

FROM BECHTEL 1ST ROUNDOUT PO & SPECS BOOK

Bechtel Corporation

Engineers—Constructors

Fifty Beale Street
San Francisco, California 94119



#7



March 25, 1968

Thorpe Insulation Co.
4780 Westway Avenue
Post Office Box 1477
Corpus Christi, Texas 78403

Attention: W. D. Leonard

Subject: Reynolds Metals Co.
Sherwin Plant Extension
Gregory, Texas
Subcontract 6165-1-M-44
Thermal Insulation

Gentlemen:

Enclosed are three (3) copies of the subject subcontract.

Please have all copies signed by an authorized person,
and return them to the attention of the undersigned for
further execution.

Very truly yours,
BECHTEL CORPORATION

Original signed by
GENE BORGOGNO

L. T. Tuttle
Subcontract Manager

GB/jh
Enclosures

003012



San Francisco Office
220 Bush Street
San Francisco
94119

BECHTEL CORPORATION

New York Office
485 Lexington Ave.
New York
10017

Los Angeles Office
4550 Seville Avenue
Vernon, California
90058

ENGINEERING FILE Page

SUBCONTRACT

Date March 19, 1968

Subcontractor: Thorpe Insulation Co.
4780 Westway Avenue
P.O. Box 1477
Corpus Christi, Texas 78403
(512) 882-1993

Contractor's Job No.: 6165-1
Subcontract No.: 6165-1-M-44
Issuing Office: San Francisco
SF-8

c.c. 300.56

Owner: Reynolds Metals Co.
Location of Work: Gregory, Texas
Sherwin Plant Extension

BECHTEL CORPORATION, herein called "Contractor," and the above named Subcontractor, herein called Subcontractor hereby agree that the portion of the Principal Contract work below specified shall be performed by Subcontractor in accordance with the provisions hereinafter stated, including the General Terms and Conditions attached hereto, which by this reference are incorporated herein.

1. (a) Work to be performed:

Subcontractor shall furnish all supervision, labor, tools, delivery and unloading necessary to install THERMAL INSULATION to Piping, Vessels, Tanks and Equipment at the above project site. All work shall be in accordance with Material Requisition 6165-1-M-44, Revision 1, and the documents listed in paragraph 1(b) below, which documents are by this reference incorporated herein.

(b) Plans, drawings, specifications:

Bechtel Specification 6165-1-M-44-Revision 2;
Bechtel Drawing SKM-428
" " SKM-429
Bechtel Form M-977-F, "Insulating Tabulation"
Bechtel Form G-321-C, "Drawing & Data Requirements"
Exhibit Sheet "B" entitled "Drawings", attached hereto.

2. Items to be furnished by Contractor:

Technical direction.

3. Time of Commencement and Completion:

Subcontractor agrees to commence work within five days after given notice to proceed. The Subcontractor shall prosecute the work with due diligence, to complete all work in accordance with Contractor's Project Schedule. Exact scheduling, as well as performance of all work, shall be as approved by Contractor's Construction Superintendent.

003013

4. Compensation:

In full and complete consideration for all work performed under this subcontract, Contractor agrees to pay Subcontractor the firm lump sum of FIFTY NINE THOUSAND, THIRTY-SIX DOLLARS (\$59,036.00) which sum includes all taxes. Following is a break-down of the lump-sum figure:

Piping.	\$49,337.00
Vessel 26-T8. . .	5,654.00
3' Dia. Flashpot. .	899.00
5' " " . . .	1,012.00
Waterproof Coating	2,134.00
	<u>\$59,036.00</u>

Terms of Payment:

At the end of each calendar month, Contractor will pay Subcontractor 90% of the value of work performed and/or material delivered in that month. The balance will be paid not later than 35 days after receipt and approval of invoice and final completion and acceptance of the work performed under this subcontract.

5. Insurance Required:

Coverage

Workmen's Compensation
Public Liability
Property Damage
Automobile Public Liability
Automobile Property Damage

Amounts and Limits

Statutory Limits
\$100,000-300,000.
50,000.
100,000-300,000.
50,000.

☒ Bonds Required: None

7. Special Provisions:

- Refer to the attached Exhibit Sheet "A" entitled "Special Provisions", which by this reference is incorporated herein.
- Refer to the attached Exhibit Sheet "B" entitled "Drawings", which by this reference is incorporated herein.

IN WITNESS WHEREOF, the parties hereto have executed this Subcontract the day and year first above written.

REYNOLDS METALS CO

BY *L. M. Lehan*

CONTRACTOR:

BECHTEL CORPORATION

SUBCONTRACTOR:

THORPE INSULATION CO.

By _____

Title _____

By _____

Title _____



BECHTEL CORPORATION

SUBCONTRACT

GENERAL TERMS AND CONDITIONS

1. **CONTRACTUAL RELATIONSHIP:** In the performance of this Subcontract, Subcontractor shall operate as an independent Contractor and not as agent of Contractor. Subcontractor shall hold Contractor and Owner free and harmless from all liability, costs and charges arising out of or in connection with any act or representation of Subcontractor, its agents or employees.

2. **ITEMS TO BE FURNISHED BY SUBCONTRACTOR:** Subcontractor shall supply and furnish at the location where the work is to be performed all items, including labor, materials, and equipment, necessary for the complete and satisfactory performance of this subcontract, except such items as the Contractor in the Subcontract of which these terms and conditions are a part specifically agrees to supply or furnish to or for the use of Subcontractor.

3. **PERFORMANCE REQUIREMENTS:** Work shall be performed in accordance with the provisions of this Subcontract, and such specifications and drawings as may be referred to in this Subcontract.

Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown and mentioned in both. In case of conflict with the drawings, the specifications shall govern. In case of discrepancies the matter shall be submitted immediately to Contractor for determination.

4. **CHANGES IN SPECIFICATIONS AND DRAWINGS:** Contractor reserves the right by written notice to correct any errors or to make any changes in the specifications and/or drawings. If such changes cause a material increase or decrease in the cost of performing the work or the time of performance and written notice thereof is given to either party, within ten days after the giving of such notice of change, an equitable adjustment in the contract price and/or the time of performance shall be made. If the parties cannot agree upon such adjustment within ten days after receipt of such notice, the matter shall be submitted to arbitration as hereinafter provided, but the Subcontractor shall proceed immediately with the work as changed.

5. **EXTRA WORK:** Subcontractor shall not be entitled to any compensation in addition to that specified on the face hereof for the performance of any work not required under this Subcontract, unless, prior to the performance of such work, it shall have received from Contractor written authorization to perform such work and additional compensation shall have been agreed upon in writing; provided, however, that in the event work is being performed as provided in Article 4, this article does not apply thereto.

6. **INSPECTION AND REJECTION OF MATERIALS AND WORKMANSHIP:** All materials and workmanship furnished or performed by Subcontractor shall be subject to final inspection, tests and acceptance by Contractor and Owner upon completion of all Subcontract work and whether or not previously paid for by Contractor. At any and all proper times during manufacture or performance of the work, all materials and workmanship furnished or performed by Subcontractor shall be subject to inspection, tests and approval by inspectors of the Contractor, or Owner, at any and all places where such manufacture or performance shall be carried on. Failure of such inspectors to make inspection or test or to discover defective workmanship or material shall not prejudice the rights of Contractor or Owner on final inspection and test. If facilities of Contractor are not available, Subcontractor shall furnish, at its expense, such facilities as may be necessary for the making of such inspection.

If upon any such inspection or test any material or workmanship shall be found to be defective or not to conform to the requirements therefor, it shall be promptly rejected and the Subcontractor shall be notified thereof. Subcontractor, at its own expense, shall promptly correct workmanship which does not comply with such requirements by making the same comply therewith and shall promptly replace any material or equipment (except such as may have been furnished by Contractor) which does not conform to such requirements. If Subcontractor shall fail to replace or correct rejected material or workmanship promptly, Contractor, at its option may replace or correct the same and all costs and expenses of Contractor in connection therewith shall be borne by Subcontractor.

7. **TIME OF PERFORMANCE:** Time is of the essence of this Subcontract and all actions taken by the parties hereto shall be taken to the end that the performance of this Subcontract shall be fully expedited. Subcontractor shall indemnify and hold harmless Contractor from and against any penalty or liability incurred by Contractor to Owner because of Subcontractor's failure to perform the work within the time agreed upon.

8. **EXTENSION OF TIME-SUBCONTRACTOR'S WAIVER OF DAMAGES FOR DELAY:** In case of any delay caused by Contractor or the Owner or any delay which is beyond the reasonable control of Subcontractor, the cause of which was not reasonably ascertainable by Subcontractor at the time this Subcontract was entered into, written notice thereof and of the anticipated results shall be given promptly to Contractor by Subcontractor. Failure to give such written notice promptly shall be deemed sufficient reason for a denial of an extension of time by Contractor. Contractor shall notify Subcontractor promptly, if, in its opinion, the cause of delay specified is such as not to entitle Subcontractor to an extension of time. After such cause of delay has ceased to exist, Subcontractor shall file with Contractor a statement in writing, of the actual delay resulting from such cause. If, in the opinion of Contractor, the cause of delay was beyond the reasonable control of Subcontractor and was not reasonably ascertainable by Subcontractor at the time this Subcontract was entered into, the duration of delay shall be determined by Contractor and the time of performance of the work, the performance of which has been delayed thereby, shall be extended, in writing, by Contractor.

9. **ORDER OF PERFORMANCE OF WORK:** Contractor represents that it, the Owner and other contractors and subcontractors may be working at the site of the work during the performance of this Subcontract. Contractor reserves the right to direct the Subcontractor to schedule the order of performance of the Subcontract work in such manner as not unreasonably to interfere with the performance of work by Contractor, the Owner and other contractors or subcontractors.

10. **REMOVAL OF DEBRIS AND WASTE MATERIAL:** During performance of the work under this Subcontract and upon termination or completion thereof, Subcontractor shall remove all debris and waste material and keep and leave the site of the work in a condition satisfactory to Contractor.

11. **DESIGNATION OF SUPERINTENDENT:** Subcontractor shall designate a competent superintendent who, on behalf of Subcontractor, shall have complete charge of all work. Subcontractor shall advise Contractor in writing of the name, address and telephone number (day and night) of such designated superintendent and of any change in such designation.

12. **LIENS AND CLAIMS:** Subcontractor shall indemnify and save harmless Contractor and Owner from all claims, demands, causes of action or suits of whatsoever nature arising out of the services, labor and materials furnished by Subcontractor, or its subcontractors, under this Subcontract.

Subcontractor shall immediately pay and discharge, or shall provide security sufficient and satisfactory in itself to its labors, materialmen or other creditors, or those of its subcontractors, for the payment of any obligation, or alleged obligation, it, or any of its subcontractors may have, in aid of the enforcement of which a lien or right of any kind is established, or is attempted to be established, upon or against the work or the real property upon which the work is situated.

Contractor may, as a condition precedent to any payment hereunder, require Subcontractor to submit complete waivers and releases of any and all claims of any person, firm or corporation. Such releases must be submitted covering all such claims as a condition precedent to final payment.

13. **PATENTS AND ROYALTIES:** Subcontractor shall defend all suits relating to and shall hold Contractor and Owner harmless from any and all claims, royalties, damages, and costs resulting from any infringement or alleged infringement of any patents or for the misuse of any patented article by Subcontractor, or its subcontractors, in the performance of the work.

14. **INJURY OR DAMAGE TO PERSONS AND PROPERTY:** Subcontractor shall be solely responsible for and shall hold Contractor and Owner harmless from any and all losses, expenses, damages, demands and claims arising out of or in connection with injuries (including death) or damages to any and all persons, employees and/or property in any way sustained or alleged to have been sustained in connection with or by reason of the performance of the work by Subcontractor, its subcontractors, agents or employees.

15. **LABOR CONDITIONS:** Subcontractor shall comply with and be bound by any labor agreements executed by Contractor and applicable to the work to be done hereunder, copies of which may be obtained from Contractor by written application thereto. The wages paid by Subcontractor shall be the same standard as those paid by Contractor and shall be subject to its approval. Contractor may require Subcontractor to discharge any incompetent or undesirable employee.

16. **RESPONSIBILITY FOR WORK:** Subcontractor shall be responsible for all materials delivered and work performed until completion and final acceptance and upon completion of the Subcontract the work shall be delivered complete and undamaged.

17. **INSURANCE AND BONDS:** Subcontractor, at its own expense, shall procure, carry and maintain on all its operations hereunder the bonds and policies of insurance in the amounts specified in the Subcontract. The bonds and policies of insurance shall be in such form and shall be issued by such company or companies as may be satisfactory to Contractor. Subcontractor shall cause to be furnished to Contractor certificates of insurance from the assuring companies which shall include the following clause: "Ten (10) days' advance notice shall be given in writing to Telcel Corporation, 220 Bush Street, San Francisco, California, on cancellation, termination, or any alteration of the policy or policies evidenced by this certificate."

18. **COMPENSATION AND PAYMENTS:** (a) Subcontractor agrees to accept the specified compensation as full compensation for doing all work and furnishing all materials contemplated by and embraced in this Subcontract; for all loss or damage arising out of the nature of the work or from the action of the elements or from any unforeseen or unknown difficulties or obstructions which may arise or be encountered in the prosecution of the work until its acceptance; and for all risks of every description connected with the work.

(b) Unless otherwise provided in the Subcontract, Contractor shall make partial payments as the work progresses, as follows: At the end of each calendar month or as soon thereafter as practicable, Contractor shall estimate or cause to be estimated the Subcontract value of all work performed hereunder. Such estimate shall be conclusive upon Subcontractor for the purposes of this paragraph. Within ten (10) days after the making of such estimate, Contractor shall pay to Subcontractor ninety (90) per cent of such Subcontract value, less the aggregate of all payments previously made or charged to Subcontractor.

(c) As soon as practicable after completion of all work hereunder, final inspection and tests shall be made by Contractor and Owner. When such inspection and tests prove satisfactory, the work shall be accepted and the amount then remaining due to Subcontractor shall be paid; provided, that Subcontractor shall have furnished Contractor and Owner with a release of all claims against Contractor and Owner arising under or by virtue of this Subcontract, other than such claims, if any, as may with the consent of Contractor and Owner be specifically excepted by Subcontractor from the operation of the release in stated amounts to be set forth therein.

(d) Payments otherwise due may be withheld by Contractor on account of defective work not remedied, claims filed, or reasonable evidence indicating probability of filing of claims, failure of Subcontractor to make payments properly to subcontractors or for material or labor, or a reasonable doubt that the subcontract can be completed for the balance then unpaid. If the foregoing causes are removed, the withheld payments shall promptly be made. If the said causes are not removed on written notice, Contractor may rectify the same at Subcontractor's expense. Should any valid indebtedness arise after final payment is made, the Subcontractor shall reimburse the Contractor for any amount that it may pay in discharging any lien thereon on any claim affecting title to the work or Owner's property.

19. **UNEMPLOYMENT INSURANCE AND TAXES:** Subcontractor shall accept full and exclusive liability for the payment of any and all taxes and contributions for unemployment insurance, old age retirement benefits and life pensions and annuities which may now or hereafter be imposed by the United States or any state, whether measured by the wages, salaries or remuneration paid to persons employed by Subcontractor or otherwise, for the work required to be performed hereunder. Subcontractor shall comply with all Federal and State laws on such subjects, and all rules and regulations promulgated hereunder, and shall maintain suitable forms books, and records and save Contractor harmless from the payment of any and all such taxes and contributions, or penalties. Subcontractor shall likewise pay any and all taxes, excises, assessments or other charges levied by any governmental authority on or because of the work to be done hereunder, or any equipment, supplies or materials used in the performance thereof.

20. **TAKING OVER PERFORMANCE - TERMINATION OF CONTRACT:**

(a) Should Subcontractor at any time refuse or neglect to supply a sufficiency of properly skilled workmen or materials of the proper quality or quantity or fail in any respect to prosecute the Work or any separable portion thereof with promptness and diligence, or fail in the performance of any of the agreements on its part contained herein, or become insolvent, Contractor may, after forty-eight (48) hours' written notice to Subcontractor, provide any such labor or materials and deduct the cost thereof from any money due or thereafter to become due Subcontractor under Subcontract; and Contractor may also terminate Subcontractor's right to proceed with the Work or such part of the Work as to which such defaults have occurred. In the event of such termination, Contractor may enter upon the premises and, for the purpose of completing the Work, take possession of all materials, equipment, tools, and appliances thereon belonging to or under the control of Subcontractor and may finish the Work by whatever method it may deem expedient including the hiring of another contractor or contractors under such form of contract as Contractor may deem advisable. In such case Subcontractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the amount to be paid on this Subcontract shall exceed the expense of finishing the Work, compensation for additional managerial and administrative services and such other costs and damages as Contractor may suffer, such excess shall be paid to Subcontractor. If such expense, compensation, costs, and damages shall exceed such unpaid balance, Subcontractor and its sureties, if any, shall be liable for and shall pay the difference to Contractor. Failure of Contractor to exercise any of the rights given it under this paragraph shall not excuse Subcontractor from compliance with the provisions of this Subcontract nor prejudice rights of Contractor to recover damages for such default.

(b) Should the Principal Contract terminate or be cancelled, pursuant to the terms thereof, or should conditions arise which, in the opinion of Contractor, make it advisable to cease work under this Subcontract, Contractor may terminate this Subcontract by written notice to Subcontractor. Such termination shall be effective in the manner specified in said notice and shall be without prejudice to any claims which Contractor or Owner may have against Subcontractor.

(i) On receipt of such notice, Subcontractor shall, unless the notice directs otherwise, immediately discontinue the Work and placing of orders for materials, facilities and supplies in connection with the performance of this Subcontract, and shall, if requested, make every reasonable effort to procure cancellation of all existing orders or contracts upon terms satisfactory to Contractor, and shall thereafter do only such work as may be necessary to preserve and protect work already in progress and to protect material, plant, and equipment on the work or in transit thereto.

(ii) Upon such termination it is agreed:

(a') That the obligations of this Subcontract shall continue as to work already performed and as to bona fide obligations assumed by Subcontractor prior to date of cancellation or termination.

(b') That the Subcontractor shall be entitled only to pro rata compensation for the portion of the subcontract already performed, including material for which it has made firm contracts, it being understood that Contractor shall be entitled to that material.

21. **LAWS AND REGULATIONS:** Subcontractor, its employees and representatives, shall at all times comply with any applicable laws, ordinances, statutes, rules and regulations, Federal, State, County and municipal, particularly those relating to wages, hours and working conditions. Subcontractor shall procure and pay for all permits and inspections required by any governmental authority for any part of the work and shall furnish any bonds, security or deposits required to permit performance of the work.

22. **NOTICES:** Any notices hereunder may be served personally on the Superintendent of either party at the job site or may be served by registered mail direct to the address shown on the face hereof.

23. **ARBITRATION:** In case of any dispute between the parties as to the interpretation of this agreement or the performance of the same, either party may demand that the dispute be submitted to arbitration. The demand shall be in writing, shall be served on the other party and shall specify the arbitrator chosen by the party making the demand. Within seven (7) days after receipt of the demand, the other party shall appoint an arbitrator, by written notice served on the party making the demand. The two arbitrators so chosen shall select a third arbitrator. The decision of any two arbitrators shall be binding and conclusive, shall be in writing and shall be a condition precedent to any right of legal action. In no case shall submission of a matter to arbitration be a cause for delay or discontinuance of any part of the work. Each party shall bear the expense of its own arbitrator and the expense of the third arbitrator and other costs of the arbitration shall be divided equally between the parties.

24. **NON-ASSIGNMENT:** Subcontractor shall not sublet or assign the work, or any part thereof, nor any moneys to become due hereunder, without first obtaining written consent of Contractor.

25. **SUBCONTRACT INCLUDES ENTIRE AGREEMENT:** This Subcontract embodies the entire agreement between Contractor and Subcontractor. Subcontractor represents that in entering into this Subcontract it does not rely on any previous oral or implied representation, inducement or understanding of any kind or nature.

26. This is a general form of Subcontract designed for use in any State or Territory of the United States of America or in foreign countries where Contractor is performing work and any provisions herein which in any wise contravene the laws of any such State, territory or foreign country shall not be deemed a part of this Subcontract therein.

003016

Subcontract 6165-1-M-44

EXHIBIT SHEET "A"

SPECIAL PROVISIONS

BECHTEL CORPORATION

- a. Subcontractor shall comply with and be bound by any labor agreements executed by Contractor and applicable to the work to be done hereunder, copies of which may be obtained from Contractor by written application thereto. The wages paid by Subcontractor shall be the same standard as those paid by Contractor and shall be subject to its approval. Contractor may require Subcontractor to discharge any incompetent or undesirable employee.

Contractor's Labor Agreements, referred to above, contain provisions for the settlement of jurisdictional disputes in accordance with the rules and procedures of the National Joint Board for Settlement of Jurisdictional Disputes in the Building and Construction Industry. To the extent permissible under Federal or State Law, Subcontractor shall comply with and be bound by such provisions in connection with the settlement of any jurisdictional dispute, and agrees to require his subcontractors, of any tier, to also comply with and be bound by such provisions.

- b. Subcontractor shall furnish Contractor with Certificates of Insurance evidencing coverages required herein. The Certificates shall be mailed to:

BECHTEL CORPORATION
P. O. Box 3965
San Francisco, California 94119
Attention: Subcontracts Department

- c. Subcontractor will comply with and cooperate with the Contractor in putting into effect conditions including, but not limited to, starting and quitting times, smoking regulations, check-in and check-out procedures, jobsite safety regulations, daily clean-up and other working conditions which directly affect the operation of the project.

- d. Submit billing in original and four copies to:

BECHTEL CORPORATION
P. O. Box 385
Corpus Christi, Texas 78403
Attention: Mr. D. Usimaki

END OF EXHIBIT SHEET "A"

March 19, 1968
Page 1 of 1

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Subcontract 6165-1-M-44

EXHIBIT SHEET "B"

D r a w i n g s

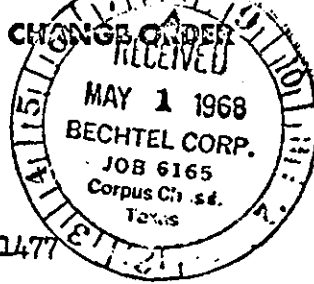
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24-P-4004	33-P-2059
24-P-4005	33-P-2061
24-P-5002	33-P-2068
24-P-5003	33-P-2069
26-P-5001	33-P-4001
26-P-5002	33-P-5003
26-P-5003	33-P-5004
30-P-4003	35-P-5005
30-P-4010	35-P-5006
30-P-5001	35-P-5007
30-P-5008	35-P-5008
30-P-5009	35-P-5011
30-P-5010	40-P-1006
30-P-5011	40-P-5001
30-P-5015	40-P-5002
30-P-5016	110-P-5001
30-P-5017	110-P-5002
30-P-5018	110-P-5003
30-P-5019	110-P-5005
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30-P-5021	110-P-5009
30-P-5022	110-P-5015
30-P-5024	110-P-5022
30-P-5031	110-P-5031
33-P-1022	110-P-5036
33-P-1012	110-P-5037
	300-P-5002
	110-P-5006
	110-P-5007

END OF EXHIBIT SHEET "B"

003018

March 19, 1968
Sheet 1 of 1

BECHTEL CORPORATION



Date: April 26, 1968

Name: Thorpe Insulation Co.

Address: 4780 Westway Drive, P.O. Box 1477

Corpus Christi, Texas 78403

Owner: Reynolds Metals Co.

Job: 6165-1 Sherwin Roundout

Subcontract No. 6165-1-M-44

Change Order No. FCO 1

Description of Change

The subject subcontract is hereby amended to incorporate the following additions and deletions.

Item 1. To supply all labor, material and equipment on a unit price basis to complete insulation and covering of all tie-in points not covered in Rev. 0 of this contract. Unit prices as per attached list. Total sum not to exceed \$10,000 (ten thousand dollars).
Unit prices to include transportation, scaffold, unloading and storage of material.

Item 2. To allow credit/debit to the purchaser for any and all additions and deletions as required by the purchaser, payment based on the unit price list submitted with vendors bid documents for subcontract. Total sum not to exceed \$10,000 (ten thousand dollars).

The completion date and the subcontract price of the above-referenced subcontract, as well as all other terms, covenants and conditions of the above-referenced subcontract, except as duly modified by this and previous change orders, if any, remain in full force and effect.

Reason for Change

Not covered in original bid submission and subcontract.

Estimated Amount of Change

Approximately

Extra \$ 20,000.00

Credit \$ _____

Approved By

She Gager
BECHTEL CORPORATION

Authorized By

Bill M. Mares

Approved By

Thorpe Insulation Co.
SUBCONTRACTOR

003019

BECHTEL CORPORATION

CHANGE ORDER

Owner: Reynolds Metals Company

Date: August 12, 1968

Job: 6165-1

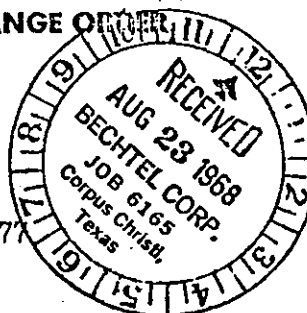
Name: Thorpe Insulation Co.

Subcontract No. 6165-1-M-44

Address: 4780 Westway Drive, P. O. Box 1477

Change Order No. FCO-2

Corpus Christi, Texas



Description of Change

The subject subcontract is hereby amended to include the following:

1. Add the following unit prices per linear feet of pipe covering using Double Coated Flexstone Finish.

a. 16 x 1½	\$10.70
b. 16 x 3	18.28
c. 20 x 1½	14.50

2. Subcontractor shall furnish all labor, material, equipment, tools, transportation and supervision to remove and reinsulate piping for Digester Condensate Flash Pot revisions as shown on R. M. C. Drawings 30-P-3124-0 and SK#5515. All work shall be performed in accordance with M-44 specifications.

a. Units 1 & 3	\$663.00
b. Units 2 & 4	579.00

The completion date and the subcontract price of the above-referenced subcontract, as well as all other terms, covenants and conditions of the above-referenced subcontract, except as duly modified by this and previous change orders, if any, remain in full force and effect

Reason for Change

Increase scope of subcontract

Estimated Amount of Change None

Extra \$ _____ Credit \$ _____ Approved By *Lee G. Mason*

BECHTEL CORPORATION

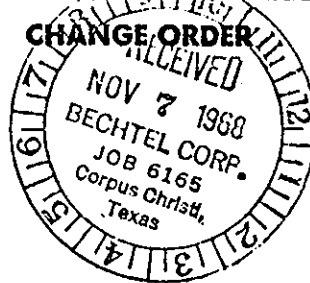
Authorized By *Lee G. Mason* Approved By *W. H. ...*

Reynolds Metals Co. *Lee G. Mason* SUBCONTRACTOR

003020

BECHTEL CORPORATION

CHANGE ORDER



Date: October 24, 1968
 Name: Thorpe Insulation Co.
 Address: 4780 Westway Drive
P. O. Box 1477
Corpus Christi, Texas

Owner: Reynolds Metals Company
 Job: 6165-1
 Subcontract No. 6165-1-M-44
 Change Order No. FCO-3

Description of Change

The subject subcontract is hereby amended as follows:

1. Delete insulation on vent piping in Facility 30.

Insulation	\$6,381.00
Less handling and restocking	<u>638.00</u>
Credit	5,743.00

2. Change the material specifications \$ 200.00 on instrumentation steam tracing from 2" thick fiberglass with "Kaylo" or equal with 0.020" thick aluminum jacketing.

The completion date and the subcontract price of the above-referenced subcontract, as well as all other terms, covenants and conditions of the above-referenced subcontract, except as duly modified by this and previous change orders, if any, remain in full force and effect

Reason for Change

Decrease scope of subcontract and change material specifications.

Estimated Amount of Change

Extra \$ _____ Credit \$ 5,543.00 Approved By _____

BECHTEL CORPORATION

Authorized By R. F. Murphy Approved By [Signature]

SUBCONTRACTOR

Reynolds Metals Company [Signature]

003021

BECHTEL CORPORATION

PURCHASE MEMORANDUM

ENGINEERING FILE

Requisition No. 6165-1-M-44 Rev. 1

Page 1 of pages

**MINING & METALS
DIVISION**

San Francisco, California

L. T. Tuttle ☐ For P.O.
Manager of Procurement M & M ☒ For S/C

COPIES TO: J. M. Snodgrass

Cost Code 300.56
Sub-
Contract \$ 59,036.00
Cost
Budgeted Cost \$ _____

Material: Insulation

Install for: Bechtel Corp. at Reynolds Metals Company,
Sherwin Plant, Gregory Texas

To be advised by Field
Required date: Bechtel Field ~~Site~~ inspection ☒ is ☐ is not required.

Subcontract to indicate best schedule after coordination with Bechtel field.

FACTORY-ASSEMBLED COMPONENTS: THE REQUISITION INCLUDES THE FOLLOWING FABRICATIONS AND EQUIPMENT PACKAGES.

☐ PIPING OR TUBING	☐ INSTRUMENT PANELS	☐ WIRING
☐ ELECTRICAL PANEL	☐ SHEET METAL	☐ NONE

ACTION:

☐ OBTAIN QUOTATIONS AND RETURN TO PROJECT ENGINEER FOR ANALYSIS BY _____
☐ OBTAIN QUOTATIONS AND PREPARE P.O.-S/C OR CHANGE ORDER. ☐ ENG. TO REVIEW LOW BID.
QUOTATIONS ARE TO BE OBTAINED FROM ☐ ONLY ☐ AT LEAST THE FOLLOWING:

☒ PREPARE P.O.-S/C OR CHANGE ORDER.
☒ REFER TO QUOTATION NO. 7688 OF Thorpe DATED February 21, 1968
AT A QUOTED PRICE OF \$59,036.00* Insulation Co.
☐ OTHER: *Insulation of piping and equipment \$ 57,320.00
Add for weather proof coat 2,134.00
Sub Total \$ 59,454.00
Less deduction for not insul. DSM screens 418.00
59,036.00

ATTACHMENTS:

☒ TABULATION OF BIDS ☒ PREVIOUSLY FORWARDED.
☐ OTHER: Specification 6165-M-44, Rev. 2

Drawings, sketches and Bechtel forms previously forwarded.

003022

J. M. Snodgrass (2072) Mechanical F. A. Allen
ORIGINATOR - PHONE NO. SECTION PROJECT ENGINEER

△									
△									
△									
△									
△									
1	3/14/68	Issued for Purchase							
0	1/15/68	Issued for Quotation							
NO.	DATE	REVISIONS						ORIGINATOR (NAME)	APPROVALS T/N



PURCHASE ORDER NO.

REQUISITION NO.

6165-1-M-44, Rev.1

PAGE 1 OF 3 PAGES

ITEM LIST

REV	ITEM NO.	QUANTITY AND UNIT	DESCRIPTION	COST CODE	UNIT PRICE	EXTENSION
			ATTACHMENTS: ☒ SPECIFICATIONS ☒ PROJECT GENERAL CONDITIONS AND STANDARD SPECIFICATIONS FOR MECHANICAL EQUIPMENT ☐ SUPPLEMENTARY SPECIFICATIONS FOR AUXILIARY MOTORS AND ELECTRICAL EQUIPMENT ☒ DRAWING AND DATA REQUIREMENTS FORM G-321-C ☐ CONVEYOR DATA SHEET ☐ ELECTRIC MOTOR DATA SHEET ☐ AIR COMPRESSOR DATA SHEET ☐ PUMP DATA SHEET As tabulated on Page 2 & 3 ☒ DRAWINGS SKM-428 SKM-429 MATERIAL: Form M-977-F		\$	\$
	A	1 LOT	DRAWINGS AND DATA IN ACCORDANCE WITH ATTACHED DRAWINGS AND DATA REQUIREMENTS			
	B	1 LOT	DETAILED APPROVAL DRAWING SCHEDULE AND PRODUCTION PROGRESS REPORTS ARE REQUIRED MONTHLY. SUBMIT TO THE ATTENTION, EXPEDITER NAMED ON PAGE 1. PARTS LISTS REQUIRED UNDER ITEM C OF DRAWING AND DATA REQUIREMENTS SHALL CONTAIN THE NAME AND ORDER NUMBER OF EVERY PART FOR THE EQUIPMENT AND ITS AUXILIARIES INCLUDING DRAWINGS IN SUFFICIENT DETAIL TO LOCATE AND IDENTIFY EACH PART. IN ADDITION, WHERE PARTS ARE MANUFACTURED BY OTHER THAN THE VENDOR, THE NAME OF THE ORIGINAL MANUFACTURER AND HIS PART NUMBER SHALL BE MATCHED WITH THE VENDOR'S NUMBER ON THE PART LISTS.			
						003023



PURCHASE ORDER NO.

REQUISITION NO.

6165-M-44 Rev.1

PAGE 2 OF 4 PAGES

ITEM LIST

REV	ITEM NO.	QUANTITY AND UNIT	DESCRIPTION	COST CODE	UNIT PRICE	EXTENSION																																																								
	1	lot	Piping insulation per specification 6165-M-44 as indicated on following drawings: <table><tr><td>24-P-4002</td><td>33-P-2055</td></tr><tr><td>24-P-4004</td><td>33-P-2059</td></tr><tr><td>24-P-4005</td><td>33-P-2061</td></tr><tr><td>24-P-5002</td><td>33-P-2068</td></tr><tr><td>24-P-5003</td><td>33-P-2069</td></tr><tr><td>26-P-5001</td><td>33-P-4001</td></tr><tr><td>26-P-5002</td><td>33-P-5003</td></tr><tr><td>26-P-5003</td><td>33-P-5004</td></tr><tr><td>30-P-4003</td><td>35-P-5005</td></tr><tr><td>30-P-4010</td><td>35-P-5006</td></tr><tr><td>30-P-5001</td><td>35-P-5007</td></tr><tr><td>30-P-5008</td><td>35-P-5008</td></tr><tr><td>30-P-5009</td><td>35-P-5011</td></tr><tr><td>30-P-5010</td><td>40-P-1006</td></tr><tr><td>30-P-5011</td><td>40-P-5001</td></tr><tr><td>30-P-5015</td><td>40-P-5002</td></tr><tr><td>30-P-5016</td><td>110-P-5001</td></tr><tr><td>30-P-5017</td><td>110-P-5002</td></tr><tr><td>30-P-5018</td><td>110-P-5003</td></tr><tr><td>30-P-5019</td><td>110-P-5005</td></tr><tr><td>30-P-5020</td><td>110-P-5008</td></tr><tr><td>30-P-5021</td><td>110-P-5009</td></tr><tr><td>30-P-5022</td><td>110-P-5015</td></tr><tr><td>30-P-5024</td><td>110-P-5022</td></tr><tr><td>30-P-5031</td><td>110-P-5031</td></tr><tr><td>33-P-1022</td><td>110-P-5036</td></tr><tr><td>33-P-1012</td><td>110-P-5037</td></tr><tr><td></td><td>300-P-5002</td></tr></table> Steam traced instrumentation lines to be insulated all located in Facility 110: (refer to 300-P-5006): <u>Boiler B-10 to Local Panel</u> (2) Steam Flow Meters (2) Boiler Feed Water Flow Meters (2) Steam Drum Level (2) Yarway Meters (1) Pressure Gage (1) Master Pressure Control	24-P-4002	33-P-2055	24-P-4004	33-P-2059	24-P-4005	33-P-2061	24-P-5002	33-P-2068	24-P-5003	33-P-2069	26-P-5001	33-P-4001	26-P-5002	33-P-5003	26-P-5003	33-P-5004	30-P-4003	35-P-5005	30-P-4010	35-P-5006	30-P-5001	35-P-5007	30-P-5008	35-P-5008	30-P-5009	35-P-5011	30-P-5010	40-P-1006	30-P-5011	40-P-5001	30-P-5015	40-P-5002	30-P-5016	110-P-5001	30-P-5017	110-P-5002	30-P-5018	110-P-5003	30-P-5019	110-P-5005	30-P-5020	110-P-5008	30-P-5021	110-P-5009	30-P-5022	110-P-5015	30-P-5024	110-P-5022	30-P-5031	110-P-5031	33-P-1022	110-P-5036	33-P-1012	110-P-5037		300-P-5002		\$	\$
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	300-P-5002																																																													

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9-380-C N2M 9-18-67



PURCHASE ORDER NO.

REQUISITION NO.

6165-M-44, Rev.1

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ITEM LIST

REV	ITEM NO.	QUANTITY AND UNIT	DESCRIPTION	COST CODE	UNIT PRICE	EXTENSION
			<u>Boiler Feed Water Pump</u> (2) Flow Meter Control <u>Pressure Reducing Station</u> (1) 600-300 Psig Pressure Control (1) 300-50 Psig Pressure Control <u>Cooling Tower</u> (2) Flow Meters <u>Condensate Filtration</u> (2) Flow Meters		\$	\$
	2	1	40' - 0" diameter desilicator tank (refer to GATZ drawing 1-422) 26-T-8 1-1/2" thick insulation on tank sides only - <u>do not</u> <u>insulate tank roof or bottom.</u>			
1	3	4	3'-0" diameter condensate flash pots (refer to General Steel Tank Co. Dwg. B-1763) 30-V-130 30-V-133 30-V-136 30-V-139 2" thick insulation on all vessel surfaces.			
1	4	8	5'-0" diameter condensate flash pots (refer to General Steel Tank Co. Dwg. A-1443) 30-V-131 30-V-137 30-V-132 30-V-138 30-V-134 30-V-140 30-V-135 30-V-141 2" thick insulation on all vessel surfaces.			

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PURCHASE ORDER NO.

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6165-M-44 Rev. 1

PAGE 4 OF 4 PAGES

ITEM LIST

REV.	ITEM NO.	QUANTITY AND UNIT	DESCRIPTION	COST CODE	UNIT PRICE	EXTENSION
1	5	3	DSM Screens		5	5
1	6	LOT	Weather proof coating for Limpet spray on insulation using Benjamin Foster 30-36 reinforced with Glass fab mesh			

003026

BECHTEL CORPORATION

ENGINEERING SPECIFICATION

FOR

HOT INSULATION

MATERIAL AND APPLICATION

SPECIFICATION NO. 6165-M-44

JOB NO. 6165-1

REV	DATE	DESCRIPTION	APPROVALS
2	3/14/68	Delete DSM Screens Add Weather Proofing	<i>[Signature]</i> <i>[Signature]</i> <i>[Signature]</i>

PREPARED BY: *J. M. Snodgrass* DATE: Dec. 8, 1967
J. M. Snodgrass

APPROVED BY: *F. A. Allen* DATE: 12/8/67
F. A. Allen
Project Engr.

APPROVED BY: *M. M. Morris* DATE: 1/10/68
M. M. Morris
Reynolds Metals

003027

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	<u>TITLE</u>	<u>PAGE</u>
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1.0 SCOPE

- 1.1 This specification covers the furnishing and application of thermal insulation to piping, vessels, tanks and equipment.
- 1.2 The type, thickness, and method of application of insulation shall be in accordance with this specification and the attached drawings and tables.

2.0 GENERAL

- 2.1 Materials, facilities, and work furnished by Bechtel Corporation, hereinafter termed "Company".
 - 2.1.1 The company will furnish at the jobsite all necessary water, electric current at 110 volt single phase and 440 volt 3 phase, 60 cycles. These utilities will be furnished at existing outlets only. Any extension shall be furnished by the Subcontractor at his own expense.
 - 2.1.2 The company will provide the Subcontractor with necessary working space and material storage space at the jobsite, but will not furnish a warehouse or other means of protection from the elements. The location of this space will be designated by the Company's construction superintendent.
 - 2.1.3 Subcontractor will properly prepare and thoroughly clean all surfaces to remove oil, grease, loose scale and dirt, before application of insulation materials.
- 2.2 Materials and work to be furnished by Subcontractor.
 - 2.2.1 The subcontractor shall furnish all labor, tools, implements, vehicles, facilities and materials for the complete installation of all insulation, unless specifically stated in this specification as being furnished by the company.
 - 2.2.2 The subcontractor shall be responsible for unloading all materials from the cars or trucks and do all the necessary handling of such materials.

- 2.2.3 The subcontractor shall furnish and install all required non-structural supports which are not part of the shop fabrication for holding insulation on the equipment and piping.
- 2.2.4 The subcontractor shall furnish and erect at his own expense and risk, all scaffolding that he may require.
- 2.2.5 The subcontractor shall furnish and install all necessary steel flashing. Aluminum jacketing, where required, will be furnished in standard mill-run coils by Reynolds Metals Company for installation by the Subcontractor. Accessories, bands, etc., for aluminum jacketing shall be furnished by the subcontractor. Subcontractors to notify Bechtel well in advance of requirement for aluminum jacketing material.
- 2.2.6 The subcontractor shall protect the insulation against injury during all stages of application, including the final weatherproof coat. Any insulation damaged, including damage due to incorrect application or application contrary to manufacturers recommendations, shall be replaced to the satisfaction of the company. In addition, he shall handle and apply insulation in a manner resulting in the minimum of debris and keep his work area policed at all times.
- 2.2.7 The subcontractor shall clean all spray and splatter from equipment and machinery and shall make a daily clean-up of the area to remove wrappers, cartons, sacks and other large debris.
- 2.2.8 The subcontractor shall plan and schedule his work as directed by the company and be coordinated with the work of the other crafts. In particular he should schedule insulation sufficiently in advance of required painting to allow the insulation and its finish to completely dry.
- 2.2.9 It will be the subcontractor's responsibility to furnish a job which will be satisfactory in all respects, and if the subcontractor for this work believes that any of the requirements of this specification do not permit him to fulfill such responsibility, he must submit with his bid recommendation of changes for approval. Failure to meet this requirement will not relieve the Subcontractor of such responsibilities.

- 2.3 All bidders must visit jobsite to inspect the work and acquaint themselves with the working conditions prior to submitting a bid. Arrangements for visit should be coordinated by contacting Mr. L. M. Yager, Bechtel Corporation, c/o Reynolds Metals Company, Sherwin Plant, Gregory, Texas, telephone no. 512 area code, TU-2-2909.

3.0 INSULATION APPLICATION

3.1 Piping

- 3.1.1 All lines 24" in O. D. and under (Reference Fig. 1 and Fig. 2) shall be covered with sectional or segmental pipe insulation in 3 foot lengths, and shall be pittsburgh Corning "Unibestos", Owens Corning "Kaylo", Johns Manville "Thermobestos", Philip Carey "Careytemp", Owens Illinois "Kaylo" or approved by the company. When pipe covering is of combination or two layer construction, the second layer shall be applied with full staggered joints, and each layer shall be secured independently. Circumferential joints shall be staggered and longitudinal joints shall be 45° off from normal center-line except where hangers or supports require otherwise. Ragged or open joints shall be filled, without "overspread" onto the surface of the pipe insulation with monolithic insulation which shall be Johns-Mansville No. 352, or equal approved by the company. Piping insulation shall be secured in the following manner:

Lines 16" and smaller - Minimum of 4 ties per joint
18 AW6 stainless steel wire.

Lines 18" and larger - 4 bands per joint - 1/2" x .015
stainless steel.

- 3.1.2 All lines over 24" in diameter shall be covered with the same type of insulation, and secured in the same manner as is specified in the previous paragraph, except that block insulation may be used, mitered to fit the pipe to which it is applied.
- 3.1.3 A metal stop or support shall be provided at the bottom of all pipe insulation on vertical lines in sizes 4" and over and where lengths involved exceed 10 feet. These stops shall be furnished in place by the company.
- 3.1.4 Steam traps and outlet piping from steam traps shall not be insulated except where required for personnel

3.1.4 Cont'd.

protection. Piping leading from drip legs to traps for superheated steam lines shall be insulated. Piping from drip leg to trap for saturated steam lines shall not be insulated.

3.1.5 Final covering for pipe lines except those in powerhouse area shall be 50-pound asphalt saturated asbestos felt, Johns-Manville "Double-Coated Flexitone" roofing felt or approved equal. It shall be cut to fit with a lap of approximately 3" both at longitudinal and end laps and applied with laps "away from the weather". The roofing jacket shall be secured in place with 1/2" x .015" 304 stainless steel bands on approximate 12" centers.

3.1.6 Final covering for pipe lines inside the powerhouse building (in Facility 110) shall be 6 oz. white canvas secured with paste. Final covering for pipe lines outside the powerhouse building and up to plot limits of Facility 110 shall be Reynolds Metals Company .020" x 3S half-hard mill finish flat aluminum, furnished by Reynolds Metals Company, and which will be machine rolled to fit OD of pipe insulation by the subcontractor. Before applying the aluminum jacketing, the pipe insulation shall be wrapped with "Sisalkraft" type paper, lapped 3", and fastened with glue or plastic cover staples. The aluminum jacketing shall then be installed with approximately 3" laps at longitudinal and circumferential joints. The jacket shall be secured in place with 1/2 x .020" 3S aluminum bands spaced on 12" centers. Jackets on vertical lines shall be supported with two "Z" clips per section of jacket. The laps in metal shall be placed or located in such a manner as to be "away from the weather" and where least conspicuous.

3.1.7 No insulation shall be applied to any piping prior to completion of hydrostatic testing without the written consent of company.

3.1.8 Thickness of pipe insulation shall be in accordance with Table I of this specification.

3.1.9 Heat traced lines shall be insulated by wrapping bundles with 2 inch wide fiberglass with Kraft paper backing and

3.1.9 Cont'd.

and aluminum foil vapor barrier. Wrap shall be spiral with butt joint (no overlap). No seal required at butt joint.

3.2 Valves and Fittings

- 3.2.1 Special pattern slurry valves shall not be insulated. Flanges and valves shall be insulated only in steam lines within the powerhouse area (Fac. 110), except when required for personnel protection. Such valves and fittings shall be insulated with molded sectional pipe insulation of the same material as the adjacent pipe insulation neatly cut to fit and secured in place with 18 AWG stainless steel wire loops, using not less than two loops per flange. These wire loops are to be counter-sunk flush with the insulation surface. The surfaces of the insulation shall be reinforced with one layer of stainless steel, 20 ga. (min.), 1" hex mesh neatly fitted and securely laced and covered with a light coat of Johns-Manville Insulkote-ET or equal approved by the company. The flange or valve insulation shall then be finished with a 1/4" wet coat (1/8" dry) of Insulkote-ET or equal.
- 3.2.2 In the case of uninsulated flanges and valves pipe insulation shall be stopped short of the flange, or valve a sufficient distance to permit removal of the flange bolts, the valve, or slipping of the union nut. Terminus ends are to be finished off to a 45° bevel and reinforced with stainless steel, 20 ga. (min.), 1" hex mesh secured in place with a light coat of finishing material. In cases where pipe insulation is covered with roofing felt, these terminus ends shall be finished with Eagle-Picher "Stalastic" or equal approved by the Company. In cases where pipe insulation is jacketed with aluminum, these terminus ends are to be finished with Alumiseal.
- 3.2.3 Weld ells, 2" pipe size and larger, shall be insulated with prefabricated covers made in two half-sections from insulation material of the same type and thickness as the adjacent pipe insulation. These ell covers are to be of proper length to extend 1" onto the pipe for pipe size 2", this overlap to increase as pipe size

003033

3.2.3 Cont'd.

increases, progressing to a 2" overlap at 8" pipe sizes. The ell covers shall be secured in place with 18 AWG stainless steel wire loops, not less than two loops per cover for 3" pipe size and below and not less than 3 loops per pipe sizes 4" through 12", 4 loops for pipe sizes 14" and larger. The wire loops are to be neatly counter-sunk flush with the surface of the insulation. The surface of the weld ell cover shall be reinforced with stainless steel, 20 ga. (min.), 1" hex mesh neatly fitted and securely laced, and cover with a light coat of Johns-Manville Insulkote-ET or equal and then finished with a 1/4" wet coat (1/8" dry) of Insulkote-ET or equal.

3.2.4 Weld tees, caps and reducers shall be insulated and finished with the same material as the adjacent pipe insulation, except that these fittings in aluminum jacketed lines shall be finished with 1/4" wet coat of Johns-Manville Insulkote-ET, or equal, reinforced with stainless steel, 20 ga. (min.), 1" hex mesh, neatly fitted and securely laced.

3.2.5 Weld ells and screwed fittings 1-1/2" pipe size and smaller shall be insulated with a combination of Johns-Manville No. 352, or approved equal, and pipe insulation per Para. 3.3.1, and finished in a manner similar to the flange insulation.

3.2.6 Expansion joints shall be installed as required, and constructed in accordance with SKM-429. In straight runs of pipe, intervals between joints shall not exceed 50' for pipe operating at temperature in excess of 500°F, and 100' for pipe operating at temperature up to 500°F.

3.2.7 Thickness of valve and fitting insulation shall be in accordance with Table I of this specification.

3.3 Pressure Vessels (Fac. 30 Condensate Flash Pots)

3.3.1 Vessels requiring insulation shall be insulated with Limpet LW-25 (for use up to 700°F) or approved or equal.

- 3.3.2 Vessel Walls, Heads and Bases - shall have Graham pins stud welded on 18" centers in a diamond pattern in the shop, prior to stress relieving. As-sprayed insulation thickness shall be 1/4" less than required (Table II). 4"x4" squares of stainless steel lath shall be impaled on the pins and snugged up to the insulation. Stainless steel speed clips shall be placed on, and the excess pin cut off at clip. An additional 1/2" of insulation shall be sprayed on heads and bases and pressed down to a total required thickness as specified in Table II.
- 3.3.3 No spray insulation is to be applied below 40°F nor during periods of rain or impending rain, without approval of the Company.
- 3.3.4 Insulation may not be applied over an asphalt type primer.
- 3.3.5 Finish - all surfaces shall be finished with Benjamin Foster 30-36 breather mastic, reinforced with 10 x 10 glass fabric. Two coats of weather proofing material (1/8" min. dry film thickness) are required. The weather proof material is to be applied by spray on large areas, and palmed or troweled on others. Finish shall be applied only in accordance with manufacturers recommendation concerning moisture content of insulation, curing time, etc.
- 3.4 Tanks (Fac. 26 Desilicator Tank)
- 3.4.1 Tanks requiring insulation shall be insulated with Limpet LW-25 or approved equal.
- 3.4.2 Tanks shall be field stud weld by Subcontractor with Graham pins in 18" centers, in a diamond pattern on all surfaces. As-sprayed thickness shall be 1/4" less than required by Table II. 4" x 4" squares of stainless steel lath shall be impaled on the pins and snugged up to the insulation. Stainless steel speed clips shall be placed over the pins and excess pin cut off at the clip. An additional 1/2" of insulation shall then be sprayed on and pressed down as per vessels.

- 3.4.3 Thickness of tank insulation shall be as per Table II.
- 3.4.4 Tank roofs that require insulation shall be insulated in same manner as tank sides.
- 3.4.5 No spray insulation is to be applied below 40°F nor during periods of rain or impending rain, without approval of the Company.
- 3.4.6 Insulation may not be applied over an asphalt type primer.
- 3.4.7 Finish shall be as per pressure vessels as indicated in paragraph 3.3.5.

3.5

Equipment

- 3.5.1 Equipment requiring insulation shall be insulated with Limpet LW-25, or approved equal. Moving parts shall be masked so that the insulation is not sprayed onto or in a manner to interfere with moving parts.
- 3.5.2 Application of insulation to be per paragraphs 3.4.2, 3.4.5, and 3.4.6.
- 3.5.3 Thickness of equipment insulation shall be as per Table III.
- 3.5.4 Bolts to be covered with insulation shall be first covered with pieces of aluminum foil.
- 3.5.5 Insulation shall be stopped short of casing flanges sufficient distance to permit removing bolts, finished off to a 45° bevel and properly sealed. Manufacturers nameplate shall not be covered with the insulation, beveled and sealed as above.
- 3.5.6 Finish shall be as per pressure vessels as indicated in paragraph 3.3.5.

TABLE I - PIPE INSULATION, CODE H

<u>Pipe Size</u>	<u>Pipe Surface Temperature</u>		
	<u>to 480°F</u>	<u>481° to 780°F</u>	<u>781° to 980°F</u>
1/2 inch	1 inch	1-1/2 inch	2-inch
3/4	1	1-1/2	2
1	1	1-1/2	2
1-1/2	1	2	2-1/2*
2	1-1/2	2	2-1/2*
3	1-1/2	2-1/2*	3*
4	1-1/2	2-1/2*	3*
6	1-1/2	2-1/2*	3*
8	1-1/2	3*	3-1/2*
10	1-1/2	3*	3-1/2*
12	1-1/2	3*	3-1/2*
14	1-1/2	3*	3-1/2*
16	1-1/2	3*	3-1/2*
18	1-1/2	3*	3-1/2*
20	1-1/2	3*	3-1/2*
24	1-1/2	3*	3-1/2*

Over 24" - See Table II.

*Indicates double-layer construction required.

Personnel Protection, Code P. Insulation for personnel protection is required on any line or duct having a temperature of over 151° within three feet of a working space, and shall be insulated for a length sufficient to protect a man working in that space. Insulation shall be as tabulated in column for surface temperature to 480°F, and applied in the same manner as Code H thermal insulation.

TABLE II - VESSEL AND TANK INSULATION, CODE H

<u>Vessel or Tank Surface Temperature</u>	<u>Thickness</u>
Up to 300°F	1-1/2 inch
301° to 450°F	2
451° to 600°F	3

TABLE III - EQUIPMENT & DUCT INSULATION, CODE H

<u>Machine Surface Temperature</u>	<u>Thickness</u>
150° to 175° F	1 inch
176° to 325°F	1-1/2
326° to 550°F	2
551° to 750°F	2-1/2
751° to 950°F	3

Personnel Protection. Code P. Insulation for personnel protection is required on any vessel, tank, equipment or duct having a temperature of over 151°F and located within three feet of a working space. Code P insulation shall extend over all portions within reach of personnel, and shall be 1-1/2" thick, conforming in all other respects to Code H thermal insulation.

4.0 METHOD OF PAYMENT

All payments shall be on a lump sum basis in accordance with subcontract terms and conditions. Additions or deletions will be on a unit price basis.

5.0 METHOD OF MEASUREMENT FOR UNIT PRICE ADJUSTMENTS

- 5.1 Measurement procedures specified herein shall be considered as part of the subcontract conditions unless otherwise specified in writing.
- 5.2 The quantities of insulation applied shall be determined by actual measurement, and shall not be calculated from drawings or judged by visual gauging. A representative of each interested party shall be present when measurements are made.
- 5.3 Measurements shall be recorded on forms (M-977-F attached). Certified copies of the record shall be given to all interested parties, and all copies shall be signed by the persons measuring.
- 5.4 The basis for payment for patching, repair and replacement due to damage for which Bechtel Corporation is responsible shall be negotiated with Bechtel field supervision.
- 5.5 The attached drawing SKM-428, outlining method of measurement, shall be used as a guide in conjunction with this set of rules.

6.0 PIPING AND FITTINGS

- 6.1 Measurements shall be made through all insulated or uninsulated fittings in insulated lines. The length of bent piping shall be measured separately along the outside radius of insulation between tangent points.
- 6.2 Hangers, shoe type supports, guides, anchors, brackets, etc., which attach to the insulated line, shall be considered as normal piping practice and the unit price of line insulation will include same.
- 6.3 Each flange on fittings shall be counted as a flange and not as part of its fittings.

- 6.4 All fittings that connect two or more different sizes of pipe shall be counted as part of the largest size involved. Bosses shall be considered fittings and shall be priced at 2 x unit price for size of boss.
- 6.5 Unit prices for fittings and flanges listed below shall be the unit price of the adjacent pipe covering multiplied by the factor.

<u>Item</u>	<u>Factor</u>
(a) Pipe Bends over 1-1/2 diameters	2 x length
(b) Flanges (Pair)	2
(c) Fittings, incl. tees, reducers, valve bodies, traps, std. ells, unions and end caps	2