treatment.

(f) Every pile in each charge shall be bored to determine the depth of penetration. For piles of Southern Yellow or Norway Pine, the depth of penetration shall be not less than 3-1/2 inches or 90 per cent of the sapwood thickness. For all other species, the sapwood shall be entirely penetrated. Red oak piles shall have not less than 3 inches penetration. Where the above minima are not attained, the non-conforming piles shall be rejected or returned to the cylinder for further treatment. Test holes shall be plugged tight with creosoted wood. All creosoted piles shall be subject to reinspection at any time, and timber that is defective or injured in handling will be rejected.

LOAD TESTS:

2-8 (a) Load tests on ( ) piles as selected by the local Housing Authority shall be made as follows:

In not less than 2 days or more than ( ) days after driving, each pile shall be loaded, by means of a suitable balanced platform and heavy material, with a weight equal to one half the design bearing value shown on the drawings. After 24 hours, the load shall be increased to the full bearing value. Twenty-four hours later, the load shall be increased to one and one half times the full bearing value. After another 24 hours, the load shall be finally increased to twice the bearing value and allowed to stand at least 24 hours. Each of

these loads shall be allowed to stand until all settlement of pile ceases before additional load is applied.

(b) During the test, the load shall be guyed laterally in a manner which will not affect the accurate measurement of the applied load.

(c) Test readings with an instrument will be taken by the local Housing Authority before placing any load, at time of completing the placing of the first load and each increased load, and 24 hours after each load has been placed, or the settlement has ceased.

DEFECTIVE WORK:

2-9 (a) If piles are damaged or are not located as required, additional piles shall be driven as specified so located as to bring the center of gravity of the pile cluster within 3 inches of being under the center of gravity of the supported load and the Contractor shall redesign the concrete caps to the approval of the local Housing Authority.

(b) Every pile that has been distorted by the driving of subsequently placed piling shall be corrected to the approval of the local Housing Authority.

(c) Piling rejected after driving may remain in the ground cut off as directed. When rejected piling is withdrawn, the space shall be filled with gravel or broken stone well tamped.

(d) Any damage to existing sewers or other existing utilities that may occur as a result of execution of the piling work shall be made good to the satisfaction of the local Housing Authority.

NOTE TO ARCHITECT:

It is recommended that an alternate proposal be requested as follows:

ALTERNATE NO._____; PILING,
For Piling Based on Total Linear Feet:

(a) See General Note applicable to alternate proposals.

(b) The bidder shall state in his proposal the amount that shall be deducted from the Base Bid if the "BASIS FOR CONTRACT" for the timber piling and related work as specified in the division "PILING" is omitted and in lieu thereof, the amount that shall be added for the timber piling as specified, based on (state amount) linear feet in (state number) piles, as follows:

1. Lump sum price for furnishing, driving, and cutting off (state number) piles, each (state amount) feet long.

2. A Unit Price per pile in place of each of the following lengths within a tolerance of 1 foot less in length: 15, 20, 25, 30, 35, 40, 45, and 50 feet (change range of lengths as applicable).

3. These unit prices shall be as specified in "Unit Prices to be Submitted" in the division "Instructions to Bidders" and shall include the cost of furnishing, handling, treating, driving to specified bearing values, and cutting off.

4. After completion of the piling work, the Contract Price shall be adjusted for the piles actually used in the work, as described in "Contract Price Adjustment Due to Changes Ordered" in the division "Instructions to Bidders," using the approved unit prices as the contract cost of each length of pile.

(c) If this alternate is included in the Contract awarded, the Contractor

shall drive (State number) piles of the type proposed, at locations selected by the local Housing Authority, in accordance with the specifications, to determine the required approximate driving lengths of the remainder of the piles. The cost of driving these test piles shall be included in this alternate proposal.

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SUGGESTED SPECIFICATION DIVISION - 2

DIVISION - 2
PILING (CONCRETE):

SCOPE:

2-1 Include furnishing, installing and cutting off of concrete piling necessary to fully complete all concrete piling and related work shown and specified.

(a) The number of piles shall be that shown on the drawings. The Contractor shall determine the proper lengths of piles, to obtain the specified load bearing capacity.

(b) Subsurface soil data is shown on the drawings, representing the best available information. The Local Authority assumes no responsibility as to their accuracy or comprehensiveness.

NOTE TO ARCHITECT:
The above scope and this specification are all inclusive for various types of cast-in-place and precast concrete piles and any piling shown on the drawings but not to be included in the contract, and any limitations as to type on concrete piles, should be specifically noted in the scope and corrected in the specification.

OPTIONAL TYPES OF PILES:

2-3 (a) Type of Pile - Piles shall be either precast or cast in place and may be, at the Contractor's option, either round, octagonal or square. Square piles shall have chamfered corners. Piles may be of constant

cross-section (with or without bevelled tips) or tapered their full length (stepped or uniform).

(b) Before piles are fabricated, the Contractor shall submit to the Local Authority for approval complete data, including drawings and specifications, of the type of pile he proposes to use and a description of his proposed method of installation, and all driving equipment, including data required for the driving formula.

(c) 1. Precast Piles (Constant Cross Section) - The least lateral dimension of piles which are of constant cross-section shall be 13-1/2 inches for piles up to 27 feet long. This dimension shall be increased 1 inch for every 8 feet of pile length or fraction thereof in excess of 27 feet. Tips may be tapered to a minimum lateral dimension of 10 inches but shall not be tapered more than 1 inch in every 4 feet.

2. Precast Piles - (Tapered) - The least lateral dimension of piles tapered their full length shall be 10 inches at the tip. Starting at the tip, the least lateral dimension shall increase not less than 1 inch in every 8 feet of pile length. The least lateral dimension at the butt shall not be less than 13-1/2 inches.

3. Precast piles shall be reinforced with longitudinal steel not less than 1 per cent of the average gross cross sectional area of the pile and any additional reinforcing steel necessary to take care of stresses due to handling or driving. Lateral reinforcing shall consist of 1/4 inch round hoops or spirals spaced not more than 12 inches apart the full length of the pile, except that for three feet at each end, the spacing shall not be over 3 inches. No steel shall be closer than 2 inches to any outside surface of the pile.

4. Forms for precast piles shall be tight and rigid to prevent leakage or distortion. All piles shall be plainly marked with the casting date. Piles shall be protected against frost or other damage and kept wet until they have attained a 2000# per square inch compressive strength. No piles shall be moved from casting position or racked in banks until tests show they have attained a compressive strength of at least 2000# per square inch. Banks shall not be over 3 piles high. The finished piles shall be sound and free from cracks, spalls and voids.

(d) 1. Cast-in-place Piles - (Constant Cross Section) - The least lateral dimension of piles which are of constant cross-section shall be 13-1/2 inches for piles up to 27 feet long. This dimension shall be increased 1 inch for every 8 feet of pile length in excess of 27 feet. Tips may be tapered to a minimum lateral dimension of 10 inches but shall not be tapered more than 1 inch in every 4 feet.

2. Cast-in-place Piles - (Tapered) - The least lateral dimension of piles tapered their full length shall be 10 inches at the tip. The least lateral dimension at the butt shall be 13-1/2 inches. Starting at the tip, the least lateral dimension shall be increased not less than 1 inch in every 8 feet of pile length.

3. Cast-in-place piles shall have steel shells driven to the required bearing capacity. Shells may be either of the type which shall remain in place permanently or of the removable type which is withdrawn as concrete is placed through it. All shells shall be of such section or have circumferential corrugations or reinforcing to give them sufficient strength to withstand the pressure of the surrounding materials, and to prevent their distortion from the ground pressure developed by the driving of the adjacent piles.

4. No shell shall be filled with concrete until after all the adjacent shells within a radius of 5 feet center to center have been driven to the required bearing and the shell approved by the local Housing Authority.

5. No shell containing water shall be filled with concrete or where, in the opinion of the local Housing Authority, it is leaking sufficiently to damage the green concrete. Facilities for lowering a light down into the shell for easy inspection of the interior of the shell shall be provided.

CONCRETE:

2-4 (a) Concrete and concrete materials for all piles, unless otherwise specified, shall conform to "2,000-pound concrete" as specified in the division "CONCRETE" and shall be thoroughly rodded and worked into place. All tests and furnishing of samples for tests, required under "CONCRETE" shall be furnished for this work.

(b) The concrete for the removable shell type of piles shall have the water content, including free water contained in the aggregate, limited to 6 gallons of water per sack of cement, and the proportions of fine and coarse aggregate shall be so adjusted as to have a slump not in excess of 2 inches, and this concrete shall be placed under sufficient pressure while the shell is being withdrawn to completely fill the full penetration with concrete.

DRIVING EQUIPMENT:

2-5 (a) Piles shall be mandrel driven by means of single-acting steam hammers, the striking part of which shall weigh not less than 5,000 pounds. --3,000 pounds. [NOTE: Delete weight not applicable.]

(b) If piles are to be jetted, the apparatus used to jet the pile in place shall be capable of delivering water continuously at a pressure of at least

100 pounds per square inch through a pipe or pipes of approved size and of such length as to extend to the depth to which piles are to be jetted.

DRIVING:

2-6 (a) Rough excavations shall be made approximately to top of concrete pile caps before piles are driven.

NOTE: Check each job regarding this excavation and adjust this paragraph to suit.

(b) Piles shall be driven to a final penetration as determined by the following formula:

$$P = \frac{2\ W\ H}{S \text{ plus } 0.1}$$

in which

P (bearing capacity in pounds) shall be 25% more than the design bearing value shown on the drawings
W is the weight in pounds of striking parts of hammer
H is the height of fall in feet
S is the average penetration in inches per blow for the last six blows.

(c) Piles shall be driven with a variation of not more than 1/8 inch per foot from the vertical. Pile heads shall be within 3 inches of the locations and, except as may otherwise be directed by the local Housing Authority, cut off within 1 inch of the elevations shown on the drawings.

(d) The above formula shall apply only when the hammer has a free fall, the head of the pile is free from damage, the penetration is at a reasonably quick and uniform rate, and there is no sensible bounce after the blow. The driving shall be continuous from the time of starting until the required bearing value has been reached. Collars, caps and bands of approved design shall be provided and used as necessary to protect the piles.

(e) In case obstructions are encountered in the ground not more than 6 feet below cutoff elevation, and which interfere with the driving of piles in their proper location, such piles shall be withdrawn and redriven where directed by the local Housing Authority without extra payment therefor.

(f) A follower shall not be used except where specifically permitted by the local Housing Authority. When used, the safe bearing power of the pile shall be determined by making a proper allowance for reduced penetration caused by shock absorption of the follower.

(g) If piles are to be jetted, they shall be jetted in place to such elevations above the assumed depth of driving as approved by the local Housing Authority. The remaining distance of travel shall be accomplished by a final driving without jetting to the specified bearing capacity (P). Care must be used in jetting so as not to over jet the hole and reduce the full bearing capacity of the piles.

CUTTING OFF:

2-7 (a) Cut off piles level and true within 2 inches of the cutoff elevations indicated, unless the driving of any piles to specified bearing capacity necessitates lower cutoff elevations.

(b) If cut-off of piles are made at levels lower than indicated, the Contractor shall redesign the concrete pile caps to the approval of the local Housing Authority.

LOAD TESTS:

2-8 (a) Load tests on ( ) piles as selected by the local Housing Authority shall be made as follows:

In not less than 7 days or more than ( ) days after driving, each pile shall be loaded, by means of a suitable balanced platform and heavy material

with a weight equal to one half the design bearing value shown on the drawings. After 24 hours the load shall be increased to the full bearing value. Twenty-four hours later, the load shall be increased to one and one half times the full bearing value. After another 24 hours, the load shall be finally increased to twice the bearing value and allowed to stand at least 24 hours. Each of these loads shall be allowed to stand until all settlement of pile ceases before additional load is applied.

(b) During the test, the load shall be guyed laterally in a manner which will not affect the accurate measurement of the applied load.

(c) Settlement readings will be taken with an instrument by the local Housing Authority before placing any load, at time of completing the placing of the first load and each increased load, and 24 hours after each load has been placed, or the settlement has ceased.

DEFECTIVE WORK:

2-9 (a) If piles are damaged or are not located as required, additional piles shall be driven as specified so located as to bring the center of gravity of the pile cluster within 3 inches of being under the center of gravity of the supported load and the Contractor shall redesign the concrete caps to the approval of the local Housing Authority.

(b) Every pile that has been distorted by the driving of subsequently placed piling shall be corrected to the approval of the local Housing Authority.

(c) Piling rejected after driving may remain in the ground, cut off as directed. When rejected piling is withdrawn, the space shall be filled with gravel or broken stone, well tamped. Rejected shells left in place shall be filled with concrete.

(d) Any damage to existing sewers or other existing utilities that may occur as a result of execution of the piling work shall be made good to the satisfaction of the local Housing Authority.

(e) Infiltration of water into the bottom of any shell to the extent that in the opinion of the local Housing Authority it will prevent placing of concrete without segregating the materials shall be construed as evidence of a damaged shell.

NOTE TO ARCHITECT:
It is recommended that an alternate proposal be requested as follows:

ALTERNATE NO._____; PILING.
For Piling Based on Total Linear Feet:

(a) See General Note applicable to alternate proposals.

(b) The bidder shall state in his proposal the amount that shall be deducted from the Base Bid if the "BASIS FOR CONTRACT" for the concrete piling and related work as specified in the division "PILING" is omitted and in lieu thereof, the amount that shall be added for the concrete piling as specified, based on (state amount) linear feet in (state number) piles, as follows:

1. Lump sum price for furnishing, driving and cutting off (state number) piles, each (state amount) feet long.

2. If it is necessary to drive more than (state number) piles, state Unit Price per pile based on a length of (state amount) feet for each additional pile.

3. If less than (state number) piles are driven, state Unit Price per pile based on a length of (state amount) feet for each pile less than (state number) piles.

4. If it is necessary to drive piles longer than the footage of (state amount) feet each, state the Unit Price per foot for each additional foot over (state amount) feet.

5. If piles are driven less than (state amount) feet, state the Unit Price per foot deductions for each foot less than (state amount) feet.

(c) If this alternate is included in the Contract awarded, the Contractor shall drive (state number) piles of the type proposed, at locations selected by the local Housing Authority, in accordance with the Specifications to determine the required approximate driving lengths of the remainder of the piles. The cost of driving these test piles shall be included in this alternate proposal.

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SUGGESTED SPECIFICATION - DIVISION 3

DIVISION - 3
EXCAVATING, FILLING AND SITE GRADING:

SCOPE:

3-1 Include excavating, filling, rough grading, finish grading of sub-grade, and related items required to fully complete the work within entire project area, unless specifically excepted. Provide additional fill if necessary. Include disposition of surplus materials, material not suitable for filling, and debris.

3-2 Excavating and backfilling for utilities (pipes and conduits) is included under heating, plumbing, electrical and site improvement requirements.

NOTE TO ARCHITECTS:
Specification for mechanical work should be written to conform to the above paragraph.

3-3 Furnishing and placing top soil and landscape work is (is not) included in this contract.

SITE CONDITIONS:

3-4 Visit the site and become familiar with existing ground conditions.

GROUND TESTS:

3-5 Ground tests have been made and results of tests are indicated: but the contractor shall draw his own conclusion therefrom and be responsible therefor. The accuracy of this data is not guaranteed.

NOTE TO ARCHITECTS:
If ground tests have been made, all possible data should be indicated on the drawings.

EXCAVATING:

3-6 Excavations, including sufficient working space, shall be made to depths and dimensions indicated, or required, for execution and inspection of all foundation work.

3-7 If practicable, and approved by the Local Authority, footing trenches may be cut to exact sizes of concrete footings.

3-8 The material to be excavated is earth, (rock) and all other materials, (except rock) and all debris encountered within the project area; it is anticipated that some rock may be encountered, but the Authority assumes no responsibility for its location, physical properties and extent.

NOTE TO ARCHITECTS:
Exercise caution in the language of the above paragraph so that it unmistakably defines the nature of the materials to be excavated.

3-9 Should site conditions require changes in elevations due to unsatisfactory soil conditions or obstructions, or rock excavations, adjustment in contract price will be made on the following basis and in accordance with the terms of the contract.

(a) Earth includes all materials that can be removed by power shovel.

(b) Rock includes stone or boulders too large to be removed by power shovels or without the use of explosives or drills. The written consent of the Local Authority must be obtained before explosives are used and if used, all local regulations, laws and ordinances must be observed.

3-10 Shore and brace excavations as required to maintain them secure; remove shoring before backfilling but not until permanent supports are provided.

3-11 Keep excavations free from water; provide pumps, hose and drainage lines for this purpose; water removed shall be conducted away from project site but not on adjacent privately owned properties.

3-12 Footings and foundations shall rest on undisturbed firm bottoms; excavations carried below indicated levels shall be filled with concrete used for footings.

3-13 Where excavations are carried below indicated levels for slabs on ground, the excess cut shall be filled with gravel or cinders well tamped.

3-14 Where foundations are extended below existing construction, do all underpinning and excavating required, both temporary and permanent; remove all temporary work and make all necessary repairs.

NOTE TO ARCHITECTS:
The above paragraph covers underpinning of existing construction on the project site; if existing construction is beyond the project property lines, specification should require underpinning work to be executed in accordance with, and as required by, local laws and ordinances.

3-15 Excavated materials not required for filling and grading, and debris, shall be removed from the project area.

3-16 Existing walls, floors, footings, piers and other obstructions within an area 2 feet beyond enclosing walls of buildings, tunnels, and other structures shall be entirely removed unless in the opinion of the Local Authority they do not interfere with nor endanger new work.

3-17 Existing walls, curbs, paving and other improvements within the project area on the surface or indicated and not within areas of building excavations, shall be removed to a minimum depth of 2 feet below finish grade, unless otherwise specified or indicated. Items removed shall become the property of the Contractor and shall be disposed of by him.

NOTE TO ARCHITECTS:
If demolition is included in the contract, coordinate the above with work specified under "Demolition". The drawings should carefully indicate in detail all items to be removed or to remain under the above requirement because items which are not exposed to view during the period of bidding may be claimed by him as extras to the contract if discovered and required to be removed after the award of the contract.

3-18 Insanitary conditions shall be corrected or entirely removed.

COLD WEATHER EXCAVATION:

3-19 When freezing temperatures may be expected, excavations shall not be made to full depths indicated unless footings can be poured immediately after excavating work is completed; if the excavation has been carried to required depth and concrete cannot be immediately deposited, the bottoms of excavations shall be protected from frost by suitable means. Any protective covering so placed shall be removed immediately before concrete footings are placed.

FILLING, BACKFILLING AND ROUGH GRADING:

3-20 Do all cutting, filling, backfilling and finish grading necessary to bring the entire project area to the following sub-grade levels, unless otherwise indicated:

(a) For surfaced areas, to the underside of the respective surfacing.
NOTE: Surfaced areas herein referred to mean street and driveway paving, concrete walks and play areas, sitting areas and similar surfacing.

(b) For planted areas, to within _____ inches below finished grade.
NOTE: Planted areas herein referred to mean lawns, shrub beds, and location of other planting.

NOTE TO ARCHITECTS:
Specific exceptions to the foregoing should be taken for the case of any undeveloped, meadow or similar areas which are to be brought to finished grade.

3-21 Provide necessary additional material for fill; dispose of surplus excavated material and material not suitable for filling.

3-22 Unless otherwise directed, do not backfill against foundation walls until superstructure work has been carried above first floor level.

3-23 Fill and backfill shall be deposited in layers of such thickness as required by the nature of the soil (not exceeding 18") and compacted to a uniform solid mass.

3-24 Rocks, blocks of concrete and similar material, but not debris, may be used for filling except against foundation walls; such materials shall be well distributed in earth fill, but shall not be placed in the top 18 inches of fill or backfill; if material of this nature is used voids shall be well filled and tamped to avoid settlement.

3-25 Top 18 inches of fill below sub-grade level shall be earth entirely free from large rocks, discarded building materials, junk, rubbish and other debris.

3-26 Grading around buildings shall be sloped away from walls and the entire project area outside of buildings shall be worked to smooth and regular surfaces. In case of conflict between finished grades shown by contours and figured elevations, the figured elevations shall govern. Finished grades not otherwise indicated shall be uniform levels or slopes between points where elevations are given or between such points and existing finished grade, provided that the surface shall be rounded at abrupt changes in slope.

3-27 Unless otherwise shown, spaces within building lines marked "unexcavated" shall be graded not less than 3 feet below soffits of beam, slabs and joists; no additional fill will be required.

NOTE TO ARCHITECTS:
Drawings should be carefully checked to make sure the above provision does not cause excavations to extend below footings or foundations, or form dangerous pockets in unexcavated areas without adequate drainage.

3-28 Before final acceptance of the work, subgrades which have settled shall be filled to the required levels.

DISPOSITION OF UTILITIES:

3-29 Existing utilities and service lines shall be protected, removed, sealed, or relocated as shown and specified.

NOTE TO ARCHITECTS:
Indicate in detail on drawings and specify all requirements relative to work under this heading.

3-30 Active utilities shown on the drawings shall be adequately protected from damage and shall be removed or relocated only as shown or specified. If active utilities are encountered that are not shown on the drawings, written instructions from the Local Authority shall be followed.

3-31 Inactive and abandoned utilities interfering with the work shall be removed, plugged or capped as required. In the absence of specific requirements inactive utilities lines shall be plugged or capped approximately 5 feet outside of building walls, or as required by the building code.

BENCH MARKS:

3-32 Bench marks, monuments and other reference points shall be carefully maintained; if disturbed or destroyed, they shall be replaced in a manner prescribed by the Local Housing Authority.

TREES:

3-33 Trees within 4 feet of building walls and only those others so noted shall be removed. Trees to remain shall be adequately boxed and protected. Interfering branches shall be removed without injury to trunks or other parts of trees. All cutting or trimming shall be done in accordance with standard modern practice. No grading shall be done within area of spread of branches, except as required by foundation excavations or utility line trenches, in which case no roots over one inch in diameter shall be cut. No fires shall be lit under or near any tree to remain and no debris or material piled or discarded within spread of branches.

3-34 Stumps and roots within building areas and 5 feet outside of building walls shall be completely removed; all other stumps and roots shall be removed to a depth not less than 18 inches below sub-grades.

DRAIN TILE AND FILL:

NOTE TO ARCHITECTS:
Soil and water conditions should determine the use of "Drain Tile" around foundation walls.

3-35 Around foundations walls on approximate level with footings and where indicated, furnish and lay 4 inch agricultural drain tile or 4 inch terra cotta bell and hub tile, or 3 cell terra cotta partition tile; drain tile shall be laid with butted open joints, pitched in the direction of the flow; cover joints with burlap 12-inches wide. Over drain tile fill trench 18" deep with 1/4 to 1 inch (size) broken stone or gravel, or clean cinders.

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NOTE TO ARCHITECTS:
"Unit Prices" should be requested in "Bid Form" for the various items of work required in this division.

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SUGGESTED SPECIFICATION - DIVISION - 4 (SHORT FORM)
For Brick Veneer or Ordinary Construction

DIVISION - 4
CONCRETE WORK:

SCOPE:

4-1 Include all concrete and related work shown and specified. Concrete work included in the other divisions of the specification that is not specifically described shall comply with this division.

(a) Include redesign of slabs, pits and foundations under boilers, chimneys, and equipment indicated on the drawings, to suit the boilers, chimneys and equipment furnished, as necessary.

(b)(Include only if pile foundations are included). Include redesign changes of concrete pile caps as required in the division "PILING" for deviations from pile locations and cut offs shown on the drawings.

(c) (Include only if radial brick chimney is included.) Include redesign changes in the foundations and other related work to adapt the construction to the approved detail of chimney used as provided in the division "RADIAL BRICK CHIMNEY."

NOTE TO ARCHITECT:
The above scope is all inclusive and therefore any concrete work indicated on the drawings, but not to be included in the Contract, should be so noted in this paragraph.

MATERIALS:

4-2 All standard Portland cement, high early strength Portland cement, aggregates, reinforcing steel and cold drawn steel wire shall conform to the requirements of the standards of the American Society of Testing Materials or to the Federal Specifications applicable.

(a) Cement shall be standard Portland or high early strength Portland cement.

(b) Coarse aggregate shall be of 1 inch maximum size for concrete, and uniformly graded from 1/8 to 3/8 inch for cement finish.

Fine aggregate for cement finish shall have not more than 5 per cent pass a 100 mesh sieve and not more than 15 per cent shall pass a 50 mesh sieve.

(c) Water shall be clean, fresh and free from oils, acids, and injurious amounts of alkalies or organic matter.

(d) Reinforcing steel shall be deformed, either intermediate-billet, hard-rail or hard-axle grade steel except that expansion steel, beam stirrups, and column ties or spirals shall be intermediate-billet or structural-billet grade only, either plain or deformed, or cold drawn steel wire.

(e) Metal fabric or wire mesh shall be made of cold drawn steel wire.

(f) Metal accessories shall include spacers, chairs, ties, and other devices necessary for properly assembling, placing, spacing and supporting the reinforcement in place.

(g) Metal anchors for securing brick to concrete walls shall be of dove-tailed shape of 12 gauge steel, 1 inch wide, of any approved type to fit into slots inserted into the face of the concrete. They shall be hot dipped zinc-coated after fabrication. Slots shall be formed of hot dipped zinc-coated steel, dove-tail shape in cross section.

(h) Wire mesh for reinforcement of cement fill on metal stairs shall be 2-inch mesh poultry netting.

(i) Aggregate for non-slip cement finish shall be abrasive aggregate composed of at least 55 per cent aluminum oxide ceramically bonded at high temperature, uniformly graded from 1/32 inch to 1/4 inch.

TESTING AND INSPECTION OF MATERIALS:

4-3 (a) The local housing authority shall have free access to all points where concrete materials are stored, proportioned or mixed and all materials, equipment and methods used shall be subject to their inspection, test and approval.

(b) Samples of materials for tests to be made by the local housing authority shall be furnished by the Contractor, either at the site or at the source of supply, as directed.

STORAGE OF MATERIALS:

4-4 (a) Aggregates shall be handled and stored separately in a manner to prevent segregation or intrusion of foreign matter.

(b) Cement shall be stored in watertight sheds having floors raised off the ground.

(c) Hardened cement and all other rejected materials must be immediately removed from the site.

PROPORTIONING AND MIXING:

4-5 (a) All concrete not shown otherwise on the drawings or not otherwise specified shall be "2,000-pound concrete".

(b) "2,000-pound concrete" shall be proportioned so that the sum of the volumes of fine and coarse aggregates, measured separately damp and loose, shall not exceed six times the volume of cement (one sack of cement being considered as one cubic foot), but not less than five and one half sacks of cement shall be used for each cubic yard of concrete.

(c) The slump shall not exceed 5 inches and the water content, including free water contained in the aggregate, shall not exceed 7-3/4 gallons per sack of cement. Proportion of fine to coarse aggregate shall be such as to produce concrete which will work readily into the forms and will not cause water to collect on the surface, the fine aggregate being not less than one third nor more than one-half of the total aggregate, measured separately.

(d) For all concrete indicated to be "3,000-pound concrete", one sack of cement per cubic yard of concrete shall be added to the mix specified for "2,000-pound concrete" and the water content shall be adjusted so that the slump will not exceed 5 inches and the water contained in the aggregate will not exceed 6-1/2 gallons per sack of cement.

(e) All concrete shall be mixed in a power-operated batch mixer, continuing the mixing at least one minute after all ingredients are in the mixer.

(f) Ready mixed concrete may be used if transported to the site in watertight agitator or mixer truck loaded not in excess of its rated capacity. Discharge at the site shall be made within one and one half hours after water is introduced into the mixer.

(g) Ready dry batched delivery of cement and aggregates may be used if delivered to the site in vehicles having batch compartments of size to suit the rated capacity of the mixer. No water shall be added to the batch until deposited in the mixer. Delivery to the mixer shall be made within one and one half hour after the cement has been added.

(h) No change in the materials or mixes established shall be made without the approval of the local housing authority.

FORMS:

4-6 (a) Forms shall be clean, smooth, sufficiently tight to prevent leakage of cement, securely braced and maintained in position and properly shored to support the construction loads. Sufficient temporary openings shall be provided to permit cleaning and inspection just prior to depositing concrete.

(b) Forms or shores shall not be removed until by thorough examination the concrete is determined to have developed ample strength to support any loads to be superimposed.

(c) Form material shall be such that will produce the following concrete surfaces:

1. Exterior exposed surfaces and interior exposed surfaces in stair halls and in all spaces where plastered walls occur, shall be smooth, dense and free from honeycombing, prominent grain marking, and bulges or depressions more than 3/16 inch in 4 feet. Fins shall be cut off and depressed joint lines filled flush with adjacent surfaces. External angles of exposed concrete lintels shall be beveled.

2. Other exposed interior surfaces shall be dense, free from fins and honeycombing, equal in all respects to surfaces produced by tight and clean surfaced lumber forms.

3. All surfaces not otherwise specified shall be equal to that produced by tight and clean rough lumber forms, free from honeycombing.

(d) No metal tie wire, stays and braces for forms will be allowed to remain within 3/4" of the face of concrete that is to be exposed or finished with paint, plaster or stucco.

(e) Forms shall not be coated with any material that will stain or cause injury to exposed surfaces or finishes of concrete.

(f) Where the soil and workmanship permit accurate excavation to the dimensional sizes of footings, forms may be omitted.

REINFORCEMENT:

4-7 (a) Metal reinforcement shall be free from excessive rust, scale, or other coatings that will reduce bond.

(b) All bending shall be done without heating. Bars shall be free from kinks or bends not called for by the drawings and no bars shall be bent or straightened in a manner that will injure the material.

(c) Wire fabric shall be lapped 4 inches on sides and ends. Temperature bars shall be lapped 1 foot. All other splices where required and permitted shall develop the stress in the steel.

(d) Reinforcement shall be accurately placed in positions shown on the drawings, securely fastened and supported.

(e) Shop drawings for all concrete reinforcement, showing bending and setting diagrams, shall be furnished as required under the heading "SHOP DRAWINGS".

FASTENING DEVICES FOR OTHER WORK:

4-8 (a) Provisions shall be made for installation of inserts, anchors and other fastening devices required for installation of other work.

(b) Where concrete walls, piers, or beams are veneered with brick or other masonry, metal anchor slots shall be built into the concrete spaced as follows:

1. Not over 3 feet apart.

2. Not less than 2 lines of slots between openings in walls.

3. None required in walls where veneer extends 2 feet or less below top of wall, or in spandrel beams 2 feet or less in depth.

(c) Anchors to fit into the slots shall be provided to secure brick work at every fifth course and to secure other masonry as near to that required for brick work as is possible with the type of masonry used.

DEPOSITING CONCRETE:

4-9 (a) Concrete shall not be placed until reinforcing steel, pipes, conduits, sleeves, hangers, anchors, waterproofing and other work required to be built into concrete has been inspected and approved by the local housing authority.

(b) Water and foreign matter shall be removed from the forms and excavations, and unless otherwise directed, wood forms and sand or sandy loam shall be thoroughly wetted just prior to placing concrete on them. Soil under slabs on ground shall be compacted to a firm unyielding surface.

No concrete shall be laid on frozen soil and adequate protection against frost action shall be provided during freezing weather. No foundations shall be placed on back filled or otherwise distrubed earth.

(c) Concrete shall be transported from the mixer to place of final deposit as rapidly as practical by methods which will prevent separation of the ingredients and displacement of the reinforcement. Partially hardened concrete shall not be deposited in the work.

(d) Before placing concrete adjoining construction joints in walls or slabs, the surface of the joints already in place shall be picked, brushed clean and given a coat of neat cement grout. Columns and piers which are to receive connecting beams shall be thoroughly rodded to compact the concrete and eliminate subsequent subsidence.

(e) Immediately after removal of forms, metal form ties extending into concrete shall be cut off at least 3/4 inch back from exposed surfaces and holes filled with a 1:2 cement and sand mortar approximately the same color, and finished flush with the adjacent surface, mixed and placed as dry as possible to avoid excessive shrinkage.

(f) Either internal type mechanical vibrators or other tools and hand spading shall be used as necessary to produce the required concrete quality and finish. Care shall be taken that vibration is not applied long enough to separate the ingredients.

(g) Concrete slabs on the ground shall be well tamped into place. The floors of all Laundries, Play Spaces, Offices and Toilet Rooms built on the ground shall be placed over the following construction:

1. Over the ground surface place a 6-inch bed of stone or gravel consisting of 5 inches graded

from 3/4 to 1½ inch and a one inch layer graded from 1/4 to 3/4 inch. Wet this bed with water, tamp and roll until thoroughly compacted.

2. A tough waterproof paper shall be so laid over the stone or gravel to prevent concrete from combining with the loose material. Care shall be taken to prevent tearing the paper when the concrete is deposited.
(See detail of this construction on the drawings.)

CEMENT FLOOR FINISHES:

4-10 (a) The surface of concrete for slabs shall be struck off reasonably true at the proper level for the specified finish. All water, laitance, and dirt that may work to the surface shall be removed.

(b) Type 1 finish to be used for all floor slabs for which is required the application of asphalt, rubber or ceramic tile, linoleum or wood laid in mastic, shall be composed of 1 part cement and 2 parts fine aggregate, thoroughly mixed dry and spread to a depth not exceeding 1/8 inch over the screeded wet slab, floated and then steel troweled.

(c) Type 2 finish to be used for all slabs for which is required the application of a waterproofing membrane, roofing or roof insulation, shall consist of the screeded wet slab floated to a reasonably smooth finish. A dry mix composed of 1 part cement and 2 parts of fine aggregate may be spread over the screeded slab to a depth not exceeding 1/8 inch before floating.

(d) Type 3 finish to be used for all concrete floor slabs, steps and platforms not otherwise specified, shall be composed of 1 part cement, 2 parts fine aggregate, and 1-3/4 parts of coarse aggregate, mixed dry. This mix may be varied slightly to obtain desired consistency. If the mixture seems too harsh, the coarse aggregate may be reduced. In no event shall the amount of

coarse aggregate be less than 1½ times the amount of the fine aggregate. The finish shall be of the driest consistency possible to work with a sawing motion of the strike-off board, but not more than 5 gallons of water, including the moisture contained in the aggregates, shall be added for each sack of cement in the dry mixture. Mixing shall be done in a batch mixer and continue for not less than 1½ minutes after all ingredients are in the mixer. The mixture shall be spread over the screeded wet slab to a depth of not less than 1/2 inch, struck off and compacted by rolling or tamping and floated to the established elevation. The surface shall then be steel troweled.

(e) During floating test surfaces with a straight edge and eliminate high or low spots. Steel troweling shall be delayed until the concrete has hardened sufficiently to prevent excess fine material or water working to the surface. The finish shall be brought to smooth surface free from defects and blemishes. No dry cement, or cement and sand, shall be placed directly on the surface to absorb moisture or to stiffen the mix.

NON-SLIP FINISH:

4-11 The cement finishes of the treads and platforms of exterior entrance steps indicated to be non-slip shall have not less than 2-1/4 pounds per square yard of non-slip abrasive aggregate embedded uniformly in the finish and compacted to a reasonably level surface.

CURING AND PROTECTION:

4-12 (a) All concrete work and cement finishes shall be protected as necessary against injury from the elements and defacement of any nature during construction operations.

(b) All concrete and cement finish shall be placed and maintained after depositing to have a temperature above 70°F. for not less than 72 hours or above 50°F. for not less than 120 hours when standard Portland cement is used and above 70°F.

for not less than 48 hours or above 50°F. for not less than 72 hours when high early strength Portland cement is used. If necessary, the materials shall be headed and the concrete shall be sufficiently protected so that this temperature can be maintained. No manure, salt or other chemical may be used for such protection.

(c) When atmospheric temperatures above 60°F. occur, concrete slabs without overhead cover shall be covered immediately after the concrete has been placed or the cement finishing has been completed, with two layers of wet burlap. The concrete or cement finished surfaces shall be kept continuously wet for at least 7 days after application, but the burlap may be removed after being in place 72 hours.

(d) For slabs with overhead cover and for all slabs when temperatures above 40°F. occur, the concrete or cement finish need not be covered with burlap but must be kept continuously wet for at least 7 days. When temperature is below 40°F. the concrete shall be kept as moist as practical during the curing period.

(e) Where concrete for walls is placed during dry weather when the temperature may reach 80°F. or higher, the top of the wall shall be covered with wet burlap or other similar material and the entire wall kept continuously wet for a period of at least 72 hours.

(f) If high early strength cement is used, the surfaces need be kept continuously wet for not less than 3 days and the burlap covering may be removed after being in place 48 hours.

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PROJECT NO._____
CONCRETE 4-1

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SUGGESTED SPECIFICATION - DIVISION - 4 (LONG FORM)

DIVISION - 4
CONCRETE WORK:

SCOPE:

4-1 Include all concrete and related work shown and specified. Concrete work included in the other divisions of the specification that is not specifically described shall comply with the requirements of this division.

(a) Include redesign and changes of slabs, pits and foundations under boilers, chimneys, and equipment indicated on the drawings, to suit the boilers, chimneys and equipment furnished, as necessary.

(b) Include redesign changes of concrete pile caps as required in the division "PILING" for deviations from pile locations and cutoffs shown on the drawings. (Include only if pile foundations are included.)

(c) Include redesign changes in the foundations and other related work to adapt the construction to the approved detail of chimney used as provided in the division "RADIAL BRICK CHIMNEY." (Include only if radial brick chimney is included.)

NOTE TO ARCHITECT:
The above scope is all inclusive and therefore any concrete work indicated on the drawings but not to be included in the Contract, should be so noted in this paragraph.

MATERIALS:

4-2 All Portland Cement, High Early Strength Portland cement, aggregates, reinforcing steel, cold drawn steel wire and structural clay tile, to be used for concrete work shall conform to the requirements of the Standards of the American Society of Testing Materials or to the Federal Specifications applicable.

(a) Cement shall be Portland cement or High Early Strength Portland cement.

(b) Coarse aggregate shall be of designated sizes ranging from No. 4 to one inch for concrete and from 1/8 inch to 3/8 inch for cement finish.

Fine aggregate for cement finish shall have not more than 5 per cent pass a 100-mesh sieve and not more than 15 per cent pass a 50-mesh sieve.

(c) Water shall be clean, fresh, and free from oils, acids, and injurious amounts of alkalies or organic matter.

(d) Reinforcing steel shall be deformed, either intermediate-billet, hard-rail, or hard-axle grade steel, except that Expansion Steel, Beam Stirrups and Column Ties and Spirals shall be plain or deformed of intermediate-billet or structural-billet grade only, or cold drawn steel wire. Hard-rail grade bars must be from steel rails which have seen service in track.

(e) Metal fabric shall be made of cold drawn steel wire.

(f) Metal accessories shall include spacers, chairs, ties, and other devices, necessary for properly assembling, placing, spacing and supporting the reinforcement in place.

(g) All supporting legs of beam stirrups and metal accessories which will be in contact with the formwork for exposed concrete surfaces shall be hot zinc coated.

(h) Cinders for concrete fill shall be clean and well-burned.

(i) Metal anchors for securing brick to concrete walls, columns, or beams shall be of the dove-tailed shape of 12 gauge steel, 1 inch wide of any approved type to fit into slots inserted into the face of the concrete. They shall be hot dipped zinc coated after fabrication. Slots shall be formed of hot dipped zinc coated steel, dove-tail shape in cross section.

(j) Metal anchors for securing stone work or other masonry shall be of wrought iron or steel zinc coated after fabrication, of suitable gauge and shape, as approved by the local Housing Authority to fit into metal slots or inserts.

(k) Metal fabric for securing concrete fireproofing to steel columns and beams shall be No. 10 plain steel wire, spaced 6 inches on centers, arranged to be secured firmly in position 3/4 inch away from the flat surface of the column or beam flanges.

(l) Coloring pigment for cement floor finish shall be lime proof mineral oxides ground and machine mixed with the Portland cement at the mill.

(m) Precast roof slabs shall be of concrete, light weight concrete, cinder concrete, aero crete, nailcrete, or of gypsum, of standard and established manufacture, adequately reinforced to resist tensile stresses, provided that the material to be used shall meet the approval of the local Housing Authority and shall be capable of supporting a uniformly distributed ultimate test load of 250 pounds per square foot for the spans shown on the drawings. They shall be free from warps, cracks and chipped surfaces or broken off places.

(n) Joint filler material for precast roof slabs shall be commercially manufactured asphalt cement meeting the approval of the local Housing Authority.

(o) Structural clay tile for combination tile and concrete floor construction shall be grade M.

(p) Wire mesh for reinforcement of cement fill on metal stairs shall be 2-inch mesh poultry netting.

(q) Aggregate for non-slip cement stair tread and platform finish shall be abrasive aggregate composed of at least 55 per cent aluminum oxide ceramically bonded at high temperature, uniformly graded from 1/32 inch to 1/4 inch.

TESTING AND INSPECTION OF MATERIALS:

4-3 (a) The local Housing Authority shall have free access to all points where concrete materials are stored, proportioned or mixed and all materials, equipment and methods used shall be subject to their inspection, test and approval.

(b) The Contractor shall furnish to the local Housing Authority mill test reports for all Portland cement, high early strength cement, reinforcing steel and cold drawn steel wire used for this work. Four copies of all of such reports and of tests specified to be made by the Contractor, shall be furnished to the local Housing Authority.

(c) Samples of materials for tests to be made by the local Housing Authority shall be furnished by the Contractor, either at the site or at the source of supply, as directed.

STORAGE OF MATERIALS:

4-4 (a) Aggregates shall be handled and stored separately in a manner to prevent segregation or intrusion of foreign matter.

(b) Cement shall be stored in watertight sheds having floors raised off the ground.

(c) Hardened cement and all other rejected materials must be immediately removed from the site.

PROPORTIONING AND MIXING:

4-5 (a) All concrete not shown otherwise on the drawings or not otherwise specified shall be "2,000-pound concrete." The Contractor shall have the option of furnishing a "fixed volume mix concrete" based on established results for average materials, as provided in the following paragraph (b), or a "controlled mix concrete" as established by an approved testing laboratory, as provided in the following paragraph (c).

(b) The "fixed volume mix concrete" for all "2,000-pound concrete," shall be

proportioned so that the sum of the volumes of fine and coarse aggregates, measured separately damp and loose, shall not exceed six times the volume of cement (one sack of cement being considered as one cubic foot), but not less than five and one-half sacks of cement shall be used for each cubic yard of concrete.

(c) The "controlled mix concrete" as established by an approved testing laboratory for all "2,000-pound concrete," shall contain not less than five sacks of cement per cubic yard of concrete. Advance tests in accordance with A.S.T.M. C-39-33 to determine the proper mix, at the expense of the Contractor, shall be made prior to beginning operations with this type of mix. Four cylinder specimens from each of at least four different mixes shall be tested, 2 at 7 days and 2 at 28 days. The mixes to be used in the structure shall be such as to produce a cylinder strength of not less than 1,200 pounds per square inch at 7 days and 2,000 pounds per square inch at 28 days.

(d) For either concrete mix the slump shall not exceed 5 inches and the water content, including free water contained in the aggregate, shall not exceed 7-3/4 gallons per sack of cement. Proportion of fine to coarse aggregate shall be such as to produce concrete which will work readily into the forms and will not cause water to collect on the surface, the fine aggregate being not less than one-third nor more than one-half of the total aggregate, measured separately.

(e) For all concrete shown on the drawings to be "3,000-pound concrete," one sack of cement per cubic yard of concrete shall be added to the mix approved for "2,000-pound concrete" and the water content shall be adjusted so that the slump will not exceed 5 inches and the water content, including free water contained in the aggregate, will not exceed 6½ gallons per sack of cement.

(f) All concrete shall be mixed in a power-operated batch mixer. For mixers of 1 cubic yard or less capacity, mixing shall continue at least one minute after all ingredients are in the mixer. If batches are larger than 1 cubic yard, the mixing time shall be increased at least 30 seconds for each cubic yard or fraction thereof additional capacity. Either ready mixed, ready dry batched, or concrete mixed at the site may be used.

(g) Ready mixed concrete shall be transported to the site in a watertight agitator or mixer truck loaded not in excess of its rated capacity. Discharge at the site shall be made within one and one-half hours after water has been introduced into the mixer.

(h) Ready dry batched delivery of cement and aggregates shall be delivered to the site in vehicles having batch compartments of size to suit the rated capacity of the mixer. No water shall be added to the batch until deposited in the mixer. Delivery to the mixer shall be made within one and one-half hours after the cement has been added. No frozen materials nor materials containing ice shall be used.

(i) No change in the materials or established mixes shall be made without the approval of the local Housing Authority.

FORMS:

4-6 (a) Forms shall be sufficiently tight to prevent leakage of mortar, clean, smooth, securely braced in position and sufficiently shored to safely support construction loads. Temporary openings shall be provided where necessary to facilitate cleaning and inspection immediately before depositing concrete.

(b) The Contractor shall remove forms after use at his own responsibility but only after permission for their removal has been given by the local Housing Authority.

(c) Forms may be either lined or unlined but shall produce the following surfaces:

1. Exterior exposed surfaces and interior exposed surfaces in stair halls and in all spaces where plastered walls occur, shall be smooth, dense and free from honeycombing or prominent grain marking. The edges of all form panels in contact shall be in the same plane within a tolerance of 1/16 inch. There shall be no bulges or depressions deeper or higher, respectively, than 3/16 inch in four feet. Fins shall be cut off and depressed joint lines filled flush with adjacent surfaces. Any of these concrete surfaces which do not conform to the above requirements shall be corrected to conform in a manner satisfactory to the local Housing Authority. External angles of exposed concrete beams in these spaces shall be beveled.

2. Other exposed interior surfaces shall be dense, free from fins, and honeycombing, equal in all respects to surfaces produced by tight and clean surfaced lumber forms.

3. All surfaces not otherwise specified shall be equal to that produced by use of rough lumber forms, free from honeycombing.

(d) No metal tie wire, stays, and braces for forms will be allowed to remain within 3/4" of the face of concrete that is to be exposed or finished with paint, plaster or stucco.

(e) Forms shall not be coated with any material that will stain or cause injury to surfaces or finishes of concrete.

(f) Where the soil and the workmanship permit accurate excavation to the dimensional sizes of footings, forms may be omitted.

REINFORCEMENT:

4-7 (a) Metal reinforcement, before being placed, shall be free from excessive rust, scale or other coatings that will reduce bond.

(b) Column bars less than one inch in diameter may be bent as required at the site but all other bending shall be done without heating in a fabricating plant. Bars shall be free from kinks or bends not called for by the drawings and no bars shall be bent or straightened in a manner that will injure the material.

(c) Splices shall not be made in reinforcement for slabs, beams and girders. Wire fabric shall be lapped 4 inches on sides and ends. Temperature bars shall be lapped 1 foot. All other splices where required or permitted shall develop the stress in the steel.

(d) Reinforcement shall be accurately placed in positions shown on the drawings, securely fastened and supported.

(e) Shop drawings for all concrete reinforcement, showing bending and setting diagrams, shall be furnished as required under the heading "SHOP DRAWINGS." Separate placing plans shall be made for each building, foundation, and for all except identical floor and roof plans. Buildings of opposite hand shall have separate placing plans.

FASTENING DEVICES FOR OTHER WORK:

4-8 (a) Provisions shall be made for installation of inserts, anchors and other fastening devices required for installation of other work.

(b) Where concrete walls, columns or beams are veneered with brick or other masonry, metal anchor slots shall be built into the concrete, spaced as follows:

1. Not over 3 feet apart.

2. Not less than 2 lines of slots between openings in walls.

3. None required in walls where veneer extends 2 feet or less below top of wall, or in spandrel beams 2 feet or less in depth.

(c) Anchors to fit into the slots shall be provided to secure the brickwork at every fifth course and to secure other masonry as near to that required for brickwork as is possible with the type of masonry used.

DEPOSITING CONCRETE:

4-9 (a) Concrete shall not be placed until reinforcing steel, pipes, conduits, sleeves, hangers, anchors, waterproofing and other work required to be built into concrete has been inspected and approved by the local Housing Authority.

(b) Water and foreign matter shall be removed from forms and excavations, and unless otherwise directed, wood forms and sand or sandy loam shall be thoroughly wet just before concrete is deposited on them. Soil under slabs on ground shall be compacted to a firm, unyielding surface. No concrete shall be laid on frozen soil and adequate protection against frost action shall be provided during freezing weather. No concrete for foundations shall be placed on earth which has been back filled or otherwise disturbed. All soil bottom for slabs and footings shall be approved by the local Housing Authority before placing concrete.

(c) Concrete shall be transported from the mixer to the place of final deposit as rapidly as practical by methods which will prevent separation of the ingredients and displacement of the reinforcement, and which will avoid rehandling. Partially hardened concrete shall not be deposited in the work.

(d) Before placing concrete adjoining construction joints in walls and slabs, the surface of the joint already in place shall be picked, brushed clean and given a coat of neat cement grout. Columns and piers which are to receive connecting

beams shall be thoroughly rodded to compact the concrete and eliminate subsequent subsidence.

(e) Immediately after removal of forms, metal form ties extending into concrete shall be cut off at least 3/4 inch back from surfaces exposed to view and holes pointed up with a 1:2 cement and sand mortar approximately the same color and finish as the adjacent concrete surface, mixed and placed as dry as possible to avoid excessive shrinkage.

(f) Either internal type mechanical vibrators or other tools and hand spading shall be used as necessary to produce the required concrete quality and finish. Care shall be taken that vibration is not applied long enough to separate the ingredients.

(g) Concrete slabs on the ground shall be well tamped into place. The floors of all Laundries, Play Spaces, Offices and Toilet Rooms built on the ground shall be constructed as follows:

1. Over the ground surface, place a 6 inch bed of stone or gravel consisting of 5 inches graded from 3/4 to 1-1/2 inch in size and a one inch top layer graded from 1/4 to 3/4 inch. Wet this bed with water, tamp and roll until thoroughly compacted.

2. A tough waterproof paper shall be so laid over the gravel or stone as to prevent concrete from combining with the loose material.

3. The concrete slab shall then be poured on this paper and tamped, care being taken to prevent tearing of paper. (See detail of this floor construction on the drawings.)

(h) Work shall be laid out so that each floor and roof slab may be poured in one operation, if possible. Construction joints shall be vertical and in no event located within 3 feet of the support of any slab or beam.

(i) (To be included when cement finish is to be applied separately.)
The surface of the structural floor slab shall be finished reasonably true and struck off at a level 3/4-inch below the required finish floor elevation.

As soon as the condition of the concrete base permits, before it has fully hardened, all dirt, laitance and loose aggregate shall be removed from the surface with a wire broom so that the coarse aggregate in the surface of the slab is left slightly exposed to insure a satisfactory bond for the cement finish.

If the laitance is not fully removed and all surfaces are not adequately roughened by brooming and kept clean by adequate protection, the surface shall be thoroughly cleaned and roughened by chipping to insure complete bond before application of the cement finish after the base has hardened.

CEMENT FLOOR FINISHES:

4-10 (To be included when cement finish is to be applied integrally.)

(a) The surface of the structural slab shall be struck off reasonably true at the proper level for the specified finish. All water, laitance, and dirt that may work to the surface shall be removed.

(b) Type 1 finish, to be used for all floor slabs for which is required the application of asphalt, rubber or ceramic tile, linoleum or wood laid in mastic, shall be composed of 1 part cement and 2 parts fine aggregate thoroughly mixed dry, and spread to a depth not exceeding 1/8 inch over the screeded wet slab, floated and then steel troweled.

(c) Type 2 finish, to be used for all slabs for which is required the application of a waterproofing membrane, roofing or roof insulation, shall consist of the screeded wet slab floated to a reasonably smooth finish. A dry mix composed of 1 part cement and 2 parts fine aggregate may be spread over the screeded slab to a depth not exceeding 1/8 inch before floating.

(d) Type 3 finish, to be used for all concrete floor slabs, steps and platforms not otherwise specified, shall be composed of 1 part cement, 2 parts fine aggregate and 1-3/4 parts of coarse aggregate, mixed dry. This nominal mix may be varied slightly depending on the consistency. If the mixture seems too harsh, the coarse aggregate may be reduced. In no event shall the amount of the coarse aggregate be less than 1½ times the amount of the fine aggregate. The finish shall be of the driest consistency possible to work with a sawing motion of the strike off board, but not more than 5 gallons of water, including the moisture contained in the aggregates, shall be added for each sack of cement in the dry mixture. The mixing shall be done in a batch mixer and continue for not less than 1½ minutes after all ingredients are in the mixer. The mixture shall be spread over the screeded wet slab to a depth not less than 1/2 inch, struck off and compacted by rolling or tamping and floated to the established elevation. The surface shall then be steel troweled.

(e) During floating of cement finishes, the surface shall be tested with a straight edge to detect high and low spots which shall be eliminated. Steel troweling shall be delayed until the concrete has hardened sufficiently to prevent excess fine material or water working to the surface. The finish shall then be brought to a smooth surface free from defects and blemishes. No dry cement, or cement and sand, shall be placed directly on the surface to absorb moisture or to stiffen the mix.

(f) (To be included when cement finish is to be applied separately.)

The cement finish (including the coved cement base) to be used for (specify scope), shall not be applied until after the interior partitions have been placed and finished and all other work which may damage or deface the cement finish is completed. The mixture shall consist

of 1 part cement, 1 part fine aggregate and 1-3/4 part coarse aggregate. If the mixture is too harsh the coarse aggregate may be reduced but in no case shall the amount of coarse material be less than 1½ times the amount of the fine aggregate. If color pigment is added to the cement, adjustment of the mix shall be made by reducing the amount of the fine aggregate and maintaining the specified proportion of cement. The consistency shall be as dry as possible to work with a sawing motion of the strike off board, but in no case shall more than 5 gallons of mixing water, including the moisture in the aggregates, be used for each sack of cement. The mixing shall be done in a batch mixer and shall continue for at least 1½ minutes after all ingredients are in the mixer.

(g) Just prior to placing the finish, the base slab shall be thoroughly cleaned by scrubbing, chipping the slab if necessary, to insure complete bond. The base slab shall then be thoroughly wetted, but there shall be no free standing water left on the wetted surface. A thin coat of neat cement grout shall be broomed into the surface of the slab for a short distance ahead of the topping. The cement finish shall be immediately applied to a depth not less than 3/4 inch, and struck off before the grout has hardened, compacted by tamping or rolling and then floated to the established grade. The surface shall be tested with a straight edge to detect high and low spots which shall be eliminated.

(h) The floating shall be followed by steel troweling after the concrete has hardened sufficiently to prevent excess fine materials from working to the surface. The finish shall be brought to a smooth surface free from defects and blemishes within a tolerance of 1/16 inch for high or low spots. No dry cement, or cement and sand, shall be sprinkled directly on the surface to absorb moisture or to stiffen the mix.

(i) Cement finish for floors of closets shall be the same as the cement finish for adjoining floor surfaces, regardless of finished covering.

(j) Cement fill and finish for all metal pan stairs shall be of composition and finish specified for Type 3 Finish, reinforced, for the landings only, with poultry mesh.

NON-SLIP FINISH:

4-11 The cement finishes of the treads and platforms of exterior entrance steps shown on the drawings to be non-slip shall have not less than 2¼ pounds per square yard of non-slip abrasive aggregate embedded uniformly in the finish and compacted to a reasonably level surface.

CURING AND PROTECTION:

4-12 (a) All concrete work and cement finishes shall be protected as necessary against injury from the elements and defacement of any nature during construction operations.

(b) All concrete and cement finish shall be placed and maintained after depositing at a temperature above 70° F for not less than 72 hours, or above 50° F for not less than 120 hours when standard cement is used and above 70° F for not less than 48 hours or above 50° F for not less than 72 hours when high early strength cement is used. If necessary, the materials shall be heated and the concrete shall be sufficiently protected so that this temperature can be maintained. No manure, salt or other chemical may be used for such protection.

(c) When atmospheric temperatures above 60° F occur, concrete slabs without overhead cover shall be covered immediately after the concrete has been placed or the cement floor finishing has been completed, with two layers of wet burlap. The concrete and cement finished surfaces shall be kept continuously wet for at least 7 days after application, but the burlap may be removed after being in place 72 hours.

(d) For slabs with overhead cover and for all slabs when temperatures above 40° F. occur, the concrete or cement finish need not be covered with burlap but must be kept continuously wet for at least 7 days. When temperature is below 40° F., the concrete shall be kept as moist as practical during the curing period.

(e) Where concrete for walls is placed during dry weather when the temperature may reach 80° F. or higher, the top of the wall shall be covered with wet burlap or some similar material and the entire wall kept continuously wet for a period of at least 72 hours.

(f) If high early strength cement is used, the surfaces need be kept continuously wet for not less than 3 days and the burlap covering may be removed after being in place 48 hours.

CINDER CONCRETE FILL:

4-13 Cinder concrete fill shall be mixed in the proportions of 1 part cement to 8 parts of cinders, placed after concrete surfaces are dry and floated to a reasonably smooth finish. Where pipes which are not coated with asphaltum extend through roof slab, use stone concrete fill in lieu of cinder concrete for a distance of one foot around pipes.

CANT STRIPS:

4-14 Cant strips, formed of cement finish composed of 1 part cement, 3 parts fine aggregate and 5 parts of coarse aggregate, and of dimensions as shown on drawings, shall be provided at all angles formed by the intersection of concrete roof surfaces with the surfaces of the other construction (except pipes) extending above roofs. Such strips shall be floated to a reasonably smooth finish, properly aligned and mitred at corners of walls.

PRECAST ROOF SLABS:

4-15 The precast roof slabs the Contractor proposes to use shall be fully described, detailed and substantiated by authentic laboratory test reports and evidence of satisfactory use in similar building construction, which shall be submitted to the local Housing Authority for approval. Shop drawings shall be furnished in accordance with the heading "SHOP DRAWINGS." Installation shall conform to the approved manufacturer's directions. All joints shall be sealed at the top surface with asphalt cement joint filler.

LOAD TESTS:

4-16 (a) In the event that tests on specimens of the concrete being furnished show that the average strength of specimens tested at age of 28 days falls below 2,000 pounds per square inch for "2,000-pound concrete" and 3,000 pounds per square inch for "3,000-pound concrete," the local Housing Authority shall have, in addition to other recourses, the right to require at the Contractor's expense a load test on any slabs or beams in which such concrete was used. Such test need not be made until the concrete has aged 60 days.

(b) The slabs or beams under consideration for a load test shall be loaded to one and one-half times the design load, including the weight of the concrete as part of the load. The load shall be applied uniformly over the portion being tested in an approved manner, and left in position for 24 hours. The structure shall be considered satisfactory if the deflection "D" in feet, at the end of the 24 hour period does not exceed the value of $D = \frac{0.001L^2}{t}$, in which "L" is the span in feet, "t" is the depth of slab or beam in inches.

(c) If the deflection exceeds the value of "D" in the above formula, the construction shall be considered to have failed unless within 24 hours after removal of the load, the slab or beam under test shows a recovery of at least 75 per cent of the observed deflection.

(d) For any other portions of the work in which such concrete of indicated deficient strength has been used where load test will be impractical, the local Housing Authority shall have in addition to other recourses the right to substitute the requirement that, at the Contractor's expense, specimens of the hardened concrete be secured in accordance with A.S.T.M. C42 and tested per A.S.T.M. C39, as applicable. Should such specimens not have developed compressive strengths of at least 2,000 pounds per square inch for "2,000-pound concrete" and 3,000 pounds per square inch for "3,000-pound concrete," the concrete shall be considered faulty and such changes or modifications as are necessary shall be made to make the structure adequate for the designed capacity.

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DEPARTMENT OF THE INTERIOR
UNITED STATES HOUSING AUTHORITY
WASHINGTON, D. C.

DATE
OCT.-1938

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DEPARTMENT OF THE INTERIOR
UNITED STATES HOUSING AUTHORITY
WASHINGTON, D. C.

DATE
SEPT.-1938

REVISIONS

SUGGESTED SPECIFICATION - DIVISION - 5

DIVISION - 5
MASONRY WORK:

SCOPE:

5-1 Furnish all labor, materials and other items of masonry and construct the work shown on the drawings and as provided in the specification.

NOTE TO ARCHITECT:
The above paragraph is all inclusive; therefore, any masonry work indicated on the drawings, but not included under this division, shall be noted.

5-2 Items not included under this heading:

MATERIALS:

5-3 BRICK FOR FACING work shall be new, whole, sound, hard common or face brick made from clay or shale, evenly burned, free from cracks and badly warped surfaces and other defects; they shall be of material and manufacture which has proven satisfactory over a period of years in local use. Brick shall absorb not more than 18 percent moisture after being fully submerged in water 24 hours. Two bricks when struck together shall emit a clear ringing sound; slight variations and irregularities that are characteristic of the type of brick selected will be accepted. Subject to the approval of the Local Authority, the Contractor may furnish brick comparable in qualities to the brick for facing specified.

5-4 Absorption tests will be made on samples, taken from deliveries at the discretion of the Local Authority. All brick delivered for use shall meet the absorption requirements of Federal Specification SS-B-656-Grade M.

5-5 BRICK FOR FACING shall be similar in color and texture, and equal with respect to physical characteristics to the samples submitted by the Contractor and approved by the Local Authority and on display in the office of the Architect during the period of bidding and construction.

NOTE TO ARCHITECT:
If facing brick as selected or as obtained in the local market are of sizes other than standard stock, include the following paragraph;

5-6 The drawings are based on the use of standard size brick, as established by simplified practice, namely: 2-1/4 by 3-3/4 by 8 inches; brick that is acceptable for quality but does not come within the specified limitations for size in one or more dimensions may be used, provided the Contractor makes and assumes responsibility for all necessary adjustments in the work affected by such change. Changes in size of brick and adjustments as required shall be approved by the Architect before proceeding with the work.

NOTE TO ARCHITECT:
The following paragraph should be included where design calls for two color brick.

5-7 Attention is directed to the fact that "dark" and "light" facing bricks are required (see drawings).

5-8 BRICK OTHER THAN FACING BRICK shall be medium or hard burned, sound, common

brick, uniform in shape and size. Causes for rejection: over or under-burning, warping, excessive cracks or spalls.

5-9 TERRA-COTTA TILE, LOAD BEARING TYPE, (side construction or vertical cell) shall conform to applicable requirements of A. S. T. M. Standard or Federal Specification; they shall be sound, medium or hard burned units, free from large cracks, spalls, reasonably free from laminations and without excessive warpage; they shall be of standard shapes and dimensions and shall include stock closures, shapes and fitters, required to properly bond themselves, and connecting work. Surfaces that are to be plastered shall be keyed or scored; the keys or scoring shall be of such character as to provide a satisfactory mechanical bond for plaster; surfaces exposed in the finished work shall be smooth.

5-10 TERRA-COTTA TILE, NON-LOAD-BEARING TYPE, shall conform to applicable requirements of A. S. T. M. Standard or Federal Specification; they shall be class "Soft or Better", of standard shapes and dimensions and include all stock specials required to properly bond themselves and connecting work. Surfaces that are to be plastered shall be keyed or scored; the keys or scoring shall be of such character as to provide a satisfactory mechanical bond for plaster; surfaces exposed in the finished work shall be smooth. Provide all necessary stock closures, shapes and fitters where required.

5-11 MASONRY UNITS, (CEMENT BOND) LOAD-BEARING TYPE, shall conform to applicable requirements of A. S. T. M. Standard or Federal Specification; they shall be free from organic substances and materials that will stain

plaster. Surfaces exposed in the finished work shall have a relatively fine uniform texture; units, when delivered, shall be in good condition. Provide all necessary stock closures, shapes and fitters where required.

5-12 MASONRY UNITS, (CEMENT BOND) NON-LOAD-BEARING TYPE, shall conform to applicable requirements of A. S. T. M. Standard or Federal Specification; they shall be free from organic substances and materials that will stain plaster. Surfaces exposed in the finished work shall be smooth. Surfaces that are to be plastered shall be keyed or scored; the keys or scoring shall be of such character as to provide a satisfactory mechanical bond for plaster. Units, when delivered, shall be tough enough to prevent breakage in shipment and handling, and shall be delivered in good condition. Provide all necessary stock closures, shapes and fitters where required.

5-13 GLASS BUILDING UNITS shall be fabricated of heat resisting, water clear crystal glass, formed into hollow units having a partial vacuum; glass units shall have smooth or corrugated exterior surfaces with inner surfaces corrugated or treated to produce a translucent but not transparent unit. All edges and surfaces in connection with mortar shall provide a rough sanded surface for proper bond for setting. Glass building units shall be of size and thickness shown, unless otherwise approved by the Local Authority; units shall be of uniform size throughout and shall lay up equal distance center to center of joints in each direction.

5-14 GYPSUM BLOCK shall be a standard stock commercial product, straight, true and

scored or roughened to provide a key for plaster; they may be either solid or cored. Blocks shall have a ultimate compressive strength when dry, and tested on edge, of not less than 75 pounds per square inch of gross area.

5-15 FACING TILE: Where facing tile is designated on the drawing, they shall be smooth face terra-cotta tile partition block, free from defects that would mar the appearance or affect the structural strength of the wall. They shall be of an approved color to match a sample on file in the office of the Architect during the period of bidding and construction. Exposed surfaces shall be free from spalls; tile shall be of thickness required by the details; surfaces of tile where plaster is required shall be keyed or scored. The keys or scoring shall be of such character as to provide a satisfactory bond for plaster.

5-16 FACING TILE: Where face tile is designated on the drawings, they shall be masonry units with an applied dull ceramic glaze of an approved color to match a sample on file in the office of the Architect during the period of bidding and construction. The glaze shall produce an impervious vitreous surface, shall be smooth and shall have edges free from spalls. If one side of the tile is to be plastered, this surface shall be free from glaze and keyed or scored; the keys or scoring shall be of such character as to provide a satisfactory bond for plaster. Units shall be approximately 5 by 12 by 3-3/4 inches, unless otherwise shown. All necessary shapes shall be provided at external angles and elsewhere as required.

5-15 FACING TILE: Where face tile is designated on the drawings, they shall be masonry units manufactured from

fire clay, semi-fire clay, or shale, or a combination thereof, with a salt glazed vitrified facing to match a sample on file in the office of the Architect during bidding and construction. Exposed surfaces shall be highly resistant to staining; shall be smooth and have edges free from spalls. If one side of the tile is to be plastered this surface shall be free from glaze and keyed or scored. They key or scoring shall be of such a character as to provide a satisfactory bond for plaster. Units shall be approximately 5 by 12 by 3-3/4 inches unless otherwise shown. Where used as furring, the units shall be 1 inch thick. Units shall be delivered in cardboard or heavy paper or other suitable containers. All necessary shapes shall be provided at external angles and elsewhere as required.

5-16 FLUE LINING shall be sound, hard burned, unwarped, terra-cotta flue tile, free from cracks and spalls; provide necessary thimbles of required size.

5-17 FIRE-CLAY BRICK shall be a stock commercial product, conforming to applicable minimum requirements of A. S. T. M. Standard or Federal Specification.

5-18 WALL COPING shall be a stock commercial product of vitrified clay tile, with or without salt glazed finish surface (see sample in Architect's office during the period of bidding). Pieces shall be of proper width to lap the walls; they shall be approximately 2 feet long with ends formed to provide lap joints.

(a) The top surface of joint shall finish flush with the top surface of the coping.

(b) Top surface of joint shall finish above the top surface of the coping.

(c) Coping tile shall be so formed that when set in place and caulked, as required, they will exclude water from the top of the masonry walls. Provide starting pieces, corner pieces, special shapes and closed end pieces, where required.

5-19 MORTAR MATERIALS: Portland cement, masonry cement and lime shall conform to applicable A. S. T. M. Standards or Federal Specifications.

(a) LIME shall be of a highly plastic type and may be either hydrated lime, pulverized quick lime or lump quick-lime. After cooling and before being used, the putty shall season as follows: Hydrated lime putty at least 24 hours. Pulverized quick-lime putty at least 72 hours. Lump quicklime putty at least 21 days. Putty shall be well sieved and shall be smooth, stiff and kept moist until used.

(b) Packaged materials shall be delivered in unopened containers bearing manufacturer's name and brand.

5-20 SAND shall be clean and sharp; it shall pass a number 8 sieve and not more than 5 percent shall pass a number 100 sieve; it shall be well graded within these maximum and minimum sizes; it shall contain not more than 5 percent of organic or other deleterious matter.

5-21 **WATER** shall be fresh, clean and free from injurious substances.

5-22 ANCHORS for securing brick to concrete surfaces are specified under the division "CONCRETE WORK". Build in all anchors where anchor slats are provided; anchors shall be spaced not over every fifth course vertically.

NOTE: The contractor shall not, except at his own risk, order any material required under this division until he has submitted to the Local Authority such samples or data (or both) as the latter may require and until the items have been approved in writing by the Local Authority. Approval of materials shall be general only and shall not preclude rejection of materials actually delivered to the site and subsequently found not to comply with contract requirements (see heading "Samples").

MORTAR:

5-23 Mortar materials shall be accurately proportioned and shall be thoroughly mixed; mortar which has been mixed more than 2 hours shall not be used and the necessity for retempering shall be kept to the practicable minimum.

NOTE TO ARCHITECT:
Section 5-24 and 5-25 cover alternate suggestions for mortar specifications. One or the other should be specified but not both. Selection should be made by the Architect.

5-24 Mortar shall be made from a mixture of portland cement, lime (dry or putty), and sand; or a standard brand of masonry cement and sand.

The brand of materials and proportions in which they are to be used shall be submitted by the Contractor to the Local Authority for approval before incorporating in work.

The mortar shall be such as to produce a satisfactory bond with the brick or tile used and the Contractor shall be responsible for adjusting the mortar consistency, as used, to suit the surface characteristics of the masonry units being laid.

All mortar shall have a compressive strength of not less than 350 pounds per square inch at the end of 7 days storage. 2 inch cubes shall be made in accordance with Federal Specification SS-C-181a, from mortar in use. These samples for test shall be made from time to time at the discretion of the Local Authority, by their representative on the site.

NOTE TO ARCHITECT:
Mortars commonly used and likely to prove satisfactory, range from 1:1:6 to 1:2:9, depending upon the physical properties of the cementiceous materials used. In the case of masonry cements, the proportion of cement and sand must be adjusted to suit the physical characteristics of the particular masonry cement used. Proportions recommended by the manufacturers, generally, should be followed, provided the mortar resulting therefrom meets the requirements as specified.

5-25 Mortar shall be composed of 1 part of portland cement, 1 part pulverized hydrated lime (dry basis) or 1-1/2 parts of lime putty and 6 parts sand, all by volume.

The Contractor may, at his option, use one of the standard brands of prepared masonry cement which will produce mortar; having approximately the composition and other physical properties contained in the mortar specified above, especially with reference to plasticity and shrinkage. The material shall be mixed as directed by its manufacturer; this prepared masonry mortar as mixed shall have when tested a compressive strength of not less than 350 pounds per square inch, at the end of 7 days. Two inch cubes shall be made in accordance with Federal Specification SS-C-181a, from mortar in use. These samples for test shall be made from time to time at the discretion of the Local Authority, by their representative on the site.

5-26 Mortar for glass brick shall be 1 part portland cement, 1 part lime and 4 part sand by volume.

5-27 Mortar for Gypsum blocks shall be 1 part of neat gypsum plaster and 3 parts of sand, by volume.

WALL CONSTRUCTION:

5-28 It is the intent of this contract that all masonry work be sound, straight, true, and first class and complete in every respect.

SPECIAL NOTE:

The Contractor shall warrant the exterior walls to be free from leakage due to any natural cause for a period of one year from date of final payment for the work and he shall, within such period at his own expense, upon written notification by the Local Authority, pursue such approved remedial measures as may be necessary to correct any condition of leakage and damage incident thereto that may develop. The Contractor, in signing this contract, accepts the above conditions; in so

doing he also agrees either, that the materials and methods specified herein are such as to insure the results to be as required, or that he will, at no additional expense furnish such additional or alternative items of labor and materials (or both) as may be necessary to accomplish the stated intent of the contract; provided, that no deviation from the specified and approved materials and methods shall be undertaken without the prior approval of the Local Authority.

5-29 Before brickwork is started two sample walls 4 by 5 feet in size shall be built for the approval of the Architect; walls shall be located where directed and shall not be removed until so directed; they shall be truly representative of the materials and method of laying to be incorporated in the work under the Contract; they shall contain the full range of color, texture and quality of the brick, joint finish and workmanship of the finished work.

5-30 Exterior masonry walls shall be built-up of approved common or approved facing brick backed-up with common brick, or backed-up with terra cotta tile, or backed-up with masonry units as indicated. Thickness of walls shall conform to the requirements of the drawings and details.

NOTE TO ARCHITECT:
Provision for furring or its elimination is left to the architect in each case.

WORKMANSHIP:

5-31 All work shall be laid plumb, level and true. The work shall be properly conducted, keeping the tools and mortar boards, and other equipment in good order and free from unnecessary accumulation of mortar. The work shall be maintained level all around each building as far as practicable, but where

necessary to run up part of the work in advance of the remainder the courses shall be racked back; toothing shall not be permitted.

5-32 The following specific requirements shall be closely followed:

(a) Face brick bond shall be laid out dry on the foundation wall and adjusted before starting work. Closures at jambs and angles, and jumping of bond will not be permitted.

(b) Wetting of brick before laying shall be done in a manner consistent with the nature of the brick, the kind of mortar used, and the weather conditions; the object being to adjust the absorption of moisture from the mortar so as to obtain proper bond between mortar and brick. Excessive wetting of brick during periods when freezing may be expected shall be especially avoided.

(c) All masonry shall be laid up in a good workmanlike manner, in conformance with the best American standards. Bed joints shall be properly filled to provide bearing to utilize the full structural value of each unit.

Vertical joints between facing brick, between back-up units and between facing brick and back-up units shall be adequately filled to give structural security to the wall and to prevent leakage "See special note under wall construction" (5-28).

(d) Except as may be otherwise clearly indicated all brick facing shall be laid in common American bond. Every sixth course of brick shall be a full-header or a header-stretcher course. The work shall start

with a header course, and subsequent header courses shall be maintained at the same levels all around the perimeter of each individual building.

(e) Build masonry solidly against columns and against waterproofing membrane on faces of spandrel beams or slabs.

(f) Form slots, chases, recesses, pilasters and other items shown or necessary to the proper completion of the work. The various trades shall cooperate to the fullest extent to the end and that work be laid out and built-in properly as the work proceeds and to avoid excessive cutting of masonry after completion.

NOTE TO ARCHITECTS:
If work involves forming of arches, grinding arch brick, corbels, skewbacks, pattern brickwork, brick sills or other special items, specify same here as a paragraph under this general heading.

(g) Where required, sections of walls supporting structural members shall be bonded to back-up units at the sides.

(h) Piers built for structural purposes when less than 2 square feet in plan area shall be of solid brick construction.

(i) Where indicated and where required provide chases for pipes and conduits, and grooves or reglets to receive flashings.

5-33 Where facing brick occurs in front of concrete columns, the brick shall be tied to the concrete by means of anchors (see heading "Materials-Anchors" under division "CONCRETE") and the space between the back of brick and face of

concrete shall be slushed full with mortar as each course of brick is laid.

5-34 Walls constructed of all terra-cotta tile or masonry units shall be laid with units in level courses; each unit shall be laid level, plumb and true, vertical joints shall be broken at each course.

5-35 Side construction tile, if of the interlocking type, shall be laid in accordance with the directions of the manufacturer.

5-36 Where header courses (in walls constructed of 4 inches thick facing brick backed-up with 4 inches thick tile or masonry units) are exposed on the inside face of the wall, the bricks of header courses shall be plastered with mortar, plastering shall be full height of each header course and surface of plastering shall be flush with the inside face of the tile or masonry unit.

5-37 For load bearing interior masonry partitions, units shall be of the load-bearing type; for non-load-bearing partitions, units shall be of the non-load-bearing type. Units shall be full thickness of partitions. Unless otherwise shown or specified units shall terminate against bottoms of beams, floor slabs and other soffits; units shall be wedged tight and the joints filled with mortar.

5-38 Gypsum Block shall be laid in level courses; they shall be bonded each course, at corners and intersections; vertical joints shall be broken at least 3 inches. Unless otherwise shown or specified, block shall terminate against bottom of beams, floor slabs and other soffits; blocks shall be wedged tight and the joints filled with mortar.

5-39 Facing brick for brick veneer buildings shall be laid in straight running bond, in straight level courses, plumb, true and securely anchored on line of each second stud 32 inches on centers measured horizontally; provide one row of anchors for each five courses of brick

measured vertically; 20 penny cement coated nails or other approved type anchors shall be used as anchors; if anchors are of sheet iron or steel they shall be heavily zinc-coated. Bond in brickwork shall be laid out and adjusted for each space between openings in walls so that closures will not be required at jambs or external angles. Joints in facing brick shall be as uniform in thickness as possible, not more than $\frac{1}{2}$ inch or as required; they shall be tooled as hereinafter specified.

5-40 One side of double partitions enclosing pipe shafts shall be built after the pipes are in place and tested.

5-41 Where load-bearing tile or masonry units are set with cells vertically, two solid flat slab tiles 1-inch thick, or two courses of brick shall be laid to provide bearing for floor framing.

5-42 Facing tile shall be laid in regular bond. Tile courses shall be level; each tile shall be laid level, plumb and true; vertical joints shall be broken at each course; joints shall be not more than 1/4 inch wide, slightly recessed back from the face and finished smooth. Cutting of tile shall be done with a motor-driven carborundum saw or other method that will produce clean-cut edges at a right angle to the face which is cut. Suitable means shall be provided to properly bond the tile to themselves and to connecting work.

5-43 Joints in exposed faces of exterior brick work shall be not less than 3/8 inch nor more than 1/2 inch wide but shall be uniform except that head joints may vary slightly in width as may be necessary to adjust the bond and eliminate closures; these joints shall receive special and careful attention. As the brick is laid the mortar shall be cut flush with the surface with the edge of the trowel. The mortar shall remain in this condition until it has taken a moderate set; the elapsed time will vary, dependent upon the exact nature of the brick and mortar

and upon weather conditions. The joints shall then be firmly tooled with a round iron, taking the head joints first then the bed joints. At the time of pointing all nail and other surface holes shall be carefully filled. This shall be done in such manner as to thoroughly compact the mortar and close all fissures. The surface shall then be lightly brushed to remove irregular projections of mortar and loose particles.

5-44 Joints on interior partitions which are to be plastered shall be cut flush; joints in plastered partitions that are built of solid brick shall be raked out to provide key for plaster bonding; all other masonry surfaces on the interior, including the interior surfaces of exterior walls, whether to be plastered or not, shall be trowel struck; where such surfaces are to be dampproofed this shall include the filling of all holes and gaps so that the surface will be in proper condition to receive dampproofing (see division "Dampproofing").

5-45 Where caulking is required, the joints and spaces shall be completely filled with mortar and then raked out, with a "V" shaped tool, to a depth of not less than 1/2 inch; caulking reglets shall be neat, clean and not less than 3/8 inch wide. (See division "Caulking").

LAYING GLASS BRICK:

5-46 Glass brick panels shall be built in, where indicated.

(a) Joints, both vertical and horizontal, shall be not more than 1/4 inch; glass bricks shall be selected or arranged in such manner that, whichever width of joint is selected, same shall present a uniform appearance throughout the entire glass brick panel.

(b) Metal reinforcement of glass brick shall be provided if called for in the standard details of the manufacturer.

(c) In laying glass bricks the edges of same shall be buttered with mortar and pressed firmly into place, using enough mortar in all joints to force out excess mortar used in laying, thus completely filling joints and eliminating air pockets. Remove excess mortar immediately after laying units. When mortar has reached its initial set, rake back from the face of the unit approximately 3/16 inch, then tool with a round pointed tool to a hard, smooth surface.

(d) Expansion joints shall be provided in the junction of glass block panels and all other materials so that in no case will the connecting joints be filled with mortar, nor the block be in direct contact with the structure of the building except at the sill. Expansion joints at jamb of panels shall be at least 1/2 inch in thickness. Expansion joints at heads of panels are to be thick enough to provide for maximum lintel deflection plus 1/2 inch. Fill expansion joints with loosely packed dry rope oakum, or insert a prepared expansion joint strip made from fiber glass and bonded with a thermoplastic binder backed on both faces with asphalt treated paper. Joints shall be kept entirely free from mortar if oakum is used; panels shall be allowed to set, then wedge and ram oakum tight between sides of block and sides of chase for support against lateral pressure. Care should be taken not to drive the panels out of plumb. Point surfaces of all

expansion joints with not less than 3/8 inch of waterproof caulking compound. (See division "Caulking").

(e) All units shall be laid up true, square, and in line. They shall be laid in horizontal courses; one course at a time; proper care shall be exercised to allow sufficient time for the setting of mortar in the previous course before laying the next course; wedges may be used if necessary to insure uniform joints and to prevent mortar from being compressed by superimposed courses, laid before mortar has set. All wedges shall be removed before pointing and tooling of joints.

(f) To insure a permanent watertight installation, glass units shall not be disturbed after they have been set in place and the mortar allowed to set; in the event that it becomes necessary to remove or adjust the unit, the mortar around same shall be entirely removed and the unit cleaned before being re-laid.

(g) Upon completion of the laying of each of the glass brick panels the mortar joints shall again be rubbed with a medium grade of steel wool to a smooth and even surface and cleaned with a stiff brush and the glass units shall be thoroughly washed, both sides, with soap and warm water.

SETTING WALL COPING:

5-47 Vitrified tile wall coping shall be set over a full solid bed of mortar, which shall completely fill all voids between the top of the wall and the underside of the tile; coping tile shall be accurately lined and leveled up and joints pointed with caulking compound (see division "caulking").

SLATE COURSE IN FOUNDATION WALLS:

5-48

NOTE TO ARCHITECT:
This provision may or may not be required; inclusion is optional with architects.

Masonry foundation walls shall have a slate course inserted in the mortar joint approximately 6 inches above the finished grade lines. The slate courses shall be kept back from the outer face of the wall 3/4 of an inch to permit a solid exterior mortar joint. Slate courses shall be continuous, full thickness of the wall, and shall be well bedded in mortar below and above the slate.

CHIMNEYS - INCINERATOR FLUES:

5-49 Flue linings shall be full height of shaft and set in place one section ahead of the masonry; joints shall be solidly filled with mortar; joints inside of flue lining shall be struck flush with the inside surface. Build-in all necessary thimbles as indicated. Flues shall be kept clear of brick and surplus mortar.

BOILER STACKS (When part of wall construction):

5-50 Boiler stacks for heating plants shall be built in accordance with the details indicated; they shall be lined with fire-clay brick. Size and height of flue lining shall be as noted; unless otherwise indicated the lining shall extend 30 feet above the boiler grate. Stacks shall be kept clear of bricks and surplus mortar.

(a) Mortar to be used in laying fire brick or radial brick lining in the chimney shall be an acceptable grade of cold-setting mortar, preferably of the wet mix type, composed of fire clay to which

has been added Sodium Silicate, or other cementing ingredients. Test Specimens of the mortar, approximately 1" x 1/4"x 6", after aging at atmospheric temperature for three days, shall develop a strength such that after heating to a temperature of 1000 degrees C. for a period of 4 hours, shall show modulus of rupture of not less than 625 pounds per square inch. The mortar shall have a P.C.E. of not less than Cone 18 when tested in accordance with A.S.T.M. C24-35 Standard Method of Test for Pyrometric Cone Equivalent of Fire Clay and Fire Brick.

BUILT-IN WORK:

5-51 Build in flashings at junctions of roofs and walls as indicated in a substantial and workmanlike manner. Flashings shall penetrate masonry walls not less than 1-1/2 inches.

5-52 Set and build in all miscellaneous steel, bearing plates, lintels, items of miscellaneous metal, bolts, anchors and similar items. Lintels and plates shall be set to exact lines and levels, properly bedded in mortar.

5-53 Build in door frames, window frames (incinerator parts), (thimbles in chimneys) and all other items intended to be incorporated in the masonry work.

5-54 Build in pipe sleeves as required for installation of all pipes and conduits.

PARGING FOUNDATION WALLS:

5-55 Masonry wall surfaces to be parged, shall be thoroughly brushed with wire brushes to remove all dust, dirt and loose particles. Surfaces shall be wet down by spraying and then given two coats of mortar hereinbefore specified applied with a trowel or float and finished reasonably smooth. Each coat shall cover the surface completely and shall be thoroughly worked into wall surfaces. At angles between the footings and foundation walls provide a tight joint.

5-56 Backfilling shall not be done until the above work has been dampproofed (if dampproofing is specified) inspected and approved.

5-57 Parge the back of all stone work before same is set in place.

CUTTING AND PATCHING:

5-58 Consult all trades in advance and make provisions for the installation of their work without the necessity of cutting and patching, as far as possible.

5-59 Do necessary cutting and patching with sufficient care to prevent damage to structural stability, appearance or weather resistance. Exercise extreme care not to damage the structural or weather resistance strength of the wall.

PROTECTION:

5-60 The top of walls and partitions shall be covered at the end of each day's work, using waterproof reinforced paper or canvas weighted down. No masonry shall be laid during freezing weather unless approved adequate means are employed to prevent freezing of the work; nor shall masonry be laid when it may be reasonably anticipated that freezing will occur within eight hours unless provisions for protection are employed. All work shall be protected, as may be necessary, against mechanical injury.

CLEANING:

5-61 On completion of the masonry work all exposed masonry surfaces shall be thoroughly cleaned down and mortar joints pointed to leave the work in a condition acceptable to the Local Authority. Cleaning and pointing shall be started at the top and worked down. Cleaning shall be done with fiber brushes using soap powder boiled in water (the contractor may, at his option, subject to approval of the Local Authority, use dilute muriatic acid if adequate precautions are taken to protect metal and other parts against injury by the acid). Excess mortar stains shall be removed and the entire surfaces rinsed with clean water. Cut out defective mortar joints where necessary and fill the crevices solidly with mortar and tool as specified.

NOTE TO ARCHITECTS:
"Unit Prices" should be requested in "Bid Form" for the various items of work required in this division.

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WASHINGTON, D. C.

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SUGGESTED SPECIFICATION - DIVISION-6

DIVISION-6
INCINERATORS

SCOPE:

6-1 For locations and number of incinerators, see drawings.

INCINERATORS:

6-2 Incinerators shall be the flue-fed, built-in type equipped with draft regulators and capable of producing complete and ordorless incineration of waste products normal to apartment buildings.

(a) Complete design data shall be submitted for approval, including photographs or cuts and detailed description of proposed incinerators, together with proof that design and equipment proposed will fulfill the requirements specified.

MATERIALS:

6-3 Masonry and masonry materials shall conform to applicable requirements of division "Masonry Work".

6-4 COMBUSTION CHAMBER shall be lined with fire-clay brick not less than 4 inches thick and shall extend up to meet the terra cotta flue lining. Fire-clay brick shall conform to A. S. T. M. Standard Specification C 106-36, refractories for construction of incinerators. (Fire-brick lining shall be considered as having any structural value.) Size of combustion chamber shall be in accordance with the manufacturers' printed schedules.

6-5 GRATES shall be of heavy cast-iron, either stationary or dumping type; supports shall be of sufficient length to prevent sections from dropping should grates warp.

6-6 ASH PIT, FIRING DOORS AND FLAMES shall be of heavy cast-iron; frames shall have anchors for securing them to masonry, and shall be of size comparable to size of incinerators, but in no case less than 208 square inches, clear opening; doors shall have suitable handles and latches. Firing doors shall have suitable baffle plates.

6-7 FLUES shall be stock size of standard terra cotta flue lining and shall extend from top of combustion chamber to 2 inches above masonry shaft; provide proper thimbles for connection to all hopper door frames.

6-8 HOPPER DOORS AND FRAMES shall be of heavy cast-iron; frames shall have anchors for securing them to masonry, and shall have clear door openings not less than 74 square inches. Doors shall be of the self closing type.

6-9 SPARK ARRESTOR shall be fabricated of No. 14 gauge heavily galvanized wire, 1/2-inch mesh, shall be securely fastened to top of each incinerator shaft.

6-10 FIRING TOOLS: Provide one complete set for each incinerator.

OPTIONAL CONSTRUCTION:

6-11 Contractor may install incinerators comparable with equipment herein specified and shown, if prior approval is obtained from the Local Authority.

PRIMING:

6-12 Metal work, unless otherwise specified, shall be given a shop coat of manufacturers' standard priming paint - neutral gray color; ash pit and firing doors, including frames, shall be primed with heat resisting paint; grates shall not be painted.

INSTALLATION:

6-13 A representative of the manufacturer shall supervise the installation.

6-14 Incinerator shafts shall be entirely free standing, independent of surrounding work, and structurally sound.

6-15 Installation of all items of equipment shall be in accordance with approved shop drawings.

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SUGGESTED SPECIFICATION - DIVISION - 7

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DIVISION - 7
RADIAL BRICK CHIMNEY:

NOTE TO ARCHITECT:
If chimney is not of the radial brick type of isolated chimney, omit this division and include chimneys in the division "MASONRY WORK". Except as stated otherwise, this specification is all inclusive and any work shown on the drawings that is not to be included should be mentioned in the scope of the work.

SCOPE:

7-1 Include all masonry and related work for the radial brick chimney shown and specified. (For location, see drawings.)

(a) Excavation is specified in the division "EXCAVATING, FILLING AND SITE GRADING".

(b) Concrete work for the foundations shall be as specified in the division "CONCRETE WORK".

(c) The breeching is specified in the division "HEATING".

DESIGN:

7-2 The chimney shall be of the height and inside diameter at the top and have the general architectural design shown on the drawings, but other dimensions and details may be varied to suit the standard practice of the Contractor, provided that the construction meets the requirements set forth in this specification.

(a) The chimney shall be designed to resist a horizontal wind load of not less than ___ pounds per square foot applied to the vertical projected area of the chimney within the following maximum extreme fibre stresses based on the gross cross sectional area of the walls:

1. 200 pounds per square inch in compression.

2. 25 pounds per square inch in tension.

The weight of the brick masonry walls shall be assumed as 120 pounds per cubic foot, unless otherwise fully substantiated.

(b) Shop drawings showing complete design and details of the chimney and assembly of the lightning conductor installation, which the Contractor proposes to furnish shall be submitted in accordance with heading "SHOP DRAWINGS", and complete computations and substantiating data for the structural design shall be submitted with the shop drawings.

MATERIALS:

7-3 Masonry and metal materials, except as otherwise specified herein, shall conform to applicable provisions of other divisions of the specification:

(a) RADIAL BRICK shall be well burned, sound, free of checks, manufactured from clay or shale, cored vertically not to exceed 30 per cent of the gross area; smooth faced, reasonably uniform in size and color, shaped to conform to the circular and radial lines of the shaft with a tolerance of 1/2 in 1 foot, scored on radial lines. Water absorption after 24 hours immersion shall be 2 per cent minimum and 10 per cent maximum of the dry weight of the brick. Face color shall match closely color of facing brick used for buildings, as approved by the Local Authority.

(b) RADIAL BRICK, as specified, may be used for chimney lining provided that such brick shall be made from fire clay and have a P. C. E. of not less than Cone 20, as determined by A.S.T.M. C24-35 Standard Method of Test for Pyrometric Cone Equivalent of Fire Clay and Fire Brick.

(c) MORTAR for the shell of the chimney shall be of 1 part portland cement, 1-1/2 parts lime putty or 1 part dry pulverized hydrated lime, and 5 parts of sand, by volume.

(d) MORTAR to be used in laying fire brick or radial brick lining in the chimney shall be an acceptable grade of cold-setting mortar, preferably of the wet mix type, composed of fire clay to which has been added Sodium Silicate, or other cementing ingredients. Test Specimens of the mortar, approximately 1" x 1/4" x 6", after aging at atmospheric temperature for three days, shall develop a strength such that after heating to a temperature of 1000 degrees C. for a period of 4 hours, shall show modulus of rupture of not less than 625 pounds per square inch. The mortar shall have a P.C.E. of not less than Cone 18 when tested in accordance with A.S.T.M. C24-35 Standard Method of Test for Pyrometric Cone Equivalent of Fire Clay and Fire Brick.

(e) CLEANOUT DOOR AND FRAME shall be of best quality cast iron, of stock pattern, with door approximately 24 inches wide and 30 inches high, hinged and fitted with a substantial latch; deliver unpainted.

(f) SILL for breeching opening shall be a lip sill of cast iron, provided with anchors to be built into masonry.

(g) LINTELS as shown on the drawings, shall be of structural steel.

(h) REINFORCING BANDS shall be of structural steel, 3 inches wide by 1/4 inch thick, each continuous with splices welded or bolted with five 1/2 inch bolts.

(i) LADDER RUNGS shall be of wrought iron bars, 1/4 inch round, bent as detailed to form steps not less than 14 inches wide 5 inches from face of wall, ends arranged to be securely anchored into wall. Rungs shall be uncoated for interior of stack and shall have 2-1/2 ounce hot zinc coating for the exterior.

CONSTRUCTION:

7-4 Workmanship and construction, except as otherwise specified herein, shall conform to applicable provisions of other divisions of the specification and best standard practice.

(a) Labor and supervision shall be by skilled mechanics experienced in radial chimney construction.

(b) Construction shall be in strict conformance with approved shop drawings.

(c) Brick shall be laid in full beds of mortar in level courses, using sufficient material to force mortar 1/2 inch into cores of brick, with vertical joints staggered and adjacent courses full bonded with header courses every other course in height; vertical joints shall be filled with mortar; horizontal and vertical joints shall not exceed 1/2 inch; face joints shall be cut flush and after mortar has taken a slight set shall be pointed and compressed with a round steel tool.

(d) The lining shall be of radial brick specified for lining or of fire clay brick not less than 4 inches thick, from 2 feet below to not less than 25 feet above the breeching opening, free standing, with 2 inches clear air space, free from mortar and debris, between lining and outer wall; horizontal and vertical joints shall not exceed 1/4 inch, struck flush; extend lining material around all sides of breeching opening.

(e) Corbel out adequately to provide for loss of horizontal wall section at breeching; also for support of lining and for a ledge over air space, with 2 inches clear space between top of lining and bottom of ledge.

(f) Build in and securely anchor metal work as the brickwork progresses; where metal frames or lintels are not provided for full thickness of wall of ample size to resist the pressures above and below openings, arches of proper strength shall be provided; ladder rungs shall be placed for the full height inside of stack at not over 20 inches centers, and on the outside of stack to the top, starting 10 feet above grade, at not over 7' 6" centers; steel reinforcing bands shall be thoroughly imbedded into the brickwork at every change in wall thickness and above and below the breeching opening; allow air space for expansion at each end of lintels above and below the breeching opening; the exact size and shape of the breeching opening shall be provided as required by the approved breeching shop drawings.

(g) Corbel out at top of chimney as shown on the approved shop drawings (omit if no corbel is required) and provide a reinforced concrete cap not less than 8 inches thick of Type 3 cement finish concrete, reinforced with 2 steel bars top and bottom, cured and finished as specified in the division for "CONCRETE".

PAINTING:

7-5 All exterior exposed metal shall be painted as required in the division "PAINTING". Lintels, sill and cleanout door and frame shall be given 2 coats of red lead and oil paint before setting. All interior exposed metal shall be left unpainted.

CLEANING:

7-6 At completion, the exterior face of the masonry shall be brushed thoroughly, using water, all mortar splashings removed, to obtain a uniformly clean surface. The floor of the chimney and all sills of openings shall be left broom clean.

LIGHTNING CONDUCTOR:

7-7 Provide complete lightning conductor equipment for chimney consisting of the following:

(a) Four vertical copper rods 3/4 inch diameter, 5 feet long, secured and braced at top of chimney.

(b) Copper cable encircling chimney at base of rods and clamped to them.

(c) Copper conductor cable 1/2 inch diameter, 7 strand, No. 10 gauge (Stubs) anchored to outside of chimney with brass anchors, approximately 6 feet on centers, extending from encircling cable above, down to ground plate; no splicing of cables will be permitted.

(d) Ground plate of wing type, buried in ground after excavations are completed and before concrete is placed.

(e) The upper 25 feet of lightning conductor equipment shall be lead coated 1/16 inch thick.

(f) Connections of all parts shall be done with approved clamps, fittings and connectors, so that an uninterrupted electric circuit conductor from rod terminals at top to ground plate distributor is obtained. All connections shall be heavily tinned.

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STONE -8-1

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SUGGESTED SPECIFICATION - DIVISION - 8

DIVISION - 8
STONE WORK:

NOTE TO ARCHITECT:
This specification covers both natural stone and cast stone work. For each kind of stone care should be taken to include only the applicable requirements therefore.

SCOPE:

8-1 Provide and set all stone where indicated. Cast-in-place concrete not included.

MATERIALS:

8-2 Masonry materials, except as hereinafter specified, shall conform to applicable requirements of division "MASONRY WORK".

8-3 STONE shall be standard stock, gray (buff) (variegated) oolitic limestone, sound and durable and free from stains. Stone shall be of quality, color and texture within the range of variations represented by samples identified and on display in the office of the Local Authority. Consideration will be given by the Local Authority to other stone which in their opinion is equal to the stone specified.

8-3 CAST STONE shall be homogeneous throughout, manufactured by a process known to have produced cast stone that has withstood exposure to the weather for a period of not less than 5 years without crazing, cracking, or disintegration. Cast stone shall be composed of cement and aggregates as may be necessary to produce the color, finish and texture within the range of variations represented by samples identified and on display in the office of the Local Authority. Cast stone shall have steel bar reinforcement as required.

8-4 DOWELS AND ANCHORS shall be steel or iron, hot dipped zinc-coated after fabrication, of approved sizes and shapes ample for the purpose.

MORTAR:

8-5 MORTAR for stonework shall be non-staining. Proportions shall be 1 part portland cement, 1 part hydrated lime (dry bases), 6 parts clean sand, by volume.

CUTTING AND FINISHING STONE:

8-6 Cutting and jointing shall be executed in accordance with approved shop drawings. Finished surfaces shall be true and in the same plane. Mouldings shall be sharp and cleancut. Beds and joints shall be at right angles to the face of the stone. Exposed surfaces of stone shall be smooth machine finish. All sills and projecting copings shall have drips.

FINISHING - CAST STONE:

8-6 Finished surfaces shall be true and in the same plane. Mouldings shall be sharp and clean-cut. Beds and joints shall be at right angles to the face of the stone. Exposed surfaces shall have smooth rubbed finish.

ANCHORAGE:

8-7 Dowels and anchors shall be used as necessary for the proper and permanent installation of the work. Items, where required to be built into concrete or other masonry work shall be installed in their proper locations. Anchorage shall be shown on the approved shop drawings and shall not be less than the following:

(a) Except for window and door sills, each piece of stone built into the walls shall have 1 anchor for each 2 feet of length or less.

(b) Each coping or similar stone shall be doweled 2 feet on centers.

HANDLING:

8-8 Stone shall be delivered, stored, and handled by methods which will protect it from damage.

8-9 Patching will not be permitted. Stone chipped or stained on the face shall not be used. Stone shall not be redressed to less than the thickness indicated on the approved shop drawings.

8-10 Stone shall be clean when set and immediately prior to setting drenched with clean water.

8-11 Each piece of stone shall be set true to line and level, with full beds of mortar and solid joints, except for copings and similar stones where joints shall be left open for pointing. All anchorage shall be solidly flushed or grouted in.

8-12 Joints shall be 1/4 inch generally, and all face joints, except as before specified, shall be neatly struck and tooled as the work progresses.

8-13 Joints in coping and similar stones shall be caulked with caulking compound as specified under the division "CAULKING".

8-14 CLEANING:
After all setting has been completed, stone shall be cleaned with a solution made with non-staining soap powder boiled in clean water and applied with stiff fiber brushes. After washing stone shall be thoroughly rinsed.

PROTECTION AND REPLACEMENT:

8-15 All stone shall be protected from damage until entire project is completed. Damaged material shall be replaced.

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NOTE TO ARCHITECT:
The above specification covers stone items such as sills, belt courses, copings and other miscellaneous pieces. If projects contain stone ashler, cornices or other special items, the necessary applicable provisions for such items, should be included in the specification.

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SUGGESTED SPECIFICATION - DIVISION 9

DIVISION - 9
CERAMIC TILE:

NOTE TO ARCHITECT:
This specification requires that the location of ceramic tile floor and base for all areas be clearly designated on the "Schedule of Interior Finishes".

SCOPE:

9-1 For location and extent of work, see drawings and "Schedule of Interior Finishes".

MATERIALS:

9-2 Masonry materials shall conform to applicable requirements of division "MASONRY WORK".

9-3 TILE - Standard Grade as classified in Simplified Practice Recommendation R-61-30-National Bureau of Standards, Washington, D. C.

(a) Before setting any tile a certificate of grade properly executed by the contractor on the standard form of master grade certificate of the Tile Manufacturer's Association shall be furnished.

(b) Containers shall be sealed and labeled when delivered.

(c) Shape numbers referred to are taken from the "Tile Manufacturer's Association 1934 Index".

(d) Floor tile shall be unglazed ceramic mosaic, of either the natural clay or porcelain type, with square or cushion edges. Patterns and colors shall be as selected by the Local Authority from manufacturers' standard stock floor designs. No border designs will be required.

Patterns

(e) BASE shall be No. A-3401, glazed or unglazed in color to harmonize with the floor tile. Interior and exterior corners shall be square and of the combination angle and stretcher type. Individual bullnose or coves will not be accepted.

GENERAL REQUIREMENTS:

9-4 Except as otherwise specified, the setting and laying of tile shall be in accordance with the applicable requirements of Basic Specification No. K-300 issued by the "Tile Manufacturer's Association".

SETTING BASE TILE:

9-5 Surfaces to receive base tile shall be moistened if necessary and have a scratch coat of mortar consisting of 1 part portland cement, 1/4 part hydrated lime and 2 1/2 to 3 parts sand, by volume applied not less than 24 hours or more than 48 hours before tile are set. On surfaces thus prepared, base tile shall be set by the "Floating" or "Buttering" method in mortar consisting of 1 part portland cement, 1/2 to 1 part hydrated lime and 3 to 4 parts sand, by volume. Base shall be set straight and true with tops level and joints 1/16 inch wide.

SETTING FLOOR TILE:

9-6 Where tile floors are to be laid over wood construction, the concrete fill shall consist of 1 part portland cement and 3 parts sand, by volume. Before concrete is placed, a layer of 13 pounds asphalt saturated felt shall be fitted over wood subfloor with joints lapped 2 inches and turned up at walls not less than 3 inches. Over the felt a 4 inch x 4 inch welded wire mesh of No. 9 gage wire shall be laid and the concrete placed and screeded to thickness indicated. (not less than 1 1/4 inches)

9-7 Immediately before setting floor tile, the concrete surfaces shall be thoroughly cleaned, saturated with clean water and uniformly dusted with dry portland cement before spreading the mortar bed. The mortar consisting of 1 part portland cement and 3 to 4 parts sand, by volume shall be spread and screeded to true and even planes. Only such areas as can be covered with tile before the mortar has reached its initial set, shall be placed in one operation. The surface of the mortar bed shall be dusted with neat portland cement immediately before placing the tile. The tile shall be placed upon and firmly pressed and tamped into the mortar bed to the proper levels. The joints between the sheets shall be kept the same width as those between the mounted tile and set without showing where the sections join.

9-8 Cutting and fitting around all pipes, fixtures, outlets and other places shall be neatly done. The completed work shall be free from cracked, broken or chipped tile.

GROUTING:

9-9 Grouting of all joints for ceramic floor and base tile shall be done with neat waterproof portland cement mixed with water to the consistency of thick cream. White cement shall be used for grouting base tile and light gray cement shall be used for grouting floor tile. Grout shall be forced into the joints, sprinkled with dry cement and finished flush and true. Cushion edge tile shall have the grout wiped out of joints to the correct depth.

CLEANING:

9-10 All surplus grouting shall be removed from tile before it hardens and surface of tile left perfectly clean with all joints full and smooth. No acid shall be used to clean glazed tile. Damaged or defective work shall be replaced and made good; no patched work will be accepted.

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SUGGESTED SPECIFICATION - DIVISION 10

DIVISION - 10
DAMPPROOFING:

SCOPE:

10-1 Provide and apply dampproofing materials to the following surfaces:

(a) Interior surfaces of exterior masonry walls which are to receive plaster direct and including inside surfaces of exterior walls back of bathtubs. (Include also gable ends in attic spaces). Dampproofing shall be extended not less than 1 foot from exterior walls, on both sides of abutting masonry partitions; dampproof jambs and heads of openings, chases, and similar spaces in exterior walls.

(b) Exterior surfaces of walls enclosing the excavated basement spaces, tunnels and similar surfaces. Dampproofing shall extend from the tops of footings to within 3 inches of the finished grades.

MATERIALS (INTERIOR):

NOTE TO ARCHITECTS:
Concerning the 3 materials for dampproofing hereinafter specified, the first is suggested for use, only where a mild weather condition exists. The second and third materials may be specified as contractor's option.

10-2 DAMPPROOFING (CUT BACK ASPHALT TYPE) material for interior wall surfaces shall be a full bodied, black asphaltic compound, containing a minimum of 55 per cent of asphalt cut-back to proper consistency for cold application by spraying; or, the material shall be a hot cut-back semi-mastic asphalt containing not less than 10 per cent (in weight of asphalt) of blown asbestos fiber for application, while hot, by spraying. Material used shall bond firmly and securely to masonry surfaces, completely sealing the surface to which it is applied; it shall act as a non-staining base and bond for plaster and shall remain elastic under all atmospheric conditions. Asphalt primer shall conform to the applicable A.S.T.M. Standards or Federal Specifications.

10-2 DAMPPROOFING (MASTIC-ASBESTOS-TYPE) material shall be a mixture consisting of asphalt, asbestos, and thinners in such proportions as will produce a plastic compound that will not settle or separate in the container.

(a) Asphalt and primer shall conform to applicable A.S.T.M. Standards or Federal Specifications.

(b) Asbestos shall consist of fibers approximately 1/8 inch long, of a grade generally used in mastics; it shall be free from dust and talc.

(c) Thinner solvent shall be mineral spirits, unrefined, with a flash point of not less than 27 degrees C.; no other adulterant shall be used.

(d) The mastic shall have a consistency such as to show a penetration in accordance with A.S.T.M. procedure at 77 degrees C. of not less than 390.

(e) The mastic shall be of such consistency as to permit application by trowel; it shall have a covering capacity of approximately 18 (12) square feet of wall surface per gallon (of mastic).

10-2 DAMPPROOFING (MASTIC-SILICA-TYPE) material shall be a mixture of asphalt and screened silica to produce a plastic compound for spray application.

(a) Asphalt and primer shall conform to applicable A.S.T.M. Standards or Federal Specifications.

(b) Screened silica shall be an evenly graded grit of such sizes as will pass a No. 8 mesh and be retained on a No. 16 mesh screen.

(c) Mastic shall have a covering capacity of approximately 18 (12) square feet of wall surface per gallon (of mastic).

MATERIAL (EXTERIOR):

10-3 Dampproofing material shall conform to applicable A.S.T.M. Standards or Federal Specification (Coal-Tar-Pitch).

Undercoater (Primer) to be used before applying the dampproofing material shall be a Creosote Oil of a type as recommended by the manufacturer of the dampproofing material used.

APPLICATION (INTERIOR):

10-4 Surfaces shall be clean and dry. Mortar joints shall be full and flush; holes and voids shall be carefully filled and pointed with cement mortar; projections from the face of the walls shall be removed.

10-5 Dampproofing shall not be applied at temperatures lower than 45 degrees F.

10-6 Before application of the dampproofing material, surfaces shall be given a coating of asphalt primer, using not less than 1 gallon per 100 square feet of surface.

10-7 Dampproofing material shall be applied in a manner that will thoroughly bond with the masonry surfaces and produce a surface sufficiently rough and otherwise suitable to provide a permanent key for plaster.

10-8 Care shall be exercised that all surfaces to be dampproofed are thoroughly covered with a continuous and unbroken coating.

10-9 Cut-back type material shall be sprayed on in not less than 2 coats, completely covering all surfaces and filling all voids and cracks; it shall be free from runs and sags.

10-9 Mastic (Asbestos-type) - material shall be applied by trowel, with sufficient pressure to force the mixture into voids and crevices in the masonry surfaces; thickness of material shall be approximately 3/32 (1/8) inch, throughout its entire area.

10-9 Mastic (Silica-type) - material shall be applied by a spray gun method in a manner as to include the introduction of the admixture of inert material to produce a mastic coating. The material shall be applied so as to fill all voids and crevices in the masonry surfaces; thickness of material shall be approximately 3/32 (1/8) inch throughout its entire area.

APPLICATION (EXTERIOR):

10-10 Surfaces shall first be given 1 coat of Primer freely flowed on, then given 1 mop coat of Coal-Tar-Pitch using not less than 25 pounds per 100 square feet of wall surface; it shall be carefully and evenly applied. The pitch shall be heated to flow freely but not over 375 degrees F. The finished work shall present an impervious, smooth, lustrous, surface. Dull or porous spots that appear shall be corrected by applying additional coats of material.

PROTECTION:

10-11 Floors, trim, and other adjacent surfaces that are not covered with other materials shall be carefully protected from dampproofing materials; the Contractor shall remove any misplaced materials, immediately upon completion of the dampproofing.

* * *

NOTE TO ARCHITECTS:

Dampproofing materials hereinbefore specified should not be applied to backs of masonry walls that are furred; it is considered good practice however to apply a spray coat of cut-back asphalt to the masonry surfaces where climatic conditions are such to warrant the added cost.

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SUGGESTED SPECIFICATION - DIVISION 11

DIVISION - 11
WATERPROOFING:

NOTE TO ARCHITECT:
Site conditions are determining factors in the use of membrane and metallic waterproofing. Scope and drawings should include any other special conditions.

SCOPE:

11-1 Provide waterproofing for the following locations:

(a) Three (Five) Ply Waterproofing on floors of basement spaces and on outside surfaces of foundation walls where shown or noted. Waterproofing on walls shall be to a height of ___ feet above top of footings. (See drawings.)

(b) Waterproofing on spandrel beams and other locations where shown or noted. (See drawings.)

(c) Metallic waterproofing on floors of basement spaces and on inside surfaces of foundation walls where shown or noted. Waterproofing on walls shall be to a height of ___ feet above the floor levels. (See drawings.)

MATERIALS:

11-2 Materials shall conform to applicable A.S.T.M. Standards or Federal Specifications.

11-3 For three (five) ply waterproofing the following materials shall be used:

COAL-TAR PITCH shall be uniformly glossy black when freshly melted, and upon aging one week its surface shall not become dull or show any separation of ingredients.

FELT shall be 13 pound, coal-tar-pitch saturated, either 32 or 36 inches wide. The surfaces shall not be coated with any substance tending to interfere with adhesion between the fabric and the bituminous compound and cement.

PLASTIC CEMENT shall be composed of an inorganic filler, solvent and a nonvolatile bituminous binder. The binder shall be mainly coal tar with organic properties added if necessary to produce a cement of better working and lasting properties. Cement shall be a smooth uniform mixture, not thickened or livered, and showing no separations which cannot be readily overcome by stirring.

11-4 For spandrel waterproofing the following materials shall be used:

WOVEN COTTON FABRIC, asphalt or coal-tar-pitch saturated: The meshes of the fabric shall be sufficiently open to allow the moppings of asphalt plastic cement to come through. Fabric shall not be coated with any substance which would tend to interfere with the adhesion between the fabric and the cement. Weight of fabric shall be not less than 11 ounces per square yard.

REINFORCED FABRIC: Asphalt or coal-tar-pitch saturated fabric reinforced with expanded copper incorporated therein.

COPPER MEMBRANE, bonded to a reinforced waterproof paper or fabric.

COPPER MEMBRANE, coated on both sides with an approved flexible waterproof compound.

NOTE: Where copper is used, it shall be 2 ounce sheet. Plastic cement shall be as specified under materials for membrane waterproofing.

NOTE TO ARCHITECT:
In specifying membrane for spandrel waterproofing use either one of the above types. The use of Woven Cotten Fabric material is not suitable for severe climatic conditions.

11-5 For metallic type waterproofing the following materials shall be used:

PLASTERING MATERIALS and application shall conform to applicable requirements under division "PLASTERING".

IRON FILINGS shall be clean, finely ground iron of carefully graduated sizes made from clean iron castings, and shall be mixed with a chemical oxdizing agent which shall not be less than 5 nor more than 7 per cent, by volume, of the total mix. The filings shall pass the following screen analysis:

All shall pass a No. 35 sieve.
At least 90% shall pass a No. 40 sieve.
Not less than 45 per cent or more than 60 per cent shall pass a No. 100 sieve. Not more than 20 per cent shall pass a No. 200 sieve.

The iron oxide content when the material is used shall not exceed 5 per cent, by volume. The iron shall contain not more than 1 per cent, by weight, of nonferrous metal. The presence of foreign substances, such as dirt, grease, oil, wax, or bitumen, in excess of 0.1 per cent, by weight, will be cause for rejection. The material shall be delivered to the site in original sealed containers bearing the brand and name of the manufacturers.

APPLICATION:

11-6 Surfaces to which materials are to be applied shall be free from holes, cracks, projections, and conditions that would prevent complete adhesion of waterproofing.

11-7 Waterproofing shall not be applied at temperatures lower than 50 degrees F.

11-8 The application of waterproofing material shall be done in the most workmanlike manner and only by firms and workmen thoroughly familiar and experienced in this class of work.

11-9 THREE-PLY WATERPROOFING:

(a) Surfaces shall be uniformly coated with hot coal-tar-pitch. Over this coating place 3 layers of 32 inch wide coal-tar-pitch saturated felt, lapping each sheet 22 inches over the preceding sheet. Lap ends not less than 6 inches. (If 36 inch wide felt is used, lap sheets 24-1/2 inches). Mop each of the sheets full width of lap, with hot coal-tar-pitch, using not less than 25 pounds per square for each mopping. Over the entire surface apply a uniform mopping coating of hot coal-tar-pitch, using not less than 50 pounds per square.

(b) If asphalt saturated felt is used, the method of application shall be the same except as follows:

Before the initial coating of asphalt the slab shall have a coat of asphalt primer, using not less than one gallon (7.5 pounds) per square. The initial coating of asphalt shall be applied hot using not less than 30 pounds per square. For mopping between the sheets not less than 20 pounds of hot asphalt shall be used per square and for the final coating not less than 60 pounds per square shall be used.

(c) Where practicable, membrane waterproofing under floor surfaces shall extend up vertical surfaces 6 inches. All pipes and pipe sleeves shall be made watertight with plastic cement.

11-10 FIVE-PLY WATERPROOFING:

(a) Surfaces shall be uniformly coated with hot coal-tar-pitch, using not less than 40 pounds per square. Over this coating place 5 layers of 32 inch wide coal-tar-pitch saturated felt, lapping each sheet 26 inches over the preceding sheet. Lap ends not less than 6 inches. (If 36 inch wide felt is used, lap sheets 29 inches). Mop each of the sheets, full width of lap, with hot coal-tar-pitch using not less than 25 pounds per square for each mopping. Over the entire surface apply a uniform coating of hot coal-tar-pitch, not less than 70 pounds per square shall be used.

(b) If asphalt saturated felt is used, the method of application shall be the same except as follows:

Before the initial coating of asphalt the slab shall be given one coat of asphalt primer using not less than one gallon (7.5 pounds) per square. Over this when dry, there shall be mopped on a coating of hot asphalt using not less than 30 pounds per square. For mopping between the sheets not less than 20 pounds of hot asphalt per square shall be applied. The final coat shall have not less than 60 pounds of hot asphalt per square.

(c) Where practicable, membrane waterproofing under floor surfaces shall extend up vertical surfaces 6 inches. All pipe and pipe sleeves shall be made watertight with plastic cement.

SPANDREL WATERPROOFING:

11-11 Masonry surfaces receiving spandrel waterproofing shall be thoroughly dry, free from loose materials and reasonably smooth. There shall be no slopes such as will form pockets which would prevent free drainage of water to the exterior surfaces of the wall.

(a) Surfaces shall be thoroughly brush coated with asphalt, the sheets completely embedded in the asphalt and lapped not less than 4 inches. Sheets shall be of such lengths as to avoid as much as practicable the necessity of joints. Joints shall be made with plastic cement.

(b) Spandrel waterproofing shall be installed as indicated on drawings. Where waterproofing extends to inside of wall it shall be turned up not less than 2 inches on the inside, secured with mastic and clipped.

(c) Where it is necessary to pass anchors through sheets, the holes shall be made no larger than necessary to receive the anchors, and the anchor holes shall be waterproofed by using plastic cement.

11-12 Metallic type waterproofing on concrete surfaces (interior):

(a) Concrete surfaces to be waterproofed shall have the aggregate exposed or be thoroughly roughened as approved by the Local Authority. Surfaces shall be thoroughly cleaned to remove all scum, dirt and loose material. Holes, cracks and other voids shall be pointed with cement mortar composed of 1 part portland cement, 2 parts sand by volume and not less than 10 pounds of metallic waterproofing to each bag of cement. Surfaces shall be smooth before applying brush coats. Mortar shall be well set before waterproofing is applied.

(b) Surfaces shall then be wetted with clean water and have two heavily brushed on coats of straight metallic waterproofing material and water, using not less than 10 pounds of waterproofing material to each square of surface for each coat. After complete oxidation (not less than 48 hours) the surface shall be again wetted and a slush coat applied. The slush coat shall consist of 1 part portland cement, 2 parts sand by volume and 15 pounds of metallic waterproofing material per sack of cement with only sufficient water added to make a thick grout. Each coat shall be uniformly spread, completely covering the surface and be carefully worked in to thoroughly seal the pores.

(c) Before the slush coat has set a bonding coat composed of one part portland cement and 2 parts sand by volume shall be applied. This bond coat shall be floated on, and then thoroughly scratched.

A finishing coat consisting of 1 part portland cement and 3 parts sand by volume shall be applied over the bonding coat. The total thickness of the protective coatings shall be not less than 3/4 inch. Finish coat shall be floated with a cork trowel to a reasonably smooth finish.

(d) Floors to be waterproofed shall be treated as specified in paragraph (b) for walls and then finished as hereinafter specified. Finish coat on floors shall consist of 1 part portland cement and 2 parts sand by volume with as little water added as practicable. The mixture shall be spread to a uniform thickness not less than one inch, screeded, floated and trowelled to true, even and level surfaces.

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SUGGESTED SPECIFICATION - DIVISION 12

DIVISION - 12
CAULKING

SCOPE:

12-1 Caulk all joints between masonry and the perimeter of wood and metal door and window frames in exterior walls of all buildings. Caulking shall be done from the outside, and in addition, wood window sills shall be caulked from the inside. For wood frames caulk before staff moulds are permanently secured in place.

12-2 Caulk all joints in (tile) (stone) copings.

12-3 Caulk joints between masonry and front edge of steel lintels over openings.

MATERIALS:

12-4 CAULKING COMPOUND shall be a plastic material, light in color, of weatherproof and waterproof qualities; it shall be stain-proof to materials adjacent thereto; it shall not be affected by long exposure to extremes of outside temperatures, nor sag, nor crack, nor become brittle; it shall gradually form a thin tough skin on exposed surfaces but underneath the surface it shall remain plastic indefinitely; it shall adhere tenaciously to wood, copper, steel, glass, paint and masonry materials; it shall not adversely affect paint applied thereto. The caulking compound shall be approved by the Local Authority before shipped to the work.

CAULKING:

12-5 Joints and spaces shall be thoroughly clean and dry. Before applying the caulking compound, coat surfaces of joints with a 4 percent solution of aluminum sterate or oleate in a volatile solvent.

12-6 Caulking shall be not less than $\frac{1}{2}$ inch deep; joints shall be raked out clean and prepared to receive the compound.

Joints having a dept in excess of 3/4 inch shall be packed with oakum to within $\frac{1}{2}$ inch of its surface. Joints shall be carefully and completely filled with the compound thoroughly worked and compressed into same. Material shall finish neatly against adjoining surfaces.

12-7 The method of application shall be by means of a pressure caulking gun; in locations where a caulking gun cannot be used the compound shall be applied with hand caulking tools.

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DEPARTMENT OF THE INTERIOR
UNITED STATES HOUSING AUTHORITY
WASHINGTON, D. C.

DATE
SEPT. - 1938

REVISIONS

SUGGESTED SPECIFICATION - DIVISION 13

DIVISION - 13
ROOFING, SHEET METAL WORK:

SCOPE:

13-1 Provide all roofing materials, sheet metal and related items, and labor necessary to complete the roofing work.

MATERIALS:

13-2 Except as hereinafter specified, materials shall conform to applicable A.S.T.M. Standards or Federal Specifications.

13-3 For built-up (composition) roofs.

(a) Felt shall be either asphalt or coal-tar-pitch impregnated felt, weighing not less than 13 pounds per square.

(b) Bitumen shall be either asphalt or coal-tar-pitch:
Asphalt shall have a softening point of not more than 165 degrees F., nor less than 140 degrees F. Asphalt shall not be heated over 400 degrees F. Asphalt primer (for concrete surfaces) shall be applied at the rate of not less than 7-1/2 pounds per square. Coal-tar-pitch shall have a softening point of not more than 150 degrees F. nor less than 140 degrees F. Pitch shall not be heated over 375 degrees F.

(c) Gravel or slag shall be clean, dry, durable particles, from 1/4 to 5/8 inch in size.

Gravel on roofs shall weigh 400 pounds per square, slag 300 pounds per square.

(d) Roof insulating material shall be manufactured from cork, fiber, or mineral products with mineral binders and compressed, felted or moulded into rigid boards. The total thickness of insulating material as used, shall have a total heat transmission not greater than 0.25 B.t.u. per square foot, per hour, per degree F. difference in temperature as determined by the National Bureau of Standards.

(e) Mineral surfaced felt for base flashing shall be an approved mineral surfaced felt weighing (including the surfacing material) not less than 65 pounds per square.

13-4 For sheet metal work:

(a) Unless otherwise specified sheet copper shall weigh 16 ounces per square foot; hard copper for downspouts, gutters, and other moulded metal; soft for roofing sheets.

(b) Zinc-coated sheet steel and iron shall conform to applicable A.S.T.M. Standard or Federal Specification and shall have a minimum coating of 1-1/4 ounce per square foot. Gage of metal shall be as specified. Sheets shall be marked with the manufacturer's name and its gage or weight.

NOTE TO ARCHITECT:
When specifying items of zinc-coated metal the gage of the metal should be specified for each item.

(c) Lead coated iron or steel: The base sheet shall be either iron or copper-bearing steel, and not lighter than (24) 26 (28) gage; sheet cleaned and processed so that the lead coating is free from pits or pinholes with perfect adhesion to the base metal.

Weight of coating shall be not less than 3-1/2 ounces per square foot of base metal; equally divided on the two sides of the sheet.

NOTE TO ARCHITECT:
If zinc-coated (galvanised) or lead-coated metal is specified in lieu of copper, all detail clauses of sheet metal specification should be revised accordingly.

(d) Solder shall be composed of one-half pig lead and one-half block tin. Tin-lead solder shall be supplied in bars, ingots, or other shapes, as specified in the contract or purchase order. Tin shall be best grade metal.

(e) Flux shall be in paste form, of best quality.

(f) Nails and fastenings: All nails, rivets, screws and similar fastenings shall be of the best grade hard copper or copper alloy.

(g) Sheathing Paper shall be a "Rosin-Sized" building paper weighing 20 pounds per square.

(h) Roofer's Cement shall be a waterproof, elastic compound.

INSTALLATION OF INSULATING MATERIAL:

13-5 Surfaces shall be smooth, dry, well cured and broom clean.

(a) Mop concrete surfaces with the Bitumen (surfaces shall be primed if asphalt is used) using not less than 25 pounds per square; place insulation into mopping while still hot. Then mop over top of insulation and apply felt. If two layers are applied, mop the top of the first layer with a uniform coating of 25 pounds per square and place the second layer in the same manner as the first layer; joints broken or offset with relation to the joints of the first layer; boards of both layers shall run parallel.

(b) Where decks adjoin vertical surfaces, the boards shall be cut in a neat manner and fitted to surfaces with moderate contact. An expansion joint approximately 1/2 inch wide shall be provided between toe of cant strip and the insulating board, this joint shall be filled with roofer's cement or other approved material. Boards shall be laid with 1/8 inch open joints and grouted full with material used for mopping. Felt stops shall be installed to isolate areas of approximately 280 square feet each.

(c) Insulation material shall be kept dry and sealed with the roofing materials each day. Felt stops shall be provided at places work is stopped each day.

INSTALLATION OF BUILT-UP (COMPOSITION) ROOFS:

NOTE TO THE ARCHITECT:
For roof with a pitch of 1/2 inch or less per foot of span, coal-tar-pitch roofing should be used.

13-6 ON CONCRETE AND ON RIGID INSULATION BOARD SURFACES:
Built-up roofing shall consist of:
(3 plies of felt and 4 applications of bitumen).

NOTE TO ARCHITECT:
The use of 3 ply roofs is recommended only for garages and similar secondary buildings.

(4 plies of felt and 5 applications of bitumen).
(5 plies of felt and 6 applications of bitumen).

NOTE: If asphalt is used and the roofing is applied directly on concrete, the surfaces shall first be primed with asphalt primer.

13-7 FIVE PLY ROOFING:

(a) The surface shall be coated uniformly with hot pitch, using not less than 40 pounds per square.

(b) Over this there shall be laid five layers of saturated felt; each sheet of each layer shall be lapped 26 inches over the preceding sheet and end laps shall be not less than 6 inches. Hot pitch shall be mopped the full 26 inches, on each sheet, so that in no case will felt touch felt, using not less than 25 pounds of pitch per square between successive layers. These layers of felt shall be carried up on vertical surfaces to point where metal cap flashing enters reglets.

(c) Then the entire surface shall be coated uniformly with hot pitch, poured from a dipper using not less than 70 pounds per square.

(d) Into this, while hot, there shall be uniformly embedded not less than 400 pounds of gravel or 300 pounds of slag per square.

13-7 FOUR PLY ROOFING:

(a) Same as above for 5 ply roof.

(b) Same as above for 5 ply roof except 4 layers of felt shall be used, each sheet lapped 24-1/2 inches over the preceding sheet.

(c) Same as above for 5 ply roof.

(d) Same as above for 5 ply roof.

13-7 THREE PLY ROOFING:

(a) Same as above for 5 ply roof.

(b) Same as above for 5 ply roof except 3 layers of felt shall be used, each sheet lapped 22 inches over the preceding sheet.

(c) Same as above for 5 ply roof.

(d) Same as above for 5 ply roof.

(e) Test: The Contractor shall cut a section one foot square of the built-up roofing from _____ buildings where designated by the Local Authority. Should the cuts reveal that the roofing, as installed, does not comply with contract requirements, the Local Authority may order the roofing removed and replaced with specified work; should the sections be approved, the Contractor shall repair the openings, making them tight.

13-8 ON WOOD SURFACES:
FIVE PLY ROOFING:
Built-up roofing shall consist of:

(a) 1 layer of building paper, well lapped and nailed with galvanized nails sufficient to hold paper in place until the felt is applied.

(b) Over this there shall be laid two layers of saturated felt, each sheet of each layer shall be lapped 17 inches over the preceding sheet and end laps shall be not less than 4 inches. The sheets shall be fastened along the edges with nails driven through flat tin caps as specified, spaced as necessary to hold them in place until remaining felt is laid. These layers shall be turned up vertical surfaces to point where metal cap flashing enters the reglets.

(c) Then the entire surface shall be coated with hot pitch, using not less than 25 pounds per square.

(d) Upon this there shall be laid three layers of saturated felt, each sheet lapped 22 inches over the preceding sheet and end laps shall be not less than 6 inches. Hot pitch shall be mopped the full 22 inches on each sheet, so that in no place shall felt touch felt, using not less than 25 pounds of pitch per square between successive layers. Each layer shall be fastened approximately 6 inches from the upper edge, with nails driven through tin caps. These layers shall not be turned up at vertical surfaces, but shall cover cant strip.

(e) Then the entire surface shall be coated uniformly with hot pitch poured from a dipper, using not less than 70 pounds per square.

(f) Into this, while hot, there shall be uniformly embedded not less than 400 pounds of gravel or 300 pounds of slag per square.

13-8 FOUR PLY ROOFING:

(a) (Same as above for 5 ply roof)

(b) (Same as above for 5 ply roof)

(c) (Same as above for 5 ply roof)

(d) Upon this there shall be laid two layers of saturated felt, and each sheet of each layer shall be lapped 17 inches over the preceding sheet, and end laps shall be not less than 6 inches. Hot pitch shall be mopped the full 17 inches on each sheet, so that in no place will felt touch felt, using not less than 25 pounds of pitch per square between successive layers. Each sheet shall be fastened approximately 6 inches from the upper edge, with nails driven through flat tin caps. These layers shall not be turned up at vertical surfaces.

(e) (Same as above for 5 ply roof)

(f) (Same as above for 5 ply roof)

13-8 THREE PLY ROOFING:

(a) (Same as (a) for 5 ply roof)

(b) (Same as (c) as above for 5 ply roof)

(c) (Same as (d) as above for 5 ply roof except felt shall be turned up vertical surfaces to point where metal cap flashing enters reglets.

(d) (Same as (e) as above for 5 ply roof)

(e) (Same as (f) as above for 5 ply roof)

13-9 TEST: The Contractor shall cut a one foot square section of the built-up roofing from _____buildings where designated by the Local Authority. Should the cuts reveal that the roofing, as installed, does not comply with contract requirements, the Local Authority may order the roofing removed and replaced with specified work; should the sections be approved, the Contractor shall repair the openings, making them tight.

INSTALLATION OF FELT BASE FLASHINGS:

13-10 Where masonry walls adjoin roof surfaces the two bottom layers, or, if roof is laid in shingle fashion, all layers of the roofing felt, shall be carried up on the vertical surfaces to the point where the metal cap-flashing enters the wall and into reglets. These layers shall be cemented to each other and to underlying surfaces; shall be secured to the masonry by nailing the top edge in an approved manner. Over the roofing felt, for its entire height and extending out on the roof deck (beyond the cant strip) approximately 8 inches, provide a layer of mineral surfaced felt applied in bitumen and firmly secured at top by nailing; this cap sheet shall be, when installed, entirely free from buckle and wrinkle.

NOTE TO ARCHITECT:
If cant strip is not used, copper base flashing is recommended.

SHEET METAL WORK:

13-11 Workmanship: Sheet metal work shall be adequate to provide water and weather-tight roofs. Lines, arrises and angles shall be sharp and true. Plain surfaces shall be free from waves and buckles. Joints and seams in plain surfaces shall be avoided as far as is possible. Copper shall not come in contact with other metals, except lead; when copper is joined to such metals, the copper shall be separated by sheet lead insulation weighing not less than 2 pounds per square foot. Where joint seams are soldered the copper shall be tinned for the full area of contact. Soldering flux shall be nonacid. Seams shall be single-locked and soaked with solder or double-locked and malleted flat. Seams throughout shall overlap in the direction of the flow. Soldering shall be done slowly, with well heated cappers, thoroughly heating the seams and completely filling them with solder. Ample provisions shall be made for expansion and contraction. All exposed copper surfaces shall be cleaned as each section of the work is completed. Care shall be exercised to prevent staining or discoloring the face brick or other work in exposed portions of the buildings; work so damaged shall be repaired or replaced.

INSTALLATION OF METAL FLASHINGS:

13-12 GENERAL: Flashings shall be installed where shown and required to make the work water and weather tight. Except as otherwise specified, all metal shall be 16 ounce copper.

(zinc-coated-galvanized-steel and iron)
(lead-coated steel and iron)

(a) Valley flashings for non-metal roofs shall be not less than 20 inches wide.

(b) The exposed edges of all cap flashings shall be doubled back 1/2 inch.

(c) Flashings in connection with drains and plumbing pipes through roofs are specified under other divisions.

METAL FLASHINGS:

13-13 BASE FLASHINGS: Unless otherwise shown, base flashings shall be at least 8 inches high, extending out on roof surfaces not less than 4 inches.

(a) On sloping roofs, base flashings shall lap at least 3 inches and shall not be soldered.

(b) On flat roofs, joints shall be flat-locked and soldered.

(c) Against stucco-walls, the metal lath shall lap the outside of the flashing not less than 4 inches so that the stucco shall extend over the base flashing.

13-14 CAP FLASHINGS: Metal Cap Flashings shall turn down over base flashings not less than 4 inches.

(a) In reglets in masonry walls, cap-flashing shall have its top edge turned up 1/4 inch, be forced into the reglets at least 1-1/2 inches, and turned down over the base flashing; it shall be fastened 12 inches on centers with lead wedges or metal slips, after which the reglets shall be pointed up with roofer's cement.

(b) Built-in Flashings: cap-flashing shall be built-in by the mason when the wall is laid, with top edge turned back at least 1/2 inch, extended into the wall not less than 2 inches and turned down over the base flashing.

(c) Cap-flashing shall be in lengths not exceeding 10 feet with end joints

lapped not less than 4 inches; metal at angles shall be continuous, locked and soldered. Cap-flashing, when let into reglets, shall not be installed until the base flashing has been installed and approved. Cap-flashings for special cases shall be as required by conditions.

13-15 THROUGH-WALL FLASHINGS, where indicated, shall be installed in an approved manner and in accordance with the printed instructions of the manufacturer.

13-16 STEP FLASHINGS, shall be installed where vertical surfaces occur in connection with slopes, formed of separate pieces of metal built into the masonry, or let into reglets. Metal shall lap generally 3 inches, but in no case less than 2 inches, and shall not be soldered; lap joints shall be vertical.

MISCELLANEOUS ITEMS OF SHEET METAL:

13-17 GRAVEL STOPS, shall be placed at edges of all built-up, slag or gravel roofs formed of one piece to provide a ridge the full height of the roofing material, and extending back on the roof not less than 6 inches and nailed on top of the felts, embedded in the bitumen, then covered with two layers of felt, 10 inches wide, well mopped on.

13-18 HANGING GUTTERS AND HANGERS FOR PITCHED ROOFS: Half round gutters, of size and type indicated, shall be installed where shown. Gutters shall be in 10 foot lengths, joined by 1 inch lap riveted and soldered, or by interlocking slip joints. Outer edges of gutters shall be rounded; all joints made in the direction of the flow. Gutters shall be provided with end pieces, and caps, outlet tubes and mitres as required. Gutters shall be supported by strap hangers of approved design. (Hanger shall be of adjustable shank and circle type.) Hangers shall be spaced not more than 36 inches apart and be secured in place by screws.

13-19 MOULDED GUTTERS FOR FLAT ROOFS shall be provided with flashing strips extending onto the roof sheathing as far as possible and secured to roof.

(a) Outer edges of gutters shall be stiffened by beading. Braces shall be spaced not more than 36 inches apart, locked around or riveted to the outer edges, and secured to the roof sheathing beyond the flashing strips with two screws. Gutter joints shall lap 1 inch, secured with rivets spaced 2 inches apart, and soldered. Outlets shall be provided with tubes soldered to gutters; tubes shall be of proper length to connect with downspouts.

13-20 DOWNSPOUTS (LEADERS) shall be held in position, clear of the wall, by hooks driven

in the wall, spaced not more than 6 feet apart, or by 3-inch straps spaced not more than 6 feet apart, fastened to masonry by screws set in lead sleeves.

(a) Downspouts in 10 feet lengths shall have joints lapped and soldered; a 2-inch slip joint shall be provided every 20 feet.

(b) Downspouts connecting with underground drains shall be fitted into drainpipes with joints neatly caulked and cemented, or with metal cap sheet, soldered to downspout.

(c) Downspouts shall be provided with goosenecks where offsets occur.

(d) Downspouts discharging into the open shall have elbows at bottoms.

13-21 DOWNSPOUT HEADS shall be of stock design; outlet tubes from gutters shall extend into downspout heads not less than 2 inches and downspout shall extend approximately 3 inches into the drains; downspout heads (10 inches wide and over) shall be provided with heavy wire removable screening.

13-22 STRAINERS: Gutter outlets shall be provided with heavy wire strainers of the basket type, set loose.

13-23 SPLASH PANS: Downspouts discharging on built-up roofs shall be provided with splash pans formed of sheet metal not less than 24 inches square, with 3 sides extending upward 2 inches, bedded in hot bitumen and secured to the downspouts with approved wire fastenings.

13-24 SCUPPERS: Line all scuppers with sheet metal, which shall extend through and project beyond the outside of wall surfaces, with seams locked and soldered; lining shall be joined to roof flashings by soldered seams.

13-25 CURBS: Openings in roofs shall have flashing turned down on the inside approximately 3 inches, secured with nails spaced 1-1/2 inches apart and extending out on the roof not less than 6 inches and be nailed on top of the felts, embedded in bitumen and covered with two layers of felt, 10 inches wide, well mopped in.

13-26 SCUTTLES shall be covered with sheet metal; sheets shall be applied with flat seams soldered and carried over the edges to the underside where they shall be neatly secured with nails 1-1/2 inches apart.

13-27 CRICKET (SADDLE) FLASHINGS: Crickets shall be formed back of chimneys and similar projections through sloping roofs; they shall be entirely covered with sheet metal, using flat seam method and soldered. Flashing of crickets shall be connected to the flashings along abutting walls.

13-28 CORNICES shall be formed of sheet metal, with mouldings true, sharp and straight; flat surfaces over 5 inches wide shall be crimped; all miters and joints shall be carefully fitted, and angles and corners rigidly reinforced; joints shall be neatly riveted, soldered and made watertight. The entire installation shall be water and weather tight.

13-29 SKYLIGHTS shall be of approved design and manufacture; curbs shall be not less than 10 inches above roof surfaces; sheet metal shall be reinforced where necessary for strength and stiffness with steel sections; sash bars and bearings for glass shall have condensation gutters leading to the outside of the skylights; skylights shall be made water and weather tight with joints interlocked, riveted and soldered.

13-30 SNOW-GUARDS: Install on all sloping roofs two rows of approved No. 6 gage copper wire snow-guards spaced not over 18 inches apart in both directions and staggered.

13-31 LOUVRES, where indicated, shall be formed as detailed of sheet metal. The inside face of louvre shall be covered with wire screen cloth, 16 mesh per inch.

13-32 EXPANSION JOINTS, where indicated, shall be formed of sheet metal and plastic materials as detailed. Connections between expansion joint material and other work shall be made watertight. Vertical expansion joints in masonry walls shall be provided with sheet metal fillers, back of the face brick; this metal shall be in strips not over 4 feet in length, joints lapped not less than 2 inches, without soldering.

13-33 CLEANING COPPER: Copper work when finished shall be thoroughly cleaned. Excess flux which may cause acid stains shall be neutralized by washing with a 5 to 10 per cent solution of washing soda (or a solution of about one pound of lye in a pail of water). After cleaning, the copper shall be washed with clean water.

COPPER ROOFS:

13-34 FLAT SEAM: First lay sheathing paper parallel with eaves, with laps not less than 2 inches horizontally, 6 inches vertically, turned up 6 inches under vertical cap flashings, turned over hips and ridges 12 inches. Paper shall be secured in place with large flat head copper roofing nails.

(a) Roof surfaces shall be covered with 14 by 20 inch copper roofing sheets laid with short edge parallel with eaves; sheets shall be turned on all edges for soldering, and formed to lock 1/2 inch with adjoining sheets.

(b) The copper sheets shall be secured to the sheathing by means of 2-inch wide copper cleats, two cleats on long side and one on short side of each sheet, nailed close to edges with copper nails and ends folded back over the nail heads.

(c) The corners of all sheets shall be properly clipped to permit folding; opposite sides of sheets shall be folded in opposite directions to hook properly into adjoining sheets; cross seams shall be folded in the direction of the flow, and staggered. Seams shall be flattened with a mallet before soldering and solder well sweated in, filling the seams completely; seams shall be finished 1/2 inch wide.

(d) Where copper roofs abut vertical surfaces, the sheets shall be carried up on the walls at least 6 inches, and secured to the wall with copper nails, and cap-flashed.

(e) For cap-flashing, see "Flashings".

(f) At eaves, lock roofing sheets into edging strips and gutters.

13-35 STANDING SEAM: First lay sheathing paper parallel with eaves with laps not less than 2 inches, turned up 6 inches under vertical flashings, and over hips and ridges 12 inches, secured in place with large flat head copper roofing nails.

(a) Roof decks shall be covered with copper sheets, laid with standing seams to finish 1 inch high and parallel with the slope of the roof. Seams shall be spaced approximately 17 inches apart, unless otherwise indicated.

(b) Long sheets shall be flat locked and soldered at the shop in lengths to extend from ridge or hips to eaves; all cross seams shall be lapped in the direction of the flow and staggered; finished cross seams shall show at least 3/4 inch of evenly flowed solder.

(c) Sheets shall in all cases be turned up vertically 1-1/2 inches on one side and 1-1/4 inches on the other side and so laid.

(d) 2-inch wide copper cleats shall be spaced approximately 10 inches apart and fastened in place against the 1-1/4 inch bend of sheets with two 1-inch copper nails. The bottom end of cleat shall be folded back over the nail heads and the other end shall be bent over and around the 1-1/4 inch vertical bend of sheet; the side of the next sheet having the 1-1/2 inch vertical bend is then placed against the cleats, and both sheets folded to form a double lock.

(e) Standing seams shall be finished straight and rounded neatly at the top edge.

(f) No solder shall be used on the standing seams.

(g) At hips and ridges the standing seams shall be folded down flat and folded into hip and ridge seams.

(h) Where roof abuts vertical surfaces, the seams shall be folded down flat with the open side underneath, carried up on the walls at least 6 inches to form base flashing joints and shall be flat locked and soldered and cap-flashed.

(i) For cap-flashing, see "Flashing".

(j) At eaves, seams shall be folded over flat and locked into edging strips and gutter. Joints shall be made in direction of flow.

(k) At valleys, seams shall be folded flat and locked into valley flashings, with joints made in direction of flow.

SLATE ROOFS:

13-36 SLATE: Slate shall be Black (Blue-Black) (Gray) (Blue-Gray), A (B) (C) Grade.

(a) Surfaces shall be reasonably smooth cleavage. Slate shall be free from knots or curls that would lessen the durability of the finished work. Slate shall be rectangular with straight cut edges, reasonably full on exposed edges, with no broken corners on covered ends that would diminish its nailing strength or weathertightness.

(b) Slate shall be not less than 3/16 inch thick (when piled closely - 100 pieces - shall measure 22 to 25 inches high). Slate shall be not less than 14 inches nor more than 18 inches long and may be of uniform or random widths, with not less than 2 holes for each slate spaced to provide for 3-inch double lap.

(c) The maximum bend shall not exceed 1/8 inch in 12 inches, and if curved shall be cut so that it can be laid with convex side up.

13-37 LAYING: First, 30 pound felt shall be laid over whole area, lapping each layer not less than 2 inches horizontally and 6 inches vertically; felt shall be fastened with large flat head copper coated nails, spaced approximately 8 inches apart on all laps and edges. Felt shall extend up at least 6 inches on all abutting vertical surfaces; double felt in valleys, over hips and at ridges.

(a) Provide double slate starting courses at eaves; lay slate in straight and even horizontal courses, parallel with eaves, in accordance with the best practice of the trade. Slate shall be laid with 3-inch double lap. Slate at eaves shall over-hang gutters at least 1 inch.

(b) Valleys shall be open, approximately 6 inches across; slate shall be cut to true, straight and even lines, and embedded in roofer's cement continuously along edge.

(c) Slate at hips and ridges shall be laid to line with roofing courses, in good quality elastic roofer's cement - 12 inches each side of roof intersection.

(d) Fasten slate with large flat head, copper coated nails, but in no case shall nails penetrate completely through the sheathing where exposed to view.

(e) Flashing and cap-flashing shall be of sheet metal and installed as specified; valleys shall be flashed with sheets not less than 20 inches wide.

(f) Finished work shall be weathertight and of good appearance.

NOTE TO ARCHITECT:
Specify head lap and exposure of slates desired.

SHINGLE TILE ROOFS:

13-38 Tile shall be flat shingles, composed of clay or shale, or a mixture of both, burned to form hard terra-cotta slabs free from defects that impair durability, appearance, and weathertightness.

(a) Tile shall be from 6 to 10 inches wide, approximately 16 inches long and not less than 1/2 inch thick. Top surfaces of tile shall be machine-roughened (smooth).

(b) Ridge and hips shall be covered with special trim tile; all necessary hip and tile starters shall be provided.

(c) Tile shall be of the following color combinations:

70% - - - reds
10% - - - light sage brown
20% - - - special burned fire flashed tile of various kiln run shade.

NOTE TO THE ARCHITECT:
The above colors and color combinations indicate the method of specifying; architect will specify colors and color combination best suited to his project.

13-39 LAYING: First, 30 pound felt shall be laid over whole area parallel with eaves, lapping each layer not less than 2 inches horizontally and 6 inches vertically; felt shall be fastened with large flat head, copper coated nails, spaced approximately 8 inches apart on all laps and edges. Felt shall extend up at least 6 inches on all abutting vertical surfaces, double felt in valleys, over hips and at ridges.

(a) Field tile shall be laid with not less than 2-inch head lap in regular courses, not less than 5 inches nor

more than 7 inches to the weather, and with medium close joints. (Irregular courses, and at random, with butts staggered from 1/2 inch to 1-1/2 inches with medium close joints.)

(b) Provide double starting courses at eaves. All special shapes such as hip, ridge and valley tile, and coping enclosures shall be furnished and installed as necessary. Tile shall be laid in accordance with the best practice of the trade. Tile at eaves shall overhang gutters at least 1 inch. Vertical joints shall overlap each other not less than 3 inches.

(c) Valleys shall be open, approximately 6 inches across. Tile at hips and ridges and valleys shall be laid in good quality elastic roofer's cement - 12 inches each side of roof intersection.

(d) Tile shall be fastened with large flat head, copper coated nails, but in no case shall nails penetrate completely through the sheathing where exposed to view.

(e) Flashing and cap-flashing shall be of sheet metal installed as detailed or specified; valleys shall be flashed.

(f) Finished work shall be completely weathertight and of good appearance.

INTERLOCKING TILE ROOFS:

13-40 Tile shall be of lightweight interlocking shingles, composed of clay or shale, or a mixture of both, burned to form hard terra-cotta slabs free from defects that impair durability, appearance, and weathertightness. Tile shall be furnished in weathered or smooth top surface, as selected by the Architect.

(a) Tile shall be of regular sizes, approximately 9 x 13-1/2 inches; butts shall be approximately 3/4 inch thick; weight of tile in place shall be not more than 600 pounds per square; tile shall interlock at sides only. Tile along hips and valleys shall be cut to proper angles before burning.

(b) Provide "V" type hip and ridge roll tile, also plain terminals and hip starters; provide end bands and rakes at gable ends.

(c) Tile shall be furnished in color range of _____, as selected and approved by the Architect, the shades shall be uniformly distributed throughout roof surfaces.

13-41 LAYING: First, 30 pound felt shall be laid over whole area, parallel with eaves, lapping each layer not less than 2 inches horizontally and 6 inches vertically; felt shall be fastened with large head, copper coated nails, spaced approximately 8 inches apart on all laps and edges. Felt shall extend up at least 6 inches on all abutting vertical surfaces, double felt in valleys, over hips and at ridges.

(a) Tile shall be laid with not less than 2-inch head lap in regular courses; with not less than 5-3/4 inches nor more than 8 inches to the weather, with vertical joints broken in alternate courses, and with butts parallel

with eaves. Starting course at eaves shall be of special lip type and shall overhang gutters at least 1 inch.

(b) Valleys shall be open, approximately 6 inches across. Valley tile shall be laid in roofer's cement.

(c) Tile at hip, ridges and valleys shall be laid in best quality elastic roofer's cement - 12 inches each side of roof intersection.

(d) Tile shall be fastened with large flat head, copper coated nails of lengths required, but in no case shall nails penetrate completely through the sheathing, where exposed to view.

(e) Flashing and cap-flashing shall be of sheet metal and installed as detailed; valleys shall be flashed.

(f) Finished work shall be weathertight and of good appearance.

ASBESTOS CEMENT SHINGLE ROOFS:

13-42 Shingles shall be of dense, rigid structure and shall be composed of Portland cement and asbestos fibre, free from defects that impair durability, appearance and weathertightness. The exposed surfaces shall reproduce the appearance of old, hand-riven, wood shingles in a combination and range of weathered grays; colors shall not fade appreciably on continued exposure to weather.

NOTE TO ARCHITECT:
Base colors of shingles are black, red and mottled gray. If colored shingles are specified, include in the specification the following:

"Color shall be obtained by embedding limeproof mineral pigments or mineral granules, or both, in the exposed faces or by chemical impregnation."

(a) Shingles shall be 8 by 16 inches, or may be in random widths from 6 to 10 inches, 1/4 inch thick at butts and tapered.

(b) Shingles shall be 8 by 16 inches, or may be in random widths from 6 to 10 inches, of uniform thickness of not less than 5/32 inch thick.

13-43 LAYING: First, 30 pound felt shall be laid over whole area, parallel with eaves, lapping each layer not less than 2 inches horizontally and 6 inches vertically; felt shall be fastened with large head, copper coated nails, spaced approximately 8 inches apart on all laps. Felt shall extend up at least 6 inches on all abutting vertical surfaces; double felt in valleys, over hip and at ridges.

(a) Singles shall be laid with at least 2-inch head lap in regular courses,

with approximately 7 inches to the weather and with medium close joints "American Method". ("Dutch Lap").

(b) Provide double starting courses at eaves, lay shingles in accordance with best practice. Shingles shall overhang gutters at least 1 inch. Valleys shall be open, approximately 6 inches across. Vertical joints shall overlap each other not less than 3 inches.

(c) Shingles at hip and ridges shall be laid saddle type in roofer's cement 12 inches each side of roof intersection.

(d) Shingles shall be fastened with large flat head, copper coated nails, but in no case shall nails penetrate completely through the sheathing where exposed to view.

(e) Flashing and cap-flashing shall be of sheet metal, installed as specified; valleys shall be flashed.

(f) Finished work shall be weathertight and of good appearance.

ASPHALT SHINGLE ROOFS:

13-44 Shingles shall be composed of roofing felt, saturated or impregnated with asphalt and surfaced on exposed side with granulated slate or similar material, as required to produce the colors selected. The opposite side of the shingle shall be dusted with talc or mica to prevent sticking in the package.

NOTE TO ARCHITECT:
Basic colors of this material are: Blue-black, Tile-red, Unfading green, Weathered brown.

(a) Shingles shall be of the individual type, heavy butt, approximately 9 inches wide by 12 inches long; shingles in place shall weigh approximately 235 pounds per square. (Shingles shall be of the strip type, heavy butt, approximately 36 inches wide by 12 inches long and each shall be made to give the effect of four individual shingles when laid; shingles in place shall weigh approximately 235 pounds per square.)

(b) The weight of the surfacing material shall not exceed 35 pounds per 108 square feet of felt.

(c) The color and distribution of the surfacing material shall be uniform over the entire exposed surface, including the edges.

(d) Shingles shall meet the following test:

On heating to 176 degrees F. for 2 hours, there shall be no flowing, sagging, blistering, or absorption of the coating; the surfacing material shall not become detached or fall off; the maximum loss in weight shall be 1-1/2 per cent exclusive of weight of surfacing material and desaturated felt.

13-45 LAYING: First, 30 pound felt shall be laid over whole area, parallel with eaves, lapping each layer not less than 2 inches horizontally and 6 inches vertically; felt shall be fastened with large head, zinc-coated roofing nails, spaced approximately 8 inches apart on all laps and edges. Felts shall extend up at least 6 inches on all abutting vertical surfaces; double felt in valleys, and at ridges.

(a) Shingles shall be laid with not more than 6 inches exposed to the weather. Provide double starting courses at eaves. The instructions of the manufacturer of the shingles shall be followed in the execution of this work.

(b) Before laying first course provide a metal drip strip doubled over and projecting 3/4 inch beyond the edge of the sheathing and carried not less than 5 inches under the first course of the shingles.

(c) All courses shall be straight and even; vertical joints shall overlap on center line of the preceding course. Each shingle shall be secured with two 1-inch large flat head, zinc-coated nails. Valleys shall be cut true to line; shingles shall be nailed along valleys 2 inches apart and 1 inch from edge of shingle, and cover exposed nail heads with roofing cement. Shingles at hips and ridges shall be laid saddle type, formed by bending individual shingles over the hip or ridge 5 inches to the weather and nailing 6 inches from the exposed end on each side of the hip or ridge.

(d) Flashing and cap-flashing shall be of sheet metal and installed as detailed and specified. Valleys shall be open type, 6 inches wide, flashed with 12 inch wide sheet metal.

(e) Finished work shall be weathertight and of good appearance.

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NOTE TO ARCHITECT:
If a separate maintenance bond and guarantee is desired for roofing and sheet metal work, beyond the one year guarantee already provided in the "Performance Bond", it should be clearly stated, together with a statement of whether the contractor will be required to pay for such bond.

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PROJECT NO.
METAL WINDOWS-14-1

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SUGGESTED SPECIFICATION - DIVISION-14

DIVISION-14
METAL WINDOWS:

NOTE TO ARCHITECT:
Unless the design specifically requires metal windows, it is suggested that the drawings show, and the specification describe, alternate design for wood windows.

SCOPE:

14-1 For extent, type, dimensions and sizes see "Schedule of Metal Windows". Windows shall have glass sizes, number of lights, and vents as indicated.

NOTE TO ARCHITECT:
The scope as written above necessitates a "Schedule of Metal Windows" on the drawings; this schedule shall indicate Type, Size, Size of Glass, Swing of Ventilator; Metal Casing or Metal Stool, Screen, Shade and Drapery Rod Requirements.

In the case of single vents, in the selection of left or right hand openings, the prevailing winds should be taken in consideration.

MATERIALS:

14-2 Sections shall be fabricated from low carbon, new billet, hot-rolled solid steel shapes.

RUST PREVENTION:

14-3 After fabrication and before shipment, all windows shall be either Bonderized or Parkerized and given 1 coat of gray metallic paint, or shall be given 2 coats of gray metallic paint, with each coat separately baked on, or they shall be hot dipped zinc-coated.

NOTE TO ARCHITECT:
Zinc-coating for metal sash is not considered necessary, except in sea coast areas where zinc-coated windows are used; painting on zinc-coated windows should be omitted, unless considered essential for decorative purpose. If zinc-coated metal windows are to be painted, specify that the windows be especially treated prior to painting so that a satisfactory paint job may be had.

GLAZING:

14-4 To be executed as specified under division "Glass and Glazing".

(a) Casement type windows shall be designed for exterior glazing with copper coated spring wire clips and putty.

(b) Horizontally pivoted windows and commercial projected windows shall be designed for inside glazing with copper coated spring wire clips and putty.

(c) Glazing for basement windows shall be as designed by the manufacturer.

METAL WINDOWS:

14-5 General: Metal windows of stock fabricated units meeting the requirements herein specified will be accepted; prior approval of shop drawings shall be obtained from the Local Authority before windows are fabricated.

14-6 Sections shall be straight and free from defects. All joints shall be closely fitted.

(a) Before assembly, all frame and movable contact bars shall be process-straightened.

14-7 Metal windows shall be furnished complete, including all necessary anchors, fins, hardware and equipment hereinafter required; they shall be manufactured in complete units at factory ready for installation.

NOTE TO ARCHITECT:
Metal Windows for low-cost housing should in all cases be of stock types, size and construction, conforming to the recommendations of the "Metal Window Institute" for the type of window required.

14-8 Windows when installed shall conform to the following air infiltration test:

After installation and final painting and upon direction of the Local Authority, the Contractor shall, in the presence of the Architect, test each casement type window in the following manner:

Between the inside weathering surface of ventilators and their supporting frames, the metal to metal contact shall be so nearly perfect that when the ventilator is locked it will not be possible to insert, without forcing a metal feeler gauge 1 inch wide and 1/32 inch thick at any point in the perimeter, nor will it be possible to insert, without forcing a similar feeling gauge 1/64 inch thick at any point along 60 per cent of the perimeter.

LIGHTWEIGHT CASEMENTS:

14-9 Frame and ventilator members shall be Zee bar sections. Frame members shall have extended leg not less than 1-1/2 inch deep measured from the center line of web, either integral with frame, or applied. If applied they shall be welded, riveted or bolted to frame, for building into wall construction (jambs and heads only). If extended leg is an applied member, it shall be not less than No. 12 U. S. gauge metal.

(a) All sections, except muntins, shall be not less than 1 inch deep from front to back, and not less than 1/8 inch thick. All corners shall be mitered and electrically continuous full welded. Exposed faces at welds shall be ground smooth. Ventilators or swing leaves shall contact the frames with continuous, two-point flat contact.

(b) Muntins shall be Tee bar sections not less than 5/8 inch face with a depth of not less than 3/4 inch; continuous between rails and stiles; rigidly interlocked at intersections. Horizontal muntins punched for glazing clips.

(c) Continuous drip molds shall be provided on transom bars or at heads where ventilators extend the full height of openings.

(d) Where combinations of standard units are required for any single opening, vertical or horizontal mullion bars shall be provided.

(e) All exposed edges shall be smooth.

(f) All units shall be machined for attachment of necessary screen hardware and shade and drapery rod brackets.

14-10 Hardware shall be of malleable iron or other suitable material, all first class, substantial, smooth of operation, and free from sharp edges and other imperfections.

(a) Hinges shall be of heavy extension, friction type, with fixed bronze pins, and with bronze friction washers having ample area of approved friction surface, preventing contact between ferrous metal parts at bearing surfaces; pins shall be threaded and provided with lock washer and bronze nuts for friction adjustment of hinge.

(b) Hinges shall be designed to permit ready cleaning of the exterior face of the glass; they shall be of ample strength and rigidity to permanently support the glazed ventilator in any position without twist or sag; they shall permit the full swing of the ventilator; hinge leaves shall be riveted or welded to the frame and to the ventilator.

(c) Locking handles and keepers shall be of plain substantial pattern, securely riveted or welded to frame and to the ventilator, and shall be either a die-casting or of rust proof iron of the cam acting type engaging with beveled keepers.

NOTE TO ARCHITECT:
Metal casement windows generally shall be of the "Lightweight casement Type", but where ventilators are over 20 inches wide or over 53 inches high "intermediate casement" should be used.

INTERMEDIATE CASEMENTS:

14-11 Frame members shall be of equal leg channel section and ventilator members shall be of modified Zee bar sections. Frame members shall be designed for anchorage by means of an applied continuous angle fin not less than 1/8 inch thick; fin shall extend not less than 5/8 inch into wall construction.

(a) All sections, except muntins, shall be not less than 1-1/4 inches deep from front to back, and not less than 1/8 inch thick. All corners shall be mitered and electrically continuous full welded. Exposed faces at welds shall be ground smooth. Ventilators or swing leaves shall contact the frames with continuous, two point flat contact.

(b) Muntins shall be Tee bar sections not less than 3/4 inch face and a depth of not less than 7/8 inch, continuous between rails and stiles; at intersections muntin shall be rigidly interlocked. Horizontal muntins shall be punched for glazing clips.

(c) Continuous drip molds shall be provided on transom bars or at heads where ventilators extend the full height of openings.

(d) Where combination of standard units are required for any single opening, vertical or horizontal mullion bars shall be provided.

(e) All units shall be drilled to receive standard shade and drapery rod brackets.

14-12 Hardware shall be of malleable iron or other suitable material, all first class, substantial, smooth of operation, and free from sharp edges and other imperfections.

NOTE TO ARCHITECT:
Specification for hinges and locking handles shall be as specified for light-weight casements.

BASEMENT WINDOWS:

14-13 Windows shall conform to the manufacturer's standard stock type, hinged or projected either top or bottom as shown.

(a) Frame and ventilator sections shall be not less than 1 inch deep front to back.

HARDWARE:

14-14 Hardware shall be of malleable iron, pressed steel, or bronze complete as required for proper operation and locking of ventilator.

HORIZONTALLY PIVOTED WINDOWS:

NOTE TO ARCHITECT:
Horizontally pivoted windows are not satisfactory in dwelling units.

14-15 Frame, ventilator and muntin sections shall be not less than 1-3/8 inches deep, front to back, except that for windows with continuous full welded joints, sections may be 1-1/4 inches in depth; mullions of depth required to provide satisfactory rigidity shall be furnished for windows of multiple units.

(a) Double contact weathering shall be provided on all four sides of the ventilator.

(b) Muntin bars, except where ventilators occur, shall be continuous from head to sill and from jamb to jamb, provided that for windows with continuous full welded joints, muntin bars, either vertical or horizontal, shall be continuous in full width or height.

(c) Corner joints and connections between muntins and frame shall be tenoned and riveted, or they shall be caped or mitered, and then continuous full welded. Muntin intersections shall be mechanically interlocked or welded.

(d) Glass rebates shall be not less than 5/16 inch in depth.

(e) Ventilators shall be pivoted at sides approximately 2 to 3 inches above the center and shall open out at bottom.

(f) Applied weathering members shall be not lighter than No. 16 U.S.S. gage metal and shall be welded, riveted or bolted in place. Design of weathering shall incorporate

outside drips at top and bottom rails of vents and provision for the removal of condensation at bottom.

14-16 Hardware shall be of malleable iron or pressed steel, primed for painting. All hardware shall be full welded or riveted in place. Hardware shall be standard with the manufacturer of the window approved for use, complete, either push bar, gravity cam latch, or spring latch and chain.

COMMERCIAL PROJECTED WINDOWS:

NOTE TO ARCHITECT:
Commercial Projected Windows are not satisfactory in dwelling units.

14-17 Frame, ventilator and muntin sections shall be not less than 1-3/8 inches deep, front to back, except for windows with continuous full welded joints, sections may be 1-1/4 inches in depth. Mullions of depth required to provide satisfactory rigidity shall be furnished for windows of multiple units.

(a) Double contact weathering shall be provided on all four sides of the ventilator.

(b) Muntin bars, except where ventilators occur, shall be continuous from head to sill and from jamb to jamb, provided that for windows with continuous full welded joints, muntin bars, either vertical or horizontal, shall be continuous in full width or height.

(c) Corner joints and connections between muntins and frame shall be tenoned and riveted, or they shall be caped or mitered, and then continuous full welded. Muntin intersections shall be mechanically interlocked or welded.

(d) Glass rebates shall be not less than 5/16 inch in depth.

(e) The side of the window frame shall act as a guide for the sliding friction shoe.

(f) The sliding friction shoe shall be constructed of brass or bronze with compression spring enclosed in steel tubing.

(g) There shall be two heavy supporting arms attached to the ventilator and frame, designed to be concealed

when ventilator is closed. The rivet holes in supporting arms shall have brass flanged bushings.

(h) Uniform tension to hold ventilator in any desired position shall be obtained by a sliding friction shoe. Opening and closing movements of ventilators shall be uniformly smooth and free from twist or rattle.

(i) Open-in ventilators shall be equipped with solid steel stops which will prevent the ventilator from opening farther than 80 degrees.

14-18 Hardware shall be of malleable iron or other suitable material.

(a) Outward projecting ventilators within reach of the floor shall be equipped with suitable locking handle.

(b) Outward projecting ventilators not easily accessible shall be equipped with suitable locking handle and pole of proper length with hook ring; provide operating poles (one for each room); each pole shall have a malleable iron hanger, located where directed.

METAL CASINGS:

14-19 Metal casings (trim) shall be provided for all windows where called for in the "Metal Window Schedule". Metal casings shall be securely riveted, welded, screwed or bolted to window frame.

(a) Casings shall be of approximate design as shown and of dimensions required.

(b) Metal shall be hot-rolled, smooth, flat blue-annealed open hearth steel; jambs and heads shall be of No. 18 U.S.S. gage, and sills shall be of No. 16 U.S.S. gage metal.

(c) Two reinforcement plates, not less than 1 by 2 by 3/16 inches, shall be welded to back face of jambs, at head, for attachment of shade and drapery rod bracket supports. (See drawings.) Drilling for attachment of supports is included under this heading. The furnishing and installation of the supports is specified under the division "Shades".

METAL STOOLS:

14-20 Metal Stool shall be provided for all windows where called for in the "Metal Window Schedule" on the drawings.

(a) Stools shall be of approximate design as shown and of dimensions required.

(b) Metal shall be hot-rolled, smooth, flat blue-annealed open hearth steel; of No. 16 U.S.S. gage metal.

(c) Stools shall project not less than 1/4 inch beyond the finish wall surface; the ends of the stool shall extend beyond the face of the plaster returns in the reveals; ends of nozings shall be closed.

METAL SCREENS:

14-21 Metal screens shall be provided for all windows noted on "Schedule of Metal Windows". There shall be one screen for each vent, or for pair of adjacent vents.

(a) Screens shall be of the horizontal sliding wicket type, stock, standard with the manufacturer furnishing the metal windows.

(b) Provide standard type locking device for securing screen to window frame; locking device shall insure close contact, easy removal, and secure attachment.

(c) Screen frames shall be well made and of sturdy construction with provisions for easy rewiring.

(d) Screen cloth shall be of 0.0113 inch nominal diameter - 16 mesh - commercial bronze (aluminum) wire.

SETTING METAL WINDOWS:

14-22 Windows shall be delivered and set without delay to other work.

Particular care shall be exercised in setting windows; masonry walls shall be carried up approved number of courses; windows when set shall be plumbed and squared and be sufficiently braced to existing work so that no distortion will occur when window is being bricked-in.

The inside joint between window frames and masonry shall be raked out not less than 3/4 inch deep and shall be caulked and pointed-up with mastic after window is built-in.

FINAL ADJUSTMENT:

14-23 Just prior to the completion of the work and after all other trades, including painting of windows, are completed, all ventilators, including their hardware, shall be carefully adjusted to insure that all windows are in perfect working order. Friction hinges shall be adjusted to a pull of approximately 9 pounds on the locking side.

STORAGE-SHIPPING:

14-24 Windows when received at the buildings shall be carefully stored to prevent deformation of sections and injury by dirt or the weather. They shall be kept dry and the priming coat kept free from defacement or rust.

Hardware not permanently attached to windows shall be shipped separately in containers clearly marked to indicate contents and type of windows for which it is to be used.

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METAL WINDOWS

14-03 Windows shall be delivered and set without delay to other work.

Particular care shall be exercised in setting windows; masonry walls shall be carried up approved number of courses; windows when set shall be plumbed and squared and be sufficiently braced to exclude work so that no distortion will occur when window is being [illegible].

The jambs joint between window frames and masonry shall be raked out not less than 3/4 inch deep and shall be caulked and pointed-up with mastic [illegible] window is built-in.

[illegible] prior to the completion of the [illegible] all other trades, including painting of windows, are completed, including [illegible] all ventilators, shall be carefully examined to insure that all windows are [illegible] working order. Defective [illegible] shall be adjusted to a full [illegible] satisfactorily & panels on the leading [illegible]

[illegible] when received at the buildings [illegible] be carefully stored to prevent deformation of sections and injury by dirt or the weather. They shall be kept dry and the painting coat kept free from defacement or rust.

Hardware not permanently attached to windows shall be shipped separately in containers clearly marked to indicate contents and type of window for which it is to be used.

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SUGGESTED SPECIFICATION - DIVISION-15

DIVISION-15
METAL BUCKS, METAL DOORS AND METAL BASE:

SCOPE:

15-1 Furnish and install:

(a) Metal door bucks: For extent and details, see drawings.

(b) Metal Doors: For extent, design, sizes, and types see drawings and "Door Schedules".

(c) Metal base: For extent, see drawings and "Schedule of Interior Finishes". In addition to metal base so scheduled, metal base will be required around walls of all recesses, alcoves and closets without doors, where such areas occur adjacent to rooms and spaces scheduled to have metal base. No metal base will be required around walls of closets having doors.

MATERIALS:

15-2 Stock fabricated items of recognized manufacturers meeting the requirements specified will be accepted. Shop drawings shall be approved before fabrication is begun.

15-3 Metals and related items used in the manufacture of the items for fabrication herein specified shall conform to the applicable requirements of A. S. T. M. Standards or Federal specifications.

METAL DOOR BUCKS:

15-4 Metal bucks shall be formed of No. 16 gauge metal with rebates not more than ½ inch deep. Anchors and reinforcing shall be No. 14 gage metal unless otherwise noted; reinforcement for hardware shall be of proper thickness to develop the full strength of hardware attachment screws. Jamb and head members shall be continuous full welded with joints on exposed faces ground smooth. Form bucks to provide grounds for plaster. Mortise and reinforce bucks to receive hardware as required; reinforcement shall be welded in place and tapped for machine screws at factory. Weld steel strike box to jambs to receive lock bolts. Bucks and anchors shall be primed at the shop with one coat of rust-inhibitive, medium gray, paint.

NOTE TO ARCHITECTS:
Carefully studied details should be made indicating methods of anchoring to floor and ceiling construction, as well as anchorage to metal studs in 2 inch solid plaster partitions.

INSTALLATION OF BUCKS:

15-5 Bucks shall be erected plumb and true, securely anchored in place; they shall be anchored at bottom with anchors welded to bottom of jambs and secured to floor construction with an approved type of fastening device (fiber plugs will not be acceptable).

(a) Bucks in masonry walls and partitions shall be anchored at each jamb with 3 equally spaced adjustable anchors extending into masonry approximately 8 inches, and bent down over masonry unit. At head weld a 12 gauge 1½ inch wide reinforcing bar of

length to extend 6 inches into masonry on each side of jamb.

(b) In solid plaster partitions, bucks shall be anchored at jambs to adjacent studs by 3 anchors, spaced as nearly as possible opposite hardware butt cut-outs, welded to back of bucks and wired or bolted to studs. Each buck shall be anchored at top to ceiling construction with 1 x $\frac{1}{4}$ inch vertical bar uprights (one at each jamb) extending down on buck jambs 10 inches below upper butt reinforcing plate. Uprights shall be secured to ceiling construction by means of separate bent bars 1 x $\frac{1}{4}$ inch extending 6 inches on the ceiling and lapping the upright not less than 12 inches. The leg of the angle on the ceiling shall be secured thereto, by two fastening devices same as used for securing jambs to floor construction. The bent bar at ceiling shall be secured to uprights by two $\frac{1}{4}$ inch stove bolts; the holes in uprights may be slotted for adjustment. Metal bucks over 3 feet wide shall have additional reinforcing at heads. Temporary spreader braces shall be provided at bottom of each frame, and shall be left in place until frames are rigidly set.

HOLLOW METAL DOORS:

15-6 Hollow metal doors shall be constructed of not less than No. 20 gauge cold rolled furniture stock steel and unless otherwise indicated, doors shall have stiles and rail 1 3/4 inches thick, with panels not less than 1/4 (3/8) inch thick; both filled with approved insulating material.

Doors shall be panel (semi-flush) (flush) type. Stiles shall be full height with all exterior surfaces made from one sheet. Edges which contact and lock panels and stiles shall be formed with double fold, with no welding exposed on surfaces. If top and bottom rails are separate sheets, they shall interlock with panel sheet in same manner as stiles. All connections where panels contact stiles and rails shall be reinforced with channel or angle welded to panel, full height of door and width of panels.

Doors shall be reinforced for hardware and at other places where necessary to obtain true alignment and rigidity. Reinforcing shall be No. 16 gauge sheet steel except for hardware which shall be 1/8 inch thick. Reinforcement for butts shall be off set so face of butts will be flush with edge of door. Panel molds shall be secured in place in an approved manner that is standard construction of the manufacturer, when metal doors are glazed. Joints shall be full welded the entire length, ground smooth and be invisible. Doors shall be thoroughly cleaned and given a heavy coat of neutral gray paint at the factory.

METAL COVERED DOORS:

15-7 Metal covered doors shall have wood cores covered with No. 24 gage hot zinc-coated iron or steel (16 ounce sheet copper). Unless otherwise indicated, doors shall be 1 3/4 inches thick. Cores shall be non-resinous wood. Stiles and rails shall be mortised and tenoned or dowelled and glued. The metal shall be tightly drawn on surfaces, without buckles, indentations or other defects in a manner that will insure permanent continuous contact with the cores. Panel moldings may be either hollow metal or metal covered wood, secured in place with screws. Edges shall be clean, sharp, straight and true. Joints or seams shall be continuous full soldered, or welded, and ground smooth. Doors shall be given a heavy coat of neutral gray paint at the factory.

METAL BASE:

15-8 Base shall be of profile as detailed, of not less than No. 20 gage hot zinc-coated sheet steel, formed of one piece; corner angles and end stops shall be shop fabricated with legs not less than 8 inches long. Ends shall be closed at door and other openings. A splice plate, not less than No. 16 gauge metal or other method of approved design for joining adjacent members, shall be provided at every joint. Where splice plates are used, there shall be 2 screws on each side of joints spaced as far apart, vertically, as possible; screws for base shall be uniformly spaced not more than 2 feet apart, alternate screws being staggered 1 inch. Base shall be properly prepared for paint and primed on both sides at the factory. Base shall be installed in accordance with the approved shop drawings, to wood grounds, with 5/8 inch No. 6 oval head-wood screws, spaced not more than 24 inches on centers. Screws between joints shall be staggered alternately 1/2 inch above and below center line of grounds.

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SUGGESTED SPECIFICATION-DIVISION - 16

DIVISION-16
METAL STAIRS:

SCOPE:

16-1 Fabricate and erect metal stairs; for location and extent see drawings.

(a) Treads and platforms shall be of metal pan type, cement filled; see division "Concrete Work".

NOTE TO ARCHITECTS:
Check division "Concrete Work" and see that the cement fill before specified is covered.

STOCK STAIRS:

16-2 Stock fabricated metal stairs meeting the general requirements specified will be accepted, if approved by the Local Authority. Metal stairs shall approximate the design and details indicated, assembled and reinforced so as to sustain an uniform distributed live load of 100 pounds per square foot. Shop drawings shall be approved before fabrication is begun.

16-3 Iron, steel and related items used in the fabrication of metal stairs shall conform to the applicable requirements of the A.S.T.M. Standards of Federal Specifications.

16-4 In the fabrication and installation of metal stairs include all necessary parts such as:

(a) Anchors, bolts, angles, hangers, supports, and other accessories required.

NOTE: If soffits of stairs are to be plastered, provide means for securing metal furring and lath; if soffits of stairs are not plastered then said soffits should present a neat appearance.

(b) Skirtings at wall lines of stairs and intermediate platforms.

(c) Safety tread nozings of approved type, where indicated.

(d) Balustrades of steel or iron of design shown including handnails (except wood).

(e) Pipe handrails of diameter indicated, supported by brackets, on walls.

(f) Detached handrails with their supporting brackets where these handrails are noted to be of metal.

(g) Newels where indicated.

SHOP AND FIELD PAINTING:

16-5 Before shipping all metal shall be thoroughly cleaned and given one shop coat of rust-inhibitive paint of neutral gray color. All portions of stairs that will be permanently concealed shall be given an additional coat of paint in the field before erection. After installation, abraided and damaged places shall be touched up with the same paint.

ASSEMBLY AND INSTALLATION:

16-6 Members shall be closely fitted and assembled in as large sections as practicable for delivery and handling on the job. Factory assembly shall be by riveting or welding.

16-7 All work shall be accurately and securely erected with anchorage as shown and as necessary. If stairs are installed in advance of other work, provide wood plank fillers to prevent tread and platform pans from being damaged.

16-8 Safety treads shall be set flush with the surface of the cement fill and anchored to the stair construction (see details).

NOTE TO ARCHITECTS:
If stair treads are covered with asphalt tile or similar covering, then safety treads should be specified to finish flush with the finished surface of the covering material.

16-9 Balustrades, metal handrails in connection with stairways shall be installed in accordance with the approved shop drawings.

16-10 Metal handrails on wall side of stairways shall be supported on wrought or malleable iron brackets. Railing shall be fitted with moulded ends or returns secured to the rails. The supporting brackets shall be secured to wall with bolts extending completely through the wall or as shown; bolts shall be provided with suitable washers and nuts, so placed that they will be entirely covered with the plaster.

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PROJECT NO.
METAL PARTITIONS AND
SHOWER CABINETS-17-1

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SUGGESTED SPECIFICATION - DIVISION - 17

DIVISION-17
METAL PARTITIONS AND SHOWER CABINETS:

SCOPE:

17-1 Furnish and install:

(a) Metal toilet Partitions; for location extent and detail, see drawings.

(b) Shower Cabinets: for location and number, see drawings.

NOTE TO ARCHITECTS:
If shower cabinets are included in this division of the work, the "PLUMBING" division should be coordinated with the requirements herein set forth, or the entire shower cabinet may be specified under "PLUMBING".

MATERIALS:

17-2 Standard stock fabricated metal partitions (and shower cabinets) of recognized reputable manufacturers, and designed in accordance with "Simplified Practice Recomendations No. 101-29", meeting the requirements specified will be accepted. Shop drawings shall be approved before fabrication is begun.

17-3 Sheet metal shall be cold rolled, furniture stock steel that has been properly annealed and process leveled, with smooth surfaces free from buckles. Gages of metal shall be as hereinafter specified.

WORKMANSHIP:

17-4 Workmanship throughout shall be first class, fabricated in accordance with the approved shop drawings and in keeping with the best approved standard shop practices.

HARDWARE:

17-5 Hardware and accessories shall be complete, plain pattern, of cast aluminum. (Cast brass or bronze chromium plated over nickel plate).

METAL PARTITIONS:

17-6 Partitions shall be of flush (panel) type.

(a) Except as otherwise specified, all metal shall be No. 20 gage; metal for faces of doors shall be No. 22 gage; reinforcement shall be not less than No. 16 gage steel; reinforcement for hardware shall be of sufficient thickness to develop the full strength of screws or welds used for securing hardware in place.

(b) Posts and top-rails shall be square or rectangular of No. 16 gage steel or paneled of No. 18 gauge steel. Top rail fittings shall be pressed steel or malleable iron.

(c) Floor fittings shall be non-ferrous metal, adjustable, standard with the manufacturer.

17-7 Doors shall be stock product of the manufacturer and filled with sound deadening material. Hinges shall be of the gravity type, double acting, with concealed stainless steel ball-bearing rollers and hardened stainless steel cams, adjustable to permit door to be self-opening, or held ajar at an angle of about 30 degrees. Provide combination keepers having rubber buffers, throw latches, and combination coat and hat hooks having rubber tips.

SHOWER CABINETS:

NOTE TO ARCHITECTS:
This item may be specified under the division "PLUMBING".

17-8 Cabinets shall be prefabricated units, walls of not less than No. 18 gage metal and receptor of not less than No. 14 gage metal; joints shall be continuous full welded; receptors shall be in one piece. Cabinets shall be of sizes shown, complete, including curtain rods and 12 ounce white cotton duck curtains.

17-9 Equipment and accessories shall be brass, plain or chromium plated and shall include approved type two-valve mixing unit with renewable seats; adjustable self cleaning type shower head; cast waste and strainer for 2 inch pipe, and soap dish. Receptors shall be completely finished at the factory, having a non-slip baked-on enamel finish or approved non-slip terrazzo receptors will be accepted.

FINISH:

17-10 The Contractor shall furnish the enclosures and shower cabinets completely finished in accordance with the manufacturers standard of gray or olive green baked-on enamel as selected by the Local Authority.

INSTALLATION:

17-11 Metal enclosures and shower cabinets shall be installed in accordance with the approved shop drawings and as directed by the manufacturer. Method of securing of this equipment to floors and walls shall be of such nature as to insure permanency and rigidity and subject to the approval of the Local Authority.

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SUGGESTED SPECIFICATION - DIVISION - 18

DIVISION - 18
STRUCTURAL METAL:

SCOPE:

18-1 Include all structural metal and related work shown and specified. Structural metal and related work included in the other divisions of the specification that is not specifically described shall comply with this division.

(a) Loose lintels are specified to be set under the division "MASONRY." (Omit this if not applicable.

NOTE TO ARCHITECT:
The above scope is all inclusive and therefore any structural metal work indicated on the drawings, but not to be included, should be so noted in this paragraph.

MATERIALS:

18-2 Structural steel and cast iron shall conform to the requirements of the standards of the A.S.T.M. Standards or to the Federal Specifications applicable.

GENERAL REQUIREMENTS:

18-3 (a) All structural steel, unless otherwise indicated or specified, shall be designed, fabricated and erected in conformity with the current edition of "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings" of the American Institute of Steel Construction.

(b) All welding shall be carried out in accordance with the current edition "Code 1 Part A Code of Fusion Welding and Gas Cutting in Building Construction," issued by the American Welding Society.

(c) Steel shapes of other detail than those indicated may be substituted, provided no changes in architectural design will be required and that such shapes will develop strength at least equal to that of shapes indicated.

(d) Shop drawings shall be furnished as required under the heading "SHOP DRAWINGS."

(e) Certificates in quadruplicate from the manufacturers shall be furnished to the Local Authority stating that materials furnished comply with the specification requirements. Samples of materials for tests shall be furnished by the Contractor at the site or at the source of supply as directed.

(f) All beams, and assembled lintels other than angle lintels, bearing on masonry, shall be provided with steel bearing plates as indicated.

NOTE TO ARCHITECT:
Proper size bearing plates should be designed and shown on the drawings.

(g) All beams smaller than 12 inches in depth, and assembled lintels other than angle lintels, bearing on masonry walls, unless otherwise detailed, shall be provided with standard government 3/4 inch anchors. All beams 12 inches and larger in depth shall have two 6 x $3\frac{1}{2}$ x 3/8 inch angle anchors for such bearing.

(h) Provide holes of proper number and spacing in the steel work for attachment of the work of other trades. Holes made in the field shall not be burned.

(i) Built-up lintels may be bolted, riveted, or welded together, at the option of the Contractor. Separators shall be provided where indicated. Bolts or rivets shall have counter sunk and chipped heads for under side of the lintels.

(j) Pipe columns shall be of extra strong steel pipe filled with "2,000 Pound Concrete" as specified under the division "MASONRY." Provide steel or cast iron caps and bases and all special details shown or indicated.

(k) Column bases and grillage beams shall be set on metal shims. Anchor bolts shall be built into the connecting work in advance. Bases and beams shall be grouted solid, and bearing plates set in mortar as specified under the division "MASONRY".

(l) Field connections for steel work for Boiler Plant and Coal Bunkers, Auditorium Trusses,_____ _____shall be riveted. All other field connections may be bolted.

(m) Bolted connections shall have nuts drawn tight and shall be held fast by self-locking threads or by notching the threads close to the nut.

PAINTING:

18-4 (a) Paint for shop coat shall be either the Red Lead Primer or Sublimed Blue Lead Primer specified under division "PAINTING." Paint for field coat shall be an approved graphite paint, neutral gray in color.

(b) Paint, kept well stirred while being applied, shall be thoroughly brushed on and well worked into joints and open spaces. No paint shall be used after the pigment has caked or hardened.

(c) All steel shall be cleaned free from scale, loose rust and foreign matter and shall be dry when paint is being applied.

(d) All steel not encased in concrete shall be given one shop coat of paint. Parts not in contact, inaccessible after assembling, shall be properly protected by paint. Surfaces riveted in contact shall not be painted. Machine finished surfaces shall be protected from corrosion, in an approved manner.

(e) After erection, steel not encased in concrete (except loose lintels) shall have the field connections and abraded places touched up and then given one complete field coat of paint.

(f) Loose lintels shall be given a complete field coat of paint after delivery to the job, before erection.

(g) Steel to be encased in concrete shall not be painted.

(h) Bolts which will be exposed to weather shall be dipped in paint specified for shop coat work before being put in place.

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SUGGESTED SPECIFICATION - DIVISION - 19

DIVISION - 19
MISCELLANEOUS AND ORNAMENTAL METAL WORK:

NOTE TO ARCHITECT:
All items of miscellaneous and ornamental metal for each project may not be covered in this division. It is therefor suggested that a careful check be made of the drawings and such additional items as necessary be included.

SCOPE:

19-1 Furnish and install all miscellaneous and ornamental metal work and related items as indicated and specified.

(a) For location, detail and extent see Drawings.

MATERIALS:

19-2 Stock materials, patterns, products or fabricated items of manufacturers meeting the general requirements herein specified will be acceptable, if approved by the Local Authority.

(a) Metals, paints and related items used in the manufacture of the items for fabrication, unless otherwise specified, shall conform to the applicable requirements of A.S.T.M. Standards or Federal Specifications.

19-3 In addition to the above, the following shall apply:

(a) Aluminum shall be of a type suitable for the purpose as recommended by the manufacturer and shall be of approved composition and strength.

(b) Extruded aluminum sills not otherwise specified shall have the natural finish produced by the die in the extruding process.

(c) Aluminum castings, unless otherwise indicated, shall have a minimum thickness of ¼ inch. Exposed parts of cast aluminum, shall be given a medium sand blasted finish with ornamentions high-lighted and polished.

(d) Aluminum tubing shall have a minimum wall thickness of 1/8 inch and be "hard" temper for round tubing and "drawn" temper for rectangular tubing.

(e) Cast Iron shall be soft, tough, gray iron of the best quality. Castings shall be straight and out of wind, of uniform thickness, true to pattern, of good finish and clean edged at all angles.

(f) Wrought iron shall be of good quality free from slivers, depressions, seams, crop ends, burns, and other defects.

(g) Pipe shall be mild steel of standard weight.

(h) Steel structural shapes, plates or bars shall be well finished.

(i) Wire, not otherwise specified, shall be cold drawn steel.

(j) Gages specified for plate and sheet iron and steel are U. S. standard, and are the minimum acceptable.

(k) Screws, nuts and bolts and washers shall be provided where necessary.

(l) Stainless steel shall be of domestic manufacture and of 18-8 composition.

(m) Safety nosings shall be an approved type having an abrasive cast into the wearing surface.

NOTE TO ARCHITECT:
The above type of nosing to be used on all concrete stairs; coordinate with requirements specified under division "Concrete Work".

19-4 Paint for shop priming paint shall be either red-lead or sublimed blue-lead. (See division "Painting").

GENERAL PROVISIONS:

19-5 Work and items as specified herein shall be properly coordinated with the work specified under other divisions.

19-6 Verify all dimensions. Properly fit metal work with adjoining work.

19-7 Furnish necessary templates, patterns and items of miscellaneous and ornamental metal that are to be built into the construction.

19-8 Do all cutting, fitting and drilling necessary.

19-9 Fabrication shall be in accordance with "The Code of Standard Practice of the American Institute of Steel Construction".

19-10 Furnish all anchors, hooks, screws, bolts, rough hardware and other items required.

SHOP DRAWINGS:

19-11 Shop drawings showing all details including thickness of metal, sizes, and manner of assembling the various members properly coordinated with the related work, shall be submitted. Shop drawings shall show true profiles, methods of anchoring, hardware if any, and all other necessary information.

19-12 Work shall not be fabricated until prior approval of the shop drawings has been obtained from the Local Authority.

WORKMANSHIP:

19-13 Metal work shall be well formed to shape and size, with sharp lines and angles, and smooth surfaces. Work executed from details shall faithfully reproduce same in form and feeling. Members in contact shall be welded or riveted, where practicable.

19-14 Thickness of metals and details of assembling and support shall give ample strength and stiffness. Provide the necessary rebates, lugs and brackets to securely anchor the work in place. Fastenings shall be concealed where possible, and holes for bolts and screws shall be drilled. Built-up parts shall be out of wind. Joints exposed to the weather shall be formed to exclude water.

19-15 Metal work shall be properly counter-sunk to receive hardware and provided with suitable bevels or clearances and plates for mounting hardware.

19-16 All members of drawn or extruded metal shall be framed together at contact points with similar metal.

19-17 All aluminum or bronze work shall be secured to other work in such manner as to allow for expansion and contraction without damage to screws, bolts or other fastenings. Where other metals are applied directly to bronze or aluminum, they shall be insulated with a sheet of fiber profiled to render the insulation practically invisible.

19-18 Aluminum work in contact with masonry shall be protected therefrom with a heavy coat of asphalt paint.

19-19 Unless otherwise specified, shopcoat of paint shall be applied on all ferrous metal work except that protected by plating or coating i.e. zinc, copper or other nonferrous metal. All painted built-in portions and abraded parts shall be given one field coat of paint before installation.

ALUMINUM RAILINGS AND HANDRAILS (TUBING):

19-20 Aluminum railings and handrails shall be tubing with flush fittings. Unless otherwise noted railings and handrails shall be 1-1/2 inches outside diameter.

ALUMINUM RAILINGS AND HANDRAILS (EXTRUDED SECTIONS):

19-21 Handrails, top rails, bottom rails, posts, and other sections shall be of extruded shapes. Solid portion of the rail shall be perfectly flat metal not less than 1/8 inch thick, reinforced as necessary for rigidity.

(a) Aluminum handrail brackets shall be of stock pattern cast aluminum, spaced not over 3 feet 6 inches on centers, secured in place to walls by expansion bolts or other approved means.

(b) Welded or riveted connections shall be made where practicable. Bolts and screws shall be treated to prevent removal after railings have been erected.

(c) Provide all braces necessary to insure proper alignment and rigidity.

ALUMINUM SILLS:

19-22 Aluminum sills shall be of extruded metal not less than 1/8 inch thick except where lugs occur; the lip at back of sills shall be turned up not less than 1/2 inch, and the depth of sills shall suit reveals.

(a) The under-side of sills and parts in contact with mortar shall be given a heavy coating of asphalt paint, allowed to dry thoroughly before setting sills.

MANHOLE (COAL HOLE) COVERS AND FRAMES - CAST IRON:

19-23 Frames and covers shall be standard construction designed to sustain estimated loads.

19-24 Frames shall be anchored into adjoining work. Covers shall have flush drop handles, inside locking bars. Surfaces of doors that will be underfoot shall be non-slip.

COAL RECEIVING DOORS AND FRAMES:

19-25 Frames shall be of steel or malleable iron, flanged on the outside with anchors, jamb linings and sloping sills extending the full depth of walls.

19-26 Doors shall be of steel or malleable iron, hinged at the top, and equipped with approved devices that will permit unlatching from the inside only. Doors shall hold open automatically.

CLEANOUT DOORS AND FRAMES:

19-27 Cleanout doors and frames shall have flanged frames with anchors into the masonry. Doors shall have heavy pin hinges and latch, with hook or knob on face.

HATCH DOORS AND FRAMES:

19-28 Hatch door frames shall be heavy cast iron with anchors built into the adjoining work.

19-29 Doors shall be of steel or cast iron designed to sustain a live load of not less than 100 pounds per square foot. Surfaces of doors that will be underfoot shall be non-slip.

19-30 Provide brass flush type hinges, recessed lifting rings, and an approved locking device.

WHEEL GUARDS:

19-31 Wheel guards shall be approximately as shown and shall be anchored securely into place, so as not to interfere with the operation of doors.

THRESHOLDS - CAST IRON:

19-32 Thresholds, except for openings provided with weatherstripping, shall be of cast iron, not less than 1/4 inch thick, of the saddle type unless otherwise indicated. They shall extend across the full width of openings in a single piece and be neatly fitted around jambs. Thresholds shall be set level in a full bed of mastic cement and secured in place with flat-head, zinc coated screws and lead expansion shields.

VENTS IN WALLS - CAST IRON:

19-33 Provide stock type cast iron foundation wall vents for all unexcavated areas under wood first floor joists.

CLOTHES-LINE HOOKS AND HOOK SUPPORTS:
(FOR DRYING ROOMS):

19-34 Clothes line hooks and hook supports shall be of malleable iron welded to supports.

(a) All ferrous metal shall be heavily zinc coated.

LADDERS:

19-35 Ladders shall be of approved iron ladder construction, designed for load conditions indicated. Ladders shall be of mild steel and unless otherwise shown, shall be not less than 18 inches wide, 3/8 inch by 2 inch side rails and 5/8 inch round rungs spaced not more than 14 inches on centers. Rungs shall be headed into rails with ends of rungs upset.

(a) Ladders leading over parapet walls shall have side rails extending above top of parapet not less than 3 feet with goose-neck returns terminating below inside face of coping; and properly secured to wall.

19-36 Built-in ladder rungs shall be fabricated of 5/8 inch round bars, bent to form 18 inch wide U-Shaped rungs with flanges, spaced not more than 14 inches on centers built into the masonry and extending out from the walls not less than 5 inches; rungs shall be set level and in true alignment.

CORNER GUARDS:

19-37 Corner guards shall be of not less than No. 12 gage steel plate or structural steel shapes with welded anchors; the anchors shall be placed one near the top, one near the bottom and the intermediates not more than 2 feet apart.

IRON RAILINGS:

19-38 Ornamental iron railings shall be:

(a) Of iron or steel with smooth surfaces, even curves, fitted neatly and accurately, and free from kinks.

(b) Members which extend into concrete or masonry shall be set into build-in sleeves, and shall be caulked with lead. Anchors and portions of railings which come into contact with masonry shall be given 2 heavy coats of asphalt paint, which shall be allowed to dry before setting iron.

(c) Welded or riveted connections shall be made where practicable. Bolts and screws used in assembling railing shall be treated to prevent removal.

(d) Suitable braces shall be provided where necessary to assure correct alignment and rigidity.

PIPE RAILINGS:

19-39 Unless otherwise shown, pipe shall be not less than 1-1/2 inches outside diameter, standard mild steel pipe. Fittings shall be malleable iron with through pin fastenings, having ends upset and filed smooth and flush.

(a) Posts set in concrete shall be set in sleeves cast into the concrete and caulked with lead, and provided with suitable floor plates. Posts and rails shall be secured to metal work by tap screws and to masonry by bolts through flanged fittings.

(b) Where flush joints are used, the joints shall be welded and ground smooth.

(c) Railings shall be set in true alignment, with horizontal members level and vertical members plumb.

WALL RAILS:

19-40 Pipe wall rails shall be 1-1/2 inches outside diameter, light weight mild steel pipe, fitted with molded ends or returns screwed, welded or pinned to the pipe. Rail shall be securely fastened to wall rail brackets. Wall rail brackets shall be malleable iron of approved design.

(a) Where brackets are applied to solid plaster or 4 inch hollow tile partitions, they shall be held in place by through wall bolts with washers on each side of the wall. Brackets on masonry walls shall be secured with expansion bolts and shields and on wood frame walls with heavy lag screws. Brackets shall be spaced not more than 4 feet apart.

FRAMES, RECESSES AT INCINERATOR DOORS:

19-41 Frames shall be of steel plate, not less than No. 12 gage, or structural steel sections. Frames shall be neatly finished with welded angles, and have attached anchors for securing them to masonry.

DOOR FRAMES - STEEL:

19-42 Door frames shall be fabricated from structural shapes, neatly coped at joints and either welded together or assembled with countersunk rivets.

(a) Each jamb shall have not less than 3 anchors for securing frame.

(b) Frames at openings to coal storage rooms shall have angle guides to support planking. Guides shall be arranged to support each plank, and permit each to be removed separately. Guides shall be secured to jambs of frames, and shall have stops to prevent the planks from slipping through guides.

(c) When structural shapes are used for door frames, hardware may be mounted on surface.

PLATE AND ANGLE DOORS - STEEL:

19-43 Doors shall be made from 1/4 inch steel plates, reinforced with marginal and cross steel angles on one face. Marginal angles shall extend around perimeter of doors so as to permit the door plates to overlap the edges of the frames not less than 2 inches.

19-44 Doors shall be hinged to frames with not less than 3 wrought iron hinges riveted or welded to the door and secured to the frames by welding or with counter-sunk machine screws. Each door shall have a strap iron hasp welded on. There shall be a staple welded to frame to receive the hasp. Padlocks are specified under division "Hardware".

19-45 For pairs of doors, one door shall have top and bottom bolts of approved design, with metal keeper anchored in floor for bottom bolt. Staple shall be welded to one door to receive hasp from the other.

GRATINGS WALKWAYS:

19-46 Area and sidewalk gratings shall be of an approved design of sizes required and set in frames securely anchored into the concrete. Gratings shall be hinged to frames as required and shall be so designed that they will support a live load of 100 pounds per square foot. Pins for hinges shall be of bronze.

19-47 Gratings and walkway floors for interior use shall be as specified above except they shall be removable, without hinges.

(a) Supporting members shall be structural steel shapes; floor gratings shall be secured thereto. Supporting framework shall be designed to support a uniform live load of not less than 100 pounds per square foot.

(b) The open sides of walkways and platforms shall have pipe guard rails approximately 3 feet high of steel pipe, as specified herein.

WINDOW GUARDS - WIRE:

19-48 Guards shall be fabricated from No. 10 gage wire formed in 1" x 1½" diamond mesh pattern. If guards are to be used on exterior entire assembly shall be heavily zinc coated after fabrication; if used on interior they may be fabricated from zinc plated wire. They shall be secured to angle or channel frames in an approved manner; they shall be hinged and locked to steel angles, or angle clips, securely anchored into the masonry jambs of openings. Guards in windows 4 feet or less in height shall be hinged at 3 points. Guards shall be locked at not less than 2 points, with approved type locking device.

WIRE MESH PARTITIONS:

19-49 Wire mesh partitions and doors shall be as detailed. Vertical supporting members of partitions shall be 2 inch Tee section of structural steel, spaced nor more than 5 feet apart and extend from floor to ceiling construction; they shall be secured in place with angle clips. Angle clips shall be welded or riveted to top and bottom of members, and shall be anchored to floors and ceilings with an approved type anchoring device (fiber plugs will not be acceptable). Vertical supporting members shall be placed adjacent to concrete or masonry walls abutting wire mesh partitions, and be secured to walls.

(a) Panels between supporting members shall be fabricated of 1 by 1/2 inch channel frames, and No. 10 gage wire 1-1/2 inches diamond mesh secured to frames in an approved manner. Each panel shall be braced with a horizontal bar at center and well secured.

(b) Partitions shall be erected plumb, rigid and in true alignment.

(c) Panels shall have framed cut outs for the passage of pipes.

(d) Doors in wire partitions shall have substantial frames of approved sections securely cross braced, with panels same as specified for partitions. Doors shall be provided with approved type hinges, hasps and keepers.

(e) All ferrous metal parts of partitions and doors shall be heavily zinc coated.

In lieu of the above; wire mesh partitions of design, typical and standard with the manufacturer may be used if approved by the Local Authority and conforming to the general requirements set forth herein.

COVERS FOR EXPANSION JOINTS:

19-50 Cover plates shall be as detailed; cover plates in floors shall be cast iron not less than 1/4 inch thick with additional 1/16 inch thick non-slip wearing surface cast integrally.

(a) Cover plates shall be securely anchored at one side and designed to slide on a smooth metal plate anchored on the other side of joint.

19-51 Joint covers on walls or ceilings, unless otherwise shown, shall be of similar construction, using plain metal plates.

WIRE GRILLES IN PANELS OF DOORS:

19-52 Grills shall have 1 x 1/2 inch channel frames and No. 10 gage wire, 1-1/2 inch diamond mesh, secured to frames in an approved manner and all ferrous metal parts shall be heavily hot zinc coated. Grilles shall be held in place by mouldings furnished by the door manufacturer.

BOILER ROOM STAIRS:

19-53 Steel stairs shall be designed with structural channels for stringers, steel gratings for treads and landings, and pipe handrails.

(a) Stringers shall be securely anchored to floor and walls. Landings shall be solidly attached to walls and stringers, and treads shall be securely fastened to stringers.

TRENCH COVERS AND FRAMES:

19-54 Trench covers shall be made in sections. They shall fit tightly in frames and when set in floor shall be flush with the finished floor. Covers shall be non-slip steel plates not less than 1/4 inch thick. Plates shall be reinforced as necessary to sustain a 100 pound live load. Frames shall have suitable anchors not more than 3 feet apart. Lift hook holes shall be provided as indicated.

LOOSE LINTELS:

19-55 Unless otherwise indicated, loose lintels shall be structural steel angle sections and shall be not less than 8 inches longer than widths of the openings. Lintels shall be securely anchored and bonded into the masonry.

ROLLING STEEL DOORS:

19-56 Rolling steel doors shall be of interlocking slats, rolled into easy curves without sharp bends, from not less than No. 22 gage open hearth steel. Slats shall be of sufficient section to resist a wind load of 25 pounds per square foot. Alternate slats shall have malleable end locks approximately 3/8 inch thick. Curtain shall be coiled on a drum designed to carry the load of the curtain and to evenly balance the door by helical springs contained therein. Cast iron supporting brackets shall house ends of drum. Coil shall be housed in a sheet metal hood of not less than No. 24 gage metal.

(a) Guides shall be of structural steel shapes securely anchored.

(b) Curtain shall be hand operated through chain, sprocket and cast iron gear, with maximum pull of 35 pounds. Gear teeth shall be machine moulded from machine cut patterns.

(c) Door shall have an approved locking device.

(d) All ferrous metal except gears and guides shall be hot zinc coated.

(e) Installation of rolling doors shall be made or supervised by the manufacturers authorized representative.

MAIL BOXES:

19-57 Boxes shall be of a type having the approval of the Post Office Department stamped on the face. Sample of boxes shall be submitted to the Local Authority for approval.

(a) The concealed parts of boxes shall be formed of sheet steel, not less than No. 20 gage, and shall have a zinc coated or baked-on enamel finish. Exposed parts shall be of sheet brass with a brushed finish.

(b) Box doors for insertion of mail shall have locks approved by the Post Office Department. Keys for box doors shall be delivered to the Local Post Office.

(c) Doors to individual compartments shall have flat key locks with 2 keys for each. Face of each door shall have an approved holder for tenants' name and identifying number of his quarters.

(d) Arrangement and location shall be in accordance with the regulations of the Post Office Department.

NOTE TO ARCHITECT:
See Division "Hardware" for location of Mail Boxes in Flat Buildings.

VAULT DOORS:

19-58 Vault doors and frame shall be of the approximate size required by the drawings and shall have a fire rating classification of 1/2 hour. Frame shall be full depth of wall flanged on both sides. Door shall have inside cover plate insulated; shall have not less than 4-3/4 inch bolts engaging frame; and an approved combination lock. Vault door, frame, hinges, combination dial, ring handles and other trimmings shall have standard finish of the manufacturer.

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WASHINGTON, D. C.

DATE
OCT.-1938

REVISIONS

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PROJECT NO.
FIRE ESCAPES 20-1

DEPARTMENT OF THE INTERIOR
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SUGGESTED SPECIFICATION - DIVISION - 20

DIVISION - 20
FIRE ESCAPES

SCOPE:

20-1 Fabricate and erect fire escapes; for locations and extent, see drawings.

FIRE ESCAPES:

20-2 Stock fire escapes meeting the requirements specified will be accepted by the Local Authority.

20-3 Fire escapes shall conform to all requirements of the local building codes; they shall approximate the design and details indicated, assembled and welded or bolted together so as to sustain a uniform live load of 100 pounds per square foot over the entire area of platforms and stairs. Shop drawings shall be approved before fabrication; they shall show sizes and shapes of all members, overall dimensions and attachment to the structure.

MATERIALS:

20-4 Steel, iron castings, pipes and fittings shall conform to applicable requirements of A.S.T.M. Standards or to Federal Specifications; materials may be stock, commercial sizes and shapes. Paint shall be one of the "Primers for Metal" specified under division "Painting".

FABRICATION AND ASSEMBLY:

20-5 All members shall be fabricated in a neat and workmanlike manner with joints and angles accurately made and properly fitted.

20-6 The spans of main members, such as balcony framing and stair strings shall not exceed 12 feet between points of supports.

20-7 Shop work shall be riveted or welded. Field work may be bolted or riveted; bolts or rivets shall be not less than 5/8 inch diameter when used in connection with framing members; the full strength of all members shall be developed in all connections, brackets, supports, stairways and ladders.

20-8 Balconies shall be of lengths indicated and of width to provide an unobstructed passage of not less than 2 feet. Frames for the support of balconies shall be of steel flats or shapes; they shall completely surround platforms and be riveted or welded together at all angles; cross framing and intermediate framing members shall be provided of size and shape as required.

NOTE TO ARCHITECT:
If local code requirements call for unobstructed passage of more than 2 feet, specification should be so changed. If local code permits lesser width, it is recommended that minimum of 2 feet be maintained.

20-9 Platforms of balconies shall be constructed of flats set on edge and spaced 1-1/4 inches on centers; length of the flats at right angles to direction of travel with ends of flats mortised into the frame; flats more than 3 feet long shall have 1/4 inch diameter rod with metal spool separators running through center of the length. Other approved types of platform construction will be permitted if they conform to local code requirements.

20-10 Balcony framing shall be supported by brackets securely anchored in place, fabricated of flats and shapes having a thickness of not less than 5/16 inch. Brackets shall be strongly framed and securely anchored to the balcony framing; lower chords of brackets shall extend 4 inches into walls and upper chords shall extend through the masonry walls and be secured on the inside with nuts and plate washers concealed by the plaster. Railings shall be 1 inch inside diameter black pipe with stock rail fittings; railings on balconies shall be not less than 3 feet high and of 3 horizontal members; railings on stairways not less than 2 feet 6 inches high and of 2 members; railings shall completely surround balconies and stairways except where other enclosures are provided. Railings shall be securely bolted or welded to framework of balconies using not less than 2 bolts to each connection when bolts are used.

NOTE TO ARCHITECT:
The requirements contained herein are minimum; where local codes set up requirements in excess to those herein stated, code requirements should govern.

20-11 Stairways shall provide 2 feet clearance between handrails, and headroom of not less than 6 feet 8 inches. Stairways shall have strings of steel flats or shapes; treads as detailed, securely framed into strings by riveting or welding; risers shall be open and not more than 9 inches high.

20-12 Stairs or ladders to ground shall be provided; they shall be not less than 20 inches wide, fabricated of steel flats with not less than 5/8 inch

diameter round rungs, mortised into the flats, spaced not over 12 inches apart. Provide all necessary guides, pulleys and counterweights accurately balancing ladders and attached directly to an extension arm on the string of the ladder.

PAINTING:

20-13 Fire escapes shall be delivered to the site with one heavy coat of metal priming paint. (see "Painting").

CUTTING AND PATCHING:

20-14 Do all cutting, patching and repairing required or necessary in the installation of the work.

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SUGGESTED SPECIFICATION - DIVISION - 21

DIVISION - 21
PLASTERING:

NOTE TO ARCHITECT:
This specification requires that the kind and location of plaster for all areas be clearly designated on the "Schedule of Interior Finishes".

(a) The specification describes types of lath and plaster to be used.

(b) Plaster should not be applied directly on 8-inch exterior masonry; these walls should be furred.

(c) Gypsum or insulating lath should not be used as a base for Keene's cement or portland cement plaster.

SCOPE:

21-1 Do all furring, lathing, plastering and stuccoing as indicated by the drawings and "Schedule of Interior Finishes" and as specified herein.

(a) Soffits of wood stairs in plastered rooms or spaces shall be lathed and plastered the same as ceilings.

(b) Plaster will not be required for ----------

GENERAL REQUIREMENTS:

21-2 (a) Except as otherwise specified, plaster applied directly on masonry surfaces shall be 5/8-inch thick and applied in 3 coats. (Where it is local trade practice, doubling back with brown coat over

scratch coat on masonry walls only may be considered as first and second coats.)

(b) Plaster applied to gypsum and insulating lath shall be not less than 3/8-inch thick and applied in 3 coats.

(c) Plaster applied to metal lath except for solid plaster partitions shall be 3/4-inch thick and applied in 3 coats.

(d) Plaster on concrete surfaces shall consist of 1 coat of bond plaster, a brown and finish coat. The total thickness shall be approximately 3/8-inch.

(e) Stucco shall be a minimum thickness of 5/8-inch applied in 3 coats.

21-3 The finish coat of plaster shall not be applied on walls of rooms having tile base until after the base has been installed.

21-4 Method of measuring materials for mixing shall be such as to meet the approval of the Local Authority.

21-5 No plaster shall be applied unless the temperature is at least 50 degrees F. in all spaces to be plastered. All plaster shall be protected from freezing for 24 hours after application. All openings shall be kept closed in hot, dry weather for 24 hours after application of plaster. See division "Carpentry".

MATERIALS:

21-6 Materials shall be standard commercial products of recognized manufacturers, subject to approval of the Local Authority.

21-7 Lath, portland cement, lime, Keene's cement, gypsum plasters, and sand

shall conform to applicable requirements of A.S.T.M. Standards or Federal Specifications.

(a) Packaged materials shall be delivered in original containers, unopened and bearing manufacturers' names and brands.

21-8 CHANNELS shall be hot or cold-rolled unless otherwise noted, and either zinc-coated or painted one coat of protective paint before erection. 1½-inch channels shall weigh not less than 0.442 pounds per lineal foot for cold-rolled, and 0.850 pounds for hot-rolled. 3/4-inch channels shall weigh not less than 0.276 pounds per lineal foot for cold-rolled and 0.300 pounds for hot-rolled.

21-9 METAL LATH shall be either flat or ribbed expanded metal lath; or 2½ mesh per inch No. 19 gage woven wire lath; or welded wire fabric of No. 16 gage wire, not to exceed 2 x 2-inch mesh with integral paper or screen wire backing and No. 26 gage metal V-ribs, or No. 13 gage wire stiffeners at intervals of not more than 4-inches across the back of the backing. Paper shall be either absorptive or perforated. The wire fabric shall extend beyond the backing on 3 sides of sheets to allow for laps in application.

Metal lath shall be coated with rust inhibitive paint after forming or formed from zinc coated material. Lath shall be protected from rust until installation.

The maximum spacing of supports and the minimum weights of metal lath in pounds per square yard shall be as follows:

SPACING OF SUPPORTS	WEIGHT OF LATH FOR WALLS	WEIGHT OF LATH FOR CEILING
12" to 13½" Centers	Flat Exp. 2.5#	Flat Exp. 3.0# Wire Lath 2.48#
16" Centers	Flat Exp. 2.5# Wire Lath 2.48# Wire Fabric	Flat Exp. 3.4# Flat Rib 3.0# Wire Fabric
19" Centers	Flat Exp. 3.0# Wire Lath 3.3#	Flat Rib 3.4# Wire Lath 3.3#
23½" Centers	3/8" Rib 3.0#	3/8" Rib 3.0#

21-10 GYPSUM LATH shall be 3/8-inch thick, 16 x 32 or 48-inches long and of the perforated type.

21-11 INSULATING LATH shall be manufactured from wood or other vegetable fiber and subjected to such drying temperatures as will effect completed destruction of rot-producing fungi. Lath shall be proofed against vermin. Lath shall be not less than 7/16-inch thick, with interlocking or overlapping unsupported edges.

21-12 CORNER BEADS shall be not lighter than No. 26 gage zinc-coated, with expanded, or perforated flanges, or clips not less than 2-inches long on each side. Beads shall be of the small bead type (bullnose type 3/4" radius).

21-13 BASE SCREEDS shall be not lighter than No. 26 gage zinc-coated, with flanges not less than 1½-inches wide.

21-14 CORNERITES shall be strips of 2.5 pounds flat expanded metal lath bent at right angles with 3-inch legs on each side of angle.

21-15 BOND PLASTER shall be a specially prepared plaster for use on concrete surfaces.

21-16 LIME PUTTY made from quicklime shall by thoroughly slaked, allowed to cool and then let stand not less than 24 hours. Hydrated lime shall be soaked at least 24 hours. All lime putty shall be kept moist until used.

21-17 WATER shall be clean and fresh.

21-18 SAND shall be clean, free from deleterious matter, and shall be well graded from fine to coarse to produce a smooth working mix.

METAL FURRING:

21-19 (a) Provide miscellaneous metal furring, hangers, channels, clips, wiring and attachments necessary to construct substantial foundations for plastering.

(b) Chases, recesses, pockets and other gaps over 12-inches wide in masonry walls to be plastered shall be furred and lathed.

(c) Metal furring shall be 3/4-inch channels spaced in accordance with the spacing requirements for the type of metal lath used.

(d) Channels for furring exterior walls shall be fastened at floor and ceiling to a continuous channel secured thereto or by other approved methods. Channels shall not be fastened to masonry walls.

SUSPENDED CEILINGS:

21-20 (a) Suspended ceilings shall consist of 1½-inch runner channels spaced 3-inches from parallel walls and otherwise 4-feet on centers and supported on ends and at 4-foot intervals along the channels with 3/16-inch round mild steel rods or No. 6 gage zinc-coated wire. To these runner

channels, 3/4-inch furring channels shall be attached and spaced in accordance with the spacing requirements for the type of metal lath used.

(b) Wire hangers shall be properly located and secured in concrete at the time of pouring by bending or looping the upper ends; or hangers may be secured to approved inserts placed in forms. Lower end of wire or rod hangers shall be saddle tied to runner channels. Furring channels shall be saddle tied to runner channels with No. 16 gage zinc-coated tie wire, or fastened to runner channels with No. 8 gage hairpin steel clips.

(c) Application of lath and plaster shall be as hereinafter specified.

SOLID PLASTER PARTITIONS:

21-21 (a) Solid plaster partitions shall consist of 3/4-inch channel studs, metal lath and plaster, finished full 2-inches in thickness.

(b) Studs shall be set plumb and true spaced in accordance with the spacing requirements for type of metal lath used. Studs shall be temporarily braced, properly aligned, and securely anchored to floor and ceiling construction in a manner satisfactory to the Local Authority. Studs shall be doubled at openings and be securely anchored to frames or bucks. Reinforce heads of openings and provide solid backing at corners.

(c) The contractor shall have the option of using any other type of plastered partitions of 2-inch thickness, which satisfactorily pass lists acceptable to the Local Authority. Such partitions shall develop resistance to cracks

caused by slamming doors, strength, rigidity and resistance to fire equal to the solid plaster partitions specified.

(d) The contractor, if he desires, may substitute 3/8-inch gypsum lath applied on 2 sides of channels, in lieu of metal lath for solid plaster partitions. The spacing of studs shall not exceed 16-inches on centers.

(e) Application of lath and plaster shall be as hereinafter specified, except that the sequence of applying the plaster to solid plaster partitions shall be as follows:

Scratch coat on lath side.
Back-up coat on channel side.
Brown coat on lath side.
Finish coat on channel side.
Finish coat on lath side.

APPLICATION OF LATH:

21-22 Gypsum Lath shall be provided for walls, partitions and ceilings of-----
---

Lath shall be applied with length at right angle to supports. End joints shall be staggered. Vertical joints on walls shall not meet ceiling joints. Fit tight at all angles and corners and cut accurately around all pipes and outlet boxes. Lath applied to wood construction shall be nailed with 1-1/8-inch No. 13 gage, 3/8-inch head blued nails spaced 4-inches apart.

(a) Gypsum lath applied to metal supports shall be secured to adjacent lath and to supports with an approved type of clip designed for the purpose. Clips shall be placed at each corner of lath intersection and at intermediate point on side and end.

21-23 Insulating Lath shall be provided for exterior walls of ----------
---

Lath shall be applied straight and without buckles with length at right angles to supports. End joints shall be staggered. End and side joints shall be approximately 1/4 inch wide. Secure in place with 4d common, blued or box nails spaced approximately 5 inches apart and 1/2 inch from edge.

21-24 Metal Lath shall be provided for solid plaster partitions, suspended ceilings, furring and all other plastered surfaces requiring lath.

(a) Lathing shall be applied with long dimensions at right angles to supports. Flat lath sheets shall be lapped 1/2 inch at sides and 1 inch at ends. Rib lath shall be lapped at sides by nesting ribs and lapped 1 inch at ends. Wire lath and wire fabric shall be lapped by nesting ribs or selvage 1 inch at sides and ends. All end joints shall be made over supports and staggered. All side joints of lath shall be secured to supports and tied between supports at intervals not to exceed 9-inch. All other attachments for securing lath shall be spaced not more than 6-inches apart.

(b) Lath applied to wood construction shall be secured with 1¼-inch No. 14 gage wire staples or 6d common nails. Lath applied to metal supports shall be held in place with No. 18 gage soft annealed zinc coated wire ties.

(c) Lath applied over chases and recesses shall overlap the masonry on all sides not less than 3 inches. Lath over chases shall not be applied until directed.

21-25 Cornerites shall be provided to reinforce all interior angles to be plastered unless metal lath from one surface is continued around the angle at least 6 inches on adjacent surface. Cornerites shall be securely fastened along each edge to the

supports or masonry but not fastened at its corner. End Joints shall be butted.

21-26 Corner Beads shall be provided for all vertical external plaster corners and for heads and jambs of window openings where indicated. Beads shall be set plumb or level and form true arrises for the plaster. Beads shall extend full length of corners and be rigidly fastened in place at ends and at points not more than 12 inches apart.

21-27 Base Screed shall be provided for cement base in rooms having plastered walls. Screed shall be set level and straight ..... inches above and parallel to floors and rake of stairs. Fasten screeds in place at ends and at points not to exceed 12 inches apart.

NOTE TO ARCHITECT:
Specify the kinds of plaster commonly used in the locality of the project.

KINDS AND MIXES OF PLASTER:

21-28 Bond Plaster: Concrete surfaces to be plastered shall have one coat of bond plaster, a brown coat and the finish coat. Bond plaster shall be mixed and applied in strict accordance with the directions of the manufacturer. Where required to bring plaster on concrete surfaces flush with plaster on adjacent surfaces an additional brown coat shall be applied between the bond plaster and finish coat.

21-29 Portland Cement Plaster: Scratch, brown and finish coats shall consist of 1 part portland cement and 3 parts sand, by volume, to which shall be added 15 pounds of lime putty to each bag of cement.

21-30 Keene's Cement Plaster: Scratch and brown coats shall be mixed and applied in strict accordance with the manufacturer's directions for the respective surfaces to which it is applied.

Finish coat of Keene's cement plaster shall consist of 1 part lime putty and 3 parts Keene's cement by volume.

21-31 Gypsum Plaster: Scratch coat on all types of lath shall consist of 1 part "neat" gypsum plaster and not more than 2 parts of sand by weight.

Scratch coat on masonry surfaces and brown coat on lathed surfaces shall consist of 1 part "neat" gypsum plaster to not more than 3 parts sand by weight.

Finish coat for trowel finish shall consist of 3 parts lime putty and 1 part gauging plaster by volume.

Finish coat for sand float finish shall consist of 2 parts lime putty, 1-1/2 parts Keene's cement and 4-1/2 parts light colored sand by volume. Sand shall pass a No. 12 -(16) - (20) mesh sieve.

NOTE TO ARCHITECT:
If sand float finish coat is used it is recommended that the sand produce the desired color. If colored pigment is used to produce the color then the specification should require material to be a factory prepared plaster and the application and mixing done in accordance with the manufacturers directions.

21-32 Lime Plaster: Scratch coat over metal lath shall consist of 1 part lime putty and 2 parts sand by volume with 7-1/2 pounds of hair or fiber per cubic yard of mortar. Lime plaster will not be permitted over gypsum lath, insulating lath or gypsum blocks.

Scratch coat on masonry and brown coat on lath shall consist of 1 part lime putty and 3 parts sand by volume with 3-1/2 pounds of hair or fiber per cubic yard of mortar.

Finish coat shall be as specified for gypsum plaster.

21-33 Wood Fiber Plaster: Scratch and brown coats of wood fiber plaster for all lathed surfaces shall be used without adding sand.

Base coats for masonry surfaces shall consist of 1 part wood fiber plaster and 1 part sand by weight.

Finish coat shall be as specified for gypsum plaster.

21-34 Stucco shall be applied to exterior wall surfaces and _____ where indicated on drawings.

(a) Scratch and brown coat shall consist of 1 part portland cement and 3 parts sand with 10 pounds of hydrated lime to each bag of cement.

(b) Finish coat for white stucco shall consist of 1 part white portland cement, 3 parts light colored sand with 10 pounds of hydrated lime to each bag of cement.

(c) Finish coat for colored stucco shall be an approved factory prepared portland cement stucco with colors of limeproof pigments incorporated and thoroughly machine mixed. The color of finished stucco shall be _____

APPLICATION OF PLASTER:

21-35 (a) Before beginning to plaster, all grounds, screeds, corner beads, cornerites and trim shall be in place. Concrete surfaces to receive plaster shall be thoroughly roughened. Where it is necessary to reduce suction, masonry and concrete surfaces shall be dampened evenly by brushing or spraying to produce a uniform suction. Gypsum lath, gypsum blocks or insulating lath shall not be wetted.

(b) The first coat of mortar shall be applied with sufficient force to form good keys with lath and adhere firmly to the masonry and concrete.

(c) When the mortar of the first coat has become firm but not dry, the surface shall be scratched to form a rough surface to provide a bond for the brown coat.

(d) Mortar of the brown coat shall be brought to a true uniform plane with a straight edge or a floating rule to within 1/8 inch of the finished surface and left rough to receive the finish coat. The brown coat shall be dry before the finish coat is applied.

(e) The finish coat (for trowel finish) shall be applied approximately 1/8-inch thick, allowed to set a few minutes and then be well troweled with water to a smooth hard finish.

(f) The finish coat (for sand float finish) shall be applied to an even surface, and then floated with a wood or carpet or cork type float to a true even surface, free from slick spots.

(g) Finish coat of portland cement plaster shall be troweled to a uniform smooth surface with a cork trowel.

(h) The finish coat of stucco shall be given a _____ finish by means of _____.

(i) Sufficient time, as recommended by the best standard practice, shall be allowed between scratch, brown and finish coats for curing and drying.

(j) Stucco applied on exterior shall be protected from too rapid drying during hot, dry or windy weather. Protection should be accomplished by using wet burlap or other suitable methods or material to prevent rapid or excessive shrinkage and drying.

PATCHING:

21-36 (a) Plastering or stucco with cracks, blisters, pits or discolorations will not be acceptable.

(b) After mechanics other than painters have finished their work, or as may be directed, the contractor shall point up around trim and other set work and patch all plaster and stucco.

(c) The patching of plaster shall match existing work in texture and finish and at joining with plaster previously applied, shall be finished smooth. In no case shall sandpaper or other abrasive be used to clean or smooth off finished plaster surfaces.

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SUGGESTED SPECIFICATION - DIVISION - 22

DIVISION - 22
CARPENTRY AND MILLWORK:

SCOPE:

22-1 Provide the required framing, lumber, millwork and related items and do all work necessary to fully complete the project as indicated and specified.

NOTE TO ARCHITECT:
The above paragraph is all inclusive, therefore exceptions, if any, should be specified.

MATERIALS:

22-2 GENERAL:
Lumber shall conform to the following:

(a) Softwood lumber shall conform to "American Lumber Standards", shall be for size and use, as classified in "Simplified Practice Recommendation, R-16-29 Lumber". Sizes of finish, millwork, flooring and other lumber finishing 25/32 inch or less in thickness, are finish sizes; all other sizes refer to rough stock and "Yard Size Standards" will be acceptable.

(b) Hardwood lumber shall conform to the standard rules for grading hardwood lumber as adopted by the "National Hardwood Lumber Association".

GRADING AND SEASONING:

22-3 Lumber shall be graded in accordance with the latest grading rules of the Lumber Manufacturers Association under whose jurisdiction the lumber is manufactured. Flooring material shall conform to the grading rules of the Flooring Manufacturers Association under whose rules the flooring is manufactured. Each piece or bundle, if in bundled stock of lumber, and flooring shall bear the grade mark, trade mark and "Mill Indentification Mark" of the Association under whose rules it is graded.

(a) Moulded trim and turned stock shall be "Standard Moulding Grade".

(b) Lumber, when delivered to the site, except millwork and finish, shall be seasoned to a moisture content not exceeding 19%; millwork and finish not exceeding 12%.

(c) All finish lumber, millwork, flooring upon delivery to the site, shall be stored for a period of not less than 14 days prior to incorporation into the work, in a well ventilated building in which the normal temperature shall be maintained throughout storage period, especially during the night; delivery shall be deferred until all plastering, cement, masonry work, painting, wall papering and other interior finishing in the storage space are completed and are all thoroughly dry. All other lumber shall be stored, prior to incorporation into the work, for a period of not less than 14 days; the storing and piles shall be such as to insure proper protection, ventilation and drainage.

NOTE TO ARCHITECT:
The moisture content requirements provided herein (in this specification) are general, and intended only to keep the lumber within the limit of dryness necessary to inhibit the spread of rot and minimize shrinkage. The moisture content of all lumber should be such as to suit local climatic conditions.

FRAMING LUMBER:

22-4 (a) Joists, rafters and other members stressed in bending, studs, plates and other members stressed in compression, shall be of the following species of grades not lower than that specified:

(See "Grades and Species of Lumber" for grades and species).

(b) Porch Posts shall be

(See "Grades and Species of Lumber" for grades and species).

(c) Porch stair; treads and carriages shall be

(See "Grades and Species of Lumber" for grades and species).

(d) Porch floors shall be

(See "Grades and Species of Lumber" for grades and species).

(e) Sheathing, sub-flooring and roughboarding of boards shall be

(See "Grades and Species of Lumber" for grades and species).

(f) Roof trusses so indicated shall be

(See "Grades and Species of Lumber" for grades and species).

NOTE TO ARCHITECT:
Provide here for special grades desired for any certain special framing members which it is found advantageous to design for higher resistive stresses than would be permissable for lumber specified under (a); (see (f) under "Note to Architect".

GRADES AND SPECIES OF LUMBER

NOTE TO ARCHITECT:
This and the following page are for Architect's use as a guide in the selection of grades and species of lumber to be used for his project.

Kinds of lumber specified for framing, millwork, doors, windows, and sash should admit local species in common use and considered acceptable for the purpose in the project locality. Listing should also include species of lumber which originate in other sections of the country; from the following list it is suggested that not more than three species of lumber be specified under the items listed.

When specifying lumber not listed hereinafter, care should be exercised to specify grades that are favorably comparable in quality; stock sizes should be used in all cases.

Under (a) species and grades of lumber generally considered suitable are "Dimension Lumber" as follows:

No. 2 Southern Yellow Pine
Note: If short leaf, it shall be dense.
No. 2 Douglas Fir
No. 2 Western Larch
No. 2 West Coast Hemlock
No. 2 Cypress
No. 1 Eastern Hemlock
No. 1 Eastern Spruce
No. 1 Sitka Spruce
No. 1 Redwood
No. 1 Norway Pine
No. 1 White Fir
No. 1 Ponderosa Pine

Under (b) the species of lumber and grades recommended are:

No. 1 Heart Timbers of---------Douglas Fir
Western Hemlock
Eastern Hemlock
Sitka Spruce
Eastern Spruce
Larch
Long Leaf----------Southern Yellow Pine
Dense Short Leaf---------Southern Yellow Pine

Under (c) the species of lumber and grades recommended are:

No. 1 Dimension, Heart---------Douglas Fir
Southern Yellow Pine
Tidewater Red Cypress
California Redwood
Larch

Under (d) the species of lumber and grades recommended are:

Southern Yellow Pine, "B and Better", E.G. Long-Leaf;
Douglas Fir, "B and Better", V.G.;
Redwood, "Clear Heart", V.G.;
Tidewater Red Cypress "A" Flooring Grade.
Larch "C and Better", V.G.

Under (e) the species of lumber and grades recommended are:

Southern Yellow Pine, No. 2 Boards
Douglas Fir, No. 1 Boards
West Coast Hemlock No. 1 Boards
Eastern Hemlock, No. 2 Boards
Ponderosa Pine, No. 3 Boards
Eastern Spruce, No. 3 Boards
Western Larch, No. 3 Boards
White Fir, No. 3 Boards

Under (f) structural lumber supporting concentrated loads; all of structural grade, and of sufficient strength to develop an allowable fiber stress of 1400 pounds in bending.

Southern Yellow Pine
Douglas Fir
Larch
Redwood

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(g) At the option of the Contractor, subject to the approval of the Local Authority, any other commercial softwood may be used in lieu of the species specified, provided that the species and the grade supplied is equivalent in properties required for the performance of function of each item involved and that all such lumber is "grade" and trade-marked as specified.

NOTE TO ARCHITECT:
The intent of the above option is to permit the economic use of species of lumber available and suitable for the purpose with due regard to the service performances required.

22-5 FINISH LUMBER:

NOTE TO ARCHITECT:
From the lumber items as set forth hereinafter, the Architect should select from the following list, not more than three species of lumber for their Project; they shall be species available and in general use in the locality of the Project.

(a) LUMBER: EXTERIOR-FINISH, not otherwise specified. Southern Yellow Pine, "B and Better" Grade;
Douglas Fir, "C Select and Better" Grade, E. G.;
Cedar (Western Red or Port Orford), "No. 2 and Better" Grade;
Tidewater Red Cypress, "C" Grade;
White Pine, "D" Grade;
Ponderosa Pine, "D Select" Grade;
Spruce, "C" Grade;
Redwood, "Clear Heart Finish" Grade.

(b) LUMBER: INTERIOR-TRIM, not otherwise specified: (For painted Finish) Cedar (Red or Port Orford) Finish, "C" Grade;
White Pine, "D Select" Grade;
Ponderosa Pine, "D Select" Grade;
Redwood, "Clear Heart" Grade;
Coast Type Red Cypress, "C Finish" Grade;
Southern Yellow Pine, "C Finish" Grade;
Douglas Fir, "C Finish" Grade.

(c) LUMBER: INTERIOR, not otherwise specified: (For stained Finish) California Redwood, "Clear Heart" Grade;
Coast Type Red Cypress, "A" Grade;
Ponderosa Pine, "C Select" Grade;
White Pine, "C Select" Grade;
Southern Yellow Pine, "C Finish" Grade;
Douglas Fir, "C Finish" Grade;
Cedar (Red or Port Orford), "C Finish Grade.

NOTE: Only one specie shall be used for door frames and trim.

22-6 LUMBER-FLOORS: Floors, not otherwise specified, shall be not less than 25/32 inch thick; No. 1 Common Red or White Oak, Maple, Birch; or Third Grade Maple, Birch, or Beech.

NOTE: At the Contractor's option one or all of the above species of lumber may be used throughout the project, provided that only one variety shall be used in one dwelling unit and in one building only; i.e., Maple, Birch, Beech, or Oak shall be used.

Western Hemlock, Edge Grain "B and Better" Grade;
Southern Yellow Pine, Edge Grain "B and Better" Grade;
Douglas Fir, Edge Grain "B and Better" Grade;
Larch, Edge Grain "C and Better".

(a) Thresholds shall be "Clear" Oak. (or shall be of same material as used for floors.)

(b) Wood floors under linoleum and asphalt tile: Southern Yellow Pine, Flat Grain, "C" Grade; or Douglas Fir, Flat Grain, "C" Grade; or Western Hemlock, Flat Grain, "C" Grade; or Larch, "C and Better" Grade; or Ply-Wood, not less than 5/8 inch thick.

22-7 TREADS AND RISERS of finished stairs:

Oak, Select Grades;
Southern Yellow Pine, "B Finish" E. G. Grade;

NOTE TO ARCHITECT:
Where hardwood floors are specified, specify hardwood for stair treads; and for softwood floors, specify softwood for stair treads.

(a) Face and wall strings, risers and balusters shall be of the materials specified for interior trim.

(b) Stair handrails; Oak, Ash, Birch, Maple, Beech or Chestnut.

(c) Basement Stairs and stairs to attic; Douglas Fir, No. 1 common grade or Southern Yellow Pine.

22-8 BUILDING PAPER: For sheathing of walls and roofs, paper shall be a waterproof or saturated type, weighing not less than 13 pounds per square; for floors other than in toilets and bathrooms, paper shall weigh 6 pounds per square; and for toilets and bathrooms, 27 pounds per square.

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WOOD PRESERVATIVE TREATMENT:

NOTE TO ARCHITECT:
Lumber seldom needs to be treated if adequate precautions are taken against dampness, dry rot, and termites; precautions generally are:

(1) No lumber or millwork shall come within 2 feet of the ground.

(2) For each 25 lineal feet of exterior walls, provide 2 square feet of opening for ventilating purposes of unexcavated areas.

(3) Provide against accumulation of ground-water in unexcavated areas.

(4) Underneath buildings remove all vegetable matter, including stumps, roots, and wood building debris.

(5) Provide asphalt filled joints in cellar floors, forming tight joints with walls, around columns, and pipes projecting through it. If floor is subject to hydrostatic pressure, the joints should be caulked.

(6) Insert slate courses, about 6 inches above grade, in masonry walls, where subject to termite attack.

(7) For timber sills resting on masonry close to the ground, use Heart Coast Type Red Cypress, Dense Heart Short Leaf Pine, Heart Redwood, or Heart Long Leaf Pine.

In special locations where these precautions have been found insufficient, and it is considered necessary to treat lumber with wood preservative, the lumber should be pressure-treated in conformity with Federal Specification. Brush and spray treatments are not permanently effective.

Copper or zinc coated termite shields may be used in lieu of wood preservative treatment; their use is of questionable effect.

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22-9 Sills, joists, plates, girders, bridging, sub-flooring, and other wood framing (but not including the finished floor items) of and below the first floor shall be treated with one of the following wood preservative treatments:

(a) Coal-Tar Creosote: This treatment shall conform to the empty-cell method with minimum absorption of six pounds per cubic foot of lumber as given in Federal Specification for wood preservative treatment.

NOTE: Coal-Tar Creosote treatment shall not be used on lumber that comes in contact with plaster.

(b) Zinc-Chloride: This treatment shall conform to the requirements of Federal Specification for wood preservative treatment; the dry salt retained shall be not less than one pound per cubic foot of lumber.

(c) Wolman Salts or Zinc-Meta-Arsenite: In this treatment, the dry salt retained shall be not less than three tenths (0.30) pounds per cubic foot of lumber.

22-10 After salt treatment of lumber, the moisture content of same shall be reduced to not over 15 per cent by kiln-drying at the treatment plant.

22-11 Lumber sawed or cut after treatment shall have cut surfaces well brushed, coated (or dipped) with the same preservative that was used at the treatment plant.

22-12 Treated lumber, when delivered to the project site, shall be accompanied by a properly executed certificate from the Lumber Treatment Company.

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CARPENTRY:

22-13 GENERAL: Carefully lay-out, cut, fit, and erect all framing lumber, sheathing, sub-floors, bridging, blocking, and other items of work necessary to completely erect the framing as indicated. Provide and erect all items of finished millwork and woodwork of every character required whether specifically itemized herein or not. All work shall be carefully and properly executed in such a manner as to insure the greatest stability, and to minimize the effect of shrinkage. All members shall be properly braced, plumbed, and leveled. A sufficient number of nails, spikes, and bolts shall be used to insure the rigidity of all parts of the work. Provide fire stops where shown, and at least one line of stops in each story height of exterior walls.

22-14 Provide and erect all items of finished millwork and woodwork of every character required whether specifically itemized herein or not. All items of millwork shall be carefully erected with tight-fitting joints, and blind nailed where possible. Exposed nails shall be set for putty, splicing of trim members for door and window openings will not be permitted unless otherwise indicated, joints at junction of jamb and head members shall be carefully mitered and secured. Base members shall have mitered exterior angles and mitered or coped interior angles with joints not less than 12 feet apart. Trim shall not be stored in any building until the plastering is completed and dry. Trim shall be protected against dampness during delivery and until used. Trim showing tool marks or other imperfections will be rejected. It shall be cleaned before painting. All glue used for exterior work shall be waterproof. Joints in exterior work that are not glued shall be set in white lead and linseed oil paste; white lead will not be required in wood frames.

22-15 FLOOR FRAMING: Except where specifically shown otherwise, floor joists, and roof rafters shall have not less than 4 inches bearing, and where built into masonry walls shall be fire-cut with $3\frac{1}{2}$ inches bevel.

(a) Joists framing into each other at right angles shall be as detailed.

(b) Joists and roof rafters shall be lapped and spiked together at bearings, and spiked to studs. Joists and roof rafters resting on ribbon boards shall be spiked to studs or, where spacing of studs and joists does not coincide, the joist ends shall be properly blocked between studs. Joists lapped over bearings shall be spiked together. Rafters shall be subject to the same requirements as for joists, so far as applicable.

(c) Headers and trimmers shall be doubled or tripled as detailed.

(d) There shall be double joists under all partitions parallel with floor joists.

(e) Frame between the ends of the joists for nailing diagonal subfloowing and ceiling lath.

(f) Where joists are built into masonry walls, joist shall be anchored with stock tee anchors as detailed.

(g) Joists parallel with walls shall be anchored as indicated and not over 8 feet intervals, with tee anchor extending over three joists and securely spiked to each joist.

(h) Bridging shall be provided for all floor joists and roof rafters, consisting of 1-inch by 3 inch boards cut to accurate fit and fastened at each end with two 8d nails (the bottom end of this bridging shall not be secured until after sub-floors have been laid). One row of bridging shall be provided in all spans up to 15 feet and two rows in longer spans. Bridging for porch floor joists shall only be provided where shown.

NOTE: Metal bridging may be substituted for wood bridging at the option of the Contractor.

22-16 SLEEPERS: Shall be 2 inch by 3 inch, beveled, and worked from sound straight grained material; sleepers embedded in concrete cinders or fill shall be Coastal Cypress, Long Leaf Southern Yellow Pine, Heart Redwood, or Lumber pressure-treated for decay resistance.

(a) Unless finish wood floors are laid in mastic, sleepers shall be provided for all wood floors on structural slabs; they shall be spaced 16 inches on centers and, shall be placed along walls or columns and where necessary to provide a nailing base at right angles to the general run of the sleepers.

(b) Sleepers shall be accurately leveled, with their tops in alignment and at the levels required, and shall provide rigid nailing bases, free from spring.

(c) All voids between the floor construction and the bottoms of sleepers shall be filled with a neat Portland cement grout or a 1:3 Portland cement mortar grout as the case requires.

22-17 SUB-FLOORING: Where wood finish floors are laid on wood joists or sleepers, lay sub-flooring of 1 by 4, or 1 by 6 inch dressed and matched lumber. Repair sub-flooring where necessary and thoroughly clean before laying finish floors.

NOTE TO ARCHITECT:
Ply-wood, minimum 3/8 inch thick, may be used for sub-flooring.

(a) Floors in attic spaces shall be 1 by 3, 4, or 6 inch, dressed and matched, laid at right angles to the joist-construction; or provide in attic space walkways 2 feet, 6 inches wide as indicated.

(b) Construct sub-floors in bathrooms for receiving concrete base for tile floors. Sub-flooring under bathrooms shall be matched, driven up tight, and nailed securely.

(c) In laying sub-flooring, butt-joints shall be staggered and over supports; end cuts shall be parallel with joists; not less than 8d nails with 2 to each bearing shall be used; if end matched lumber is used, end joints need not be on bearings; sub-flooring not end matched may bear on 2 by 4 inch pieces cut between joists and spiked to same.

(d) Except as otherwise directed, sub-flooring shall be placed diagonally, and in buildings more than one story high, sub-flooring on second floor shall be laid at right angles to the sub-floor below.

22-18 STUD PARTITIONS: Unless otherwise shown, studs shall be 2 by 4 inches, spaced 16 inches on centers.

(a) Where partitions abut masonry walls, the end stud against the wall shall be secured thereto.

(b) Studs shall be built-up solid at corners doubled around openings, and trussed over openings 3 feet and wider unless otherwise indicated; all corners shall be securely spiked together and made solid.

(c) Bearing partitions shall be provided with single plates spliced at joints; corners shall be made solid and securely spliced together.

(d) Stud partitions shall have one row of 2 inch horizontal bridging, in each story height, full width of studding, cut in and securely nailed in place.

(e) Frame studs as indicated or as directed, for the proper installation of plumbing, electric, and other items of work to be concealed in partitions.

(f) Cut in nailing strips as required for the support of fixtures.

(g) Studs of bearing partitions shall continue down between joist-construction to plates on partitions or to beams below, unless studs extend through the two stories without splicing as detailed.

22-19 ROOF FRAMING: Wall plates on masonry walls shall be set level in beds of fresh 1:3 mortar, spread by mason and secured to masonry walls with 5/8 inch diameters, 2 feet long anchor bolts, at corners and intermediate points approximately 4 feet apart unless other size bolts and other spacings are shown. Framing of roof members shall be as hereinbefore specified and as detailed.

22-20 SHEATHING: Shall be nominal 1 by 6, or 1 by 8, or 1 by 10 inch material, square edge, or matched for walls; and nominal 1 by 6 inch square edge or matched for roofs, except that roof sheathing which has roofing material applied directly over the sheathing shall be matched. Sheathing shall be laid with courses butted but not driven tight blind and face nailed with not less than two 8d nails to each support for boards 8 inches or less in width and with three 8d nails for 10 inch wide boards; if boards are not end matched, end joints shall be over supports with not less than two boards between joints on same support; if end matched lumber is used, end joints may be at random with at least two boards between joints. Sheathing shall be kept 1/2 inch away from parapet walls and chimneys.

(a) Exposed sheathing at eaves shall be "T & G" jointed material; nails from roof covering shall not penetrate through this sheathing.

(b) Provide and install in place (under the direction of the roofer) all necessary wood cores, crickets, and other members of sizes and shapes required for the installation of the finish roofing materials.

22-21 ROOF SCUTTLES: Curbs shall be well formed and secured in place in a substantial manner.

(a) Scuttle covers shall be matched and dressed material well keyed-up; exposed surfaces shall be smooth, and surfaces which are to be covered with metals shall be in suitable condition to receive the metal.

NOTE: For metal covering of scuttle covers, see division, "Roofing and Sheet Metal Work."

22-22 WOOD FURRING: Unless otherwise indicated, wood furring shall be of 1 by 2 inch Heart, Coastal Type Cypress, or Long Leaf Southern Yellow Pine, or Redwood spaced as required. (see "Lathing") Furring shall be secured to masonry walls in an approved manner.

(a) Where indicated exterior masonry walls shall be furred to receive lath and plaster (see division "Plastering").

(b) Place miscellaneous furring where shown or required.

(c) Furr out for plumbing pipes where required. Cutting of 8 inch walls for plumbing stacks will not be permitted.

NOTE TO ARCHITECT:
If furring is of metal, it should be specified under the division "Plastering".

22-23 WOOD GROUNDS: Dressed wood grounds of thickness required (see other divisions of the specification) shall be furnished for plaster, securing wood trim, base, and wherever required.

(a) Grounds shall be set true and accurately aligned.

(b) Grounds generally shall be approximately nominal 2 inches wide.

(c) Provide two grounds or a solid wood board for securing wood base.

(d) Wood grounds shall be set for plaster for all standing trim, set back 1/2 inch from trim edge.

22-24 WOOD BUCKS: Provide and set wood bucks for all door openings in exterior masonry walls and wood trimmed openings in masonry partitions.

(a) Bucks shall be secured to masonry as indicated or as specified.

(b) Openings for wood frames in metal stud, solid plaster, gypsum, or masonry partitions shall have wood buck of 2 inch stock, of width required by jamb details. Bucks shall be either nailed or anchored to structural jambs with two anchors per jamb for frames more than 5 feet high. Anchors shall be 1/8" x 1" flat metal, bent for attaching to bucks and extending into masonry at least 9 inches.

22-25 CENTERS: Provide and set all wood centering for masonry arches. Centers shall be accurately made, strongly framed, braced, and supported in position until the masonry has thoroughly set.

22-26 PLANK SLIDES: Openings from boiler room to coal storage space shall be provided with 2 by 6 inch wood plank slides fitted into the frames.

22-27 BUILDING PAPER: Shall be installed over all sheathing and wood sub-flooring. Paper shall be secured to sheathing with nails and tin washers. Paper shall be lapped not less than 6 inches on ends and 2 inches on sides, and on sheathing shall be laid from the bottom up, shingle fashion; bottom of paper shall lap over foundation wall to form a water seal. Damaged paper shall be properly repaired or replaced.

NOTE TO ARCHITECT:
It is the intention to use stock millwork, especially such as is easily procurable in the project locality. U. S. Department of Commerce Simplified Practice Bulletin No. 4-16-29 should be followed where applicable in connection with stock designed millwork.

DOOR FRAMES:

22-28 EXTERIOR: 1-3/4 inches thick, unless greater thickness is indicated.

(a) Frames shall be worked from the solid, rebated for doors and screen doors as detailed.

(b) Lumber for exterior door frames shall be of any of the species and grades as hereinbefore specified for "Exterior Lumber", clear on the exposed faces.

(c) Jamb lining panels shall be set in white lead; panel mouldings shall be secured to stiles and rails; panels shall be solid stock not less than 1/2 inch thick or synthetic resin bonded plywood not less than 1/4 inch thick, well fitted and set in place without flue or other fastening.

(d) Frames shall be primed on all sides (on back only if stained) before they are set in place.

22-29 INTERIOR: Cut from 1 inch stock with stops applied to, or plowed in.

(a) Lumber for interior door frames shall be of any of the species and grades as hereinbefore specified for "Interior Lumber."

22-30 Frames shall be accurately machined with joints fitted tight.

22-31 Frames shall be set plumb and square, and be secured with finishing nails well set for putty-stopping.

22-32 Double wedge blocking shall be driven back of jambs at nailing points, also back of butts and lock strikes.

DOORS - See "Door Schedule"

22-33 Doors shall be of sizes, thickness, and designs indicated.

NOTE TO ARCHITECT:
For stock doors of type other than herein specified, write specification covering the type of door indicated.

(a) Doors shall be No. 1 grade and in accordance with standard specification of the National Door Manufacturing Association Inc., or "A" grade, in accordance with the grading rules of the Fir Door Institute.

(b) Joints of stiles and rails shall be doweled in accordance with the standards of the industry. Provide four dowels at each end of bottom rails and two dowels at end of top and intermediate rails; doors up to and including 1-3/4 inches thick shall have not less than 1/2 inch dowels, not less than 5 inches long. Dowels shall have glue grooves.

(c) Glazed doors shall have moulded muntins, with loose beads for glazing.

(d) Double doors shall be rebated or have astragals.

(e) Unless otherwise indicated, widths of stiles and rails shall be standard.

22-34 EXTERIOR DOORS: Shall be made of White Pine, Ponderosa Pine, V. G. Douglas Fir, Long Leaf Southern Yellow Pine, or _____. Softwood exterior doors shall be preservative treated and bear the "Seal of Approval of the National Door Manufacturing Association". Unless otherwise indicated, doors shall be 1-3/4 inches thick. Doors shall

have solid stiles and rails with standard sticking worked on the solid or applied mouldings set in white lead. Panels shall be solid, of thickness detailed, or of synthetic resin bonded plywood, flat or raised, and set in place without gluing or nailing.

22-35 INTERIOR DOORS: Shall be made of any of the Pines (except Short Leaf Southern Yellow Pine), V. G. Douglas Fir, Larch, Red Gum, (unselected for color), Birch (unselected for color), or unless otherwise indicated 1-3/8 inches thick, solid, or built-up veneered.

(a) Veneered doors shall have cores of White Pine, Ponderosa Pine, Chestnut, or Douglas Fir built up of strips not over 1-1/2 inches wide glued together under pressure and then sanded smooth to receive the face and edge veneer; face veneer shall be not less than 1/8 inch thick before sanding; edge veneer strips shall be 3/4 inch thick and of same material as the face veneer, carried on vertical stiles of door.

(b) Door may be solid, stuck or loose moulded; if loose moulded, mouldings shall be of the same material as veneer and nailed to stiles and rails only.

(c) Panels shall be three-ply laminated, both faces being veneered with the same material as the veneer on the stiles and rails.

22-36 CABINET DOORS and other Doors: Not otherwise specified, shall be not less than 1-1/8 inches thick and with stiles and rails of solid material; panels three ply laminated.

22-37 BATTEN DOORS: Shall be not less than 3/4 inch thick, using screws to assemble; faces shall be T & G, V-jointed material.

22-38 All doors shall be manufactured in accordance with best trade practices for stock doors.

22-39 Doors shall be hung with 1/16 inch clearance at sides and top, and 3/16 inch clearance at bottom, except where thresholds are flush, in which case it shall be 5/8" inch.

22-40 For glass of glazed doors see division "Glazing".

NOTE TO ARCHITECT:
Drawings should indicate where solid doors are required, where veneered doors are required; and details should show thickness, door sizes; and "Door Schedules" should be checked with catalog sizes of the National Door Manufacturers Association to make certain that stock types and sizes are used. Veneered stiles and rails should not be used for exterior doors.

WINDOW FRAMES - See "Window Schedule":

22-41 Lumber for window frames shall be any of the species and grade specified for "Exterior Lumber", except that sill shall be clear. Frames shall be preservative-treated and shall bear the "Seal of Approval of the National Door Manufacturing Association". Back liners shall be any sound-tight-knotted stock; parting strips "B" Grade, Edge Grain, Southern Yellow Pine, or "B and Better" Edge Grain, Douglas Fir, or "B and Better" Edge Grain, Ponderosa Pine.

(a) Frames for double hung windows may be either of the plank type fitted with approved coil spring sash balances, or of the box type fitted with approved pulleys, weights, and cords or chains.

NOTE TO ARCHITECT:
Many items, such as lintels, masonry work trim, etc. are affected by the inclusion of the optional type of wood window specified; therefore drawings and details showing both types should be included.

(b) Box type frames shall be cut from 1 inch stock; parting strips shall be 1/2 by 3/4 inch; sills shall be 1-5/8 inches thick, beveled. Provide weight box pockets easily accessible with faces secured by brass screws. Weights shall be of cast iron or, if space limitations prohibit cast iron, of lead. Cord shall be equal in strength and durability to "Silver Lake" or "Sampson Spot." Or maybe of non-ferrous metal chain type.

NOTE: A window, fabricated of the materials specified, including weather stripping, completely assembled when delivered to the site will be accepted if prior approval is obtained from the Local Authority. Sash for this type window may be 1-1/2 inches thick.

(c) Plank or casement frames shall be cut from 2 inch stock, rebated for both sash and screens; sills shall be 1-5/8 inches thick, beveled.

22-42 Plumb and level all window frames and maintain necessary bracing until built-in.

22-43 Window frames shall be primed on all exposed surfaces before they are set in place.

SASH: See "Window Schedules":

22-44 Sash shall be manufactured from:

White Pine, Clear Stock, Standard Sash Grade; Ponderosa Pine, Standard Sash Grade; Coast Type Red Cypress, Best Clear Heart Grade; Douglas Fir Edge Grain Clear Grade.

(a) All soft wood sash, except when specified to be all heart wood shall be preservative treated and bear the "Seal of Approval of the National Door Manufacturing Association".

(b) Sash shall be 1-3/8 inches thick up to 42 inches wide and 1-3/4 inches thick for 42 inches in width and wider.

(c) Casement sash opening in shall have drip mould let into same.

(d) Sash shall be constructed in the best manner, with mortised and tenoned and pinned joints; or slot mortised, rebated for glass and moulded.

(e) They may be fitted at the mill, or at the site, after frames are set. Double hung sash shall be properly balanced to operate freely without binding.

(f) Sash shall have a prime coat of lead and oil applied at the mill, unless stain finish is specified; if stain finish is specified, sash shall be oiled at the mill.

SCREENS - See "Window and Door Schedules":

22-45 Lumber shall be any of the species specified for wood sash and subject to the same toxic treatment, priming, and staining.

(a) Double hung windows shall be fitted with full length top hung screens; (half length vertical sliding screens with spring steel side springs; hardwood slides full length of window).

(b) Casement windows shall be fitted with full length side hinged, in-swinging screens.

(c) Frames shall be not less than 3/4 inch thick; stiles and rails shall be of widths standard with the manufacturer but in no case less than 2 inches wide for side stiles, top and intermediate rails, and 2-3/8 inches wide for bottom rails.

(d) Full length screens shall be provided with an intermediate cross rail located opposite the meeting rail of the window.

(e) Stiles and rails shall be mortised and tenoned and pinned; all joints shall be glued with waterproof glue. Corners shall be reinforced with 16 gauge zinc-coated steel angles.

(f) A duplicate numbering system of brass numbers shall be provided for all screens; one number shall be secured to the screen and the corresponding duplicate number secured to the window frame.

22-46 Door Screens: See "Door Schedule".

(a) Screen doors shall be of stock design and in no case be less than 1-1/8 inches thick.

(b) Softwood screen doors shall be preservative treated and bear the "Seal of Approval of the National Door Manufacturing Association".

(c) Stiles and rails shall be of widths shown, moulded and coped, mortised and blind tenoned, wedged and set in waterproof glue or of dowel joint construction; if doweled there shall be not less than 2 dowels to each joint.

(d) Lower panels of doors shall be provided with guard grilles having metal frames and panels formed of not less than 1/16 by 1/4 inch brass strips woven at right angles forming 3/4 inch square mesh opening; guard grilles shall be secured to the doors with round head brass screws.

(e) Screen doors shall have an approved type metal identification tag or marker attached to the door and to the frame.

22-47 Screen cloth for window and door screens shall be commercial bronze, (aluminum), natural finish, 16 mesh wire having a diameter of 0.0113 inch. Screen cloth shall be applied tight, without warp or buckle, and shall be secured in place with removable metal or reed strips let into grooves to permit of re-screening.

NOTE: One kind of screen cloth shall be used throughout the project.

MILLWORK EXTERIOR:

22-48 GENERAL: Exterior finish shall be milled and erected as detailed:

(a) All assembled members shall be set in white lead paste.

(b) The exposed surfaces of finish woodwork shall be smooth, ready to receive paint or finish.

(c) All nails shall be well set for putty-stopping.

22-49 COLUMNS AND PILASTERS: Shall be of design and size shown, complete with cores, bases, and capitals of the profile indicated.

(a) Round columns and pilasters shall be built-up with narrow staves, interlocking joints and all glued together with waterproof glue. Thoroughly paint ends of columns before assembly and erection. (Set columns on cast iron bases).

22-50 CORNICE, ENTRANCE AND PORCH FINISH: Cornices and all wood finish shall be milled and erected in strict conformity with details.

(a) Cornices shall be well braced and mitered and coped at angles and so assembled as to form protection of vertical joints. Lookouts for cornices shall be framed as detailed they shall be securely built-in or fastened in place.

22-51 PORCH FLOORS: Shall be 1-1/8 by 2-1/4 (3-1/4) inches face, square edged when laid with open joints or face matched boards when laid with tight joints.

(a) All flooring shall be given an over-all coat of white lead paint before laying.

(b) Joints shall be made with white lead.

(c) Flooring shall be securely nailed in place and all neatly finished.

22-52 PORCH CEILINGS: Ceilings shall be of

Southern Yellow Pine, No. 2 ceiling Grade;
Douglas Fir, "C" Ceiling Grade;
White Pine, "D" Ceiling Grade;
Ponderosa Pine, "D" Select Grade:
Redwood "B" Ceiling Grade;
Cypress, "C" Ceiling Grade.

9/16 inches thick, beaded, well driven up, blind nailed at each bearing; joints shall be alternated so that there shall be at least two boards between joints on the same bearing. Place bed mould at angles of ceiling and vertical surfaces.

22-53 PORCH RAILINGS: Top and bottom members of railings shall be of not less than 2 inch stock, the upper surface to have ample wash; upper rails shall be grooved to receive balusters. Balusters shall finish 1-5/16 inches square, unless otherwise shown. Balusters shall be fitted to bottom rail and be securely made with toe-nailed in place. All joints shall be white lead.

22-54 DORMERS: Over sheathing and building paper of sidewalls, place siding as detailed, blind and face nailed. Joints shall be set in white lead.

22-55 WOOD SIDING: Wood siding shall be properly fitted at joints and well nailed. Where wood siding is fitted at corners without corner beads, the corners shall be mitered so that no end grain will be exposed.

22-56 WOOD LOUVERS: Frame shall be as detailed.

(a) Softwood louvers shall be preservative treated and shall bear the "Seal of Approval of the National Door Manufacturing Association".

(b) Provide at back insect screens of No. 16 mesh non-ferrous wire in removable wood frame.

(c) Provide and attach at back of louver frame, complete with hardware, batten shutter, made of 3/4 inch T & G ceiling boards with cross battens, attached with screws.

MILLWORK - INTERIOR:

22-57 (a) Woodwork shall be sanded to remove all machine marks.

(b) Unless otherwise definitely indicated to the contrary, all interior trim, including base, shall be standard stock mouldings of widths and sizes approximately as shown.

(c) All joints shall be made in an approved manner and perfectly fitted.

(d) Finish shall be secured in place with fine finishing nails or screws where required; all nails exposed shall be well set for putty-stopping.

22-58 STANDING TRIM: Casings shall be well nailed to finished and rough jambs, with mitered joints, unless otherwise shown; casings shall be trimmed 1/4 inch back from edge of jambs.

NOTE: Window and door trim shall be similar in profile.

22-59 BASE: Unless otherwise noted, all rooms and spaces having plastered walls shall have a two member wood base consisting of a flat or moulded member and a shoe mould.

(a) Base shall be well nailed to the grounds and drawn tightly to the plaster.

(b) Shoe mould shall be nailed to the floor only, except where flooring is of other material than wood, in which case the shoe mould shall be nailed to the base.

22-60 WINDOW STOOLS AND APRONS: Window stools shall be not less than 1-1/16 inches thick; they shall be rebated over rough sills; returns shall be cut at the mill. Aprons, unless otherwise shown shall be same as trim.

22-61 CEILING SCUTTLES: Unless otherwise shown, ceiling scuttles shall have matched and beaded ceiling boards 3/4 inch thick with battans screwed on the upper surface.

22-62 FINISHED STAIRS: If of wood, above basement, shall have carriages (stringers) cut from 2 by 12 inch material, spaced not over 18 inches apart.

(a) Treads shall be not less than 1-1/16 inch thick, with scotia moulds at edges, and exposed ends; edges and ends of treads shall be rounded. Provide skirtings at wall sides. Treads shall be rebated into risers, nailed, blocked, wedged, and screwed-up.

(b) Newels shall be housed to receive treads and be strongly secured in place.

(c) Balusters shall be properly secured and blocked into handrails.

(d) Handrails shall fit neatly at newels and be well secured at joints and ends with rail bolts.

22-63 BASEMENT STAIRS: Unless otherwise indicated, stairs shall be built of 2 by 10 inch carriages spaced not over 18 inches apart, with 2 inch thick plank treads with (closed risers - 7/8 inch stock) (Open risers.)

(a) Newels shall be 4 by 4 inch chamfered. Rails shall be 2 by 4 inch chamfered. All members shall be well spiked together and rigidly secured in place.

22-64 ATTIC STAIRS: Unless otherwise indicated stair shall be of plank type built of 3-2 by 10 inch carriages with 1-1/16 inch treads and closed risers. Provide wood railings around top of well. All members shall be well spiked (or nailed together and rigidly secured in place.

22-65 HANDRAILS: Enclosed stairs shall be provided with wood handrails on metal brackets (see division "Builder's Hardware") spaced as indicated and rigidly secured in place.

WOOD FLOORS ON WOOD SUBFLOORS:

22-66 Flooring shall be 13/16 by 2-1/4 to 3 inch "T & G" end matched material, laid with close joints, tightly driven up, and blind nailed with 8d cut steel nails at all bearings; joints shall be alternated so that there will be at least two boards between them on the same bearing; provide open spaces for expansion under shoe moulds.

(a) As far as practicable short length pieces shall be used in closets and at ends of rooms and shall not be used at doorways.

(b) Flooring material shall not be brought into the buildings until the plastering is dry.

WOOD FLOORS LAID IN MASTIC ON CONCRETE SUB-FLOORS:

22-67 Wood floors to be laid directly on concrete subfloors shall be laid in mastic. Flooring material may be either loose strips or prefabricated panels not over 9 by 9 inches; the mastic and the method of laying shall conform to all the requirements of the persons or firms installing the work; the completed work shall be free from defects of any nature and any damaged or defective materials and workmanship shall be corrected to the approval of the Local Authority.

22-68 Thresholds: Provide 5/8 by 3/5-8 beveled thresholds at openings where shown and at openings where different kinds of flooring meet.

22-69 Floor Sanding and Scraping: All wood, finish floors shall be scraped, and sand papered or machine buffed to a fine, smooth finish. Parts of floor which cannot be machine sanded shall be hand sanded. All parts of floors shall be brought to a fine, true, smooth finish without defacements of any kind. After scraping and buffing, the finished floors shall be protected with heavy building paper.

KITCHENS: WOOD

22-70 KITCHEN CABINETS: All kitchens throughout the project shall be furnished with prefabricated kitchen cabinets as indicated and specified.

(a) Kitchen cabinets shall be the product of a manufacturer specializing in this product.

(b) Drawings accompanying these specification show typical designs of units required and shall be followed for approximate size, design, and arrangement of sections. Units of a type standard with individual manufacturers that meet the general requirements specified will be accepted, subject to approval of the Local Authority.

(c) Each unit shall be complete with backs, shelves, compartments, doors, and drawers as detailed.

(d) Cabinets shall be fabricated from sound, thoroughly kiln-dried lumber; frames (rails, stiles and intermediate members) shall be of sufficient thickness and widths to insure sturdy and rigid construction; frames shall be assembled with full mortise and tenoned or doweled and glued joints.

(e) Shelves may be either 3 or 5 ply stock, but not less than 7/16 inch thick or solid stock not less than 13/16 inch thick; they shall be glued and let into ends; all corner joints shall be triple nail locked.

(f) Backs shall be made of plywood or pressed wood, rebated into the frame members and well secured adjoining sections shall be flush bolted together.

(g) Doors may be flush panel of 5 ply laminated stock, (or shallow panel solid stiles and rails with 3 ply laminated stock panel) with 3/8 inch lipped edges.

(h) Drawer fronts shall be made from straight grained stock with lipped edges. Drawers shall slide on hardwood slides and have stops.

(i) Finish hardware shall be brass, chrome plated over nickel and shall include hinges of a type similar and equal to Stanley Cabinet Hinge Nos. 1518-1/2 or 1561 or other approved type semiconcealed or friction type catches and door and drawer pulls.

(j) Kitchen shelving, where indicated, shall conform in all applicable requirements to the above specifications.

22-71 WORK TABLES: Shall be furnished as indicated; they shall be the product of the manufacturer furnishing the kitchen cabinets and shall be of equal construction including the following:

(a) Work tables shall be portable unless otherwise noted; legs shall allow back of tables to set against wall. Provide toe space.

(b) Tops shall be of 3 inch wide or narrower laminated strips, tongued and grooved and glued together with waterproof glue, through-bolted and finished 1-1/8 inches thick.

(c) Bread boards shall have cleated ends and finish 13/16 inch thick.

(d) Drawers shall be partitioned for silverware.

(e) Bottom compartments shall be provided with approved zinc-coated wire shelves supported by either metal or wood channels.

22-72 Kitchen cabinets and work tables shall be finished (painted) completely at place of manufacture; tops, inside of drawers shall be shellacked; (shall be shipped to the project in the white); final coat of paint shall not be applied until colors have been approved by the Local Authority.

22-73 Cabinet manufacturer shall furnish shop drawings correctly dimensioned to fit measurements of kitchens as erected. They shall be erected straight, level, and plumb and securely anchored in place, with finished mouldings and fillers to fit cabinets to walls and ceilings.

22-74 METAL CABINETS AND WORK TABLES: At Contractors option metal cabinets and work tables may be used subject to the following requirements:

Design shall closely approximate that of wood. Finishes shall be heat-baked enamel, factory applied, in colors as selected.

Table top shall be medium gauge linoleum cemented in place with edges protected with metal, or may be wood tops as specified for wood tables.

Shop drawings shall be furnished showing correct dimensions to fit measurements of kitchens as erected.

Equipment and construction, including gauges of metal shall be as indicated in the manufacturers' printed catalogues.

BATHROOMS:

22-75 WAINSCOT CAP-AND-HOOK STRIPS: Wood wainscot cap-and-hook strip 3/4 by 2-1/2 inches shall be provided around all walls of all bathrooms throughout the project. Strips shall be secured in place in an approved manner.

MEDICINE CABINETS:

22-76 Furnish and install in each bathroom over lavatory, where indicated, one recessed metal medicine cabinet with mirror door. Cabinet shall be constructed of not less than No. 20 gage furniture or auto-body steel. Construction may be one piece, welded or other approved construction with exposed jointing smoothly finished. Each cabinet shall be provided with 2 shelves of not less than No. 18 gage steel having rolled front edges. Each shelf shall be secured to 3 sides of the cabinet. The door shall cover 2 shelves only, shall overlay cabinet to permit opening, and shall be fitted with a copper or aluminum backed mirror set in a metal frame approximately 1/2 inch wide with a fibre or felt lining with sheet metal backing. The door shall be provided with concealed hinges and a suitable concealed catch. Hinges with stop and catch shall be of nickel silver, white bronze or heavy chromium plated brass. The mirror shall be No. 1 quality plate glass mirror as defined by National Bureau of Standards Commercial Standard C 5-27-36.

The interior and exposed portions of the cabinet shall be finished with a baked-on white enamel. Other portions shall be finished with white paint. Cabinets shall have safety razor slots.

Cabinet dimensions shall be as follows:

Wall opening...Approximately 14 x 21"
Outside dimensions..... 13½ x 20"
Mirror size..... 14½ x 21"
Depth of Cabinet..... 3-1/2"

The above dimensions are approximate and slight variations will be permitted if they are manufacturer's stock dimensions.

Cabinets shall be set so that the center line or mirror is 5 feet 3 inches above finished floor.

22-77 BATHROOM ACCESSORIES: Provide the following:

(a) Paper Holder: Convenient to every watercloset furnish and install an approved paper holder. Holders shall have wood or metal bars held between chromium plated heavy spring wire, posts arranged to receive the bars or other approved type. The posts shall be secured to nickel plated back or base which shall be screwed to the wainscot cap.

(b) Robe Hook: On each door of bathroom and toilet rooms provide painted cast iron robe hook.

(c) Provide towel bar: 24 inches long; one in each bathroom, nonferrous posts, pyroxylin enameled finished wood bar.

CLOSETS:

22-78 In all closets, except as otherwise indicated, provide:

(a) Wood base will not be required in closets having doors.

(b) Shoe mould will be required in all closets having wood floors.

(c) 3 inch hook strip around 3 sides of each closet.

(d) Two shelves approximately 12 inches wide, lengthway of closets supported on the hook strip and securely fastened.

(e) Except in linen closets, provide each closet with a 3/4 inch diameter zinc-coated pipe clothes pole and supports.

Linen Closet:

(f) Shelves shall be as indicated and supported on suitable strips.

(g) Shelves more than 5 feet in length shall have approved intermediate supports.

(h) Each closet, except linen closets, shall be provided with cast iron coat-and-hat hooks spaced 9 inches apart screwed to hook strips, 3 sides of closet.

(i) Closets without doors shall be provided with a wrought-steel telescoping tubing, nickel plated curtain rod; outer tube not less than 1 inch outside diameter; length shall be as required; metal flange at ends shall be securely attached to the tubing.

BUILT-UP UNITS:

22-79 IRONING BOARDS FOR PUBLIC LAUNDRY ROOMS shall be an approved stationary type, securely bolted to wall and supported by 1-1/4 inch diameter mild-steel or iron pipe and malleable fittings. Stationary ironing boards of stock design and manufacture will be acceptable as meeting the contract requirements.

22-80 COUNTERS: In administration building, shall be fabricated and installed in accordance with the details.

(a) Unless noted otherwise, counter tops shall be 1-1/8 inch thick formed of narrow strips tongued, grooved, doweled, and glued together; exposed edges shall be rounded or moulded.

(b) The entire top surface of counter tops shall be covered with Battleship Linoleum, 3/16 inch thick of color selected by the Local Authority; linoleum shall be cemented to the counter top and all edges shall be protected with an approved nonferrous edging strip having proper size lip to receive and protect the linoleum.

(c) Shelves, division strips, and similar members shall be not less than 11/16 inch thick; shelves shall be substantially supported.

(d) Doors and drawers shall be fabricated in keeping with best standard wood cabinet work practice.

(e) Foot rails shall be formed of iron pipe with standard screw flange fittings, secured in place with screws where applied to wood, and with expansion bolts where applied to masonry.

(f) Guard screens on top of counters shall be provided in accordance with details shown on the drawings. Unless otherwise shown on details screen shall be not less than 20 inches high, made of glass set in nonferrous frames and provided with nonferrous grilles in openings in front of cash drawers.

(g) Gates for counters shall be 1-1/8 inch thick with 3 ply veneer panels; stiles and rails shall be mortised, doweled, and glued together.

(h) Doors, Sash, and Drawers: Shall be accurately fitted with proper clearance, and left in perfect working condition.

TEMPORARY ENCLOSURES:

22-81 Exterior door openings shall have temporary batten doors complete with hinges and padlocks. In hot dry weather before plastering is begun, window openings not glazed in plastered portions of the buildings shall be covered with strong muslin stretched on wooden frames. Temporary enclosures shall be maintained in good repair until no longer required. Steel windows may be glazed instead of temporarily enclosed.

CUTTING AND PATCHING:

22-82 Under this heading do all cutting and render other carpentry assistance required for work of other trades within the scope of the contract requirements.

22-83 Woodwork shall be delivered dry, stored in a dry place and protected from injury or dampness. Millwork shall not be stored or installed in any part of the buildings until concrete masonry and plaster in such parts is dry.

ROUGH HARDWARE:

22-84 The Contractor shall furnish all rough hardware, such as nails, screws, bolts, rods, anchors, ties, and other items, as well as all metal fastenings of any nature for the proper installation of carpentry and millwork.

22-85 Fastenings to concrete and other masonry for wood grounds, furring, and other engaging woodwork, shall be of approved metal types spaced to suit conditions.

22-86 Nails, spikes, screws and similar items shall be of types and sizes sufficient to draw the members in place and securely hold same.

APPLICATION OF FINISH HARDWARE:

22-87 The Contractor shall receive all finish hardware, store, and be responsible for its safety, distribution and application.

(a) Hardware shall be accurately fitted, securely applied, and carefully adjusted.

(b) Care shall be exercised not to mar or injure existing work when applying hardware.

(c) All keys shall be properly tagged, indexed, and filed in the key cabinet as directed. All keys locking the key cabinet shall be delivered to the Local Authority at completion and acceptance of the work.

(d) Door knobs shall be kept covered with heavy cloth until acceptance of the project.

(e) Door knobs except as otherwise shown, shall center 38 inches above the floor.

(f) Door pulls shall center 45 inches above the floor.

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INSULATION-23-1

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SUGGESTED SPECIFICATION - DIVISION - 23

DIVISION - 23
INSULATION

NOTE TO ARCHITECT:
Attention is directed to insulating lath under division "Plastering" and rigid insulation under division "Roofing and Sheet Metal Work".

SCOPE:
23-1 Furnish and install:

(a) Loose-fill-type or bat type insulation between ceiling joists of

(b) Mineral-bat-type or flexible blanket-type insulation between studs or furring of exterior walls.

(c) Rigid-type-insulation on the underside of concrete slabs over (heating boilers) (pump rooms) and (heater rooms).

NOTE TO ARCHITECTS:
Materials indicated above in (a) (b) and (c) are intended for 3 different uses; for example, (a) Loose fill or bat type insulation is suggested for use between ceiling joists;

(b) Bat-type or blanket type is suggested for use between studs in exterior walls;

(c) Rigid type is suggested for use on the underside of floor construction over boiler and similar spaces. The following sub-headings should be coordinated with the "Scope" paragraphs (a), (b) and (c) respectively.

MATERIALS:

23-2 Insulation shall be in form, specified. Materials shall be rot resisting, vermin and rat proof and shall not support combustion. It shall be of such thickness that, when installed, the thermal conductivity shall not exceed that specified. Insulating products shall be approved by the Local Authority before the material is shipped to the site.

(a) Loose-fill-insulation shall be composed of mineral matter in fibrous or granular form; the total thickness shall be such that the thermal conductance of the material as used shall not exceed 0.83 B.t.u. per hour, per square foot, per 1 degree F. difference in temperature between the two surfaces of the material. Bat-type-insulation meeting the thermal conductivity herein set forth will be acceptable in lieu of loose-fill type material.

(b) Bat and flexible-blanket-type insulation shall be composed of mineral fibers felted and bound together to produce a semi-rigid spongy block of uniform thickness. Bats shall have heavy waterproof kraft paper secured to one face with folded flanges along each of the long sides for nailing; the total thickness shall be such that the thermal conductance of the material as used shall not exceed 0.30 B.t.u. per hour, per square foot, per 1 degree F. difference in temperature between the two surfaces of the material.

Alternate.
(b) Flexible-blanket-type insulation shall be manufactured from clean and sterilized animal hair, wood, mineral or other fibers or combination of these materials loosely assembled and effectively attached to one side of, or confined between, strong durable waterproof papers. Paper shall be extended to provide flanges along each of the long sides for nailing. The total thickness shall be such that the thermal conductance shall not exceed 0.30 B.t.u. per hour per square foot, per 1 degree F. difference in temperature between the two surfaces of the material.

(c) Rigid insulating material shall be manufactured from wood or other vegetable fibers compressed or moulded into rigid sheets. Insulation shall be water resistant in single or multiple-ply as required. Joints for multiple-ply material shall be formed with moisture resistant cement; the total thickness, shall be such that the thermal conductance shall not exceed 0.23 B.t.u. per hour, per square foot per 1 degree F. difference in temperature between the two surfaces of the material.

23-3 The thermal conductivity ratings of insulating material shall be in accordance with the ratings given by the National Bureau of Standards.

INSTALLATION:

23-4 Loose-fill-type insulation shall be carefully installed so as to cover entire areas specified to the thickness required.

23-5 Bat, flexible or blanket-type-insulation in walls shall be installed with paper flanges extending out over supports and nailed thereto at 1 foot intervals. End joints between bats and other joints shall be tightly fitted to provide continuous insulation. Bats shall be installed with paper adjacent to the plaster.

23-6 Rigid-type insulation shall be placed in the forms before pouring of the concrete; it shall be secured with No. 10 galvanized wire "U" shaped staples, one in every square foot of surface areas, extending through the full thickness of the material and extending approximately 3 inches into the concrete slab with ends bent at right angles, or by other approved methods. The insulating material shall be butted snugly against sides of beams and walls. Beams, soffits and sides shall not be covered.

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WEATHERSTRIPPING-24-1

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SUGGESTED SPECIFICATION - DIVISION - 24

DIVISION - 24
WEATHERSTRIPPING:

SCOPE:

24-1 Furnish and install weatherstripping on

(a) All wood windows in exterior walls of all buildings except

(b) All outside doors, except

(c) Sills only of all outside doors, except

24-2 Thresholds shall be provided for doors that are to be weatherstripped.

WEATHERSTRIPPING:

24-3 For Wood Windows:

(a) Weatherstripping shall be of the metal to wood type, standard with the manufacturer, fabricated of zinc sheared and formed across the grain, or of other nonferrous metal; in any case not less than 0.018 inch thick.

Strips may be of the spring tension type with hemmed edges or rib type, providing continuous seal around windows, across meeting rails and past operating devices.

Weatherstripping shall pass the following test:-

For one complete window the average air infiltration shall be not more than 1.75 cubic feet of air per hour, per foot of crack, per mile per hour of wind velocity. The Contractor shall certify to this requirement before installing the work.

(b) For wood casement windows: Weatherstripping shall be of cold rolled tempered, spring phosphor bronze not less than 0.018 inch thick; it shall provide a continuous seal past hinges and other hardware.

24-4 For Wood doors:

Weatherstripping shall be of cold rolled, tempered, spring phosphor bronze not less than 0.018 inch thick with edges hemmed; it shall provide a continuous seal past hinges and other hardware. Sill weatherstripping shall be friction type, (operating directly against the thresholds) or interlocking type (interlocking with the threshold).

24-5 Thresholds shall be of cast or extruded brass or bronze; unless otherwise shown, shall be not less than 3 inches wide and of stock section, and of a type approved by the Local Authority.

INSTALLATION:

24-6 Weatherstripping shall be installed in accordance with the manufacturer's directions, carefully, accurately, and neatly cut, fitted, and firmly secured in place with fastenings of approved material, size, and spacing.

24-7 Thresholds shall be set in caulking compound, firmly secured with brass or bronze countersunk screws let into expansion shields.

24-8 Care shall be exercised to prevent damage or defacement of any work; damaged work shall be repaired or replaced.

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SUGGESTED SPECIFICATIONS - DIVISION 25

DIVISION - 25
ASPHALT TILE FLOOR COVERING:

NOTE TO ARCHITECT:
This specification requires that the location of asphalt tile floor and base for all areas be clearly designated on the "Schedule of Interior Finishes."

SCOPE:

25-1 For location and extent of work, see drawings and "Schedule of Interior Finishes".

MATERIALS:

25-2 ASPHALT TILE shall be a standard product, calendered to thickness specified, free from defects affecting their serviceability, and appearance and shall have straight edges and square corners. The wearing surfaces shall be smooth and free from sand, grit and lumps. Colors shall be of the darker shades as selected by the Local Authority from manufacturer's plain, stock colors. Tile for floors shall be 1/8 inch thick 6 by 6 inches. (9 by 9 inches). (Tile laid on concrete slabs on earth shall be 3/16 inch thick).

(a) Indentation and flexture tests will be required which shall conform to the requirements of Federal Specification for Asphalt Tile; sizes and thickness of tile for floors shall be within the tolerances permitted by this specification.

Before tile is delivered to the project a complete record of the required tests performed by a recognized testing laboratory shall be submitted to and approved by the Local Authority. Check test from material delivered will be made by the Local Authority.

NOTE TO ARCHITECT:
The following are manufacturers' standard stock sizes and colors:

SIZES	COLORS
6" x 6" x 1/8"	Black
6" x 12" x 1/8"	Mahogany
9" x 9" x 1/8"	Brown
12" x 12" x 1/8"	Red
12" x 24" x 1/8"	

25-3 ASPHALT TILE BASE shall be moulded, 6 inches (4 inches) high, $\frac{1}{4}$ inch (3/16 inch) thick, with rounded top, covered (straight) bottom and in approximately 2 foot lengths. Interior and exterior corners shall be in one piece to fit square corners. Cove tile shall have a 1/8 inch lip at floor to finish flush with floor tile.

25-4 LINING FELT over wood sub-floors shall be of such type, weight and brand as recommended by the Manufacturer of the tile used.

25-5 ADHESIVE for securing felt and tile shall be of a type recommended by the manufacturer of the tile. Adhesive shall be delivered in original sealed containers and used without the addition of any unauthorized material.

25-6 EDGING STRIPS shall be of brass or white metal alloy, of the lip type, with a 20 gage flange extending

under edge of tile and properly secured to the subfloor. Edging strips shall be installed at all locations where edge of tile would otherwise be exposed or unprotected.

LAYING:

25-7 Cutting, fitting and laying of asphalt tile shall be done in the neatest and most workmanlike manner and only by firms and workmen thoroughly familiar and experienced in this class of work.

25-8 A temperature of 70 degrees F. or more, shall be maintained in rooms and spaces for not less than 48 hours before the tile is laid and continued for 48 hours thereafter. Tile shall be stored at such temperature for 48 hours prior to laying.

25-9 Surfaces to receive tile shall be thoroughly cleaned to remove all grease, dirt or other substances which would prevent complete adherence of the adhesive. Subfloors shall be moisture free. Wood subfloors shall be dressed flush and sanded smooth.

25-10 Concrete floors on earth to receive asphalt tile shall be primed with cut back asphalt primer and allowed to dry before adhesive is applied.

25-11 Tile shall be laid in patterns indicated on drawings (as directed by the Local Authority). Field tile shall be laid symmetrically about the center lines of the rooms or spaces, with borders equalized as much as possible; field tile shall not be cut. Except in corridors, borders shall be not less than 4 inches or more than 8-1/2 inches wide and cut from pieces not less than 24 inches long. In corridors and similar spaces, borders or closures shall be not less than 3 inches wide.

25-12 Cutting and fitting shall be executed as required; edges and ends shall be closely fitted. The adhesive shall be evenly spread over the subfloor using approximately 1 gallon for each 140 square feet. Each tile shall be completely bedded in the adhesive and joints made as inconspicuous as possible. The entire finished surface shall be smooth, straight and free from buckles, waves or projecting edges.

CLEANING AND BUFFING:

25-13 Adhesive shall be removed from face of tile as the work progresses. Completed floors shall have all spots and stains removed and be buffed to a clean dull gloss surface.

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LINOLEUM 26-1

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SUGGESTED SPECIFICATION - DIVISION - 26

DIVISION - 26
LINOLEUM FLOOR COVERING:

NOTE TO ARCHITECT:
This specification requires that the location of linoleum floors for all areas be clearly designated on the "Schedule of Interior Finishes".

Linoleum should not be specified for concrete floor slabs resting directly on earth.

SCOPE:

26-1 For location and extent of work, see drawings and "Schedule of Interior Finishes." Areas exposed to view under equipment shall be covered.

MATERIALS:

26-2 LINOLEUM shall be a standard product having an unpainted burlap backing. Surfaces shall be smooth and free from defects. Linoleum shall be 1/8 inch thick battleship, (Jaspe) and supplied in any of the standard shades of tan, brown, terra-cotta, gray or green as selected by the Local Authority. Linoleum shall be delivered to the work in full rolls or cut to size; in either case each piece shall be labeled with maker's name, gage and type.

26-3 LINING FELT over wood sub-floors shall be of such type, weight and brand as recommended by the manufacturer of the linoleum used.

26-4 EDGING STRIPS shall be white metal alloy or brass, of the lip type with a No. 20 gage flange, extending under the edge of linoleum and properly secured to sub-floor. Edging strips shall be installed at all locations where edge of linoleum would otherwise be exposed or unprotected.

26-5 ADHESIVE, cleaning and polishing materials shall be of kinds recommended by the manufacturer of the linoleum and shall be used as directed. The materials shall be delivered in their original sealed containers and used without the addition of any unauthorized material.

LAYING:

26-6 Cutting, fitting and laying of linoleum shall be done in the neatest and most workmanlike manner and only by firms and workmen thoroughly familiar and experienced in this class of work.

26-7 A temperature of not less than 70 degrees F. shall be maintained in rooms and spaces for not less than 48 hours before the linoleum is laid, and continued for 48 hours thereafter. Linoleum shall be stored at such temperature for 48 hours prior to laying.

26-8 Surfaces to receive linoleum shall be thoroughly cleaned to remove all grease dirt or other substances which would prevent complete adherence of the adhesive. Concrete sub-floors shall be smooth and moisture free. Wood sub-floors shall be dressed flush and sanded smooth.

26-9 Ends and edges of linoleum shall be cut to fit accurately at joinings with other material. Joints and seams around base, pipes, fixtures and other vertical surfaces shall be completely filled with cement. The entire surface of floor shall be evenly coated with adhesive, using enough to insure adhesion over the entire surface of

linoleum. Linoleum shall be laid so as to avoid air pockets or blisters and be thoroughly rolled to insure complete contact and adherence. At joints and seams the linoleum shall be laid by lapping not less than 1/2 inch; both thickness of material shall be cut through at line of joint and seams. The entire finished surface shall be smooth and free from waves, buckles or projecting edges.

CLEANING AND POLISHING:

26-10 Completed floors shall have all spots and stains removed and be thoroughly waxed and buffed to a clean polished surface.

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SUGGESTED SPECIFICATIONS-DIVISION-27

DIVISION-27
RUBBER TILE:

NOTE TO ARCHITECT:
This specification requires that the location of rubber tile floor and base for all areas be clearly designated on the "Schedule of Interior Finishes".

Rubber tile should not be specified for concrete floor slabs resting directly on earth.

SCOPE:

27-1 For location and extent of work, see drawings and "Schedule of Interior Finishes".

MATERIALS:

27-2 RUBBER TILE shall be made either from the relatively hard or soft flexible type material and may or may not contain cotton or other fibers. Tile shall be of permanent color with color extending entirely through the tile. Tile shall have a smooth surface which will retain its polish under hard use without waxing and which can be readily cleaned of ordinary stains without injury to the tiles. Tile shall be separate units 6 x 6 inches (9 x 9 inches), 1/8 inch thick of uniform size and thickness and furnished in colors and types as selected by the Local Authority.

27-3 RUBBER TILE-BASE shall be 4 inches (6 inches) high, 3/16 inch (1/8 inch) thick with coved bottom and rounded top and in approximately 2 foot lengths. Interior and exterior corners shall be in one piece to fit square corners. Cove at bottom shall have a 1/8 inch lip at floor to finish flush with floor tile.

27-4 ADHESIVE for laying rubber tile shall be waterproof and of a type and brand recommended by the manufacturer of the tiles. Adhesive shall be delivered in sealed packages with manufacturer's labels attached, and shall be used without the addition of any unauthorized material.

27-5 LINING FELT over wood subfloors shall be of such type, weight and brand as recommended by the manufacturer of the tile used.

27-6 EDGING STRIPS shall be of brass or white metal alloy, of the lip type, with a No. 20 gage flange extending under edge of tile and properly secured to the subfloor. Edging strips shall be installed at all locations where edge of tile would otherwise be exposed or unprotected.

LAYING:

27-7 Cutting, fitting and laying of rubber tile shall be done in the neatest and most workmanlike manner and only by firms and workmen thoroughly familiar and experienced in this class of work.

27-8 Surfaces to receive rubber tile shall be thoroughly cleaned to remove all grease, dirt or other substances which would prevent complete adherence of the adhesive. Concrete subfloors shall be smooth and moisture free. Wood subfloors shall be dressed flush and sanded smooth.

27-9 Tile shall be laid in patterns indicated on drawings (as directed by the Local Authority). Field tile shall be laid symmetrically about the center lines of the rooms, with borders equalized as much as possible on all sides. Field tile shall not be cut.

27-10 The adhesive shall be evenly spread over the subfloor, using enough to insure adhesion over the entire surface of the tile. Tile shall be rubbed into the cement with a sliding, twisting motion to insure complete contact and adhesion and to force the cement up into the joints. There

shall be no open joints left between tiles. Tile shall be thoroughly rolled and all joints between base, pipes, fixtures, and other vertical surfaces shall be sealed with cement. The entire finished surface shall be smooth, straight and free from waves, buckles or projecting edges.

27-11 All adhesive shall be removed from face of tile as the work progresses, and completed floors shall have all spots and stains removed and be thoroughly cleaned.

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SUGGESTED SPECIFICATION - DIVISION-28

DIVISION-28
GLAZING:

SCOPE:

28-1 Glaze windows, doors and other openings having glass; see "Window and Door Schedules".

28-2 Furnish and install metal work, awning rollers and glaze store display windows.

MATERIALS:

28-3 Glass shall conform to the following:

(a) Window glass shall be clear.

(b) Obscure glass shall be ribbed or roughened by decorative design on one surface, other surface smooth.

(c) Wire glass shall be standard with one smooth surface; stock thickness.

(d) Plate glass shall have both surfaces polished, glazing quality, 1/4 inch thick.

28-4 Except for "SS-B" glass, each piece shall bear manufacturer's label showing grade, thickness and quality.

28-5 Putty shall be composed of the best quality whiting, or white lead-whiting, and pure linseed oil only, with dryers, mixed in proper proportions; it shall be waterproof and shall not be affected by high or low temperatures; it shall become hard and firm without shrinking or becoming brittle; either whiting or white lead-whiting putty may be used when putty is in contact with wood, and whiting putty only shall be used when putty is in contact with steel. Putty shall be delivered in manufacturer's original containers and shall be used without adulteration.

SCHEDULE OF GLAZING

NOTE TO ARCHITECT:
List kind and location of glass required throughout entire project.

28-6 Except as otherwise specified, all windows shall be glazed with "SS-B" window glass.

(a) Windows in toilets and bathrooms shall be glazed with obscure glass.

(b) Store display windows shall be glazed with plate glass set in metal work.

28-7 Except as otherwise specified, all doors shall be glazed with "DS-B" window glass.

(a) Doors so noted glazed with wire glass.

(b) Entrance doors to stores glazed with plate glass.

METAL WORK FOR STORE FRONT CONSTRUCTION:

28-8 Metal not otherwise specified, shall be standard composition alumilited aluminum alloy, (copper), (bronze), (stainless steel), manufactured for store front construction, oxidized, (satin), (polished) finish. Attachment and fastening members shall be of nonferrous metals.

28-9 Sections shall consist of sill covering, jamb, glass setting, dividing and corner bars, awning bars and other parts required to complete the installation.

(a) Manufacturer's stock sections approximating those indicated will be accepted if prior approval is obtained from the Local Authority.

(b) Glass setting members shall be of the ventilating type and shall allow free drainage; they shall be held in position by means of set screws concealed from the outside and operating on a draw

acting lever which will hold the outer member firmly against the glass; the design of setting members shall be such that the glass will yield to vibration and to movement caused by atmospheric changes.

(c) Dividing and corner bars shall be of the heavy type, properly reinforced to withstand wind pressure and designed to receive and hold the glass by means of cover plates secured to the bars in an approved manner.

(d) The work shall be substantially installed in accordance with approved shop drawings.

AWNING ROLLERS AND OPERATING MECHANISM:

28-10 Store fronts, where indicated, shall be equipped with manual operating awning mechanism complete including roller, but not awning fabric.

(a) Rollers shall be not less than 3/8 inches outside diameter, zinc-coated tubing, spirally wrapped with canvas and provided with lacing approximately 8 inches on centers for the attachment of awning cloth. Rollers over 20 feet in length shall be equipped with spread roller center support.

(b) Gears shall be of steel, machine cut, with zinc-coated iron housing, shaft, hook and gudgeons. Gear cases, center supports and brackets, including other wall fixtures shall be attached to zinc-coated iron plates with cap screws. The plates shall be secured to wall with expansion bolts let into lead sleeves or other approved fastening.

(c) The mechanism shall consist of lateral joint arms with a housed steel spring attachment at the joint, operating like a human

arm, and equipped with a bronze chain to control the lower half of the arm. The lateral arm shall be so designed that the length of the arm will provide approximately 6 feet projection of awning, with a minimum of 7 feet 6 inches clearance above the sidewalk. One lateral arm shall be provided for each 10 feet of awning length, with not less than 2 arms for any one awning. Arms shall be operated by a collapsible steel winding brace.

(d) The front rod shall be 1 inch or larger, zinc-coated tube, with ball or acorn style ends.

(e) Checks shall be supplied to control the distance the awning can be unrolled and rerolled correctly. Checks shall have a malleable iron body enclosing a solid bronze stud and nut.

GLAZING:

28-11 Glass in wood sash shall not be set until rebates have been primed. Glass shall be bedded in putty, sprigged and puttied to true even levels with clean cut miters.

28-12 Glass in wood exterior doors shall be bedded in putty and secured with wood beads (primed) and fastened with brass brads.

28-13 Glass in steel sash shall be bedded in putty, secured with stock wire glazing clips and puttied to true even levels with clean cut miters.

28-14 Figured glass shall be set with smooth face out; all glass shall be free from rattle.

GLAZING STORE DISPLAY WINDOWS:

28-15 Glass shall be set on felt or leather cushions and in a manner to prevent damage to glass due to vibration or temperature changes; the method of securing the glass shall be in accordance with the directions of the manufacturer of the store front setting members used.

CLEANING AND PROTECTION:

28-16 All glass shall be washed clean and be left whole and sound.

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SUGGESTED SPECIFICATION DIVISION - 29

DIVISION - 29
PAINTING

SCOPE:

29-1 Provide all paint materials and do all painting required to fully complete the work, except as specifically excepted.

29-2 Painting will not be required for the following items:

NOTE TO ARCHITECT:
The scope paragraph above is all-inclusive therefore items not requiring paint finish should be so noted in detail.

GENERAL:

29-3 Before delivery of paint, the contractor shall submit to the Local Authority for approval samples and Certificates governing each kind of paint he proposes to use as required under Section, Samples, Certificates and Tests.

29-4 Paint materials shall be delivered to the work in the manufacturer's sealed and labeled containers together with manufacturer's formula for each kind of paint used.

29-5 Paint shall be well mixed and shall not settle badly in containers. When broken up with a paddle paints shall be smooth, uniform, and of good brushing consistency. Paint shall not run nor sag, and, unless otherwise specified, shall dry to touch within eighteen hours.

29-6 Primers, undercoaters and oil finish paints may be either paste-in-oil or ready mixed.

29-7 Paint when prepared from a paste at the project site, shall be mixed not less than twenty-four hours before using; the containers shall be covered during this period and the paint strained before using. Some of the turpentine and all of driers shall be added just before application.

29-8 In both paste-in-oil and ready-mixed paints, proper color pigments shall be added to produce the tints to match the colors for finish paint as selected by the Local Authority.

29-9 Where the color of paints selected require modifications of the composition given such changes shall be made as approved by the Local Authority.

29-10 Where alternate materials and mixtures thereof are specified the choice shall be optional with the Contractor.

29-11 Wherever, in the following paragraphs the term "as satisfactory" is used, the Local Authority shall determine the relative merits of the products offered for use.

MATERIALS:

29-12 BASIC MATERIALS entering into the compounding and manufacture of paints, shall be the best quality, products of recognized manufacturers, subject to the approval of the Local Authority and shall conform to applicable requirements of A.S.T.M. Standards or Federal Specifications.

29-13 BLACK PAINT: Shall be paste-in-oil or ready mixed in qualities at least equal to requirements of Federal Specification TT-P-61.

29-14 COLOR PIGMENTS: Shall be pure, non-fading, substances, finely ground in linseed oil. Colors that are to be used in paint for plaster, concrete and similar surfaces shall be lime-proof-dry colors.

29-15 STAINS: Shall be clear toned, penetrating non-fading materials that will not cloud or obscure the grain of the wood.

29-16 WAX: Shall be mixed in the proportions of 2 parts of Carnauba wax, 2 parts ceresin and 3 parts turpentine by weight. The wax shall be thinned to proper working consistency by mixing with mineral spirits or turpentine.

PRIMERS:

29-17 Primers shall be of such nature that they will not have a damaging effect upon superimposed coats and ready mixed primers shall be as recommended or approved by the manufacturer of the paints used.

29-18 PRIMERS for exterior and Interior Metals:

(a) RED LEAD PRIMER shall be mixed as follows:

Red-lead ..... 100 pounds
Linseed Oil ..... 1-7/8 gallons
Turpentine ..... 1-1/2 pints
Liquid Drier ..... 1-1/2 pints

(b) BLUE LEAD PRIMER shall be made by reducing 100 pounds of sublimed blue-lead-in-oil, with 2-2/3 gallons of raw linseed oil, 1-1/2 pints of turpentine and drier as required, or may be a ready-mixed sublimed-blue-lead primer.

(c) RUST INHIBITIVE PAINT shall be made with a pigment composed primarily of sublimed-blue-lead containing not more than 15 percent of zinc-oxide and a small proportion of iron oxide and siliceous ingredients.

The vehicle shall be composed of a pure linseed oil liquid containing not over 20% of thinner and drier. The paint shall give a smooth, hard-drying egg-shell-gloss finish of medium gray color.

29-19 PRIMERS FOR EXTERIOR WOODWORK:

(a) LEAD-IN-OIL PRIMER: Shall be made by reducing 100 pounds of white lead-in-oil with 4 gallons of raw linseed oil, 2 gallons of thinner (turpentine, volatile mineral spirits, or a mixture thereof), and 1 pint of drier. The primer shall contain at least 60 percent of pigment.

(b) READY-MIXED PRIMER: Ready-mixed finish paints may be used as primers. Paints shall be reduced only in accordance with the printed directions on the labels.

(c) ALUMINUM PRIMER: Shall consist of 1-1/2 pounds of aluminum powder or 2 pounds of aluminum paste dispersed in 1 gallon of mixing varnish for aluminum paint. The varnish shall be as satisfactory in all physical properties as required by the Federal Specification TT-V-81.

NOTE TO ARCHITECT:
Experience has shown that in many cases especially when finish is 2 coat work of light tints, aluminum primer has not proven satisfactory; extreme caution shall be exercised in permitting the use of aluminum primer.

29-20 PRIMERS FOR INTERIOR WOODWORK:

(a) LEAD-IN-OIL PRIMER shall be mixed as follows:

White-lead-in-oil	...100 pounds
Linseed Oil	..... 3 gallons
Turpentine	..1-3/4 to 2 gallons
Liquid Drier	..... 1 pint

For priming of Southern Yellow Pine, Cypress and Hemlock the quantity of oil may be reduced and the amount of turpentine increased.

(b) READY-MIXED PRIMERS: A paint as satisfactory in all physical requirements as those given in Federal Specification TT-P-51a shall be used as a primer. A maximum of one pint of turpentine per gallon of paint may be used to reduce the mixture if the paint is too heavy for smooth application.

29-21 PRIMER FOR INTERIOR PLASTER AND CONCRETE SURFACES:

(a) OIL PRIMER: Shall be as satisfactory in all physical requirements as that described by Federal Specification TT-P-56, except that it shall dry hard within 18 hours to a gloss free finish.

(b) HYDRAULIC PRIMER: Shall be a size primer composed of not less than 50 percent (by weight) of Portland Cement, mixed with ingredients which will produce a lime-locking gel when water is added. It shall have the qualities of stopping up pores, locking in any lime, and solidifying

to a hard, horny, substance that is unaffected by dampness and moisture; it shall adhere to green plaster or damp surfaces without being damaged; it shall be of such nature that cement, casein or similar paints can be superimposed upon it without being damaged.

NOTE: Hydraulic primer shall not be used where finished paints have oil or varnish vehicles.

PAINTS:

29-22 PAINTS FOR EXTERIOR WOODWORK AND METAL:

(a) LEAD-Zinc-OIL PAINTS shall be as follows:

Body Coat:

White lead paste	75 to 80 pounds
Zinc-oxide paste	20 to 25 pounds
Linseed Oil	1½ gallons
Turpentine	2 gallons
Drier	1 pint

Finish Coat:

Pigment as above	100 pounds
Linseed Oil	3½ gallons
Turpentine	1 quart
Drier	1 pint

NOTE: The zinc and lead shall be factory ground and mixed.

(b) READY-MIXED PAINT: shall be as satisfactory in all physical requirements, as that described in Federal Specifications TT-P-101a or TT-P-36.

29-23 PAINTS FOR INTERIOR WOODWORK AND METAL:

(a) LEAD-IN-OIL PAINT (Mixed-at-Project-Site): shall be proportioned approximately in accordance with the following:

Body Coat:

Pigment	100 pounds
Linseed Oil	1½ gallons
Turpentine	2 gallons
Drier	1 pint
Tinting Color	as required

Finish Coat (Flat):

Pigment	100 pounds
Varnish	1 pint
Turpentine	2 gallons
Drier	½ pint
Tinting Color	as required

Finish Coat (Gloss):

Pigment	100 pounds
Varnish	1¼ gallons
Turpentine	1½ gallons
Drier	½ pint
Tinting Color	as required

(b) OIL BASE PAINT (ready-mixed) shall be composed of the following:

Undercoater: Equal parts by volume of primer and sealer Federal Specification TT-P-56, and oil-base-paint Federal Specification TT-P-51a.

Finish coat (oil base paint): all requirements to be at least equal to those given in Federal Specification TT-P-51a. Paint shall be used without the addition of any unauthorized materials, shall be in approved tints, and shall finish flat.

NOTE TO ARCHITECT:
The use of enamel paint should be kept to a minimum.

(c) ENAMEL PAINT: shall be a factory prepared material as satisfactory, in requirements as that described in Federal Specification TT-E-506. Where two coats are required, the undercoat shall be an enamel undercoater of type recommended by the manufacturer of the finish coat. White enamel shall be pure white. Light colored enamel shall be made with pale varnishes.

(d) RADIATOR ENAMEL shall be zinc-oxide ground in Demar Varnish, thinned with pale baking varnish and turpentine, and shall be tinted as required. The enamel shall be free from mineral spirits, shall cover well in two coats and dry with a good gloss. The enamel shall contain not less than 38 percent pigment.

29-24 PAINT FOR INTERIOR PLASTER AND CONCRETE SURFACES:

(a) CASEIN PAINT shall comply with Federal Specification TT-P-23, Grade B, and shall be either Type I or Type II for concrete surfaces; type II only for smooth, finished plastered surfaces. Color pigments shall be added at the factory to give the color tones desired in the finished work. No color pigment or other material shall be added at the project site.

(b) INTERIOR OIL PAINT (Egg-Shell Flat or Gloss Paint) shall be a factory prepared material as satisfactory in all physical requirements as that described in Federal Specification TT-P-51a.

29-25 PAINT FOR EXTERIOR AND INTERIOR CONCRETE AND MASONRY SURFACES.

(a) CEMENT-WATER PAINT shall be a hydraulic base paint delivered in powder form ready for use with the addition of water only. The powder shall consist of not less than 85% Portland cement, hydrated lime, hygroscopic salt, a small amount of water-repellent metallic soap and small amounts of other agents or chemicals to impart workability. A small percentage of titanium oxide may be included. Limeproof pigment colors shall be added at the factory to provide the desired color tone, but the amount of color used shall not be in excess of 4 per cent by weight. The paint shall be suitable for brush or spray application to clean unpainted porous surfaces (such as concrete, masonry, stucco or sand-finished plaster) and when applied shall flow evenly and cover solidly.

Surfaces to be painted shall be damp when paint is applied. When hardened and cured, the paint shall form a dampproof film that will not powder, chip or rub off and may be washed repeatedly without damage to the surface film. The powder shall be mixed with water in strict accordance with the printed directions of the manufacturer. No more shall be mixed at one time than can be used within 4 hours after mixing. Any mixed paint that is left over at the end of a day shall be wasted.

COLORS AND SAMPLE DWELLING UNIT:

29-26 Colors to be used will be determined by the Local Authority. Before sample colors have been selected the Contractor shall prepare samples (approximately 8 inches by 10 inches) for approval. After approval six record samples of each kind and color, properly identified, shall be furnished to the Local Authority.

29-27 The right is reserved to select, allocate and vary the color of paint on different surfaces throughout the project, and to vary the color schemes of different dwelling units, subject to the following limitations:

(a) For exterior work a maximum of 4 different colors will be required with variations for

(1) Trim, including windows,
(2) Doors, and
(3) Miscellaneous wood and metal work.

(b) For interior work a maximum of 12 different colors will be required with a variation of not more than 4 colors in any one room nor more than 4 colors for any one purpose.

29-28 Complete instructions for use will be given by the Local Authority at the time of approval of color samples.

29-29 Before proceeding with the work, the Contractor shall paint and finish one entire dwelling unit as a sample for the approval of the Local Authority, using only approved colors and materials. This approved dwelling unit, except for colors, shall serve as a standard for all other painted work throughout the entire project.

SCHEDULE OF PAINTING:

29-30 EXTERIOR METAL: Except as hereinafter specified, all exterior metal work shall be given 1 coat of "Primer for Metal" and 2 coats of "Paint for Exterior Metal."

(a) Items of metal work surfaced finished at the place of fabrication shall not be painted at the work.

(b) Non-ferrous metal, and metal that is zinc-coated unless otherwise definitely specified, shall not be painted.

NOTE TO ARCHITECT:
Specify here items of zinc-coated metal and copper to be painted.

(c) Where metal work is given a prime (or shop) coat of paint at its place of fabrication, the prime coat specified herein shall be omitted.

29-31 EXTERIOR WOODWORK (PAINTED): Except as herein specified, all exterior woodwork shall be given 1 coat of "Primer for Exterior Woodwork" and 2 coats of "Paint for Exterior Woodwork."

(a) Exterior woodwork specified to be stained and varnished shall not be primed or painted.

(b) Grounds, blocking, framing, rough boarding and sheathing will not be painted, unless specifically required.

(c) Shop coating, if specified and applied under other divisions of the specification, shall be considered as the priming coat required herein.

(d) The edges of double hung sash and runs for same (except where exposed on the outside) shall be given one coat of boiled linseed oil.

(e) Ends of framing rafters, exposed to view in the finished work shall be painted as specified for exterior woodwork.

(f) Underside of sheathing, exposed to view in the finished work shall be painted as specified for exterior woodwork.

29-32 EXTERIOR WOODWORK (STAINED): Exterior woodwork required to be stained shall be given 2 coats of creosote base oil stain. (specify surfaces to be stained)

29-33 INTERIOR METAL: Except as hereinafter specified, all interior metal work shall be given 1 coat of "Primer for Metal" and 2 coats of "Paint for Interior Metal."

(a) Items of metal work finish painted at place of fabrication shall not be painted in the field after erection.

(b) Non-ferrous metal, and metal that is zinc-coated unless otherwise definitely specified, shall not be painted. (specify items to be painted).

(1) Zinc-coated, pipes, and tanks in kitchens, shall be painted, as required for interior metal work.

(c) Prime coated hardware shall be painted to match the work to which it is attached.

(d) Prime coated surfaces of plumbing fixtures, where exposed to view in the finished work, shall be painted with the finish coats of paint required for the wall surfaces.

29-34 INTERIOR WOODWORK (Painted): Except as hereinafter specified, all interior finish woodwork shall be given 1 coat of "Primer for Interior Woodwork" and (1 coat) (2 coats) of "Paint for Interior Woodwork."

(a) Grounds, blocking framing and rough boarding, shall not be painted.

(b) Shop coating specified in other divisions of the specification, shall be considered as a priming coat required herein.

(c) Millwork and finish woodwork specified to be surface finished at place of manufacture shall not be painted, in the field after erection.

(d) On woodwork except doors, in basement spaces other than in dwelling units, only one coat of paint shall be applied in addition to priming. On doors in basements apply 2 coats of paint.

NOTE TO ARCHITECT:
Specify here in detail the number of coats and the kind of paints required on trim, walls and ceilings of play rooms, kindergartens, recreation rooms, craft rooms, assembly halls and all other public spaces requiring special or decorative finish.

(e) Shelving in closets shall be given one coat of boiled linseed oil. Surplus oil shall be wiped off with burlap or excelsior.

29-35 INTERIOR WOODWORK (Stained and waxed): Stained woodwork shall be given one coat of oil stain of color to match sample selected; one coat of wax and then rubbed to a dull gloss finish.

NOTE TO ARCHITECT:
Specify in detail requirements under this heading.

29-36 INTERIOR WALLS AND CEILINGS: Except as hereinafter specified all plastered walls and ceilings shall be given 1 coat of "Primer for Plaster and Concrete Surfaces" and 1 coat of "Casein Paint."

(a) Walls and ceilings of toilets and bathrooms shall be given 1 coat of oil Primer for interior plaster and concrete surfaces, 1 coat of egg-shell flat paint and 1 coat of oil gloss paint.

(b) In spaces where walls are painted with casein paint, concrete ceilings shall be given 2 coats of casein paint.

NOTE TO ARCHITECT:
In basements spaces other than in dwelling units specify clearly what rooms or wall and ceiling surfaces are to be painted. On interior masonry and concrete surfaces specify either 2 coats of cement-water paint or casein paint.

29-37 RADIATORS AND EXPOSED PIPE TO RADIATORS: Under the mechanical divisions of the specification, it is required that radiators and exposed piping in all rooms and spaces having painted walls and ceilings shall be primed. Under this heading radiators and piping shall be given one coat of "Radiator Enamel".

NOTE: The first coat on radiators may be applied either before or after setting in place, but the second coat shall be applied after the radiator is set in place; in either case, the walls and other work back of radiators and pipes shall be completely finished as required.

29-38 WOOD HANDRAILS: Handrails shall be stained and finished as specified under the heading "Interior Woodwork-(Stained and Waxed)".

PAINTING COPPER:

29-39 Copper, where required to be painted (see schedule of painting) shall be scrubbed to remove all grease, oil or dirt; given a priming coat of aluminum varnish paint and then painted 2 coats of lead and oil or lead-zinc and oil paint as specified for "Exterior Metal". Only those surfaces of copper work that will be exposed to view after installation shall be painted.

PAINTING ZINC-COATED METAL:

29-40 Zinc-coated metal where required to be painted (see schedule of painting) shall be cleaned of all grease by washing with turpentine or mineral spirits. Surfaces shall then be given one coat of a solution containing 79 to 81% zinc dust and 21 to 19% zinc oxide, (lead free) in a liquid consisting of 89 to 91% raw linseed oil, 5 to 4% thinner and 6 to 5% drier and 2 coats of paint as specified for "Exterior Metal".

FINISHING WOOD FLOORS AND STAIR TREADS:

29-41 Material for finishing wood floors and stair treads shall be a standard brand commerical product especially prepared for finishing hard wood floors. It shall have an established record of satisfactory performance and shall produce the following results:

The material shall penetrate the wood, filling and binding the surface fibers; it shall dry hard and shall take dull gloss finish under friction. It may be colorless, in which case, staining of the floor may be required before finish is applied, or may be in an approved color.

The finishing material shall be applied in 2 coats and in accordance with the directions of the manufacturer of the product used. After the material has thoroughly dried and become sufficiently hard, it shall be waxed and buffed to a uniform polish.

PAINTING EXTERIOR MASONRY SURFACES:

29-42 Exterior masonry surfaces to be painted shall be given 2 coats of "Cement Water Paint".

The coating for exterior masonry units shall be applied with stiff long fiber brushes and thoroughly scrubbed into all joints and surfaces. Before application of coating the surfaces shall be well wetted. For cinder concrete units great care should be exercised to see that all surfaces are completely filled, leaving no voids. The first coat shall be cured by spraying the surface as soon as it has set and keeping it damp for 3 days. While surfaces are still damp, apply second coat and keep damp for at least 7 days. Cinder concrete units should weather not less than 60 days before the coating is applied.

WORKMANSHIP:

29-43 Priming, painting and finishing shall be done in a neat and workmanlike manner by journeyman experienced in the trade.

29-44 Each coat of paint shall be well brushed on, evenly worked out, and allowed to dry before a subsequent coat is applied. Each coat of paint shall be a different tint from that of the preceding coat. Finish coats shall be the exact tints, shades and textures approved.

29-45 The finished work shall be free from runs, sags, defective brushing and clogging of lines and angles. Edges of paint adjoining other materials or other colors shall be full and clean without overlapping.

29-46 The finished work shall be uniform throughout and in strict accordance with the approved color samples. Should the painted finish be found defective in any respect, the Contractor shall, after proper preparatory work, apply such additional coats as may be necessary to give surfaces with a satisfactory finish in accordance with the approved color samples.

PRIMING:

NOTE TO ARCHITECT:
Coordinate this heading with all other divisions of the specification relative to priming.

29-47 Woodwork to be primed shall be clean dry and smooth and adequately protected from dampness.

29-48 Damaged or discolored spots on woodwork, and rusted and abraided spots on metal work, shall be sanded and then touched up to provide a uniform, clean and flawless surface suitable for the application of finish coats of paint.

29-49 Before any priming is done all pitch pockets, streaks and all knots shall be given a coat of aluminum primer or a heavy coat of shellac.

29-50 All nail holes, etc., shall be carefully puttied after the first coat of paint or stain has been applied.

29-51 Built-up millwork, such as window frames, door frames, doors and similar items may be primed either at the mill or at the building site see "Carpentry". Other items of finished work, shall be primed at the building site. For priming of sash see division "Carpentry".

29-52 Exterior woodwork shall be primed on all faces and edges before being set in place.

29-53 Interior trim shall be primed after it has been permanently secured in place, except that wood panels shall be back primed before setting; if the contractor elects to prime the trim before erecting, it shall be primed on all faces and edges.

APPLICATION:

29-54 All materials shall be mixed and used in strict accordance with specification requirements except in cases where better results may be obtained by other methods. In such case alternate method must receive the approval of the Local Authority before using.

29-55 All rooms shall be clean and free from dust and rubbish before applying any paint.

29-56 No exterior painting shall be done in damp rainy weather or when the temperature is less than 50 degrees F. Varnish shall not be applied in a temperature below 70° F. nor in any place not properly closed and protected from drafts and dust.

29-57 All oil painting shall be applied with brushes. The use of pneumatic tools or sprays will not be permitted in the application of lead and oil, or oil-base paints.

NOTE TO ARCHITECT:
If trade practice in locality of the project permits the use of sprays for application of paint, the above paragraph should be revised.

29-58 All natural woodwork finish shall be applied in such a manner as to produce good, clear, transparent surfaces.

29-59 In painting glazed openings, the priming coat shall be applied before glazing, and the finish coats applied after glazing. Finish coats of paint shall be applied on putty when painting adjacent wood or metal provided that no putty shall be painted until sufficient time after glazing has elapsed to permit surface oxidation producing a firm surface to render the putty in proper condition for painting.

29-60 In all rooms and spaces where painting is being done the contractor shall furnish and lay drop clothes to protect floors and other work from damage during the execution of the painting.

29-61 All material shall be stored where directed. Oily rags, waste and cans when empty shall be removed from the site every night, and under no circumstances shall they be allowed to accumulate.

29-62 At the completion of the work, the Contractor shall clean off all paint spots, oil and stains from floors, woodwork, glass, hardware and similar items.

TOUCHING UP:

29-63 At the completion of other branches of the work all painted and finished work shall be touched up and restored where damaged or defaced and the entire work left free from blemishes.

LETTERING - NUMBERING:

29-64 Provide three two-inch numberals on each entrance door of

29-65 The numbers shall be in accordance with the assignment which will be as designated by the Local Authority.

29-66 Doors to

shall be lettered with the names of the rooms, allowing twelve letters per door. (two-inch letters)

(a) All additions to or deductions from the specified basis in the number of numerals and letters actually required will be adjusted on the basis of unit price per number and letter as agreed.

(b). Lettering and numbering work shall be executed by experienced mechanics, in style and design as approved by the Local Authority, using coach enamel containing spar varnish. Colors will be selected by the Local Authority.

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HARDWARE -30-1

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SUGGESTED SPECIFICATION - DIVISION - 30

DIVISION - 30
BUILDERS' HARDWARE

SCOPE:

30-1 Provide Builders' Hardware for proper operation and fastening of all movable parts of all buildings, except as otherwise specified.

(a) Hardware for metal windows, metal toilet partitions, kitchen cabinets and work tables, and hardware and fittings for mechanical and electrical equipment is specified under those divisions. See also other divisions of the specifications.

30-2 Should hardware as specified be found unsuitable for locations where it is to be applied, provide in lieu thereof suitable types of similar operation and equivalent quality.

30-3 Should items of hardware not definitely specified be needed for completion of the work, provide such items of type and quality suitable to the service required and comparable to adjacent hardware, as selected by the architect.

MATERIALS:

30-4 Builder's Hardware shall conform to the requirements of the following Federal Specifications as amended to date. Where specific requirements are modified, said modifications shall be carefully followed and strictly adhered to.

Padlocks----------No. FF-P-101a
Locks and Lock Trim-------No. FF-H-106
Shelf and Miscellaneous---No. FF-H-111
Hinges----------No. FF-H-116a
Door Closers----------No. FF-H-121a

NOTE TO ARCHITECT:
Federal Specifications provide valuable basic information as to material, mechanism, operation and finish of standard Builders' Hardware. All hardware manufacturers are familiar with them. It should be borne in mind however that many items illustrated are more expensive than low-cost housing requires.

Reference to manufacturers' catalog numbers should be avoided wherever possible.

Federal Specifications for Builders' Hardware are for sale by the Superintendent of Documents, Washington, D.C.

FINISH:

30-5 With exceptions noted hereafter, finish for all hardware shall be:

USP (Painted)
US 3 (Bright Brass)
US 9 (Bright Bronze)
US 10 (Dull Bronze)

Door closers shall be primed for painting - (Sprayed aluminum-bronze)-(Sprayed gold bronze).

Toilets, bathrooms and shower rooms, except hinges for entrance doors shall have finish US 14 (Nickel Plated). Coat and hat hooks and door stops shall be furnished in prime coat of paint.

TEMPLATES:

30-6 Hardware for metal doors shall be sent to the factory and applied there, or templates shall be furnished to the manufacturer furnishing metal doors and bucks so that the work may be fitted to receive the hardware.

KEYS AND KEYING:

30-7 Each cylinder lock shall be differently keyed, except where specified to be keyed alike. All locks, unless otherwise specified, shall be provided with three keys each. Cylinder locks in areas as designated shall be master keyed. Master keyed locks shall be grand master keyed. Furnish six master keys for each area, and three grand master keys. Requirements for master keying and pass keys shall be obtained from the Local Authority before fabrication of hardware.

NOTE TO ARCHITECT:
Designate exactly the systems of master keying desired. The system of master keying and pass keying should be carefully studied and approved by the management. Only the resident manager and his assistant should be provided with pass keys to apartments, flats and house units; janitor's pass keys should operate only such locks as are specifically designated by the management. If the project is constructed under two or more general contracts, careful coordination will be necessary to secure the above results.

30-8 Bit key locks inside of dwelling units shall be provided with two keys each. Padlocks shall be provided with two keys each, and shall be master keyed.

30-9 Rooms and spaces under management control shall be keyed alike as required; provide three keys for each keyed alike system.

30-10 Keys shall be die stamped with the number of the cylinder or of the bit key lock.

30-11 Locks for doors to mercantile stores shall not be master keyed.

30-12 Master and grand master keys shall be shipped directly to the local Authority who will receipt and become responsible for them.

KEY CONTROL CABINET:

30-13 Furnish a visible key control cabinet for all keys of cylinder locks, all padlocks and all locks under management control. Cabinet shall be of an approved metal wall type, having a door with a tubular lock. Finish shall be baked-on enamel olive green color. Cabinet shall be of ample size and contain the required number of combination hook and label pockets for all keys plus a minimum of 10 additional hooks and label pockets. The cabinet shall have an approved label system consecutively numbered. For each key hook furnish a vulcanized fiber tag of a permanent locking type; tags shall be approximately 1½ inches diameter; they shall bear the legend "FILE KEY - MUST NOT BE LOANED" and shall be die stamped to correspond with the consecutive numerals on the labels in the hook sockets. The cabinet shall contain one brass receipt holder for each hook and a sufficient number of receipt forms for record for all keys; the cabinet shall have a cross index for recording keys alphabetically, numerically and by serial number.

PACKING AND MARKING:

30-14 All items of hardware and all locks shall be packed in containers, complete with necessary screws. Boxes in which hardware is shipped shall be plainly marked, listing all items enclosed therein. All hardware requiring screws shall have the proper kind and number of screws furnished with each item.

MANUFACTURERS' HARDWARE SCHEDULE:

30-15 Before fabrication of hardware, the contractor shall submit for approval by the Local Authority a full and complete Schedule of Hardware indicating the type, number, location and finish of each item required; approval of this schedule does not relieve the contractor of responsibility for furnishing all Builders' Hardware items required.

HINGES:

30-16 Except as modified herein, sizes of all hinges shall be in accordance with "Table I-Rules for Sizes of Non-template Butt Hinges" - page 36 of Federal Specification FF-H-116a. Hinges of any one type shall be the product of one manufacturer.

(a) Interior and exterior doors over 32 and up to 37 inches in width and 1 3/4 inches thick, shall be provided with 4½ by 4½ inch hinges in lieu of the 5 by 5 inch listed therein.

(b) One pair of hinges per door shall be provided for all doors, except as follows: (Outside entrance doors) (hollow metal doors) (Kalamein doors) and all doors over 3 feet 0 inches wide, 1½ pair of hinges per door.

(c) Unless otherwise specified, all hinges shall be Type 2014½P.

(d) Template butt hinges shall be of the sizes required by "Table I" above referred to for non-template butt hinges. Metal doors and metal frames shall have template butt hinges.

(e) Fire resistive entrance doors from public stair halls to dwelling units in apartment buildings shall be provided with single acting spring hinges, Type 2331-A, of size required 1½ pair of hinges per door.

(f) Screen doors shall be provided with hinges Type 2021; brass pins, size 3½ by 3½ inches for 1 3/8 inches thick doors and 3 by 3 inches for 1 1/8 inches thick doors; 1 pair per door.

(g) Doors in exterior openings which open outward, except screen doors, shall have hinges Type 2005, with pins so arranged that pins cannot be withdrawn when the door is in a closed position.

ESCUTCHEONS:

30-17 (a) Except as otherwise specified, furnish for outside face of exterior doors

and for entrance doors from public stair halls to apartments

escutcheons Type 300, size approximately 9 by 2 3/4 inches.

(b) For inside faces of doors above specified, and for all other doors having cylinder locks furnish escutcheons Type 300, minimum size 7 by 2¼ inches.

(c) Except as otherwise specified, for both sides of all doors equipped with bit key locks furnish escutcheons Type 301, minimum size 7 by 2¼ inches.

For doors with narrow stiles escutcheons shall be minimum 7 by 1¼ inches in size.

(d) For all doors equipped with latches, furnish blank escutcheons Type 301, minimum size 7 by 2¼ inches, both sides.

(e) For all other locks provide escutcheons standard with the lock set furnished. Size not less than 7 by 2¼ inches.

KNOBS:

30-18 Type 210-B shall be provided for all exterior faces of all entrance doors. Outside knobs shall be pinned fast to spindles. Other knobs shall be Type 210-B, size 2 inches except that french doors shall have knobs and lever handle type 224.

DOOR CLOSERS:

30-19 Door closers shall be Types 3001 or 3002; one size smaller than those given in "Table I" - page 4 of Federal Specification FF-H-121a, except for hollow metal doors and doors over 2 feet 10 inches wide, size shall be as given in said table.

(a) All outside entrance doors to public stair halls in apartment buildings shall have closers, equipped with holder arms; only one closer shall be provided for each pair of doors unless otherwise specified. Provide brackets for closers on all doors opening out.

(b) Screen doors throughout shall have closers Type 3015.

(c) Also provide closers for the following doors: Outside entrance doors to basements and laundry rooms, penthouse doors, incinerator room doors, mercantile store entry doors, entry doors to public toilet rooms, exterior and interior doors in connection with offices, auditorium, recreation rooms, heating plants and similar buildings.

NOTES TO ARCHITECT:
Add other special room doors where door closers are required by Local or Underwriters Codes, or where conditions definitely require closers.

MORTISE BOLTS:

30-20 Mortise bolts shall be similar to Type 1053-A.

PUSH PLATES:

30-21 Push Plates Type 462; shall be provided on both sides of double-acting doors and on push side of single or double leaves of dead locked doors having closers.

PULL PLATES:

30-22 Door Pull Plates Type 451; shall be provided on pull side of all doors not provided with knobs or lever handles. Pull plates will not be required on screen doors and doors equipped with lock Type 136.

DOOR PULLS:

30-23 Door pulls, both sides Type 1276, shall be provided for doors with locks Type 136.

KICK PLATES:

30-24 Kick plates shall be Type 1224, not less than 7-3/4 inches high, full width of door allowing clearance for stops and rebates; they shall be provided for push sides of outside entrance doors in apartment buildings, both leaves where double doors are indicated.

NOTE TO ARCHITECT:
Consideration should be given to the advisability of providing kick plates for push side of entrance doors to recreation rooms, administration buildings, auditoriums, mercantile shops, etc. where such are included in the project.

DOOR BOLTS:

30-25 Door Bolts shall be Type B-1044-B; top and bottom bolts shall be provided for (and mounted on edge of inactive leaf) all pairs of doors; rod for bottom bolt shall be 12 inches and for top bolt to suit height of door.

LETTER DROPS:

30-26 Letter drops shall be Type B-1228 with inside plate; they shall be provided for front entrance doors to houses and flats also group houses and flat buildings and wherever multiple letter box units are not provided. Unless otherwise shown, letter drops shall be located on center line of cross rail of door.

NOTE TO ARCHITECT:
Two story flat buildings having complete living units on the first and second floors should be provided with gang type mail boxes located at the foot of the stairs on the first floor to serve the first and second floors in which case the letter drops specified should be omitted. Gang mail boxes should be specified under the division "Miscellaneous and Ornamental Metal".

DOOR STOPS:

30-27 Door stops of iron with rubber bumper, approximately 3 inches long, shall be provided for all doors opening against trim and where knobs will strike walls; either floor or wall type as conditions require. Suitable expansion shields shall be provided for door stops where required. Stops not required where doors have closers or spring hinges.

COAT HOOKS:

30-28 Coat Hooks shall be Type 1162-B; provide coat hooks for all closets, except linen closets; they shall be spaced approximately 9 inches apart on rear wall of closets. Provide one coat hook on door in each toilet and bathroom.

HANDRAIL BRACKETS: (For Wood Handrails only)

30-29 Brackets shall be Type 1064; they shall be provided for all wood handrails when rails are attached to walls; they shall support ends of rails and be spaced approximately 5 feet apart.

LOCK REQUIREMENTS:

30-30 (a) All cylinder locks throughout entire project shall be the product of one manufacturer and shall have the fronts secured to cases by machine screws.

(b) The hubs of cylinder knob locks and mortise bit key locks for exterior doors shall be of brass or bronze and shall have approved adjustment features.

(c) All cylinders shall be supplied with cylinder rings made of wrought bronze of an adjustable compression or spring type to allow for adjustment of cylinder to door thickness.

(d) All lock bolts shall have keepers and all catches shall have strikes.

DOOR TRIM SCHEDULE:

30-31 In addition to the hardware above specified furnish the following items, typical for all doors:

30-32 HOUSES AND FLAT BUILDINGS:

(a) Front entrance doors, Lock Type 88.

(b) Rear Doors, Lock Type 7.

(c) Porch and Balcony Doors Lock Type 4A. If with narrow stiles, Lock Type 12A.

(d) Communicating and Closet Doors in Dwelling units, Latch Type 28. One closet in each dwelling unit to have Lock Type 4.

(e) Bathroom doors, similar to Lock Type 17A. except with single compression spring.

30-33 APARTMENT BUILDINGS:

		Type	No.
(a)	Entrance Doors----------	Lock	125
	with handles both sides----	Lock Trim	400
(b)	Doors from Public Stair Hall to Dwelling Units----------	Lock	88
(c)	Porch and Balcony Doors---------	Lock	4A
	if with narrow stiles----------	Lock	12A
(d)	Communicating doors inside dwelling units----------	Latch	28
(e)	Closet Doors, except as otherwise specified----------	Latch	28
(f)	One closet door in each dwelling unit as designated---------	Lock	4
(g)	Bathroom doors similar to------ except with single compression spring.	Lock	17A
	Exterior Doors, not otherwise specified----------	Lock	97

30-34 BASEMENT DOORS:

	Type	No.
Except as otherwise specified--- no stops in face of lock.	Lock	97
Doors to Incinerator Rooms, Meter Rooms, Unexcavated Space----------	Lock	136

NOTE TO ARCHITECT:
It is essential to list in detail all hardware items for all movable parts in all buildings throughout the project. The above Door Trim Schedule is typical and should be supplemented for all special items required in buildings such as Boiler House, Administration building, Stores, Community and similar buildings.

This proceedure makes it possible to secure close competitive bids and prevents misunderstandings between the Local Authority and the Contractor.

30-35 WOOD DOUBLE-HUNG WINDOWS:
Sash fasteners shall be Type No. 1139; provide one sash fastener for each double-hung window.

30-36 Sash Hook Lifts shall be Type No. 1201; provide two sash hooks for bottom sash of each double-hung window (for other hardware for wood double-hung windows see "Carpentry").

30-37 TRANSOMS:

(a) Catches: Type No. 1097; provide one catch for each transom.

(b) Chains: Type No. 1120-A, length 12 or 15 inches as required; provide two chains for each transom.

(c) Operating Pole; oak not less than 1-1/8 inches diameter 6 feet long; ends chucked and fitted with cast iron hooks 4-1/8 inches long; provide pole, also sash pull plates for each transom and pole hanger for each pole.

30-38 (Alternate) Transom Operators: Type 1198 (1199).

NOTE TO ARCHITECT:
Transoms should be fixed, unless special conditions require otherwise.

WOOD WINDOW SCREENS:

30-39 Half screens: Lifts shall be Type No. 1269, size 3⅛ inches; provide two lifts for each screen (mounted on top edge of bottom rail of screen).

30-40 Full length Screen: Screen hangers shall be Type No. 1825 or 1825-B as required; provide one pair of screen hangers for each screen.

30-41 Fastener-hook and eye Type No. 1601-B length 2 or 3 inches as required; provide two fasteners for each full length screen.

SCREEN DOORS:

30-42 Lock Type 1086 (with closer--see Door Closers).

STORM SASH:

30-43 Hangers shall be Type No. 1825 or 1825B; provide two hangers for each storm sash. (If storm sash is provided coordinate with hardware for full length screens.)

30-44 Fasteners shall be Type No. 1650; provide two fasteners for each storm sash.

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SHADES-31-1

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DIVISION - 31
SHADES:

SCOPE:

31-1 Furnish and install shades where indicated; see "Window and Door Schedules".

31-2 Where multiple windows are shown, each window shall be provided with a separate shade.

MATERIALS AND MANUFACTURE:

31-3 Materials and manufacture of shades shall conform to the applicable requirements of Federal Specifications.

31-4 Shade cloth shall be one of the following: Translucent Cambric, or Hollands or Pyroxylin impregnated; color shall be both sides.

NOTE TO ARCHITECT:
Commercial colors for shade cloth are: Dark colors: dark green, medium green. Light colors: white, light ecru, dark ecru.

31-5 All rollers shall be of wood; unless otherwise specified rollers shall be not less than 1-inch in diameter; rollers over 46 inches in length shall be 1¼ inches in diameter. Except as to type and diameter shade rollers shall otherwise conform to applicable requirements of the Federal Specification for shade rollers.

31-6 Slats shall be of wood, not less than 7/8 inch in width, up to 46 inches long; slats over 46 inches in length shall be 1-1/8 inch in width.

31-7 Pulls shall be No. 1 crocheted cotton ring; color shall be same as shade cloth.

31-8 Brackets shall be of adequate design and type, primed for painting.

31-9 Materials and accessories shall be new, commercially perfect, and of first quality.

WORKMANSHIP:

31-10 Shade cloth shall be cut and mounted on rollers square and true, with suitable fasteners. Workmanship shall be first class. Hems shall be of proper widths; sewed with zig zag stitch and then back stitched. Slats shall be inserted into the hems and be secured to cloth with aluminum eyelets.

If outside brackets are used, width of cloth shall be not less than 2 inches greater than opening. Length of shade cloth shall be approximately 12 inches longer than height of opening.

INSTALLATION:

31-11 Shades shall be installed in accordance with best trade practice.

NOTE: Drilling for shade brackets on metal sash is specified under Division "Metal Windows".

31-12 Brackets shall be accurately located and securely fixed in place with screws only. Springs shall be set at proper tension and shades shall hang plumb.

31-13 Care shall be exercised not to mar or damage adjacent work; damaged work shall be repaired or replaced.

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NOTE TO ARCHITECT:
"Unit Price" per shade installed, should be requested in "Bid Form".

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SUGGESTED SPECIFICATION - DIVISION 32

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SITE IMPROVEMENT:

SCOPE:

32-1 The scope of Site Improvement is set forth in "Instructions to Bidders" and is further defined under "Special Conditions".

32-2 Certain items of Site Improvement, including general grading, excess excavation and foundation costs in connection with buildings, extension of cast iron soil pipe house drains beyond building walls, electrical distribution outside of buildings, yard lighting and landscape development are covered by other divisions of the Specification or are omitted from this contract, as elsewhere stipulated.

NOTE TO ARCHITECT:
This paragraph may require revision to adapt it to the exact scope of the project and to the scope of the work specified in this division.

CITY AND STATE SPECIFICATIONS:

32-3 Where the words "City Specifications" and "State Specifications" are used herein they shall be understood to refer to the City of _____ standard specifications and to the standard specifications of the _____ State Highway Department, respectively, covering the class of work specified.

32-4 Where the word "City" or "State" or any designated department thereof appears in such City or State specifications, or where any City or State official or employee is named, such word or name shall be understood to mean the Local Authority.

NOTE TO ARCHITECT:
The foregoing section obviously is required only when City or State standards are specified.

CO-ORDINATION WITH LANDSCAPE WORK:

32-5 Except as noted, landscape work including topsoiling will be performed under a separate contract. Site improvement work shall be co-ordinated with that of the landscape contractor in so far as practicable.

NOTE TO ARCHITECT:
This paragraph is to be deleted in case landscape development is included in the general contract, and should be altered as necessary in case topsoiling or any other landscape work is included in this contract.

EXISTING IMPROVEMENTS:

32-6 Existing street curbs, sidewalks, paving, catch basins, drains, utilities and other improvements to be left in place shall be protected from damage and any such damaged or temporarily removed work shall be restored to its original condition by the Contractor and at his expense.

SUBGRADE:

32-7 The Contractor shall perform any grading in addition to that specified under the Division "Excavating, Filling and Site Grading" to bring site improvement subgrades, after final compaction, to the required grades and sections. Spongy or otherwise unsuitable material shall be removed and replaced with suitable material. Exceptionally hard spots shall be loosened and recompacted and every precaution taken to obtain a subgrade of uniform bearing power.

CONCRETE:

32-8 Concrete for site improvement work shall conform to all applicable requirements of the division "Concrete Work," provided that, except as otherwise noted, concrete shall be composed by volume of one part Portland cement and six parts aggregate, the coarse and fine aggregates to be so proportioned that a dense mix will be obtained; in mixing, only sufficient water shall be used to produce a plastic, workable concrete; and all concrete

shall be cured by keeping the surface covered with burlap, straw, or a layer of sand or earth, which shall be kept thoroughly dampened for at least 72 hours, unless a longer period is specified, and then completely removed.

32-9 The use of high early strength concrete will be permitted, subject to approval of the Local Authority, and its directions as to use and curing.

32-10 Concrete shall be placed only on an evenly graded, well compacted and moistened subgrade, with the tops of forms set at exact finished grades. Forms shall be true to line and of sufficient strength to resist the pressure of the concrete without springing. Concrete shall be well spaded along forms (including expansion joints and separation plates) and shall be tamped and screeded to a dense surface.

32-11 Expansion joint material shall conform to State (City) specifications for material for similar use.

STREET SIDEWALKS:

32-12 Concrete walks in City streets shall be constructed in accordance with City specifications and requirements therefor.

NOTE TO ARCHITECT:
The City specifications should be checked to ascertain whether any clarification is necessary or whether exemption from any requirements should be requested from the City. The limits to which the City specifications apply may require definition, particularly if any project streets or drives on which walks are located, are to be dedicated to the City.

CONCRETE WALKS:

32-13 These specifications shall apply to all concrete walks except street sidewalks and concrete block walks.

32-14 Concrete walks shall be 4 inches in thickness. Walks shall be cut into approximately square flags by separation plates 1/8 to 3/16 inch in thickness, extending full depth of the slab, except that in walks 3 feet or less in width, every other joint may be a dummy joint 1/4 inch deep, and that in walks wider than 7 feet a central, longitudinal, full-depth joint shall be provided.

32-15 One-half-inch expansion joints with filler as specified shall be provided not more than 50 feet apart, also where walks terminate at curbs, at top and bottom of steps, around utility structures, where walks abut buildings, platforms and other fixed structures and elsewhere as shown.

32-16 Concrete in walks shall be tamped and screeded to bring sufficient mortar to the surface for finishing and shall be given a wood-float finish. All edges, including those at separation plates and expansion joints, shall be rounded to a 1/4-inch radius.

32-17 The Contractor shall permit no pedestrian traffic on concrete walks for three days after the concrete is placed.

32-18 On instruction by the Local Authority, the Contractor shall make slight adjustments in the grades and cross slopes of walks to connect with existing work, or to improve drainage.

NOTE TO ARCHITECT:
A cinder or gravel sub-base is recommended for concrete walks only for unstable and decidedly impervious soils. If such sub-base is used, the specifications or drawings should require provision for the escape of water at low points.

CONCRETE BLOCK WALKS:

32-19 Concrete blocks for walks and concrete areas shall be of dimensions shown and may be cast

either flat or on edge. The concrete shall be spaded sufficiently to give a reasonably dense surface. Minor imperfections in the surface and in edges and corners will not be considered objectionable. No rubbing or other finishing will be required.

32-20 Forms shall be left in place at least 24 hours and the blocks thereafter kept damp for not less than 72 hours. The blocks shall be permitted to harden until they can be handled and laid without damage.

32-21 Blocks shall be firmly and evenly bedded on the earth subgrade. They shall be laid with butt joints and/or as stepping stones, as shown.

NOTE TO ARCHITECTS:
The fact that only concrete and concrete block walks are here covered does not imply that these types only are acceptable.

CONCRETE GUTTER, CURB AND
COMBINATION CURB AND GUTTER:

32-22 Concrete gutter, curb or combination curb and gutter in city streets shall conform to city standards and requirements therefor.

32-23 Gutter, curb and combination curb and gutter other than in city streets, shall be constructed in uniform lengths of approximately 10 feet, except at closures where lengths may be reduced to not less than 6 feet. Sections shall be separated by 1/8-inch steel templates.

NOTE TO ARCHITECT:
For curbing or curb and gutter abutting concrete pavement, this paragraph should be revised to make joints correspond to those in the pavement.

32-24 Templates and forms shall be removed as promptly as practicable. Minor defective spots shall be corrected by patching with mortar and the concrete to be exposed shall

be rubbed to a smooth surface. Plastering will not be permitted. Edges at joints shall be finished with a suitable edging tool.

CONCRETE PAVEMENT:

32-25 The subgrade shall be brought to a uniformly firm condition by rolling with a 3-wheel power roller weighing not less than 7 tons and exerting a pressure of not less than 250 pounds per lineal inch of wheel tread, places inaccessible to the roller to be tamped. All fills over 2 feet in depth placed by the Contractor under locations of pavement shall be jetted according to standard practice in addition to being compacted as elsewhere specified, and shall be allowed to settle and dry out before final preparation of subgrade.

NOTE TO ARCHITECT:
For driveways limited in extent and having little heavy traffic, the specification for concrete given in paragraph 32-8 should be adequate and no further specifications should be required. Where concrete drives or streets will carry considerable heavy traffic or where soil or other conditions are unfavorable, it may be advisable to specify a higher cement content or to insert the following paragraph.

32-26 Concrete for pavement shall be of the mix hereinbefore specified, except that the requisite proportions of coarse and fine aggregates, shall be determined according to the "fineness modulus" of the materials used and a water cement ratio shall be established which will produce a concrete having a crushing strength of not less than 3,500 pounds per square inch at the end of 28 days. The theoretical proportions of the aggregates so determined may be varied slightly by increasing the fine aggregate and reducing the coarse, when the quality of materials makes this necessary to overcome the harshness of the designed mix.

32-27 Expansion joints shall be provided as shown, and 1/2-inch joints with filler as specified shall be placed wherever the pavement adjoins walks, manholes, water boxes, platforms, buildings or other structures. Joints shall be straight and perpendicular to the surface. If premoulded bituminous filler is used, it shall be cut down slightly below the top of the slab and the space so formed shall be sealed with poured filler. Edges of slabs at all joints, including construction joints, shall be rounded to a 1/2-inch radius.

32-28 The concrete surface shall be floated in an approved manner and tested with a 10-foot straight-edge. Any irregularities greater than 1/4 inch in 10 feet shall be corrected and laitance removed by belting or light screeding. Before the concrete sets and edges are rounded, the surface shall be swept at right angles to the center line with a coarse broom, to produce a uniform non-skid finish.

32-29 The Contractor shall permit no foot traffic on the pavement for 3 days, no vehicular traffic for 14 days and no heavy vehicular traffic for 21 days, after pouring. The covering hereinbefore specified for concrete surfaces shall be kept dampened for 10 days, provided, that in lieu of such covering, the Contractor will be permitted to use sodium silicate or calcium chloride, applied according to the manufacturers' directions, for curing the slab.

NOTE TO ARCHITECTS:
The foregoing is a very brief specification recommended for the case of a limited amount of concrete driveway paving. If the work is located in City streets (present or to be dedicated), or if there is a considerable amount of such work to be done, it may be specified that City or State standards be followed. In case it is stipulated that the work conform to State specifications,

the latter should be examined carefully and exception taken to any requirements which are clearly not applicable or which would add unnecessarily to the cost of the work.

BITUMINOUS PAVING:

NOTE TO ARCHITECT:
Bituminous pavement materials and construction methods vary so widely that it is not practicable to suggest a specification that would be generally applicable. The advice of City or State engineers should be sought concerning a pavement that is adapted to local materials, that local contractors are experienced in laying and which can be laid within the estimated cost.

BITUMINOUS SURFACING:

32-30 Bituminous surfacing for play areas, sitting areas and other yard areas so shown, shall consist of a 3-inch broken stone base course, a bituminous prime coat, a 1½-inch bituminous binder course, a ½-inch bituminous surface course and a seal coat. Thicknesses here specified shall be measured as compacted.

32-31 Aggregates shall be of the following approximate sizes:
Base course: 1½-inch to ¼-inch (with fines)
Binder course: 1¼-inch to ½-inch
Surface course: ½-inch to ¼-inch
Aggregates shall conform in quality to the City (State) standard requirements for similar construction.

32-32 Emulsified asphalt of the slow-breaking type shall comply with Federal Specification SS-A-681; of the quick-breaking type, it shall comply with Federal Specification SS-A-676.

32-33 Tar shall conform to Federal Specification R-T-101, Grade TC-1-25.

32-34 Except at curbs, walks or other places affording a firm side support, 2-inch wooden forms shall be used for the surfacing. The forms shall be set ½-inch below grade and shall be securely staked. If so directed by the Local Authority, they shall be left in place.

32-35 The Contractor shall observe all necessary precautions to avoid spattering walks or other construction with asphalt.

32-36 On the subgrade, which shall be compacted at the required grade with a roller weighing not less than 5 tons and exerting a pressure of not less than 200 pounds per lineal inch of wheel tread, the base course material shall be spread evenly, watered thoroughly, and compacted with a roller as just specified, until it shows no sign of further settlement under the roller. Uneven spots and dust pockets shall be corrected and recompacted until the surface is firm, uniform and true to grade. A fairly dense surface is required in order to hold the bituminous prime coat and screenings shall be added and swept into the surface during the process of rolling, if necessary, in order to meet this requirement.

32-37 Upon the prepared base course shall be applied a bituminous prime coat of slow-breaking asphalt emulsion or cold tar, at the rate of 0.30 gallon per square yard.

32-38 The aggregate and emulsified asphalt for the binder and surface courses shall be mixed in a mixer of a type which will coat thoroughly the aggregate. The quantity of emulsion used shall be sufficient to give a good coating on all particles of aggregate without appreciable excess. Excessive mixing, which tends to "break" the emulsion, shall be avoided. The pre-mixed material shall be spread evenly and quickly to the required thicknesses before the emulsion "breaks." Each course shall be compacted, after the emulsion has completely broken, by means

of a power roller of the weight above specified. Uneven and defective spots shall be corrected, and the surface of each course shall be solid, uniform and true to grade.

32-39 Surface voids shall then be swept full of coarse sand, and quick-breaking asphalt emulsion applied at the rate of 0.25 to 0.30 gallons per square yard. This application shall be covered immediately with approximately 10 pounds of dry sand per square yard.

32-40 Before final acceptance of the work, all surplus sand shall be swept off, and the surface left in an acceptable condition.

NOTE TO ARCHITECT:
A similar specification might be drawn for cold tar or for cut-back asphalt, instead of emulsified asphalt. The choice between these materials, as well as the choice between the foregoing and some other type of bituminous surfacing, will be governed in large part by the character of materials available locally and the kinds of surfacing which local contractors are experienced in, and equipped for, laying. In all cases, the advice of a local engineer thoroughly experienced in bituminous work should be obtained in drafting the specification.

The foregoing suggested specification is based on machine mixing in small quantities, since play areas will require generally only limited amounts of paving material and it will not be feasible to prepare the mixture in an ordinary "hot-mix" plant. If a local plant is equipped to furnish other material comparable in price and quality, the specifications may be drawn to permit its use.

Concerning aggregates, reference has been made to crushed stone only. If

slag or gravel is available at appreciably less cost, the appropriate use of such material should be permitted.

It is important that the requirements for materials be modified to adapt them to local standards. This applies to the reference to Federal specifications for bituminous materials and, particularly, to the specified sizes of aggregate, which should be altered to fit local standards.

BRICK SURFACING - SAND BASE:

32-41 Brick surfacing for sitting-out areas and other paved areas so shown, shall consist of brick laid flat on a one-inch cushion of sand spread over an evenly graded, well compacted subgrade.

32-42 Brick shall be hard, sound, dense building brick of approved color. The brick shall be laid as closely as practicable in the pattern shown. Where brick surfacing abuts lawn or planting areas, the dimension indicated may be increased or reduced by half the width of a brick to avoid cutting. The brick shall be compacted in place with a tamper striking a piece of 2-inch plank and inequalities corrected until the surface is firm and smooth. Brick which are broken or misshapen shall be replaced. Thereafter the joints shall be swept full of very fine dry sand and the surface shall again be tamped. A slight surplus of sand shall be left on the surface.

NOTE TO ARCHITECT:
Include in the foregoing any necessary reference to edging or curbing around the brick surfaced areas.

CONCRETE AREAS:

32-43 Concrete surfacing for sitting areas and similar paved areas shall conform to all applicable requirements of the specifications hereinbefore given for concrete walks. Full depth joints shall be provided as shown.

NOTE TO ARCHITECT:
The fact that the foregoing specifications for paving of yard areas cover only three types - concrete, bituminous and brick-on-sand - does not imply that other types should not be considered. For example, cost limitations may necessitate an inexpensive type of surfacing, such as sand-clay or clay-gravel, for play areas; and flagstones, old paving blocks or similar material may be available locally at low cost and be suitable for other paved areas.

GARBAGE COLLECTION PLATFORMS:

32-44 Garbage collection platforms shall be constructed to conform to all applicable requirements of the specifications hereinbefore given for concrete walks.

NOTE TO ARCHITECT:
The foregoing will serve to call attention to this item. The specification should be amplified as necessary to cover the design of the platforms or stations.

CHAIN LINK FENCES:

NOTE TO ARCHITECT:
The following specification is for 3-foot fence, except that figures in parentheses apply to 6-foot fence.

Most of the information here given may, if desired, be set forth on the drawings instead of in the specifications.

32-45 All zinc coated materials shall be hot-dippe galvanized after fabrication. Zinc coating on fabric shall be capable of withstanding 6 one-minute immersions under the Preece Test for uniformity of coating and shall weigh not less than 1.2 oz. per square foot of actual surface. Zinc coating on all othe materials, including posts, rails, fittings, etc., shall weigh not less than 2.0 oz. per square foot of actual surface. If present to any considerable extent, frozen joints,

uneven and poorly formed mesh, roughness, blisters, sal-ammoniac spots, bruises and flaking shall constitute ground for rejection.

32-46 Ferrous materials, excepting malleable iron, shall be open hearth steel containing not less than 0.2 per cent copper ladle analysis, provided that posts may be high carbon steel.

32-47 The fabric shall be chain link type 3 feet (6 feet) wide and woven of No. 11 wire (No. 9 wire), United States Steel Wire gauge, in 2-inch diamond mesh. Top and bottom edges shall have knuckled finish.

32-48 Intermediate posts shall have a rolled open section, either H, I or U shaped, weighing not less than 1.80 (4.1) pounds per foot. End, corner and gate posts shall also have a rolled open section, H, I or U shaped, weighing not less than 2.40 (5.25) pounds per foot, or tubular square section 2 ($2\frac{1}{2}$) inches outside or circular $2\frac{1}{2}$ (3) inches O.D., each weighing not less than 3.65 (5.79) pounds per foot. Posts shall have approved caps and connections for top rail.

NOTE TO ARCHITECT:
Although rolled sections are considered preferable for all posts, tubular sections are permitted in the foregoing for end, corner and gate posts, and it may be desirable under certain conditions to permit the use of tubular sections for intermediate posts also. If so, the following sizes and weights are recommended:

For 3-foot fence - 2-inch O.D. weighing 2.72 pounds per foot.
For 6-foot fence - $2\frac{1}{2}$-inch O.D. weighing 3.65 pounds per foot.

32-49 The fence shall have a top rail of tubular section, 1-3/8 (1-5/8) inches O.D., weighing 1.68 (2.27) pounds per foot. Top rail

shall be continuous through intermediate posts or malleable iron post caps and shall be provided with approved malleable iron or pressed steel connections to end, corner or gate posts. Approved expansion joints shall be provided at intervals not exceeding 50 feet; otherwise, lengths shall be coupled with approved sleeve couplings.

32-50 Gates shall be 3 feet wide, made of 1-3/8 inch O.D. tubular or 1¼-inch outside square tubular frames and covered with the same fabric as the fence. They shall be complete with approved fixed pin hinges and latches and shall be erected with hardware permanently secured to posts and left in proper operating condition.

NOTE TO ARCHITECT:
Gates in 6-foot fences vary with requirements of location; and hardware and hinge requirements must be specified differently.

ERECTION OF CHAIN LINK FENCES:

32-51 Posts shall be spaced uniformly and not farther than 10 feet on centers; they shall be plumb in each direction and in perfect alignment.

32-52 Post settings shall be concrete 2 feet 4 inches (3 feet) deep for intermediate posts with top diameter 8 (10) inches and bottom diameter 10 (12) inches and posts set 4 (6) inches above bottom; for end, gate and corner posts, settings shall be 3 feet deep with top diameter 10 (10) inches and bottom diameter 12 (12) inches and post set 6 (6) inches above bottom. The top of the setting shall extend 2 inches above adjacent finished grades and shall be trowelled to a smooth bevelled surface.

32-53 Where fence posts are to be set in masonry walls or solid rock suitable holes 12 (18) inches in depth shall be provided for the setting and the posts shall be solidly

grouted in place, provided that, where set on masonry, the posts may have approved welded base plates, securely fastened with at least 4 expansion bolts to the masonry.

32-54 After the concrete has set and the posts have become rigid, the top rail shall be placed and the fabric shall be placed flush with the top of the top rail and with bottom 2 inches above finished grade; it shall be tightly stretched to eliminate all sags and buckles and laced to posts every 14 inches and to top rail every 24 inches with No. 6 galvanized wire or other rust-resisting material. Ends of lacing wire shall be turned back so as to eliminate exposed ends.

32-55 Where fences extend up onto rear porches, a post shall be securely anchored into the building wall or porch or both, and posts weighing not less than 2.40 pounds per foot shall be set at the top and bottom of the steps. The requisite fittings shall be provided, together with braces, if necessary, for proper and stable erection.

32-56 For fencing 6 feet high, panels adjoining end, corner or gate posts shall be truss-braced in approved manner with a strut equivalent to a tubular section 1-5/8 inch O.D., weighing 2.27 pounds per foot, and an adjustable tie rod, minimum 3/8-inch diameter, equipped with turnbuckle arrangement.

WIRE STRAND FENCES:

32-57 Wire shall be No. 9 (United States Steel Wire gauge), open hearth steel with a minimum copper content of .20 per cent by ladle analysis and shall be zinc coated by the hot dip galvanizing process to withstand 6 one-minute dips under the Preece Test for uniformity of coating.

32-58 Intermediate posts shall be 5 feet long and end corner and gate posts 5 feet 6 inches long. All posts shall be of open hearth copper-bearing steel or high carbon steel having a zinc coating weighing not less than

2.0 ounces per square foot of actual surface. Intermediate posts shall have an approved rolled section, T, U, or L shaped, weighing 1.12 pounds per foot minimum, and shall have punched slots for attaching the wire strands. End, corner and gate posts shall have an approved rolled section, either H, I or U shaped, and shall weigh 2.40 pounds per foot minimum, or they shall have a 2-inch O.D. tubular section weighing 2.72 pounds per foot. Tubular poles shall be provided with malleable iron caps.

32-59 Gates (if required) shall be 3 feet wide, of 1-1/8-inch tubular frames, with covered woven wire fabric, 2-inch mesh, No. 11 wire. They shall be complete with fixed pin hinges and latches and shall be erected with hardware permanently secured to posts and left in proper operating condition. Gates shall be heavily galvanized after fabrication.

32-60 Posts shall be spaced uniformly and not farther than 8 feet apart. Intermediate posts shall have concrete settings 8 inches in diameter and 2 feet deep with a smooth bevelled finish one inch above finished grade. End, corner, and gate posts shall be set in concrete $2\frac{1}{2}$ feet deep and 10 inches in diameter, with the top 2 inches above finished grade and trowelled to a smooth bevelled finish.

32-61 Wire strands shall be 8 inches, 22 inches and 36 inches, respectively, above finished grade, posts to extend 2 inches above the top strand. The wire shall be strung in lengths between end, gate and corner posts and drawn tight with a hand tool. Care should be taken not to injure the zinc coating. The wire shall be fastened to the intermediate posts by means of approved staples or fasteners driven through the slots and to the end, gate and corner posts by means of approved bands around the post.

CLOTHES LINE POSTS:

32-62 Clothes line posts shall be of approved H, I or U section weighing not less than 4.1 pounds per foot, with longest sectional dimension not more than $2\frac{1}{2}$ inches, or of 3-inch O.D. tubular section weighing 5.79 pounds per foot. Posts shall be of open hearth steel containing at least 0.20 per cent copper by ladle analysis or shall be high carbon steel. A hook of approved design shall be securely attached at or near the top of each post, the length of posts to be such that hooks will be located $6\frac{1}{2}$ feet above finished grade. After fabrication poles shall be given a zinc coating, not less than 2.0 ounces per square foot, by the hot dip galvanizing process. Tubular posts shall have malleable iron caps.

NOTE TO ARCHITECT:
The posts just specified are adapted to locating at some distance from buildings, clothes lines to be strung from these posts to hooks set in the building walls. Other types of post have proven satisfactory, e.g., steel posts with cross arms and hooks for accommodating 3 or 4 lines, these posts located on the division lines between tenant yards. For community drying yards, posts supporting a continuous bar, to which hooks are attached, make a convenient type of support.

32-63 Clothes line posts shall have concrete settings not less than 12-inches in diameter at the bottom and 10 inches at the top, settings to be 3 feet deep below finished grade and to be given smoothly trowelled, bevelled finish to 2 inches above finished grade. Base of posts shall be 6 inches above bottom of setting. Posts shall be accurately lined and plumbed.

32-64 Clothes line posts located in fence lines may be utilized as fence posts with the fencing material attached thereto.

UTILITY INSTALLATION--COMPLIANCE WITH CODES:

32-65 The installation of sewers and water and gas piping shall be in accordance with the requirements of all State and Municipal codes and regulations locally governing that work, provided that any requirements of the drawings and the specifications conflicting therewith shall govern, unless special permission to the contrary is granted by the Local Authority or unless the requirements of the drawings and specifications are less exacting than those of the local codes and regulations, in which case it shall be incumbent on the Contractor to comply with such codes and regulations without additional compensation.

NOTE TO ARCHITECT:
The project plans and specifications should be coordinated to the fullest practicable extent with local code requirements.

TRENCHING FOR INSTALLATION OF UTILITIES:

32-66 The Contractor shall perform all excavation and backfill required for sewers, water and gas piping, and appurtenances thereto.

32-67 Trench widths shall be sufficient to permit proper installation of the work and bottom of trenches shall be evenly graded, with bell holes provided to insure uniform bearing for pipes. Excavations below required depths shall be refilled with sand or gravel firmly compacted. Rock encountered shall be excavated 3 inches below the lowermost part of the pipe and the space so formed refilled with sand or gravel well compacted.

32-68 When trenches are required within the area outlined by the spread of branches of an existing tree to be retained, the Contractor shall exercise extreme care to protect the roots from injury. No root having a diameter greater than one-inch shall be cut or broken and work within such tree areas shall be executed by methods approved by the Local Authority.

32-69 It is assumed that the material to be excavated for installation of sewers, water and gas piping and their appurtenances, can be removed without drilling or explosives. If any excavation for such work requires the use of drilling or explosives, equitable adjustment therefor shall be made in the contract price.

NOTE TO ARCHITECT:
If a unit price for rock excavation is to be set up in the "Bid Form", reference should be made thereto.

If there is to be no extra compensation for rock excavation, the following alternate clause is suggested.

32-69 (It is understood that there will be no classification of material to be excavated for the installation of sewers, water and gas piping and their appurtenances, and that the contract price covers full compensation to the Contractor for such excavation, whatever material be encountered.)

32-70 Wherever, in the opinion of the Local Authority, the soil at or below grade is unsuitable for supporting sewers or water or gas piping, such provisions for proper foundations shall be made, in addition to those shown or specified, as the Local Authority may direct, equitable adjustment therefor to be made in the contract price.

32-71 Trenches shall be sheathed or braced and pumping or bailing performed as necessary to protect workmen and adjacent structures and permit proper execution of the work. After piping installed has been tested, inspected and approved by the Local Authority, excavations shall be backfilled with approved material tamped or puddled compactly into place. Special precautions shall be observed to obtain thorough compaction of backfilled earth under streets, drives, walks and other surfaced areas.

32-72 The Contractor shall replace all existing street pavement, curbs, sidewalks, etc., removed or damaged by him in connection with utility installation, unless such improvements are to be removed or replaced under this contract.

SEWER MATERIALS:

32-73 Pipe and fittings for sanitary, storm and combined sewers shall be deep-and-wide socket type, vitrified clay pipe complying with Federal Specification SS-P-361. Fittings shall be supplied as necessary for proper installation and connection of all lines.

NOTE TO ARCHITECT:
If consistent with local practice and local ordinances permit, concrete pipe may be used for sewers. In this case, reference may be made to A.S.T.M. specifications, or a brief specification to cover a satisfactory pipe manufactured in local plants. Vitrified clay pipe is recommended for sanitary sewers, except under exceptional conditions.

For projects on which a limited amount of sewer pipe is required, reference to the federal specification for vitrified pipe may be omitted and a specification similar to the following inserted.

32-73 (Pipe and fittings for sewers shall be first quality, hard-burned, salt-glazed, vitrified clay pipe, sound and free from large blisters, objectionable warp and other defects. Pipe smaller than 12-inch shall be "standard" and pipe 12 inches and larger shall be "double strength." The necessary fittings shall be supplied for proper installation.)

32-74 Cast iron soil pipe and fittings required for sewers shall comply with Federal Specification WW-P-401.

32-75 Brick for manholes, catch basins, surface drains, etc. shall be medium clay sewer brick, Grade C, complying with Federal Specification SS-B-691; or well burned No. 2 paving brick. For manholes, a special radial manhole brick or concrete block of good quality may be used with the Local Authority's approval.

32-76 Castings for manholes, catch basins and other sewer structures in streets and drives, shall conform to the standard design and specifications therefor of the City sewer department. Castings for manholes to be located in planted areas or walkways shall conform to applicable requirements of the city standards but it is not required that they have a total weight of more than 300 pounds. Castings for yard catch basins shall be of the approximate form and dimensions shown. Unless provided otherwise by the City specifications, all castings shall be whole and free from defects, and neatly cast of soft grey iron without the admixture of inferior metal; before leaving the foundry they shall be thoroughly cleaned and subjected to the hammer test, after which they shall be given two coats of coal tar pitch varnish.

32-77 Concrete and concrete work shall conform to the applicable requirements therefor given in the Division "Concrete Work", provided that concrete for sewer work shall be composed of one part Portland cement to six parts aggregate, without tests to determine the strength of the concrete.

32-78 Mortar for sewer pipe joints shall be a 1:2 cement-sand mix. Mortar for other purposes, including brick masonry, shall be a 1:3 cement-sand mix.

32-79 Bituminous compound for joints in pipe sewers shall meet the following requirements:

	Minimum	Maximum
Specific gravity at 25 degrees C	1.45	1.55
Melting point (degrees F)	195	205
Penetration at 25 degrees C	8	15
Adhesion at 25 degrees C (lbs. per sq. in)	80	--
Total bitumen (per cent)	45	55
Total inert material (per cent)	45	55

The compound shall melt and run freely at a temperature of 250 degrees F, shall adhere firmly to surfaces of pipes and, when set, shall be sufficiently elastic to permit slight movement of pipes without injury to joints or breaking of adhesion to the pipes. The compound shall not deteriorate when submerged in water or domestic sewage and shall form a tight joint when poured in pipe partly or entirely submerged in water. It shall show no deterioration of any kind when immersed for a period of 5 days in a one per cent solution of hydrochloric acid or a 5 per cent solution of caustic potash.

SEWER CONSTRUCTION:

32-80 All connections to city sewers, including new manholes, and other work on city sewers, as specified, shall be performed or arranged for by the Contractor, who shall secure the necessary permits and pay all costs and charges in connection therewith, and furnish proof of acceptance from the City Department having jurisdiction.

NOTE TO ARCHITECT:
Should there be any fees or assessments to be paid, which are in effect a contribution to the original cost of an existing sewer, it is recommended that such costs be paid by the Local Authority and that it be stated in the Specification that the costs will be so paid.

If cutting off existing sewer connections is a City requirement and such work is to be included in this contract, its extent and requirements should be set forth clearly in the specifications and/or on the drawings.

32-81 Existing manholes and catch-basins shall be raised or lowered as necessary to conform to finished grades. In raising manholes, the existing walls shall be cut down sufficiently to permit building the manhole to finished grade of such diameter that it can be entered without difficulty.

32-82 The Contractor shall conduct his work so as not to interfere with the functioning of existing sewers. Extreme care shall be observed to prevent debris from entering existing sewers as a result of his work.

32-83 Pipe shall be firmly bedded at the required line and grade, with bell-holes excavated so that the barrel of the pipe rests for its entire length on the bottom of the trench. Spigots, bells and the interior of the pipe shall be clean when it is lowered into the trench.

32-84 Joint mortar shall be spread of proper thickness in the bottom one-third of the circumference of the bell. A closely twisted hemp or oakum gasket of sufficient diameter to hold the spigot firmly centered in the bell and long enough to lap at the top shall then be forced into the mortar. After the pipe has been seated in the bell and shoved "home", the gasket shall be solidly calked into place, and the remainder of the joint space packed with mortar leveled off at a 45-degree angle with the exterior of the pipe. The interior of pipes shall be carefully swabbed after each joint is made. Sufficient earth shall be packed around joints to keep the mortar from sagging and to hold the pipe in place. Backfilling

shall follow pipe laying as soon as joint mortar has set sufficiently so that joints will not crack, and earth shall be tamped carefully for a depth of one foot above the top of the pipe.

NOTE TO ARCHITECT:
The following alternate paragraph may be inserted if bituminous compound is to be used for the pipe joints.

32-84 (A closely twisted hemp or oakum gasket of sufficient diameter to hold the spigot firmly centered in the bell and long enough to lap at the top, shall be solidly calked into place. A suitable joint runner shall then be placed and the compound poured at one time to fill the annular space. The runner shall not be removed until the compound has cooled completely. It will be permissible to join two pieces of pipe vertically on the bank provided care is taken to line the pipe carefully before the joint is poured and to avoid injury to the joint when the pipes are lowered and laid in the trench. In backfilling the earth shall be placed carefully and hand tamped along the sides of the pipe and for a depth of one foot over it.)

32-85 Pumping and bailing shall be performed as necessary to avoid laying the pipe in water and to protect the joints. The mouth of the pipe shall be protected by a stopper when work is not in progress. Special care shall be taken not to disturb the pipe until the joint mortar has set.

32-86 Wye-branches placed for future connections and for cleanouts shall be capped with special vitrified or cement caps, set in lime mortar. Ends of yard sewers not to be connected immediately to house sewers shall be temporarily plugged.

NOTE TO ARCHITECT:
Following are alternate specifications for service piping less than 3 inches in diameter; the kind of pipe to be used will depend on local practice and experience.

32-92 (Underground water pipe, $2\frac{1}{2}$ inches or less in diameter shall be Class "B", extra strong, galvanized wrought-iron pipe, complying with Federal Specification WW-P-441, extra strong. Fittings shall be galvanized malleable iron (threaded), Class "B" 250 pounds, complying with Federal Specification No. WW-P-521.)

32-92 (Underground water pipe, $2\frac{1}{2}$ inches or less in diameter, shall be standard weight Grade "A" brass, iron-pipe size, conforming to Federal Specification WW-P-351. Fittings shall be cast brass, iron-pipe size, Grade "A", complying with Federal Specification WW-P-448.)

32-92 (Underground water pipe, $2\frac{1}{2}$ inches or less in diameter, shall be hard drawn copper tubing, Type K, complying with Federal Specification WW-T-799. All copper tubing shall be stored in a protected place and care taken to prevent the pipe from being flattened. Fittings shall be cast brass or wrought copper suitable for sweat joints with copper tubing, and shall have a minimum wall thickness throughout equal to the wall thickness of the tubing. Solder shall be of a composition recommended by the manufacturer of the fittings of the particular service involved. Mitered joints for elbows and notching straight runs of pipes for tees will not be permitted. Tubing and fittings shall be designed with suitable clearances for solder.)

32-93 Connections between copper tubing and valves shall be made with adapters of approved type, having a female soldered end and a male threaded end. Connections between copper tubing and cast-iron pipe shall be made with a cast copper calking connection having a soldered end and a beaded end.

32-94 Valves for underground water lines shall meet the standards and requirements of the local water department (company). In the absence of such standards, they shall be iron body, bronze or brass mounted, and shall conform to the latest standard specifications therefor of the American Water Works Association. Valves shall be guarantee to remain practically water tight against a working pressure of 150 pounds per square inch. Unless otherwise shown, valves for cast iron piping shall be hub-end and for other specified piping screw-end.

32-95 Unless otherwise required, each underground valve shall have an approved, cast iron, adjustable shaft, valve box, which shall meet the standard of the local water department (company).

32-96 Fire hydrants shall be of a recognized standard make, complying with the requirements of the City Water Department and Fire Department. In the absence of such standards, the hydrants shall conform in every respect to the latest standard specifications therefor of the American Water Works Association.

NOTE TO ARCHITECT:
It may be necessary to follow with a description of the hose connections required.

32-97 Water meters shall be of a recognized make meeting the approval of the local water department (company).

NOTE TO ARCHITECT:
It will generally be necessary to supplement this paragraph with specification of type of meters required. Reference may be made, if desired, to AWWA specifications.

INSTALLATION OF WATER PIPE AND APPURTENANCES:

32-98 The Contractor shall arrange with the local water department (company) for all required

water connections to existing mains and shall pay all fees and costs in connection therewith.

NOTE TO ARCHITECT:
If cutting off existing water connections is a city or water company requirement and such work is to be included in this contract, its extent and requirements should be set forth clearly in the specifications and/or on the drawings.

32-99 All water pipe and fittings shall be stored on sills above flood water and shall not be delivered for laying until the trench is excavated. Piping shall be laid true to line, without objectionable breaks in grade and with a cover of not less than _____ feet. The interior of the pipe shall be clean before the pipe is lowered into the trench and joint surfaces wiped clean before joints are made. Junctions in lines and changes in direction shall be made by means of proper fittings.

32-100 In laying cast iron pipe, a tightly twisted gasket of hemp, jute or yarn shall be adjusted in the bell, as the spigot is being entered, to produce a uniform space around the spigot and, after the pipe is shoved "home", the gasket shall be tightly driven. Sufficient gasket material shall be used to produce a well packed joint, leaving a depth of at least 2 inches for lead. The remaining joint space shall be filled with lead at one pouring; thickness of lead shall be not less than $\frac{1}{4}$ inch. The lead shall be calked to a water-tight joint without straining the bell of the pipe. There shall be no change in alignment after the joint is calked.

NOTE TO ARCHITECT:
If local practice allows the use of a sulphur-bearing lead substitute, the following may be substituted for the preceding paragraph or added as an alternate.

32-100 (In laying cast iron pipe a tightly twisted or braided gasket of hemp shall be adjusted in the bell, as the spigot is being entered, to produce a uniform space around the spigot and, after the pipe is shoved "home", the gasket shall be tightly driven. Sufficient joint material shall be used to produce a well packed joint, leaving an open depth of at least 2 inches. A sulphur-bearing lead substitute shall be heated without burning until it has a mirror-like surface, free from scum or bubbles, and the joint shall be filled at one pouring, using a metal pouring gate, or clay dam at least 6 inches high. After the lead substitute has cooled and hardened, the excess material shall be cut away, and water applied to the joint as soon as possible to "take up" any small leaks.)

32-101 Copper tubing shall be laid by experienced workmen with care taken not to scar or dent the pipe. Jointing shall be in accordance with the pipe manufacturers' recommendations. Where the tubing is laid in fills of cinders, rock or rubbish, it shall be protected on all sides by not less than 6 inches of sand or suitable soil.

32-102 All joints in threaded pipe shall be made with red lead but caution shall be used that only a thin coat of lead is placed and on the male thread only. The ends of all pipe shall be reamed free from burrs and threads shall be clean cut and tapered. Piping shall be kept free from scale and dirt.

32-103 Where ground conditions or bends make it necessary, clamps, braces, bolted flanges or mass concrete shall be used to prevent blowing out of joints, and special supports, designed by the Contractor and subject to the approval of the Local Authority, shall be used to prevent unusual settlement.

32-104 All water mains shall be tested at the expense of the Contractor under the supervision of the Local Authority, to a hydrostatic pressure of not less than 125 pounds per square inch, after being laid and before joints are covered. Any defects so discovered shall be corrected to the satisfaction of the Local Authority.

GAS PIPING:

32-105 All underground gas piping 4 inches or more in diameter shall be cast iron bell and spigot pipe meeting the American Gas Association standard specifications.

32-106 All underground gas piping less than 4 inches in diameter shall be standard weight black steel, Type "A", conforming to Federal Specification WW-P-403, with malleable iron fittings complying with Federal Specification WW-P-521 covered with one coat of black asphaltum after installation.

NOTE TO ARCHITECT:
Following is an alternate specification for gas piping smaller than 4-inch.

32-106 (All underground gas piping less than 4 inches in diameter shall be standard weight, galvanized, genuine wrought iron pipe, Type "A", conforming to Federal Specification WW-P-441, with galvanized malleable iron fittings complying with Federal Specification WW-P-521.)

INSTALLATION OF GAS PIPING AND APPURTENANCES:

32-107 The Contractor shall arrange with the local gas company for gas service as shown to the buildings and shall pay all costs in connection therewith.

32-108 All gas piping shall be installed to conform with the rules and regulations of the local gas company (or the standard specifications of the American Gas Association) and to comply with the local plumbing code.

Gas piping shall be installed by licensed gas fitters or licensed plumbers if permitted by local code. No gas-fitter's cement shall be used except at fixture joints.

32-109 Approved drip pots shall be provided at all low points in the lines.

32-110 All required tests shall be made at the expense of the Contractor under the supervision of the Local Authority.

NOTE TO ARCHITECT:
The practice of the local gas company may generally be followed as an acceptable guide in design of the gas installation - bearing in mind, however, the period on which project design is based - and specifications both as regards materials and workmanship may be written accordingly.

X X X X X

NOTE TO ARCHITECT:
"Unit Prices" should be requested in the "Bid Form" for the principal items of work required in this division of the Specification.

X X X X X

DEPARTMENT OF THE INTERIOR
UNITED STATES HOUSING AUTHORITY
WASHINGTON, D. C.

DATE
OCT.-1938

REVISIONS

SUGGESTED SPECIFICATIONS-DIVISION 33
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PROJECT NO.

LANDSCAPE WORK-33-1

DEPARTMENT OF THE INTERIOR
UNITED STATES HOUSING AUTHORITY
WASHINGTON, D. C.

DATE
Sept.-1938

SUGGESTED SPECIFICATION-DIVISION-33

REVISIONS

DIVISION-33
LANDSCAPE WORK:

NOTE TO ARCHITECT:

These specification suggestions are based on the assumption that the landscape work will be let under a separate contract. In case the work is to be included in a General Contract, minor changes will be necessary. In every instance where sizes, quantities, weights, etc. are given they are indicated as average standards for your guidance and not as hard and fast rules.

It is understood that all the suggestions are subject to modification depending on the locality of the project.

SCOPE:

33-1 (a) The work required under this specification shall include all labor, equipment, materials and services necessary for, and incidental to, the execution of all landscape work involved in fully developing the project site in accordance with the drawings and the specification.

(b) The work embraced under this specification shall include (the treatment of existing trees; the preparation of the ground; the furnishing, planting, fertilizing, draining, guying, staking, wrapping, mulching, clipping and pruning of plant materials; the furnishing, preparation and placing of topsoil; the grading, planting, seeding and/or sodding of lawn areas) the execution of maintenance work; the clearing of the ground; and all other work required by the drawings and the specification.

SITE:

33-2 (a) The project site shall include the entire area within the property lines, as indicated on Drawing No._____, and the area between the property lines and the street curb lines.

APPROVAL AND REJECTION OF MATERIALS AND WORK:

33-3 (a) The selection of all materials and the execution of all operations required under the drawings and specification shall be subject to the approval of the local authority.

(b) The local authority shall have the right to reject any and all materials and any and all work which in its opinion do not meet with the requirements of the specification at any stage of the operations. All rejected materials shall be removed from the site by the Contractor, or as otherwise directed by the local authority.

MATERIALS:

33-4 (a) TOPSOIL. (1) All topsoil shall be a fertile, friable natural topsoil of loamy character, typical of the topsoil in the locality, without admixture of subsoil material, and obtained from a well-drained, arable site. It shall contain a normal amount of decomposed organic matter and shall be free from heavy clay, coarse sand, stones, lumps, plants, roots, sticks or other foreign materials. The depth to which the topsoil is to be taken shall be such that when removed by mechanical means or by hand the soil will be of the same composition and structure throughout. Topsoil shall not be delivered in a frozen or muddy condition.

(2) The Contractor shall furnish the local authority with the following information:

a. Specific location of property from which the topsoil is to be obtained.
b. Name and address of the owner of the property.
c. List of crops or plants which have been growing in the soil during the past two years.

d. Kind of fertilization the ground has had during the past two years.
e. Approximate amount of topsoil available.
f. Depth to which the topsoil is to be taken.

(3) Before delivery of any topsoil is made under this contract, a sample of the topsoil together with a certified analysis of it, made by a recognized authority shall be furnished to the local authority for its approval. Where topsoil is to be stripped deeper than six inches, an analysis shall be required for each six inch layer. The sample shall be submitted in a glass jar of quart size, appropriately labeled, which shall be completely filled with uncompacted soil. A further sample, not exceeding one cubic yard, may be required by the local authority to be delivered to the site, such sample to be stored and protected until completion of the work.

NOTE TO ARCHITECT:

If topsoil is available on the project site insert the following:

(4) It was required of the General Contractor (or others) that he strip from the site and store (quantity) cubic yards of topsoil for this work. It shall be the duty of this Contractor to accept the stored topsoil as he finds it, to estimate the quantity of stored topsoil available for the work and, if additional topsoil be necessary, to furnish sufficient to properly complete the work. If there be an excess amount of topsoil stored, the surplus shall be removed or otherwise disposed of as directed by the Local Authority.

(5) All stored topsoil shall be cleared of all stones, sticks, roots, plants, and all other foreign materials, and shall be conditioned by the addition of the following:

NOTE TO ARCHITECT:

It is suggested that the architect have an analysis made of the topsoil which has been stripped from the project site and stored and specifications prepared for proper conditioning.

(b) MANURE. (1) Manure shall be well rotted, unleached (cow) manure, not less than (8) months and not more than (2) years old. It shall be free from sawdust, shavings or refuse of any kind and shall contain not over twenty-five percent of straw or other material acceptable for landscape use. Contractor shall submit to the local authority a statement as to the kind of disinfectants or chemicals, if any, that have been used in storage of, or otherwise in connection with the manure.

(2) Before delivery of any manure is made under this contract, a sample of the manure proposed for use shall be submitted to the local authority for approval. The sample shall be approximately one cubic foot in volume and shall be submitted in a suitable metal container. A further sample, not exceeding one cubic yard, may be required by the local authority to be delivered to the site to be stored there and protected until completion of the work.

(c) FERTILIZERS. (1) COMMERCIAL FERTILIZER. The commercial fertilizer shall be a complete fertilizer part of the elements of which are derived from organic sources, and containing in available form a minimum of ( )N-( )P-( )K.

(2) SHREDDED COW MANURE. Shredded cow manure shall be an approved standard brand.

(3) Other.

NOTE TO ARCHITECT:-

Give detailed specifications covering any other fertilizer required such as bone meal, cotton seed meal, fish scrap, etc.

(4) Before delivery of any fertilizer is made under this contract, the Contractor shall submit the manufacturer's statement of analysis of the fertilizer, indicating the proportions of organic and inorganic matter contained and the availability of the plant food. The fertilizer shall be delivered to the site in the original containers unopened and bearing a guaranteed analysis.

(d) HUMUS. (1) The humus required herein shall be a domestic product and shall be Reed Peat, Sedge Peat, Moss Peat, Reed Muck or Sedge Muck.

(2) Before delivery of any humus is made under this contract, a sample of the humus shall be submitted to the local authority for approval. The sample shall be submitted in a glass jar of quart size which shall be completely filled with the humus.

(e) LEAF MOLD. (1) Leaf mold shall have an organic content of not less than ( ) percent, and shall meet the approval of the local authority. It shall pass through a screen of ( ) inch mesh and shall weigh under ordinary conditions ( ) pounds to the cubic yard. It shall be clean and free from stones, sticks, roots, plants and other foreign substances and the Contractor shall inform the local authority as to the source from which the leaf mold is obtained.

(2) Before any leaf mold is delivered to the project site, a sample shall be submitted to the local authority for approval. This sample shall be submitted in a glass jar of quart size which shall be filled with leaf mold.

(f) ARSENATE OF LEAD. (1) Arsenate of lead shall be a commercial product of recent manufacture in dry powder form, and shall be of the following analysis:

Active ingredients, Lead Arsenate	96%
Inert ingredients	4%
	100%

Total arsenic expressed as Metallic Arsenic 19.56%
Arsenic in water soluble form expressed as Metallic Arsenic 0.50%

Arsenic when packed shall contain not over 0.75% water soluble arsenic oxide and at least 30% arsenic oxide.

(2) Before delivery of the arsenate of lead is made under this contract, the Contractor shall submit the manufacturer's statement of analysis.

(3) The arsenate of lead shall be delivered to the site in the original containers, unopened.

(g) WATER. (1) The Contractor shall furnish the water required for the execution of all work including maintenance until all work under the contract has been completed. He may make arrangements for the supply of water with the (General Contractor) City Water Department or the Project Management, terms and conditions subject to the approval of the local authority.

(h) PLANT MATERIALS. (1) GENERAL. Plant materials shall conform to the requirements hereinafter given. No inspection or sealing of plant materials, as herein specified, shall be taken to change or modify these requirements in any way.

(2) NOMENCLATURE. Plant names used in the plant list conform to "Standardized Plant Names" by American Joint Committee on Horticultural Nomenclature, except in cases not covered therein. In these instances the custom of the nursery trade is followed.

(3) If variations in plant names from names accepted by "Standardized Plant Names", are used on the drawings, or by the nursery trade, they are given in parentheses in the plant list.

(4) (No substitutions will be allowed) No substitution will be allowed except the following:

.....for.....
.....for.....

When substitutions are made all requirements of the plant specified shall be met. The Contractor may elect any or all of the above substitutions but must supply the entire quantity required for any one kind of plant which he elects to substitute. Partial substitution of any one variety will not be allowed.

(5) QUALITY. (i) Plants shall be sound, healthy, vigorous, free from plant diseases, insect pests or their eggs and shall have healthy normal root systems. Plants shall be nursery grown stock freshly dug. Heeled-in stock or stock from cold storage shall not be accepted, except as otherwise specified.

All plants shall have been grown under climatic conditions similar to those in the locality of the project site or shall have been acclimated to the conditions of the locality for at least 2 years unless otherwise approved by the local authority.

Plants shall not be pruned prior to delivery except as authorized by the local authority.

All plants shall have been transplanted or root pruned at least once in the past three years.

Inspection for the required root system will be made upon delivery of the plants to the site.

Unless otherwise specified street trees shall be free of branches up to (seven) feet, with a single leader well branched, and with reasonably straight stems.

If a plant is well grown with single stem, well shaped and bushy and has sufficient well spaced side branches to give it weight equal to one grown with the number of canes specified in the plant list, it may be an acceptable plant.

In the case of trees, clumps shall be trees with three or more stems from the ground; in the case of shrubs, clumps indicate 8 or more stems or "canes" from the ground.

(6) COLLECTED PLANTS. The following plants may be collected material:

Any collected plant which has not been pruned or transplanted one growing season prior to planting under this contract shall have a ball of earth at least one-sixth greater in diameter than specified in the Plant List.

(7). (No collected plant material will be accepted).

(8) MEASUREMENTS. (1) The height and spread of all plants and the height of tree trunks to foliage line shall be measured with the branches in their normal position. The caliper of all trees shall be measured one foot above the surface of the ground. The lower branches of a tree need not be the height as specified for the foliage line, but they shall be of such height that the required foliage line may be obtained by pruning. No pruning of branches to obtain the desired effect shall be done before delivery to the site unless otherwise authorized by the local authority. Where caliper or other dimensions of any plant materials are omitted from the plant list, it shall be understood that these plant materials shall be normal stock for the type listed.

The Contractor may supply plants larger in size than specified under "Plant Lists" if approved by the local authority, in which case the diameter of ball or spread of roots shall be increased proportionately as directed by the local authority.

(9) SHAPE AND FORM. (1) Plant material shall be symmetrical, typical for the variety and species, and shall conform to the measurements specified in the plant list.

Plants used where symmetry is required, shall be matched as nearly as possible.

(10) INSPECTION. The Contractor shall be responsible for all inspection of plant material that may be required by state and/or federal authorities, and he shall secure and have executed any permits and/or certificates that may be necessary.

All plants shall be subject to the approval of and be inspected by the local authority at any place and at any time and before any plant is dug. Plants shall be inspected for size and quality only; variety, color, and all other requirements being the responsibility of the Contractor.

Prior to inspection, the Contractor shall select and tag with identification numbers all trees, specimen plants, and three samples typical of each kind and size of all other plant materials proposed for use. He shall also submit an inventory which indicates the quantities of materials to be inspected together with their specified sizes and locations. The Contractor or his authorized representative shall be present during inspection.

Before general planting operations have begun, the tagged samples shall be delivered to the site and planted in locations approved by the local authority. These tagged samples shall be used as standards for comparison with the plants furnished for the work.

(11) DIGGING AND MOVING. Plants marked "BB" on the plant list, shall be adequately balled and burlapped with balls of the diameter specified and of sufficient depth to incorporate all the roots. When required by the local authority, balls shall be placed on "platforms" for moving. No plant

shall be accepted when the ball of earth surrounding its roots has been cracked or broken preparatory to or during the process of planting, or when the burlap, staves, ropes or platform required in connection with its use have been removed. All balled and burlapped plants that cannot be planted immediately on delivery shall be set on the ground and the balls well covered with soil, manure or other acceptable material.

Plants marked "P" on the plant list shall be dug with bare roots which immediately after digging shall be "puddled" in mud of sufficient density so that when dry, it will adhere to the roots. The roots shall not be cut within the minimum spread specified in the plant list under "Diameter" or "Spread".

Plants shall be so handled that the roots are protected at all times, and if delivery is made in open vehicles the entire load shall be suitably covered. Coverings shall not be so tight as to cause heating.

Plants marked "P" on the plant list shall be planted upon delivery or immediately heeled-in.

In heeling-in, all bundles must be opened and the plants separated before the roots are covered, and care must be taken so that no air pockets remain among the roots.

Plants shall be properly marked for identification and for checking, each bundle of plants and all separate plants shall have legible, weather-proof labels securely attached hereto before delivery to the site.

No plant shall be so bound with rope or wire at any time as to damage the bark, break branches or destroy its natural shape.

PLANT LIST

TREES:

NOTES---1. Height shall be height in feet as shown.
2. Spread shall be minimum spread in feet.
3. Height of trunk to foliage line shall be height in feet.
4. Caliper of trunk shall be caliper in inches, one foot above ground as shown.
5. BB indicates balled and burlapped.
P indicates bare roots puddled.
6. Diameter of ball or spread of roots shall be minimum.

Scientific name Common name	Height of tree	Spread of tree	Height of trunk	Caliper BB P	Diameter Spread

NOTE TO ARCHITECT: It is suggested that the Horticultural Standards of the American Association of Nurserymen be followed except that trees are to be calipered one foot above the ground.

PLANT LIST (continued):

SHRUBS:

NOTES- - - - 1. Height shall be height in feet as shown.
2. Spread shall be minimum spread in feet.
3. Number of canes per plant shall be the minimum number.
4. BB indicates balled and burlapped.
P indicates bare roots puddled.
5. Diameter of ball or spread of roots in inches shall be minimum.

Scientific name Common name	Height of shrub	Spread of shrub	No. of canes	BB P	Diameter Spread

NOTE TO ARCHITECT: It is suggested that the Horticultural Standards of the American Association of Nurserymen be followed.

PLANT LIST (continued):

VINES:

NOTES- - - - 1. Age or size shall be as shown.
2. Number of runners shall be minimum.
3. Length of runners in feet shall be minimum.
4. BB indicates balled and burlapped.
P indicates bare roots puddled.
5. Diameter of ball or spread of roots in inches shall be minimum.

Scientific name Common name	Age or size	Number of runners	Length of runners BB P	Diameter Spread

NOTE TO ARCHITECT: It is suggested that the Horticultural Standards of the American Association of Nurserymen be followed.

PLANT LIST (continued):

GROUND COVER PLANTS:

NOTES- - - - 1. Age or size shall be as shown.
2. Number of stems shall be minimum.
3. Length of stems shall be minimum.
4. BB indicates balled and burlapped.
P indicates bare roots puddled.
Pot indicates potted.
5. Diameter of ball, spread of roots, or size of pot in inches shall be minimum.

Scientific name Common name	Age or size	No. of Stems	Length of Stems	BB P Pot	Diameter Spread Size

NOTE TO ARCHITECT: It is suggested that the Horticultural Standards of the American Association of Nurserymen be followed.

PLANT LIST (continued):

HEDGES:

NOTES- - - - 1. Natural height shall be height in feet as shown.
2. Natural spread shall be minimum spread in feet as shown.
3. Clipped height shall be height in feet.
4. Clipped spread shall be spread in feet.
5. Number of canes per plant shall be the minimum number.
6. BB indicates balled and burlapped.
P indicates bare roots puddled.
7. Diameter of ball or spread of roots in inches shall be minimum.

Scientific name Common name	Natural height	Natural spread	Clipped height	Clipped spread	No. of canes BB P	Diameter Spread

NOTE TO ARCHITECT: It is suggested that the Horticultural Standards of the American Association of Nurserymen be followed.

(i) LAWN MATERIALS. (1) LAWN SEED. Lawn seed mixture shall be composed of the following seeds mixed in the proportions by weight and testing the minimum percentages of purity and germination as indicated for same:

Scientific Name	Common Name	Proportion by Weight

Percent of Purity	Percent of Germination

All seed shall be fresh and clean and shall be "new-crop" seed. All seed shall be delivered in the original packages, unopened, which shall bear a guaranteed analysis by a recognized authority. The seed shall be mixed by approved methods on the site or as otherwise directed by the local authority.

NOTE TO ARCHITECT:

Give scientific and common name of grasses and/or stolons to be furnished.

(2) STOLONS (roots): Roots shall be healthy and vigorous, freshly dug and not allowed to freeze, dry out or be otherwise damaged, and shall be free from weeds or other foreign matter. The Contractor shall submit samples of such stolons or roots to the local authority for its approval. They shall be covered with (canvas) when out of the ground, but not so tightly as to cause heating and shall be kept moist, cool and shaded until planted. They shall be measured after being shaken down on the trucks in transit.

(3) SOD. All sod shall be of good quality lawn grass, well rooted, free from weeds and unsuitable grasses. The Contractor shall submit a sample ( ) feet by ( ) feet to the local authority and shall state where the sod is located and the amount which is available. It shall be cut in strips not less than (1½) inches thick and (12) inches in width by (3 to 4) feet long if delivered rolled or (18) inches long if delivered flat.

(j) MATERIALS FOR GUYING AND STAKING TREES. (1) GUY WIRES. Wire shall be pliable zinc-coated iron of (No. 12) and (No. 14) gauge as specified for use under planting operations.

(2) TURNBUCKLES. Turnbuckles for use with No. 12 gauge wire shall be zinc-coated and shall have (4½) inch lengthwise openings and in each end (5/16) inch diameter threaded openings fitted with screw eyes. Turnbuckles for use with 14 gauge wire shall be zinc-coated and shall have (3) inch lengthwise openings and in each end (3/16) inch diameter threaded openings fitted with screw eyes.

(3) ANCHORS. Anchors for holding guys shall be (2) inch by (4) inch solid lumber stakes (3) feet long (shall be at least (4) inch by (4) inch solid lumber dead men (4) feet long) or (3) foot lengths of iron pipe, as approved by the local authority.

(4) WOOD FLAGS. Wood flags to be fastened to guys shall be of sound lumber, painted white (3) inches wide, (12) inches long and of uniform thickness.

(5) HOSE. Hose used for covering wire shall be at least ½ inch rubber hose. Used hose is acceptable if approved by the local authority.

(6) STAKES. All stakes shall be of sound wood of uniform size not less than (2) inches by (2) inches in section or (2½) inches in diameter and not less than (9) feet long. For use in "Triple Staking with Top Braces" stakes shall be not less than (2) inches by (4) inches or (3) inches in diameter and not less than (10) feet long.

(7) BRACES. Braces for securing stakes shall be of sound wood not less than (1½) by (3) inches in section.

(8) BURLAP. Burlap strips for wrapping tree trunks shall be free from holes and tears, shall be at least (8) oz. and shall be not less than (6) inches nor more than (10) inches in width.

(k) OTHER MATERIALS.

NOTE TO ARCHITECT:

Give detailed specifications for any other material required under this contract such as drain tile, stepping stones, fences, retaining walls, walks, terraces, etc.

OBSTRUCTIONS BELOW GROUND SURFACES:

33-5 (a) The Contractor shall remove all obstructions necessary to the proper completion of the work.

(b) The contract is based upon the assumption that material to be excavated is earth. Earth shall be defined as being such material, including shale, rock, or other material, as can be removed and handled by hand methods. If excavation of other material becomes necessary, or if the quantities of earth excavation are increased or decreased by changes in the work by the local authority, the differences in cost thereof will be adjusted, based upon unit prices as provided. When other material than earth is encountered, the Contractor shall not excavate, but proceed in accordance with Article....of the Contract, Form No.____.

(c) In case any solid ledge or ledges of rock, stones, or other obstructions are encountered so that the material to be excavated is beyond the scope of "earth" excavation as defined herein, the cubic contents of same shall be measured before they are broken and the removal of same will be adjusted in the Contract Price in accordance with Unit Prices as provided.

(d) (All measurements of rock or other obstructions shall be made at any time and by any method directed by the local authority. For purposes of measurement the rock or other obstructions shall be stripped of all overlying material and entirely exposed to view. The cubic contents shall then be measured within the area to the depth specified for that particular area. No allowance will be made for additional rock or other obstruction removed, for the convenience of the Contractor, beyond the limits herein specified.)

(e) Blasting will be permitted only when the local authority approves the methods to be used and gives its written consent. In excavating rock or other obstructions, by blasting, special care shall be exercised to avoid excess noise or vibration. Matresses shall be used where necessary to prevent damage from flying fragments. Drill holes shall not be carried any further than to remove the rock or other obstruction desired. The care, handling, and storing of explosives shall conform strictly to all regulations. The Contractor shall assume full responsibility for any damage that may result from blasting.

GRADES:

33-6 (a) The General Contractor is (others are) required to establish the subgrade of the site prior to the commencement of the landscape work, as hereinbefore specified. The Contractor shall be responsible for the preservation of all established subgrades after his acceptance of them. By finished grade is meant the proposed final grade shown on the drawings or specified. Grades not otherwise indicated shall be of uniform levels or slopes between points where elevations are given or between such points and existing finished grades.

EXISTING TREES:

33-7 (a) The General Contractor is (others are) required to prepare the existing ground about all existing trees to remain, within a radius equal to the spread of the branches (but in no case less than ....feet) and to grade such areas in the following manner: In surfaced areas, to complete all additional filling and surfacing necessary to bring such prepared ground to finished grade or above as required; in lawn and planted areas, if below the required subgrade, to do all necessary filling to bring the prepared ground to the subgrade, and if at or above the required subgrade to prepare the ground but to place no fill over the area.

(b) The Contractor shall accept the condition of the existing trees as he finds them. Any boxing or other protection shall be removed only when the possibility of any damage from building or other construction operations is past or when landscape operations about these trees are started. The Contractor shall do whatever additional work is required on these trees as called for in this specification.

(c) Where any portion of the prepared ground about the existing trees is at or above the required subgrade, it shall be sloped or warped from the crown of the tree to the surrounding subgrade without any abrupt change in grade or disturbance of tree roots. A layer of topsoil shall be spread over all prepared or filled areas. This layer of topsoil shall have a minimum depth of one inch and shall vary in depth as is necessary to properly slope or warp the surface to meet the surrounding finished grade, allowing for settling. Where the existing grade at the base of the tree trunk is (6) inches or more below the required finished grade, a collar of (3/4) inch broken stone shall be extended from the tree trunk in a ring (18) inches wide

from the required subgrade to the finished grade. Topsoil shall be spread only to the stone collar, and no soil shall be placed on the stone or against the trunk. These areas when completed as specified above shall be raked to a smooth, even surface and prepared for other operations as indicated on the drawings.

(d) PRUNING. All existing trees which are to remain shall be pruned in accordance with standard modern practice and by experienced men to the satisfaction of the local authority.

(e) FEEDING, SPRAYING, BRACING, CAVITY WORK.

NOTE TO ARCHITECT:

It is desirable that all existing trees which are to remain be given careful examination and detailed specifications be written covering all requirements necessary to properly rehabilitate and preserve them.

PLANTING OPERATIONS:

33-8 (a) GENERAL. (1) The subgrade of all plant areas is required to be established ( ) inches below finished grade by the General Contractor (others). By plant areas is meant the pits for individual trees, and shrubs, shrub beds, ground cover beds, hedge trenches, vine pockets, etc., shown on the drawings or specified. The depth of plant areas shall be understood to be the depth below the finished grade.

(2) No plant areas shall be dug or prepared until their locations and/or outlines have been staked on the ground and approved by the local authority. All plant areas when dug shall have vertical sides and crowned bottoms, or as directed. Pits for plants shall be circular in outline, unless otherwise specified or otherwise shown on the drawings. Excess soil from the plant areas shall be removed from the site, or shall be disposed of as otherwise specified or as directed by the local authority.

(3) On the bottoms of all plant areas shall be added and lightly tamped a layer of topsoil at least ( ) inch thick or as much more as is necessary so that the ball or roots will rest thereon when the plant is set to the required grade.

(4) All plants shall be set so that when settled they will bear the same relation to the required grade as they bore to the natural grade before being transplanted (unless otherwise specified). Each plant shall be planted in topsoil in the center of the pit unless otherwise specified or shown on the drawings. The Contractor shall make adjustments of positions of plants where necessary as directed by the local authority.

Balled and burlapped plants shall have topsoil tamped under the edges of the balls. All (burlap) ropes, staves, etc. shall be taken off the sides and tops of balls and removed from the pit before it is filled in and no burlap shall be pulled out from under the balls.

Roots of bare-rooted plants shall not be matted together, but shall be arranged in their natural position and have topsoil worked in among them. No soil in a frozen or muddy condition shall be used for backfilling. No filling shall be permitted around trunks or stems. All broken or frayed roots shall be properly cut off.

In the event plant areas or pits are prepared and backfilled with topsoil to grade prior to commencement of lawn preparation, it shall be the duty of the Contractor to so mark the areas or pits that when the work of planting proceeds after lawns are established, they can be readily located.

(5) Banks shall be the Contractor's responsibility and where they occur in plant areas they shall be prepared as specified for plant areas. Surface of banks shall conform at all times to the required grades. The Contractor shall provide against washouts by methods approved by the local authority.

(6) In the event that "Planting Operations" are executed after "Lawn Operations" have been accomplished, the attention of the Contractor is called to the paragraph "Protection". (Section 33-12).

(b) PLANTING SEASON. The planting of plant material shall be done only within the season extending from. . . .to. . . .., except at such times herein as the local authority may deem inadvisable because of weather or other conditions. In the event that seasonal and other conditions permit, and upon approval

by the local authority, planting may start earlier or continue later than the dates here specified. Planting shall be started during the first planting season after the site or any part thereof has been released to the Contractor. The preparation of plant areas may proceed at any time after the site or any part thereof has been released.

(c) TREES. (1) PLANTING. All trees shall be planted in pits at least (2) feet greater in diameter than their ball of earth or spread of roots. The depth of the pits shall be at least (2) feet, and as much deeper as is necessary to accommodate the ball or roots and to permit the required preparation of the bottom of the pit so that when the tree is settled in the pit it will not be necessary to raise or lower the tree to bring it to the required grade. When the tree has been properly set and inspected by the local authority the pit shall be backfilled with topsoil (topsoil mixture as specified) which shall be thoroughly tamped and watered during and after backfilling. Enough topsoil shall be used to bring the surface, when settled, to the required grade. A mound of soil shall be formed around the edge of each tree pit in order to form a shallow saucer (as shown on Drawing No.).

(2) TREES IN SURFACED AREAS. In the installation of surfaced areas under the General Contract (by others) it is required that certain spaces for tree planting, located as shown on the drawings and of the dimensions shown thereon, be left unsurfaced. If trees are planted in surfaced areas after the surfacing has been installed and if the size of the unsurfaced area is less than the diameter of the ball or the spread of the roots as specified plus (2) feet, the size of the tree pit shall coincide with the size of the unsurfaced space.

(3) The required grade for trees in surfaced areas is the finished grade of the surfaced area and the entire unsurfaced space shall be brought to the finished grade with topsoil (and mulch).

(4) RELOCATION OF TREES. In the event that rock or underground construction work or obstructions are encountered in the excavation of tree pits, alternate locations may be selected by the local authority. If the necessary relocations of trees affect a formal design or arrangement of planting, the rearrangement shall comply as nearly as possible to the formality of the original design.

(5) REMOVAL OF ROCK. Where rock is encountered in the excavation of tree pits and when the locations thereof are to remain unchanged, the rock shall be removed to a depth of (2) feet below the finished grade, but in no case less than (6) inches below the ball or roots when the tree is properly set at the required grade. Sufficient soil, taken from the excavation of plant areas, or other acceptable soil, shall be spread over the bottom of these pits and compacted to a level which will properly accommodate the ball or roots after the necessary preparation has been done. (See Par. 33-5, OBSTRUCTIONS BELOW GROUND SURFACES, as to procedure).

(6) DRAINAGE. FRENCH DRAINS. All trees marked on the drawings "to be drained" shall have a drainage system constructed as follows: A ditch at least ( ) inches wide shall be made from the bottom of the tree hole toward the point indicated on the plan. It shall run at a slope of at least (one) inch to (10) feet and shall extend out from the hole to a suitable outlet as directed by the local authority. A (6) inch layer of (2) inch broken stone shall be placed on the

bottom of the ditch and well covered with a (1) inch layer of straw. The ditch shall then be refilled with dirt and thoroughly tamped.

(7) TILE DRAINS. The landscape contractor shall furnish and install all drainage for trees marked on the drawings "to be drained" in the locations and to the grades shown. Trenches ( ) inches wide and in depth nowhere less than ( ) inches below the proposed finished grade shall be dug with vertical sides and smooth bottom. Tile shall be laid true to line and grade. Joints shall meet to within (1/8) inch and shall be covered with a strip of felt or tar paper of adequate size to prevent ingress of soil. A porous layer of acceptable backfill ( ) inches in depth shall be placed over the tile line and tamped and shall nowhere be closer than ( ) inches to the finished grade. The remaining backfill shall be laid in layers and each layer shall be well tamped.

(8) GUYING AND STAKING. Trees shall be guyed or staked immediately after they have been planted. Details for guying and staking are shown on the drawings.

(9) GUYING. All trees ($2\frac{1}{2}$) inches and over in caliper in lawn and planted areas, except those within (4) feet of surfaced areas and walks and those between walks and curbs, shall be guyed in accordance with the following: Trees ($2\frac{1}{2}$ to 4) inches in caliper shall be guyed with No. (14) gauge wire and turnbuckles as specified. Trees (4) inches and over in caliper shall be guyed with No. (12) gauge wire and turnbuckles as specified. Each tree shall have (3) guys of (2) strands of wire each. Guys shall not come into direct contract with the bark of the tree at any place but shall be covered with pieces of rubber hose as necessary to prevent contact with the bark of the tree. Guys shall be located in such positions that they do not pull crotches apart.

The height from the ground at which guys shall be attached to the tree shall be not less than (1½) times the distance from the anchor to the center-line of the tree.

Guys shall be fastened to stakes or dead men as specified. Stakes shall not be driven into the ground where utility lines are within (4) feet of finished grade, but dead men shall be placed by digging holes for them. Top of stakes shall be at least (2) inches below finished grade and at least (2) feet outside the edge of the tree pit.

A wood flag shall be hung on each guy in a manner and in a position acceptable to the local authority. Flags may be omitted from guys located entirely within shrub beds.

(10) STAKING. All trees in surfaced areas; all trees within (4) feet of surfaced areas or walks; all trees between walks and curbs; and all trees less than 2½ inch caliper in lawn and planted areas shall be staked in accordance with the following:

(11) TRIPLE STAKING WITH TOP BRACES. Trees (5) inches and over in caliper shall be supported in an upright position by stakes, three to a tree. Stakes at the top shall be (1½) feet from the center line of the tree and at finished grade shall be (3) feet from the center line thereof. Stakes shall be equally spaced about the tree, shall be set at least (3) feet in the ground and shall be securely fastened at the top by horizontal braces (as shown). The tree shall be guyed to the center of each cross brace with No. (12) gauge wire, incased in rubber hose as necessary to prevent contact with the bark. Wires shall be twisted so that a double strand is carried around the brace, drawn taut, and securely fastened.

(12) TRIPLE STAKING WITHOUT TOP BRACES. Trees (3) inches to (5) inches in caliper shall be supported in an upright position by stakes three to each tree. The stakes shall be equally spaced about the tree approximately (12) inches from the trunk, and in the case of balled and burlapped trees at least (6) inches inside the perimeter of the ball. Stakes shall be driven vertically into the ground to a depth of at least (3) feet, and shall not be twisted or pulled in such a manner as to cause injury to ball or roots. The tree shall be guyed to each stake near the top with two strands of No. (12) gauge wire. Guys shall be incased in hose as necessary to prevent contact with the bark, and shall be drawn taut and be securely fastened to the stakes.

(13) DOUBLE-STAKING. Trees (2) inches to (3) inches in caliper shall be supported in an upright position by stakes, two to each tree. Stakes shall be equally spaced about the tree and shall be driven at least (3) feet into the ground within (12) inches of the trunk. Stakes shall be driven vertically, and not twisted or pulled at any time in such a manner as to cause injury to ball or roots. The tree shall be guyed to each stake near the top by means of two strands of No. (14) gauge wire incased in rubber hose as necessary to prevent contact with the bark. Guys shall be drawn taut and securely fastened to the stakes.

(14) SINGLE-STAKING. In lawn, planted, or surfaced areas, trees (8) feet or more in height but less than (2) inches in caliper shall be supported in an upright position by stakes, one to each tree. Stakes shall be driven at least (3) feet into the ground within (12) inches of the trunk of the tree.

Stakes shall be driven vertically, and not twisted or pulled at any time in such a manner as to cause injury to ball or roots. The tree shall be guyed near the top of the stake by means of two strands of No. (14) gauge wire incased in rubber hose bent in a figure eight (8) the two loops of which shall enclose the trunk and stakes respectively and which shall be fastened securely.

(15) (Trees of sizes less than those specified above need not be staked, excepting ( ) which shall be staked with stakes (8) feet long in the manner specified under single-staking.)

(16) WRAPPING. The trunks of all trees (2) inches or more in caliper, (except..... .....) shall be wrapped spirally with burlap to the height of the second branches or as directed, and tied with a suitable cord. Wrapping shall be done immediately after planting, in a neat, snug manner satisfactory to the local authority.

(d) SHRUBS. (1) PITS. All shrubs shall be planted in individual pits. Shrubs delivered balled and burlapped shall be planted in pits at least (2) feet greater in diameter than the ball of earth. Shrubs delivered with bare roots shall be planted in pits (one) foot greater than the spread of the roots. The depth of the pits shall be at least (one) foot and as much deeper as is necessary to permit the required preparation of the bottom of the pit and to accommodate the ball or roots when the plant is set to the required grade. After setting the shrub in the center of the pit, the pit shall be filled to the required grade with topsoil and thoroughly settled by tamping and watering. A mound of earth shall be formed around each plant so as to produce a shallow saucer.

If the individual pits are arranged in a group, the area between the pits shall be filled to the required grade with clean soil from the excavation of plant areas or with other acceptable soil.

After filling has been completed, and prior to mulching, the soil between shrub pits shall be cultivated to a depth of (6) inches, neatly raked and edged in a line and in a manner acceptable to the local authority. These areas shall not be edged nearer than (2) feet to any shrub therein, except where the width of the area is required to be less than (4) feet; in this case, shrubs shall be in the center thereof.

(2) SHRUB BEDS. All shrub beds (unless otherwise indicated) shall be dug and prepared prior to planting and shall have a minimum depth of (one) foot. Beds shall be filled to the required grade with topsoil (topsoil mixture as specified). Shrubs shall be set so as to allow sufficient space for the proper placing of roots or ball and so as to allow sufficient depth to properly set the crown of the plant at the finished surface of the bed. Topsoil shall be backfilled about the ball or roots and thoroughly settled by watering. A mound of earth shall be formed around each shrub so as to produce a shallow saucer. The soil between shrubs in shrub beds shall be cultivated to a depth of (2) inches prior to mulching, and the beds edged in a line and in a manner acceptable to the local authority. Arrangement of shrubs must meet with the approval of the local authority. Shrubs shall not be planted nearer than (2) feet to the edge of beds, except where beds are less than (4) feet in width; in this case the shrubs shall be planted in the center of the beds.)

(e) HEDGES. (1) SINGLE ROW. All hedge plants shall be planted in trenches in the locations shown on the drawings and, except where otherwise indicated thereon, shall be planted in single rows in the center of the trenches.

Trenches shall be (one) foot wider than the spread of roots or diameter of the

ball. The depth of trenches in lawn areas shall be at least (one) foot and as much deeper as is necessary to permit the required preparation of the bottom of the pit and to accommodate the ball or roots. Trenches in or abutting surfaced areas shall be (six) inches deeper than those in lawn areas, and in each case sufficiently deep to permit the plants to be set to the finished grade. The hedge plants shall be evenly spaced and planted in the same manner as specified for shrubs.

NOTE TO ARCHITECT:-

It is suggested that certain hedge plants such as Ligustrum form a more dense hedge if planted somewhat below the depth grown at the nursery and the soil filled about the stems to finished grade.

(2) TWO OR MORE ROWS. Trenches for hedges to be planted in two or more rows, as indicated on the drawings shall be prepared (one) foot wider than the total spread of roots. The rows shall be ( ) inches apart equally distant from the center line of the trench.

The depth of the trench and manner of planting shall be as specified for single rows.

(f) VINES. All vines (except those planted in prepared shrub beds) shall be planted in pits at least (2) feet in diameter and as much wider as is necessary to make them (one) foot wider than the ball of earth or spread of roots. The depth of the pit and manner of planting shall be the same as specified for shrubs in individual pits. Vines in prepared shrub beds shall be planted in like manner to shrubs in shrub beds. Center of vine when planted shall be (6) inches from wall of building. Vines shall be supported on or against walls and fences, or where indicated, to the height of the vine when planted, in a manner acceptable to the local authority.

(g) GROUND-COVER. (1) Beds for ground-cover plants shall have a minimum depth of (6) inches. After preparation of the subgrade as specified in "Planting Operations" the bed shall be filled with topsoil (topsoil mixture as specified) and lightly compacted. The finished surface, compacted and settled, shall conform generally at all points to the required grade.

(All ground cover plants shall be planted in pits (8) inches in depth and in the manner specified for shrubs in pits.)

Ground cover plants shall be evenly spaced so as to produce a uniform effect. Ground cover plants shall be watered immediately after being planted.

(h) TENANT PLANTING AREAS. Location, size and shape of tenant planting areas shall be as shown on the plans and when staked out shall be approved by the local authority.

These areas are required to be left (6) inches below the finished grade by the General Contractor (Others). This Contractor shall loosen the subgrade soil to a depth of (6) inches and remove all sticks, stones, and other objectionable material. The areas shall then be filled with topsoil (and humus or well rotted manure thoroughly mixed in the proportion ( ) parts of topsoil to ( ) parts of ( ) by volume) and lightly compacted to the required grade. The area shall then be raked to a smooth and even surface and left in a condition satisfactory to the local authority.

(i) PRUNING. (1) All new trees, shrubs, vines and ground cover plants shall be pruned in accordance with the instruction of the local authority. All cuts over one half inch in diameter shall be treated with an approved tree paint. Plants shall not be pruned prior to delivery except as authorized by the local authority.

(2) Hedges shall be clipped to conform to the height and spread specified in the plant list.

(j) MULCHING. (1) After the work of planting has been completed and approved by the local authority, a layer of manure (humus) ( ) inches thick shall be placed on the finished surface about all plants, (except). The mulch around isolated plants shall cover the entire area of the pit. In play and surfaced areas the mulch shall extend to the adjacent edges of the surfacing. All shrub beds including groups of shrubs planted in pits and all hedge trenches shall be completely covered with the mulch. If so directed by the local authority, the mulch shall be lightly incorporated with the soil during cultivation.

LAWN OPERATIONS

33-9 (a) GENERAL. (1) Lawn operations shall include all operations specified in this section, and the required lawn maintenance. (See Section 33-13)

(2) The ground area of the entire site shall be planted in lawn unless shown by the plans to be covered by plant materials; buildings or other structures; walks, roads or other surfaced areas; or unless required to be otherwise treated.

(b) PLANTING SEASONS. (1) The sowing of seed (the planting of stolons, roots) shall be done only within the seasons extending from.....to.....and from.....to ....., except at such times therein as the local authority may deem inadvisable because of weather or other conditions, and except as otherwise here specified. In the event that seasonal and other conditions permit, and upon approval of the local authority, seeding (or planting) may start earlier and/or be continued later than specified dates. The sowing of seed (planting of stolons or roots) shall be started on all areas during the first planting season after the areas have been released to the Contractor for lawn operations.

(2) The preparation of lawn areas shall not start until immediately preceding the season for seeding (planting), except that topsoil may be spread at the option of the Contractor, provided that it be thoroughly loosened to its full depth and brought to a friable, mellow condition before the seed (planting) bed if further prepared.

(c) PREPARATION OF SUBGRADE SOIL. (1) The subgrade of all lawn areas is required to be established ( ) inches below the finished grade by the General Contractor (others). When subgrades are verified by the Contractor and approved by the local authority, subgrade soil shall be (loosened to a depth of (4) inches and shall be) graded to remove all ridges and depressions. The subgrade must be parallel to the finished grade. All stones over (2) inches in any dimension, sticks, rubbish, or debris must be removed.

NOTE TO ARCHITECT:

Loosening of subgrade may be omitted in the case of sandy subsoils or where clay has been spread over the surface.

(2) After the preparation of the subgrade soil for lawn areas is finished, no heavy objects, except lawn rollers, shall be taken over these areas at any time unless they are adequately protected in a manner approved by the local authority.

(d) PREPARATION OF SEED BED. (1) After the subgrade soil has been prepared as specified above, topsoil shall be spread evenly over the surface, by hand or other approved method, and the area then rolled with a two hundred pound roller. No topsoil shall be spread in a frozen or muddy condition. The surface when finished and settled shall conform to finished grade and shall be free from hollows or other inequalities and from stones, sticks and other debris, and shall be satisfactory to the local authority.

(2) The commercial fertilizer shall be applied at the rate of (15) pounds to 1,000 square feet and thoroughly incorporated in the top (2) inches of the surface. Application shall be made at least (2) days before the seed is to be sown and the area thoroughly watered unless same is accomplished by rainfall. The area shall then be lightly raked until the surface of the finished grade is smooth, loose, and pulverized.

NOTE TO ARCHITECT:

If topsoil is deficient in organic matter humus may be spread uniformly over the area one inch thick. At this time the commercial fertilizer may be applied and the humus and fertilizer thoroughly intermixed with the topsoil. If the analysis of the topsoil indicates an excess of acidity 50 pounds of ground limestone or its equivalent of calcium oxide (agricultural lime) per 1000 square feet may be included with the above.

(3) (After the topsoil has been brought to finished grade as specified arsenate of lead shall be applied at the rate of five pounds of arsenate of lead per thousand square feet, mixed and spread evenly and scratched in with a short toothed rake to a depth of not more than one half inch. Seeding shall not be done within an interval of two days after the arsenate of lead is applied.)

(e) SOWING OF SEED. (1) Lawn seed shall be sown evenly at the rate of (6) pounds to 1,000 square feet of lawn area and lightly raked into the surface. The area shall then be lightly rolled once, and thoroughly watered with a fine spray. Care shall be taken that the seed is not washed out. All seeding shall be done by an experienced man, and may be done only at times approved by the local authority.

(2) No seeding shall be permitted after a rain unless the surface of the ground is loosened or when the velocity of the wind exceeds a gentle breeze or about five miles an hour. Extreme care shall be exercised during seeding and raking so that no change in grade is made and so that the seed is not raked from one spot to another.

(f) PLANTING STOLONS (roots). (1) GENERAL. Prior to planting stolons (roots) they shall be thoroughly separated so that there remain no tangled masses or clumps, and the stolons (roots) shall be cut or broken in a manner satisfactory to the local authority.

(2) PLANTING IN ROWS. After the subgrade soil has been prepared as specified topsoil shall be spread evenly over the surface, so that it will be (4) inches in depth when settled. A "scooter" or other approved device shall be used to mark of shallow furrows (12) inches apart into which the stolons (roots) shall be dropped using (1½) cu. yds. of stolons (roots) to every (1000) square feet of lawn area. They shall be firmed into the soil by the foot of the planter and covered with soil. The area shall then be lightly raked or dragged until the surface is smooth, and free from hollows or other inequalities and rolled with a (200) pound roller, to conform to finished grade. This work shall proceed only under favorable weather conditions.

(3) PLANTING BROADCAST. After the subgrade soil has been prepared as specified in (Section 33-9 (c)) topsoil shall be spread, by hand or other approved method, evenly over the surface so that it shall be (2) inches in depth when settled. The stolons (roots) shall be evenly distributed on the topsoil at the rate of (1½) cubic yds. of stolons (roots) to every (1000) square feet of lawn area. The stolons (roots) shall then be firmed into the soil by rolling with a (200) pound roller.

After the stolons (roots) have been so planted, a layer of topsoil shall be spread on the stolons (roots) so that it will be (2) inches in depth when settled and the area then rolled with a (200) pound roller. The area shall then be lightly raked until the surface of the finished grade is smooth, and free from hollows, ridges and other inequalities, conforming to the finished grades shown on the plans. This work shall proceed only under favorable weather conditions.

NOTE TO ARCHITECT:

The above suggestions are based on the use of Bermuda grass and are subject to modifications if other grasses are specified.

(g) SODDING. Sodding (where indicated) shall be done on a surface prepared as specified for subgrade soil and seed (planting) bed, except that thickness of sod shall be considered so that the finished sodded area shall conform to the finished grades. All soft spots and inequalities in line or grade shall be corrected before sodding is done. Sod shall be so laid that no voids occur between strips. Weed roots must be removed as sod is laid. Sod shall be tamped or rolled immediately after it is laid, and the finished surface shall be true to grade, and shall be smooth, even and equally firm at all points. Wheeling of sod over prepared sod bed shall be only over boards or planks. Well screened topsoil shall be lightly sprinkled over the sodded area and shall be raked to insure sealing sod joints. The sodded area shall then be thoroughly watered. Sodding shall be done only at such times as approved by the local authority.

(h) BANKS IN LAWN AREAS. (1) Establishing grass on banks in lawn areas shall be the responsibility of the Contractor. Seed, stolons (roots) or sod shall be used for this purpose as determined by the Contractor and the methods used shall be as specified in this section. Grades of banks when completed shall conform to finished grades.

(2) Protection of banks shall be the responsibility of the Contractor. Methods used for the prevention of washouts shall be approved by the local authority. Banks and other graded areas that have been washed out or damaged shall be repaired or renewed as often as necessary.

OTHER WORK:

33-10 (a) OTHER WORK.

NOTE TO ARCHITECT:

Give required methods and details of construction for all other work not covered in the foregoing. Specify the required use of all miscellaneous materials covered by (33-4 (k)).

CLEARING OF GROUND:

33-11 (a) Upon completion of the work the ground shall be cleared of all debris, of all superfluous materials and all equipment, which shall be entirely removed from the premises, to the satisfaction of the local authority.

PROTECTION:

33-12 (a) PLANTING. The Contractor shall protect all plant areas and plants against trespassing by tenants or others and from damage at all times. If any plants are injured, they shall be treated or replaced as required by the local authority. No work shall be executed in or over prepared plant areas or adjacent to planting without proper safeguards and protection.

(b) LAWNS. At all times adequate protection shall be provided for all lawn areas against trespassing by tenants or others during planting or other operations and damage of any kind. The moving of heavy equipment or materials over lawn areas shall be done on planks.

(c) OTHER WORK. All other work under the contract and the work and materials of other contractors shall be protected as required in the General Conditions.

MAINTENANCE:

33-13 (a) GENERAL: Maintenance as specified below shall immediately follow the accomplishment of planting operations as applied to any plant unit, the accomplishment of lawn operations as applied to any unit of lawn and the accomplishment of any other unit of work so specified, and shall continue on all work for a period of sixty days of growing weather, which, for the purpose of this contract, is defined as being sixty days after the close of the planting season as specified, during which the last planting operations or lawn operations were accomplished. No requirement of this specification shall be interpreted to relieve the Contractor of the responsibility of maintenance as outlined.

(b) PLANTING. Foliage where required shall be sprayed with water during the evening after sundown or otherwise, as directed by the local authority. All planting shall be kept in a healthy, growing condition by resetting or replacement of plants where necessary; by watering, weeding, cultivating, pruning, spraying, trimming, tightening of guys; and by performing any other necessary operations of maintenance.

(c) LAWNS. The contractor shall properly care for all lawn areas by watering, weeding, mowing, rolling, trimming and edging and by performing any other necessary operations of maintenance. All areas and spots that do not show a prompt "catch" shall be reseeded (replanted) at intervals of (10) days which shall continue until a good growth of grass is established over the entire lawn area (and all species sown have appeared in the lawn.) The methods pursued in the renewal or replacement of lawn areas shall be as specified under Lawn Operations.

(d) OTHER WORK. (1) All other work under the contract shall be properly maintained, and any damage thereto shall be promptly and properly repaired.

(2) All unplanted areas of the project site shall be kept free of weeds.

REPLACEMENT:

33-14 (a) At the conclusion of the maintenance period, a final inspection of the work will be made to determine the condition of plant material. All plant material not in a healthy, growing condition as determined by the local authority will be noted. The material so noted shall be removed from the site by the Contractor upon the direction of the local authority, and replaced by the Contractor during the following planting season with material of like kind and size and in a manner specified for the original planting at no cost to the local authority. A sum sufficient to cover the cost of such replacement will be retained by the local authority and paid the Contractor when replacement has been completed.

ACCEPTANCE:

33-15 (a) Upon the completion of all work, including maintenance, but exclusive of the replacement of plant material, the work will be accepted by the local authority. (At the option of the Contractor, the completed work including maintenance, but exclusive of the replacements of plant material, upon a single substantial area of approximately 3 acres, which area is possible of segregation from the remainder of the project, will be accepted by the local authority.)

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NOTE TO ARCHITECT:

"Unit Prices" should be requested in "Bid Form" for the various items of work required in this division.

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