PLAINTIFF'S EXHIBIT

TEX-115

PART I - GENERAL CONDITIONS

1.0 INTRODUCTION

1.01 The ~~Texas Company~~ Associated Petroleum Terminal Co, herein called the owner, contemplates the construction of an offshore oil loading wharf with approach causeway, and appurtenant works for the transporting and handling of petroleum products, as part of its ~~Puget Sound works.~~ ~~Bechtel Corporation is hereinafter referred to as contractor.~~ These specifications set forth the terms, conditions, standards, methods, and detail requirements by which this wharf and appurtenant facilities will be constructed under a subcontract agreement.

1.02 The word "bidder", as used herein, shall designate the party or parties who, at the request of contractor, may submit a proposal for the work herein specified.

1.03 The word subcontractor, as used herein, shall designate the party or parties whose proposal has been accepted, and who have executed the subcontract agreement described in Section 8.0 hereof.

2.0 GENERAL DESCRIPTION AND SCOPE OF WORK

2.01 The wharf is located approximately 5,600 feet offshore in Fidalgo Bay, about 1-1/2 miles southeast of the town of Anacortes, Washington.

2.02 The proposed installation consists essentially of berthing facilities for ONE ~~two~~ tankers together with barge loading facilities, mooring platforms, breasting dolphins, and interconnecting catwalks and roadway, served by a timber approach causeway, approximately 5,600 feet long. The causeway consists of a pipeway, adjacent roadway, and approach, and other appurtenant works as more specifically described in these specifications and as shown in the drawings. Also included in scope of work are approximately 2500 feet of pipe support trestle.

2.03 The work to be performed includes furnishing of materials, labor, plant equipment and all other incidentals required to complete the construction, as set forth in Parts II and III of this specification.

3.0 REPRESENTATIVE OF THE CONTRACTOR

3.01 The contractor's representative on the job will be the general superintendent. He will have engineers and inspectors who will follow the work closely, and who will report to him regarding the quality and acceptability of the work and materials of the subcontractor.

3					
2	9-30-57	Issued for Construction	JRL	VP	
1	7/25/57	General Revision Reissued for Approval and Quotation		VP	
0	DATE 4/25/57	Issued for Approval and Quotations			

FORM 292

BECHTEL CORPORATION

THE TEXAS COMPANY
PUGET SOUND WORKS
OIL LOADING WHARF AND APPROACH CAUSEWAY

JOB NO. 2525

SPECIFICATION 22M-2 REV. 2

3.02 The general superintendent shall decide upon the meaning and intent of these specifications. He shall have the right to correct any errors or omissions in the specifications and drawings where such corrections are necessary to their proper fulfillment. It shall be the subcontractor's responsibility to thoroughly familiarize all of his supervisory personnel with the contents of these specifications.

4.0 QUALITY OF WORK

4.01 The general superintendent shall be the final judge of the quality of the work and whether or not it meets the standards set forth in the specifications and fulfills the contract requirements.

4.02 The contractor reserves the right to prohibit the use of any men, tools, supplies, materials or pieces of equipment which in his opinion will not produce work meeting these specifications; and the subcontractor shall be entitled to no extra compensation because of any such prohibitions or changes resulting therefrom.

5.0 SHELTER AND SANITARY FACILITIES, TRANSPORTATION

5.01 The contractor will not provide shelter, food, medical attention, or transportation for the employees of the subcontractor. Contractor will supply sanitary facilities and potable water at existing locations. Pipeline extensions from existing outlets shall be provided by the subcontractor, if required, at his own expense. The contractor will designate storage and dump areas for the subcontractor's use.

5.02 The subcontractor shall provide shelter for all permanent materials which, in the opinion of the general superintendent, require protection from the weather.

6.0 SITE INVESTIGATION AND REPRESENTATIONS

6.01 The bidder acknowledges that he has satisfied himself as to the nature and location of work, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, power, and uncertainties of weather, physical conditions of the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during the prosecution of the work, the subcontract agreement, and all other matters which can in any way affect the work or the cost thereof under this contract.

7.0 FOUNDATION CONDITIONS

△1 7.01 The logs of borings made at the wharf site, and the Dames and Moore soil reports are on file at the contractor's field office where they may be examined by any prospective bidders. Bottom contours shown on Drawing 22 AM-56 and 57 are in accordance with a hydrographic survey made by the Coast and Geodetic Survey in 1954. Contractor furnishes the above data for information only, and for what it may be worth.

FORM 893

7.02 Bidders shall draw their own conclusions from these data as to driving and other foundation conditions, and the subcontractor shall assume full responsibility for his interpretation thereof and the completion of the work, as specified herein, without compensation other than stated in the accepted proposal, regardless of subaqueous conditions or difficulties actually encountered in the work.

8.0 CONTRACT DOCUMENTS

8.01 The contract documents consist of:

(a) These specifications and subsequent addenda thereto, and the drawings describing the work, and which are hereby made a part of these specifications.

(b) Those accepted portions of the proposal of the firm or corporation to whom the subcontract is awarded.

(c) The Bechtel Corporation subcontract agreement, copy of which is furnished with the invitation to bidders.

9.0 DRAWINGS

9.01 The drawings appended to these specifications define the nature and scope of the work to a subcontractor experienced in wharf construction, to the extent that a firm bid price for the complete construction may be submitted. 1

9.02 More detailed construction drawings, if required, shall be prepared by subcontractor and submitted for contractor's approval prior to the start of construction.

9.03 It shall be understood that proposals submitted by bidders shall be based on a complete, finished job as hereinafter described in the detailed scope of work; and the subcontractor shall be entitled to no extra compensation because of his failure to include in his proposal the price of any items not specifically or fully detailed on the drawings.

9.04 Drawings forming a part of these specifications and defining the nature and scope of the work are as follows:

FORM 293

(2)

List of Drawings

	Revision	Title
22-AM-1	2	Pipe Trestle - Plan.
2	2	Pipe Trestle - Sections
3	3	Pipe Trestle - Piling Plan
4	2	Pipe Trestle - Bent Details
5	2	Pipe Trestle - Miscellaneous Details
6	4	Wharf and Causeway - Plan and List of Drawings
7	3	Causeway Piling Plan
8	2	Wharf Piling Plan
9	2	Causeway, Typical Sections
10	2	Plan, End Dock
11	2	Causeway, Turnout
12	2	Causeway, Pipe Loop
13	2	Causeway, Small Boat Passage
14	2	Wharf and Causeway Junction, Sheet 1
15	2	Wharf and Causeway Junction, Sheet 2
16	2	Causeway Bents, Sheet 1
17	2	Causeway Bents, Sheet 2
18	3	Causeway Bents, Sheet 3
* 19		Small Boat Landing
20	2	Typical Wharf Roadway and Details
21	2	Ships Stores Platform
22	2	Plan of Berth 1, Sheet 1
24	2	Plan of Berth 2, Sheet 1
** 25	0	Plan of Berth 2, Sheet 2
26	2	Plan of Berth 3, Sheet 1
** 27	0	Plan of Berth 3, Sheet 2
** 28	0	Miscellaneous Concrete Details, Berth 2
29	2	Catwalk Details, Sheet 1
30	2	Catwalk Details, Sheet 2
31	2	Wharf Bents, Sheet 1
32	1	Wharf Bents, Sheet 2
33	1	Wharf Bents, Sheet 3
34	1	Wharf Bents, Sheet 4
35	2	Mooring Platforms, Sheet 1
36	0	Mooring Platforms, Sheet 2
37	0	Electric Substation
38	0	Miscellaneous Electrical Supports
** 39	0	Valve Platforms, Sheet 1
48	2	Typical Wharf Roadway
53	0	Plan, Test Borings, Sheet 1
54	0	Plan, Test Borings, Sheet 2
55	0	Plan, Test Borings, Sheet 3
56	0	Contour Map, Sheet 1
57	0	Contour Map, Sheet 2

* Not issued with Revision 2 of this specification.

** Not a part of wharf subcontract. Issued for information only.

FORM 293

WA-TEX 000268

10.0 SURVEYS

10.01 The subcontractor shall furnish all necessary survey crews, lines and grades for the proper execution of the work, except that necessary base lines, points, and bench marks on shore or existing facilities will be furnished and maintained by the contractor.

10.02 The subcontractor shall be responsible for final completion of the work to the lines and slopes called for on the drawings. Owner's and contractor's representatives shall at all times have access to the work. Subcontractor shall provide proper facilities for access and for inspection.

11.0 COMPLIANCE WITH LAWS AND REGULATIONS

11.01 During the performance of this work, the subcontractor shall fully comply with all applicable federal and state laws and with any and all applicable by-laws, rules, regulation, and orders, especially those pertaining to navigable waterways in the area, made or promulgated by any government, government agency or department, municipality, board, commission or other regulatory body, and shall give all stipulations and certificates of compliance therewith as may be required of such applicable laws, by-laws, rules, regulations or orders. Special attention shall be paid to compliance with rules and regulations covering warning lights, obstructions to navigation, floating debris, contamination of bay waters, etc.

11.02 The subcontractor assumes full responsibility for the payment of all contributions and payroll taxes, whether federal, state, municipal or otherwise as to its employees, servants or agents, engaged in the performance of the work specified in this contract.

11.03 The subcontractor agrees to save and hold the contractor and/or the owner harmless from any and all penalties, actions, causes of action, damages, claims and demands whatsoever arising out of or occasioned by his failure to make full and proper compliance with said by-laws, rules, regulations, laws and orders as herein set forth; or arising out of contamination to surrounding bay waters, damage to persons or property, and encroachment on lands outside the limits of prescribed working areas, where such contamination, damage, or encroachment occurs as a result of subcontractor's methods and procedures.

FORM 293

PART II - MATERIALS AND CONSTRUCTION

1.0 DETAILED SCOPE OF WORK

1.01 The subcontractor shall furnish all plant, labor, materials (except steel piles), equipment, power and incidentals to construct the wharf, approach causeway, approach roadway trestle catwalks, and pipe trestle complete in all respects with pipeway, mooring platforms and breasting dolphins with fender systems. The work to be performed specifically includes:

(a) Furnishing, driving, framing and connecting as required, all timber piles.

(b) Driving, framing and protecting as required, all steel piles.

(c) Furnishing, fabricating as required, and installing all hardware including rubber bumpers, bitts, cleats, structural connections, bolts, spikes, dowels, wire rope, chain, and other hardware shown on drawings, and as otherwise may be required to complete the work. 1

(d) Furnishing and installing all timber girts, struts, bracing, caps, stringers, guards, blocking, chocks, handrail, decking and other timber items.

(e) Furnishing and installing necessary special framing and/or anchorages, as shown on drawings, for items listed in Paragraph 1.02.

(f) Furnishing and installing all concrete, reinforcement, rubber bumpers, hardware, and related work for all mooring platforms and breasting dolphins.

(g) Furnishing and installing life preserver gear cabinets.

(h) Furnishing and installing all steel floor plate.

(i) Furnishing and installing all items for deck fire openings. 1

(j) Furnishing and driving piles, and performing load tests thereon as covered in Part III of this specification.

1.02 Work specifically excluded from the contract covered by this specification is as follows: 1

(a) All piping and electrical work except that required, furnished and installed temporarily by the subcontractor as an incidental to construction.

(b) All concrete work, except as noted in Paragraph 1.01 (f) above.

(c) Hose, hose derricks, and hose handling equipment.

(d) Uplift connections for those timber piles supporting Anchor A only, as shown on Drawing 22-AM-4. 1 2

(e) Fire fighting facilities, except for deck openings, monitor platforms and as otherwise called for on the drawings.

1 (f) Earthwork and paving.

1 (g) Electrical shelters above deck.

1 (h) Wharf office and hose cart shelters above deck.

(i) Any mechanical equipment, e.g. powered winches, pumps, compressors, etc.

(j) Valve access platforms

2.0 MATERIALS, GENERAL

2.01 All materials used in the construction shall be new and unused and shall meet fully the requirements of the applicable specifications hereinafter referred to.

2.02 The contractor reserves the right to reject any materials which in his opinion do not meet specified requirements, and the subcontractor shall remove such defective material and replace it with acceptable material at his own expense.

3.0 TIMBER PILES, GENERAL

3.01 All timber piles shall be Douglas Fir, and shall, except for tip and butt dimensions hereinafter specified, conform to the requirements for Class A round timber piles, ASTM Designation D25-55T.

3.02 All piles shall be treated as specified in Paragraph 4.0.

3.03 Pile lengths furnished shall be sufficient to obtain the penetrations into the soils, hereinafter specified, with ample length remaining to ensure cutoff at sound section below the butt.

3.04 The subcontractor shall furnish at his own expense such additional piles over and above the actual number entering into the finished work as will be required to cover breakage, rejection, or other contingencies.

3.05 Lagging may be required on some piles, and where deemed necessary by the contractor, it shall be furnished and installed by the subcontractor and paid for as an extra.

Bidders shall include with their proposal a firm price per pile for lagging as detailed on the drawings.

1 Lagging shall be untreated Douglas Fir meeting at least the requirements of No. 1 posts and timbers, Paragraph 125-C of W.C.L.A. Standard Grading and Dressing Rules, March, 1956.

FORM 293

3.06 It is intended that all timber piles be furnished in sufficient lengths without splicing, and any proposal to splice shall be subject to the approval of the contractor. In the event of unforseen conditions during the course of the work, which may require splicing, splice details shall be as shown on Drawing 22-AM-8. Bidders shall include with their proposal a firm price per splice as detailed. (1)

3.07 Pile dimensions shall meet the requirements set forth in the following table:

Pile Lengths Feet	Min. Tip Diameter Inches	Butt Diameter Inches	
		Min.	Max.
Up to 70'	8	14	18
70' to 90'	8	16	20
90' to 100'	8	17	22
100' and Over	8	18	24

4.0 PILE PRESERVATIVE TREATMENT

4.01 Preservative pile treatment shall be by the full-cell (Bethell and Burnett) method. Plant, equipment and general process requirements shall conform to Specifications C1-56 and C3-54 of the American Wood Preservers Association.

4.02 The retention of treating solution for all treated piles shall not be less than 14 pounds per cubic foot.

4.03 The treating solution shall be Grade B or coal tar creosote solution conforming to Specification P1-54 and P2-54 respectively of the American Wood Preservers Association. (1)

4.04 All treated piles shall be branded to identify the treating company and year of treatment. Piles shall be branded approximately 10 feet from the butt.

5.0 DELIVERY AND HANDLING OF TIMBER PILES

5.01 Means of transporting piles to the jobsite is optional with subcontractor except that under any and all conditions, special precautions shall be taken in lashing and stapling to prevent injury to the treated surfaces. Any such damage shall be repaired as specified in Paragraph 5.03.

5.02 Piles shall be handled at all times in a manner to prevent damage. The use of hooks, cants, peavies and other equipment that will damage creosoted material shall be avoided.

5.03 Where any surface of a treated pile is damaged, the damaged area shall be mopped with a liberal quantity of hot creosote, followed by a 1/4" coat of coal tar plastic cement. All such repairs shall be made at no additional cost to the contractor.

5.04 Treated piles which, in the opinion of the contractor's inspector, are damaged to an extent as to permit the ready entry of marine borers shall be rejected and replaced with acceptable piles at no additional cost to the contractor.

6.0 DRIVING OF PILES, GENERAL

6.01 Driving leads of sufficient length to hold the longest piles firmly in position and alignment with the hammer shall be used. Suitable driving caps shall be used to prevent damage to pile butts during driving.

6.02 Suitable bridles or slings for handling piles up to their position in the leads, that will prevent excessive bending or unacceptable damage to the piles shall be used.

6.03 Every effort shall be made to drive continuously without interrruption. Should driving of a pile be interrupted, the pile on resuming driving shall be "unfrozen" and driven to its specified penetration.

6.04 Piles shall be cut off true and level at the required elevations, or as otherwise shown on the drawings.

6.05 The piles shall be spaced accurately as shown on the plans, and shall be driven vertically or on the batter shown with reasonable accuracy in the positions indicated, so that they need not be unduly pulled into line. A deviation of not more than 4 inches off center line of the bent, and not more than 6 inches out of position along the length of the bent will be permitted.

6.06 Any pile which, in the opinion of the general superintendent, or his authorized inspectors, does not meet the requirements of this specification shall, at the contractor's request be pulled and redriven, or replaced as required, at the subcontractor's expense. △2

6.07 The subcontractor shall prepare a driving record for each pile driven, except timber fender, corner cluster, and hanging piles. Records shall include:

(a) Pile designation by bent number and row, e.g. 586 E.

(b) A driving log showing run under weight of hammer, and blows per foot of penetration through the firmer upper soils overlying the softer clays, which are shown in all borings from No. 100 to and including No. 117. This log shall be continued until pile has penetrated at least 5 feet into the softer clays as indicated by decreased driving resistance.

Where the soft clays are not encountered and piles are driven to practical refusal, as hereinafter specified, the driving log need cover only the last 5 feet of penetration, in which case, the number of blows per final inch of penetration shall also be recorded.

(c) Final tip elevation, all piles.

(d) Any additional information required to explain unusual driving conditions which deviate from those anticipated, and remedial measures taken, if any. △2

FORM 293

The records shall be delivered to the contractor within 24 hours after completion of driving the recorded pile.

7.0 DRIVING OF TIMBER PILES

2 7.01 Piles shall be driven with a hammer delivering not less than 15,000 nor more than 18,000 foot pounds of energy per blow.

7.02 Piles in bents shown below will derive their load carrying capacity through friction against the surrounding soils and shall, therefore, be driven to penetrations such that the elevation of the pile tip upon completion of driving does not fall above the elevations set forth in the following table. Elevations are based on MLLW datum equals 0.00'.

2

All Piles in Following Locations	Final Tip Elevation	*Approximate Minimum Pile Length Before Cutoff
Bents 502 to 541 incl.	-23.0	41
Bents 542 to 605 incl.	-26.0	44
Bents 606 to 661 incl.	-35.0	53
Bents 662 to 701 incl.	-40.0	58
Bents 702 to 716 incl.	-45.0	63
Bents 717 to 736 incl.	-48.0	66
Bents 737 to 752 incl.	-52.0	70
Bents 753 to 769 incl.	-56.0	74
Bents 770 to 793 incl.	-63.0	81
Bents 794 to 860 incl.	-67.0	85
All remaining timber piles in causeway and complete pierhead	-73.0	94

* Tabulated lengths apply to vertical piles only.

7.03 The above specified final tip elevations shall apply to both batter and vertical piles. Batter piles shall be furnished in lengths sufficient to reach required tip elevations, up to maximum lengths of 110 feet after cutoff.

1 2 7.04 It is anticipated that in the locations set forth in Paragraph 7.02, a layer of relatively firmer soils will be encountered at depths generally a few feet below bay bottom to an extreme of some 30 feet in the vicinity of boring 105. Thickness of these firmer soils appears to range from 12 to 25 feet, and they are underlain by a softer blueish gray clay. In all of the above locations, all piles shall be driven through the firmer soils to the final tip elevations specified. In case heavier driving than the contractor considers prudent to achieve this result becomes necessary, contractor may order either of the following options:

a) Stop driving at a higher elevation than above specified.

b) The use of driving shoes.

In case contractor orders option 2, subcontractor will be compensated therefore under Extra Work.

1 7.05 For piles in the above locations, jetting will not be permitted.

FORM 293

1 7.06 Should any unusual or unanticipated driving conditions be encountered with piles in above locations, driving shall be stopped and the condition reported to the contractor's general superintendent or his authorized representative immediately. Unusual conditions shall be construed to mean failure to reach specified tip elevations from any cause, or failure to encounter the firm soils in depth as described in Paragraph 7.04

1 7.07 Piles in Pipe Trestle and Roadway Approach

1 7.071 All piles south of Bent 501 shall be driven thru the upper sandy loam soils, thru the blue clay, and into the sandy loam soils shown on the boring logs as "supporting soils". Penetration into these supporting soils shall be not less than set forth in the following table, except that driving will be considered complete when the driving resistance reaches 50 blows per foot of penetration.

1

Boring No.	Required Penetration into "Supporting Soils" Feet	Required pile length in feet below Cutoff Elev.
46	2	48-1/2
47	1	42-1/2
48	6	42
49	6	40
51	5-1/2	42-1/2
52	2	58

7.072 Required pile length for penetrations between borings shall be interpolated from the above table, and subcontractor shall furnish piles in sufficient lengths to meet these requirements.

8.0 STEEL PILES, GENERAL

8.01 Steel piles will be furnished by the contractor in unfabricated mill lengths from 55 to 70 feet. Subcontractor shall splice lengths as necessary to meet required lengths of piles for driving.

8.02 Steel piles shall be spliced by butt welding, and as otherwise detailed on drawings. Splice welds shall be full penetration, and shall meet the requirements of the AWS Code for Welding in Building Construction.

8.03 All steel piles shall be protected as specified in Section 16.0

9.0 DRIVING OF STEEL PILES

1 2 9.01 All steel piles shall be driven with a steam hammer of sufficient rated energy to reach a final tip elevation of -95.0 feet. Required pile lengths after cutoff will accordingly be 105 feet for vertical piles, and 114 feet for batter piles; except at Platform-D, where piles will be approximately 10 feet longer.

1 9.02 Jetting of piles during driving will not be permitted, and the same requirements set forth in Paragraph 7.06 for timber piles, shall also apply to steel piles.

FORM 293

WA-TEX 000275

1 9.03 Piles driven on a batter shall be positioned for driving with sufficient accuracy, and scheduled so as to eliminate danger of encountering timber piles already driven in the vicinity.

2 9.04 Contingent upon results of load test No. 3 as specified in Part III hereof, contractor may order increased pile lengths. In such event, subcontractor will be compensated therefore under Extra Work.

10.0 TIMBER, GENERAL

10.01 All framing timber furnished and used in the construction shall be Douglas-Fir, except as provided in Paragraph 10.02, conforming with the following applicable paragraphs from the West Coast Lumbermen's Standard Grading and Dressing Rules as effective March 15, 1956:

(a)	Guard Posts and Handrails	Par. 153-b (1500F)
(b)	Guard Rails at Deck Level	Par. 124-b (1500F)
(c)	Plank Decking at 45°	Par. 124-b (1500F)
(d)	Laminated Decking	Par. 124-bb(1750F)
(e)	Deck Stringers	Par. 124-bb(1750F)
(f)	Caps Bearing on Piles	Par. 124-bb(1750F)
(g)	Horizontal Struts, Girts and Diagonal Bracing	Par. 123-b or 124-b (1500F)
(h)	Misc Blocking, Chocks, Fillers, etc.	Par. 123-b or 124-b (1500F)

1 * Unless otherwise specified on drawings.

2 10.02 Deleted.

11.0 PRESERVATIVE TREATMENT OF TIMBER

11.01 All timber entering into the construction shall have a preservative treatment. The treatment for timber, except as specified in Paragraph 11.02 shall meet fully the requirements of Paragraph 4.01 through 4.04, as hereinbefore specified for timber piles, except that minimum retention of treating solution shall be not less than 12 lbs per cu ft for diagonal bracing in vertical and inclined plane, girts, struts, and other main framing and blocking below pile cutoff elevations, and treatment shall conform to Specification C1-56 and C2-56 of the AWPA.

11.02 Material in all bents north of and including Bent 666 comprising the pile caps, deck stringers, decking guard posts, rails, struts, chocks, blocking, and other framing at or above pile cutoff elevations, shall be treated in a closed cylinder by the full-cell vacuum process with one of the following preservatives, to the minimum net dry retentions shown:

FORM 293

WA-TEX 000276

Preservative	Min Net Dry Retention lbs per cu ft
Tanalith Salts	0.35
Chemonite	0.30
Boliden Salts	0.50
Erdalith Salts	0.50

Preservative materials and practice shall be in accordance with Standards P5-56 and C1-56 of the American Wood Preservers Association.

1 2 11.03 Material comprising pile caps and deck stringers for all construction south of Bent 666, shall be given preservative treatment in accordance with requirements of Paragraph 11.01. Material above stringers shall be treated in accordance with Paragraph 11.02.

12.0 PREFABRICATION AND DETAILING

12.01 It is intended that timber be prefabricated wherever possible, especially that framing below pile cutoffs which will be subject to immersion at high water.

12.02 All holes, daps, and finish cut lengths in prefabricated timber shall be made prior to treatment.

12.03 Surfacing and dressing of timber shall be as follows:

All diagonal bracing, struts, girts, blocks, chocks, fillers, etc., at or below pile cutoffs, unless otherwise noted	Rough
Caps	Surface Top & Bottom
Stringers	Surface Top & Bottom
Blocking, chocks and fillers below deck, but above pile cut-offs	Optional
Decking at 45°	S 2 S
Laminated Decking	S 4 S
All timber above Deck	S 4 S

12.04 Detailing of timber by the subcontractor, for fabrication and construction, shall conform to Section 2508 of the Uniform Building Code, 1955 edition, especially as regards "end margin" and "edge margin" distances for bolted connections.

1 2 12.05 All washers used in the construction shall be malleable iron, ribbed type, unless otherwise called for on the drawings.

1 12.06 All drifts dowels and bolts shall be 1" nominal diameter unless otherwise called for on the drawings.

FORM 293

WA-TEX 000277

12.07 Spike grids shall be provided at all connections of framing timber to sides of piles, and at abutting flat faces of connected timber where called for on the drawings. Grids shall be flat or curved as required, and shall be galvanized in accordance with Paragraph 15.04.

12.08 Shop holes for bolts shall be drilled before treating, one sixteenth larger than the bolt diameter. Field holes for drifts shall be drilled one sixteenth under drift diameter; and for through bolts, the same diameter as the bolt.

13.0 FIELD FRAMING AND FIELD PROTECTIVE TREATMENT

13.01 In handling treated timber, the use of hooks, etc., which will damage the treated material, will not be permitted. Any scaffolding that may be required shall be hung by ropes or supported by means other than temporary nailing or bolting to treated material.

13.02 All timber and pile cuts shall be made accurately so as to secure the cleanest and closest possible fit with full contact over the bearing surfaces, and shall be given a protective treatment as specified in Paragraph 13.04 before bolting up.

13.03 Holes drilled in the field through treated material shall be thoroughly swabbed with HOT preservative of the same type used in the original treating. The bolt shank shall be fully coated with coal tar plastic cement, and the end of the bolt dipped in plastic cement so that as much cement as possible will be pushed ahead of the bolt when inserted in the hole. Unused holes shall be filled at each end with creosoted wooden plugs coated with plastic cement.

13.04 At all cuts in creosoted material, or where any surface thereof is damaged, the subcontractor shall mop such surface with a liberal quantity of hot preservative, followed by a 1/4-inch coat of coal tar plastic cement before bolting up.

1 13.05 The tops of all timber piles immediately after cutoff, shall be mopped with a liberal quantity of hot preservative, followed by a 1/16-inch coat of coal tar plastic cement. This shall be followed with a 30-inch by 30-inch piece of coal tar pitch saturated, heavy cotton fabric (made pliable in cold weather by warming) which shall be pressed smooth to contact the pile, lapped on the side of the pile, nailed with four 1-1/2-inch galvanized roofing nails 4 inches from the top, and trimmed 2 inches below the nails. Plastic cement, 1/8-inch thick, shall be applied to the top surface of the fabric. After the caps are set and secured by the drift dowels, not less than 3/8-inch of plastic cement shall be applied to the exposed area of the fabric with a 5/8-inch to 7/8-inch fillet along the face of the cap setback from the edge of the pile. Uncapped piles shall receive 3/8-inch to 1/2-inch of plastic cement over the entire area of the fabric.

13.06 Cut surfaces in salts treated timber shall be soaked with hot salts solution before framing up.

13.07 At the time of final clean-up, or before they are covered by abutting timber, all cracks in Piles above MLLW, and cracks wider than 1/16 inch in creosoted timber, shall be thoroughly cleaned of dirt, filled with hot Preservative and coated with Plastic cement.

13.08 In laying down the individual Pieces for laminated deck, sPecial care shall be taken in selection, orientation, and sequence of sPiking to stringers and adjacent Pieces, such that each Piece bears fully on all stringers and adjacent Pieces.

14.0 INSPECTION OF PILES AND TIMBER

14.01 The subcontractor shall, at his own exPense, secure the services of a reputable testing agency, and shall submit to the contractor in duplicate, test reports certified by such agency, that all piling, timber, and the treatment thereof, meet the requirements of these sPecifications.

15.0 HARDWARE

(2) 15.01 All structural steel shall conform to ASTM SPecification A7-55T, Steel for Bridges and Buildings.

15.02 All welding shall be of first class workmanshiP conforming to the AWS Code for Arc Welding in Building Construction.

15.03 Bolts, nuts, washer, drifts, sPikes, etc., shall all be of toP commercial quality.

15.04 All hardware and miscellaneous metal, including drifts, sPikes, bolting material, slide Plates for PiPing, cable lashing, fender chain, etc., but not including mooring cleats or bollards, shall be hot diP galvanized after fabrication. Galvanizing shall conform to ASTM (2) Designation A123-53.

(1) 15.05 Mooring bitts shall be as shown on Drawing 22-AM-36, excePt that contractor will entertain ProPosal to accePt cast steel bitts of similiar tyPe Provided they are of suitable size for handling tankers of 85,000 gross D.W. tons, and Provided it can be shown that their cost is less than the bitt detailed on Drawing 22-AM-36. Bidders shall include firm Prices in their ProPosals for tyPe of bitt they ProPose to furnish.

(1) 15.06 Cleats shall be 36-inch minimum overall length, caPable of safely resisting a 15-ton mooring load, and shall be of cast steel. Bidders shall include in their ProPosal Price a firm allowance for all material e.g. anchor bolts, and labor required for securing bitts and cleats to decks.

15.07 Welding of galvanized material shall be avoided. If found necessary in the field, galvanizing shall be removed down to bare steel in areas to be welded. After welding, all unProtected areas shall be thoroughly cleaned and recoated with Sealube ComPany's ZRC to the satisfaction of the general suPerintendent.

FORM 293

WA-TEX 000279

16.0 PROTECTION FOR STEEL PILES

16.01 Each steel pile shall be protected with a concrete jacket above elevation -4.5' and a steel collar at the mud line.

16.02 Jackets may be formed rectangular in section as detailed on the drawings, or circular provided diameter is not less than 28 inches.

16.03 Concrete for the pile jackets shall conform in all respects with the requirements for concrete as specified in Section 17.0 hereof, except that maximum aggregate size is limited to 1-1/2 inches.

16.04 Steel collar to be located at the mud line shall be as detailed on the drawings, and may be bolted around the pile before driving. Collars shall be located in their permanent position at the mud line as soon as practicable after completion of driving each pile, and shall be so positioned as to extend not less than one foot, nor more than three feet into the bottom. 2

16.05 With the collar in its permanent position, it is imperative that it have a snug fit in contact with the pile surfaces, but not necessarily so tight a fit that it cannot be driven down to its final position.

17.0 REINFORCED CONCRETE

17.01 Materials

17.011 Cement shall conform to all requirements of standard specifications and tests for Portland Cement, ASTM Designation C-150-52. Cement shall be Type II unless otherwise approved by the contractor.

17.012 Coarse and fine aggregate shall meet the minimum requirements in every respect of ASTM Specification for Concrete Aggregates, Designation C33-52T, except that grading shall be modified as required to produce concrete of optimum density and workability. Maximum size of aggregate shall be three inches.

17.013 Steel reinforcement shall conform to the requirements of the "Standard Specification for Billet Steel Concrete Reinforcement Bars", ASTM Designation A15-52T for intermediate grade steel. Bar deformations shall conform to "Standard Specifications for Minimum Requirements for Deformations of Deformed Bars for Concrete Reinforcement", ASTM Designation A-305.

17.014 Reinforcement splices, unless otherwise shown, shall be made by lapping bars a minimum of 30-bar diameters.

17.02 Proportioning and Placing

△1 17.021 Concrete shall develop at 28 days, not less than 3,500 psi ultimate compressive strength. The minimum cement content shall be 6 sacks per cubic yards.

FORM 293

17.022 Mixes shall be so designed and proportioned as to produce a concrete of optimum density and durability.

17.023 Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. No concrete that has partially hardened or has been contaminated by foreign material shall be deposited in the work, nor shall retempered concrete be used. Concrete shall not be deposited during rain unless adequately protected from rain until it has hardened sufficiently so that it will not be damaged.

17.024 All ends of chutes, hopper gates, and other points of concrete discharge shall be so designed or fitted with suitable baffles that concrete passing from them will not fall separated into whatever receptacle receives it. The free fall of concrete into forms shall be limited to five feet.

17.025 Concrete shall be placed as dry as possible, and shall be worked throughout with approved mechanical vibrators to ensure complete embedment of reinforcement and other steel, and a resulting concrete of maximum density. Overvibration shall be avoided.

17.026 Concrete shall be limited to a maximum slump of 4 inches. Wet batches shall be subject to rejection at no cost to the contractor.

17.027 Mass concrete in mooring and breasting platforms may be placed in separate lifts not to exceed three in number for each platform. Vertical joints are not permissible.

17.028 Horizontal joint surfaces shall be keyed in both directions: Key recesses shall be 12 inches wide by 3 inches deep at 2'-0" centers.

17.029 Subcontractor shall furnish the contractor with a sketch showing his proposal for depth of lifts, additional reinforcement required in top face of initial lift, and general keying pattern. Details shall be subject to contractor's approval.

17.0210 Joint surfaces shall be thoroughly clean and free of standing water before placing concrete for subsequent lifts thereon.

17.03 Admixture

17.031 "Plastiment" as manufactured by Sika Chemical Corporation shall be added at the mixer for all concrete, in the amount of 0.5 lb of the nonhygroscopic powder or its equivalent in liquid form per sack of cement. The use of "Plastiment" does not abrogate minimum cement requirements hereinbefore specified.

17.032 With use of "Plastiment", water content in mix shall be reduced below that used for plain concrete, to produce concrete of maximum permissible slump hereinbefore specified.

17.04 Forms

17.041 Forms shall be of sufficient strength and rigidity to maintain their position and shape under loads incidental to placing concrete.

17.042 Form ties or tying methods which cause spalling of concrete on form stripping, or which leave any permanent metal exposed to the air, shall not be used.

Holes left after removal of form ties shall be plugged with a stiff mortar mix consisting of 3 parts sand to 1 part cement. 2

17.043 Forms shall not be removed until at least 72 hours after pouring of concrete, unless otherwise approved by the general superintendent.

17.05 Curing of Concrete

17.051 Concrete shall be cured by maintaining it in a continuously damp condition for not less than 7 days after form removal. Curing may also be accomplished with 2 coats of an approved white pigmented curing compound, e.g. A.C. Horne's "Hornecure" No. 40 W. 1

17.06 Protection of Reinforcement

17.061 The minimum clear distance from reinforcement to face of finished concrete shall be 3 inches. Special care shall be taken to provide and maintain this clearance.

18.0 SITE CLEANUP

18.01 The contractor shall keep materials stored in an orderly manner, and keep site and work clear of debris so as to eliminate as far as possible hazards of fire and personal injury.

18.02 At the conclusion of the work, the contractor shall clean the site of all debris resulting from his operations, and remove it from the premises, all at his own expense, and to the satisfaction of the general superintendent. No debris shall at any time be disposed of in the bay or surrounding waters.

WA-TEX 000282

1

PART III - TEST PILES

1.0 SCOPE

1.01 Immediately after award of contract, the subcontractor shall prepare to perform without delay load tests on 3 piles. Tests shall consist of and be designated as follows:

Test No. 1 Bearing test on a timber pile

Test No. 2 Pullout test on a timber pile

Test No. 3 Bearing test on a steel pile

1.02 Subcontractor shall furnish all material, equipment, and labor for performing the above tests as hereinafter specified, ~~except that~~ contractor will furnish steel piles in mill lengths.

2.0 TEST LOCATIONS

2.01 Test piles shall be located as shown on Drawings 22-AM-54 and 55. Each test pile shall be numbered 1, 2, or 3, depending on the test number as defined above. Additional reaction piles required for each test shall be designated 1-A, 1-B, 1-C for Test No. 1, etc.

3.0 TEST PILE ARRANGEMENTS

2 3.01 Test No. 1 shall consist of the test pile flanked by 2 or more tension reaction piles as required. Reaction piles shall be driven on a slight batter (1-1/2 to 1) away from the test pile, and shall be sufficiently long to be driven through the firm soils described as grayish brown silty clay in Boring 104. Reaction piles shall be capable of resisting a maximum load on the test pile of 40 tons, without appreciable movement.

3.02 Test No. 2 shall have the same pile arrangement as Test No. 1, except that reaction piles will be in compression under test loading, and two jacks will be required.

2 3.03 Test No. 3 shall have the same pile arrangement as Test No. 1. Reaction piles shall be steel, driven firmly into the sands below approximate elevation -115.0. They shall be capable of resisting a 150-ton load on the test pile without appreciable movement.

3.04 Manner of arrangement, details of reaction beams and other structural members and connections are optional with the subcontractor. All such details shall be capable of safely sustaining the maximum test loads hereinafter specified.

FORM 293

4.0 TEST PILES

4.01 Timber test piles shall conform to requirements of Paragraph 3.01 and 3.07, Part II of this specification, except that they will require no protective treatment. They shall be peeled.

4.02 Timber reaction piles shall be Douglas Fir, conforming to ASTM Designation D 25-55T for Class B round timber piles. No protective treatment is required. Piles shall be peeled.

4.03 Steel test and reaction piles shall be 14" x 14-1/2" bearing piles weighing 89 lbs per foot. They will be furnished by the contractor in mill lengths.

5.0 DRIVING OF PILES

5.01 Reaction piles shall be driven as set forth in Section 3.0 above

5.02 Load test piles shall be driven vertically to the following tip elevations.

Test No. 1	Elevation -45.0'
Test No. 2	Elevation -45.0'
(2) Test No. 3	Elevation -95.0'

5.03 Length of all piles shall be sufficient to allow for a minimum cutoff elevation of +15.00 after driving to penetrations specified. All elevations are based on MLLW=0.00 feet.

5.04 A complete driving log and record shall be prepared for each pile driven. This record shall show ground elevation, blows per foot for each foot of penetration, final tip elevation, type of hammer used, date and hour of driving, and weather conditions. Record for each pile shall be delivered to the contractor within 48 hours of completion of driving.

6.0 TESTING OF PILES

6.01 Settlement or movement of tested pile under loading shall be measured by devices which will give accurate readings to .01 inch.

6.02 Test loads shall be applied by hydraulic jack with calibrated load gauge reading in tons, in increments as hereinafter specified for each test.

6.03 Each load increment shall be maintained until rate of settlement or movement is less than 0.10 inches per hour, before loading to next increment, or load shall be sustained for not less than 1/2 hour between incremental loadings. Movement readings shall be taken at regular intervals during the test period. Ultimate load, or failure shall be considered as that load beyond which an increase in load produces a sudden disproportionate increase in movement.

6.04 Care shall be taken to apply the incremental loadings slowly so as to minimize effect of impact.

6.05 Loads for Test Numbers 1 and 2 shall be applied in 5-ton increments up to failure, or to 40 tons, whichever is reached first.

6.06 Loads for Test Number 3 shall be applied in 10-ton increments up to failure, or to 150 tons, whichever is reached first.

6.07 Load movement curves shall be prepared by the subcontractor for each test. These curves shall show movement for each incremental loading, movement under sustained loading, and rebound upon unloading. These data shall be delivered to the contractor within 48 hours after completion of each test.

7.0 CLEANUP

△2 7.01 After completion of tests, all timber piles shall be removed so that they do not project above the bottom.

7.02 Steel piles shall be either pulled complete, or cut off not more than 1'-0" above the bottom, after which they shall be returned to contractor's stock as directed by the general superintendent.

55,
27½
82½

FORM 293

WA-TEX 000285

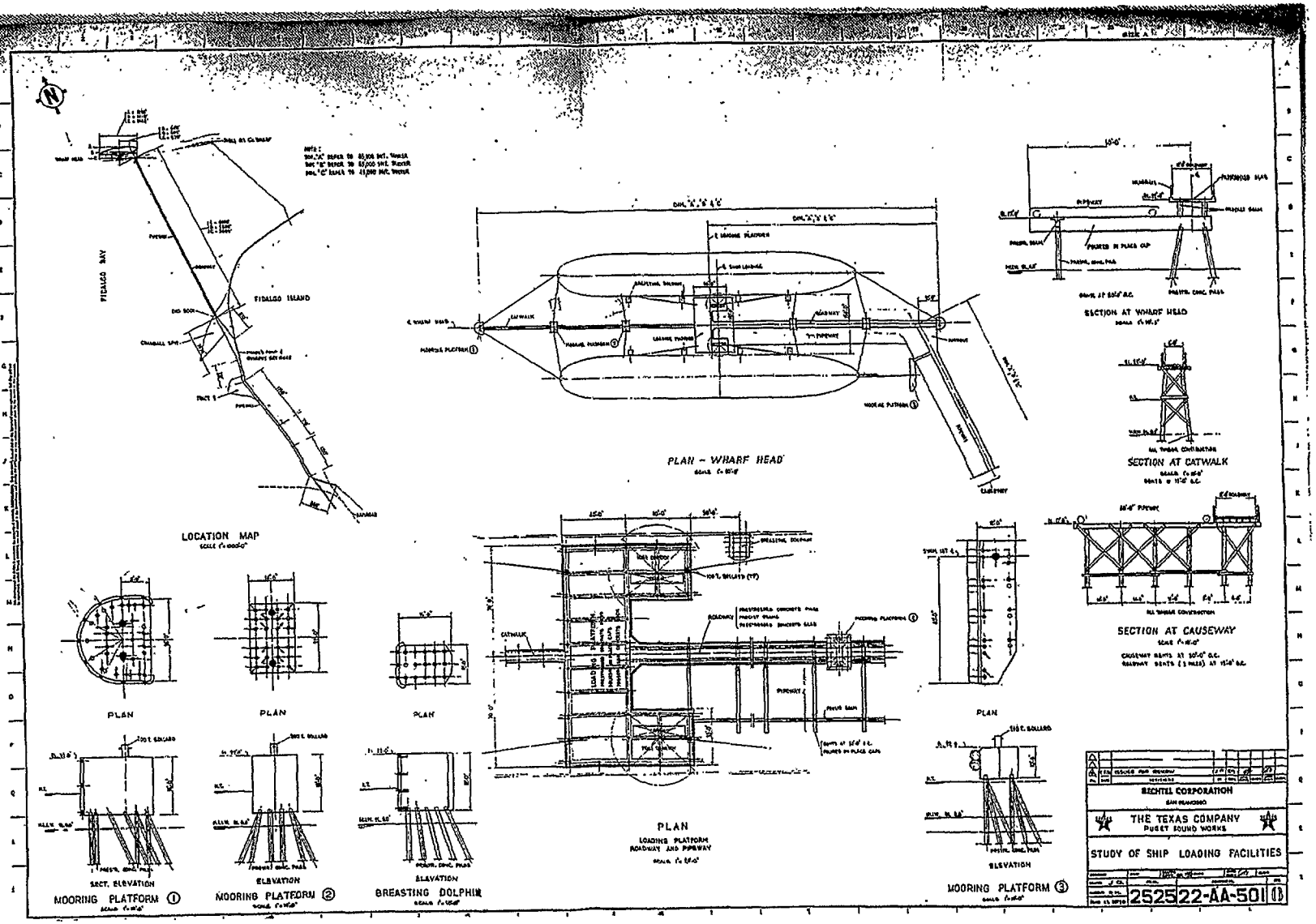
THE TEXAS COMPANY
PUGET SOUND WORKS
WHARF STUDY-MAIN STRUCTURE ONLY

		45,000 D.W.T.	65,000 D.W.T.	* 85,000 D.W.T.
1.	Ship Data			
	Length O.A.	736'-6"	790'-0"	845'-0"
	Beam	108'-0"	108'-0"	125'-3"
	Draft (Summer)	37'-6"	40'-3"	44'-3"
	Pump Capacity @ 125 lb/sq in	18 M bbl/hr	22 M bbl/hr	25 M bbl/hr
	Hoses	4-10" ϕ	4-12" ϕ	4-12" ϕ
	Capacity - 35 HPI	325,000 bbl	490,000 bbl	585,000 bbl
2.	Water depth at Wharf	45'-0"	47'-6"	50'-0"
3.	Length of Wharf	1140'	1220'	1280'
4.	Length Causeway	5600'	5800'	6000'
5.	Relative amt. Timber Piling	1.0	1.06	1.11
6.	Relative amt. Struct. Timber	1.0	1.04	1.08
7.	Relative amt. Conc. Piling	1.0	1.07	1.18
8.	Relative amt. Reinf. Conc.	1.0	1.14	1.25
9.	Relative and Prestressed Beams and Deck	1.0	1.10	1.17
10.	Relative amt. Pipe	1.0	1.05	1.10

*85,000 D.W.T. offshore and 65,000 D.W.T. shoreside

Note

If design is to be for T-2 or 25,000 D.W.T. (max) tankers reduction from 45,000 D.W.T. would be approximately equal to increase shown for 65,000 D.W.T. over 45,000 D.W.T. tanker.



WA-TEX 000287