ART ANDERSON

TECHNICAL MEMORANDUM

Date: November 9, 2020 **AAA Ref:** FWPOB103.005

To: James Weaver **Client Ref:**

Cc: Brian Robinson

From: Art Anderson

Subject: Repair Concept for Fire Damage at Port Orchard Marina D Dock, Vicinity of D-27

Exhibits

A. Initial Assessment Report of Fire Damage at Port Orchard Marina D Dock dated 27 October 2020

B. Port Orchard Marina Reconstruction Report of May 1997 by PN&D

C. PN&D Letter Dated October 17, 1997 regarding Bellingham Marine Shop Drawing Package

Introduction

This memo is in response to fire damage that occurred on the Port Orchard Marina D Dock on October 7, 2020. The initial structural integrity assessment was documented in reference A. The purpose of this report is to develop a concept design of the required repair effort and a construction cost estimate for insurance claim purposes. The fire site with potentially damaged areas is identified below in Figure 1:

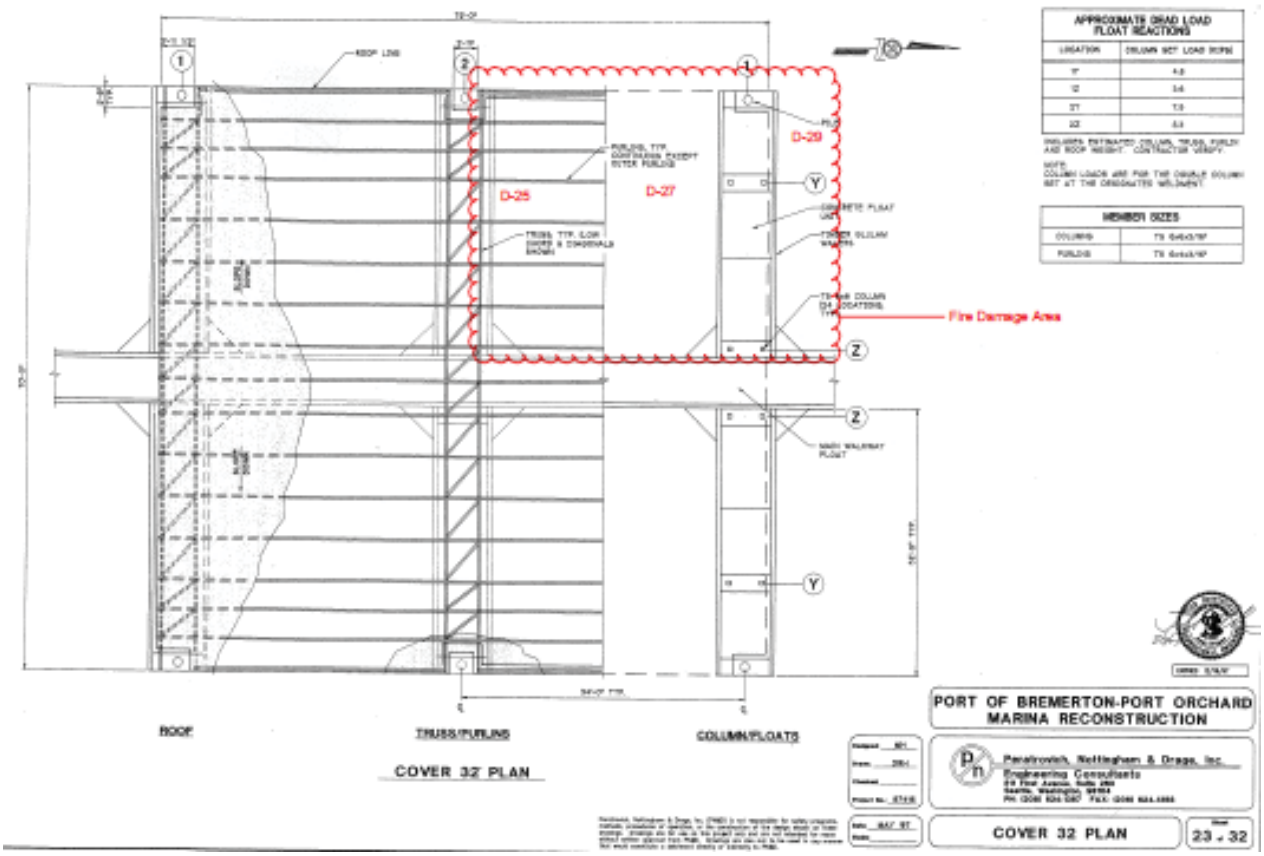


Figure 1 - Vicinity Snapshot of the Damage Location

Damage Observations and Repair Strategies

Per Reference A, the resulting fire involved fuel – both gasoline and kerosene were present on the vessel. According to reports by the fire department at the scene, a propane tank on the vessel also caught fire causing a hot fire ball, which spread towards the stern of the vessel, and burned approximately 20 minutes before it could be extinguished, completely destroying the vessel at berth D-27 and causing damage to vessels moored in the two adjacent finger float berths (D-29 and D25) on both sides of the subject vessel. As observed on two site visits (9 October and 26 October), the fire did not cause any visible damage to any of the infrastructure on or on the other side of the main float, except minor discoloration of the lid on the spill kit box at the head of the finger float on the side of the hottest area of the fire.

Although the underlying steel members are not deformed, the temperature caused by the fire was high enough to melt the galvanizing off both columns along the affected waler, as noted in Figures 2 and 3 below:

Figure 2 - Inner Roof Column Foundation

Figure 3 - Outer Roof Column Foundation

Additionally, it would appear that the roof also reached high temperatures as there is an area of roof panels that have compromised coatings, and two roof purlins that also appear to have damaged galvanizing, shown in Figure 4 and 5 below:

Figure 4 - Damaged Roof Area

Figure 5 - Purlin Galvanizing Damage

It was noted that the configuration of the D Dock and the member sizing of the Roof columns were not consistent with the approved design in reference B. In review of reference C, which included the redesign of both the piling configuration and the roof structure, the new sizing of the columns and purlins could be determined to be 4" X 4" X 1/8" columns and 8" X 2.5"" X 14 GA purlins and are assumed as installed. It will be important for the contractor to verify the member sizing and wall thicknesses to ensure that the proper replacement shape is installed during the repair.

While, as reported in Reference A, there is no visible deformation of the two affected steel 4" X 4" X 1/8" roof columns or the two affected 8" X 2.5"" X 14 GA purlins, it is not cost effective nor an advantage to the Port of Bremerton to attempt to simply repair the coatings on these members, since this type of repair would not have an equivalent life cycle of new galvanized steel replacements. An additional factor that incentivizes replacement is that the roof panels for this entire section of roof over berths D-25 and D-27 will need to be replaced as well because the coatings on these roof panels were compromised by the high temperatures, and replacement with new panels will be cheaper than cleaning. preparing and repainting the existing panels. Since this roof panel repair work will require shoring and most likely scaffolding, it will be approximately the same cost for either coating repair or replacement of the structural members and roof panels with new. Replacing all with new also eliminates quality control concerns that can influence the life cycle for repaired coating systems. The 3.5" X 4" metal gutter on one of the columns must also be replaced.

The concrete float was carefully inspected for cracks that could have developed due to the high temperatures. No cracks were found in any of the concrete surfaces. The damaged 5 1/4" X 9" waler, showed only surface damage due to the fire and still has nearly 100% of its original strength. Unfortunately, there is no way to repair the walers, so replacement is necessary. The existing cleats can be reused and re-installed on the new waler in the same positions. The 32-foot-long section of main waler and the 82" end waler must be replaced, as it is a requirement of the original design that the walers be continuous members (See Figures 6 and 7 below).

Figure 6 - First Damaged Column

Figure 7 - Second Damaged Column

The fire curtains on one side of the boat house are destroyed and must be replaced (See Figure 8).

Figure 8 - Damaged Fire Curtains

Construction Cost Estimate

Based on the above inspection results and analysis, while there was no damage that impaired the structural integrity to the concrete or roof structure over berths D-25, D 27 and D-29, several components of this section of D Dock will need to be replaced to restore the full use of these berths in the future. The detailed repair plan described above is reflected in the repair cost estimate, included in Attachment 1, for restoration of the fire damaged areas. This estimate assumes that it will be carried out under a construction contract, and that the contract will need include a contingency for potentially unforeseen damage that could be uncovered during demolition. Since every component would be replaced like in kind, there does not appear to be a need for a formal design of the repairs, however, scaffolding and shoring design may be required. The Construction cost estimate, including required design costs are $98,000.

Attachment 1

ROM Cost Estimate

ART ANDERSON ASSOCIATES

ESTIMATED BY: AAA	PROJECT No.	**FWPOB103.005**
PROJECT & CITY: Port of Bremerton Port Orchard Marina D Dock Fire Damage Repair	CONTRACT No.	
DATE: November 9, 2020	PURPOSE	ROM Est
EST. VALID TO: ROM = N/A	SHEET 1	OF 1

SCOPE OF WORK:

SCOPE OF WORK:

Replace damaged columns, gutter and purlins, repair any damaged column/purlin connections, replace timber waler, Remove and replace roof panels

LS = Lump Sum Allowance value used

LINE ITEMS	QUANTITY		LINE ITEM COST			TOTALS
DESCRIPTION OF WORK	#	UNIT	UNIT($)	SUM TOT ($)		SUM TOTS ($)
Mobilization	1	LS	$5,000.00	$5,000		$5,000
Barge w/crane Rental and Crew	1	LS	$10,000.00	$10,000		$10,000
Setup temporary structural shoring	1	LS	$4,000.00	$4,000		$4,000
Inspect connections, remove if necessary	1	LS	$1,500.00	$1,500		$1,500
Remove 2 Columns	2	Ea.	$2,000.00	$4,000		$4,000
Remove I gutter	1	Ea.	$500.00	$500		$500
Remove 2 Purlins	2	Ea.	$500.00	$1,000		$1,000
Remove waler 5.25"X9"X32', inspect rods and concrete	1	LS	$2,000.00	$2,000		$2,000
Remove end waler 2.25"X9"X82", inspect concrete	1	LS	$900.00	$900		$900
Remove roof panels	1152	SF	$1.00	$1,152		$1,152
Install new end waler and waler w/ re-installed cleats	1	LS	$2,000.00	$2,000		$2,000
Install new 4"X4" columns, reconnect to existing structure	2	Ea.	$1,000.00	$2,000		$2,000
Install 2 New Purlins	2	Ea.	$900.00	$1,800		$1,800
Install New Gutter	1	Ea.	$400.00	$400		$400
Innstall new Roof Panels 32'X36'	1152	SF	$5.00	$5,760		$5,760
Innstall new Fire Curtails 22'X32'	704	SF	$2.00	$1,408		$1,408
				$0		$0
				$0		$0
				$0		$0
Demobilize	1	LS	$2,000.00	$2,000		$2,000
				$0		$0
				$0		$0
LINE ITEM SUBTOTAL						$45,420
GENERAL CONDITIONS ITEMS	QUANTITY			COST		
Description of Item	#	UNIT	UNIT($)	SUM TOT ($)		SUM TOTS ($)
SUBTOTAL						$45,420
CONTRACTOR'S OVERHEAD	15%					$13,626
CONTRACTOR'S PROFIT	10%					$10,447
Sales Tax (on above subtotals+OH/P)	9.00%					$10,342
CONTRACTOR'S BONDS & INSURANCE	5%					$3,475
SUBTOTAL						$69,493
CONTINGENCY						
DESIGN + CONSTRUCTION CONTINGENCY	10%	0	$0.00	$0.00	$0.00	$11,491
ESCALATION CONTINGENCY (Assume 2020)	0%	0	$0.00	$0.00	$0.00	$0
CONSTRUCTION COST TOTAL						$80,984
DESIGN & ENGINEERING (Damage Assessment and Planning Effort)	0%					$8,890
DESIGN & ENGINEERING (shoring/scaffolding Design)	10%					$8,098
						$0
SUBTOTAL						$97,972
GRAND TOTAL						$97,972

Exhibit A

TECHNICAL MEMORANDUM

Date: October 29, 2020 **AAA Ref:** FWPOB103.005

To: James Weaver **Client Ref:**

Cc: Brian Robinson

From: Patrick Vasicek, P.E., Art Anderson Associates

Subject: Initial Assessment of Fire Damage at Port Orchard Marina D Dock

References

A. Washington Boat Accident Report, Kevin Conner dated 07 October 2020

Introduction

This memo is in response to fire damage that occurred on the Port Orchard Marina D Dock on October 7, 2020. The damage occurred when a fire broke out on a private vessel in the vicinity of berth D-27. Art Anderson conducted an initial visual assessment on 9 October 2020, but the site was closed due to investigation by the Fire Marshall. However, we did not observe any overtly visible structural damage to warrant discontinuing use of the other berths inside the boat house. Art Anderson returned on 26 October to carry out a more detailed investigation of damage at the site in support of preparation of a construction cost estimate for the needed repairs. The fire site with potentially damaged areas and vessel are identified below:

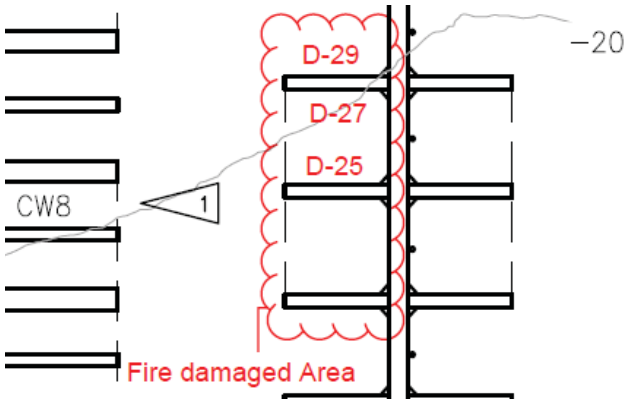


Figure 1 - Vicinity Snapshot of the Damage Location

Figure 2 - Photo of Damaged Vessel

Preliminary Damage Observations

Per Reference A, the resulting fire involved fuel – both gasoline and kerosene were present on the vessel. According to reports by the fire department at the scene, a propane tank on the vessel also caught fire causing a hot fire ball, which spread towards the stern of the vessel, and burned approximately 20 minutes before it could be extinguished, completely destroying the vessel at berth D-27 and causing damage to vessels moored in the two adjacent finger float berths (D-29 and D25) on both sides of the subject vessel. As observed on both site visits, the fire did not cause any visible damage to any of the infrastructure on or on the other side of the main float, except minor discoloration of the lid on the spill kit box at the head of the finger float on the side of the hottest area of the fire.

The purpose of this report is to document the structural integrity of the marina infrastructure in the vicinity of the fire to determine if there is a need to evacuate the berths under the affected boat house.

Although the underlying steel member is not deformed, the temperature caused by the fire was high enough to melt the galvanizing off both columns along the affected waler, as noted in the below photos:

Figure 3 - Inner Roof Column Foundation

Figure 4 - Outer Roof Column Foundation

Additionally, it would appear that the roof also reached high temperatures as there is an area of roof panels that have compromised coatings, and two roof purlins that also appear to have damaged galvanizing, shown below:

Figure 5 - Damaged Roof Area

Figure 6 - Purlin Galvanizing Damage

As stated in the American Institute of Steel Construction (AISC) steel solutions center: "It should be kept in mind that steel is born in a melting process that is significantly hotter than any building fire. Significant residual stresses are therefore present in all newly manufactured steel members. A general rule of thumb reads: 'If it is still straight after exposure to fire – the steel is OK.' Straightening techniques are also available for steel members that have been misaligned after fire exposure." It is important to note that steel melts at 2,500 – 2,800 degrees Fahrenheit.

Since the galvanizing on the foundations of the two affected columns was melted into puddles at the base of each column, we know the temperature at that location was at least 420 degrees Celsius (787 degrees F), but there was no evidence of deformation of the 4"x 4" steel columns. Similarly, temperatures approaching 420 degrees Celsius were most likely reached at the roof, but there was also no evidence of deformation of the steel purlins themselves via visual observation. In line with the above AISC guidelines, since there is no deformation of the steel shapes, the temperature was not high enough to have any effect on the structural strength of the underlying steel.

The concrete float was carefully inspected for cracks that could have developed due to the high temperatures. No cracks were found in any of the concrete surfaces. The damaged 5 1/4" X 9" waler, showed only surface damage due to the fire and still has nearly 100% of its original strength. The cleats and roof columns remain securely bolted down. The fire curtains on one side of the boat house are destroyed and are no longer protecting the boat house on the other side.

Additionally, with respect to the soot accumulated on the underside of the roof panels over berths D-25 and D-27, it expected that this residue is nearly 100% carbon black, with very few other constituents at extremely low concentrations. It is not expected that this soot presents any corrosion risk to boats below these affected panels.

Initial Structural Recommendations

Based on the above inspection results and analysis, berths D-25, D 27 and D-29 showed no structural defects or damages that would prevent continued use of this section of the Port Orchard Marina. A detailed repair plan and repair cost estimate for restoration of the fire damaged areas is being developed and will be submitted in the next report.

Exhibit B

PORT ORCHARD MARINA RECONSTRUCTION

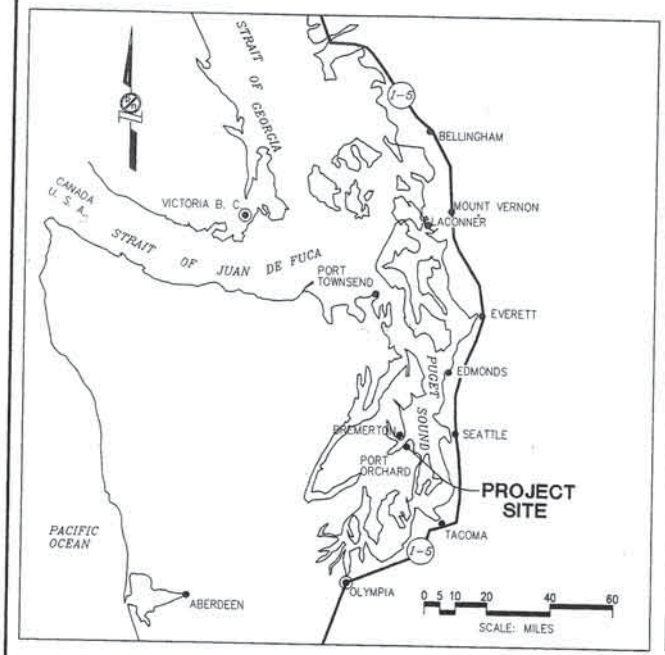
CONTRACT DOCUMENTS FOR CONSTRUCTION SERVICES
APPENDIX D

OWNER:
PORT OF BREMERTON
PORT ORCHARD, WASHINGTON

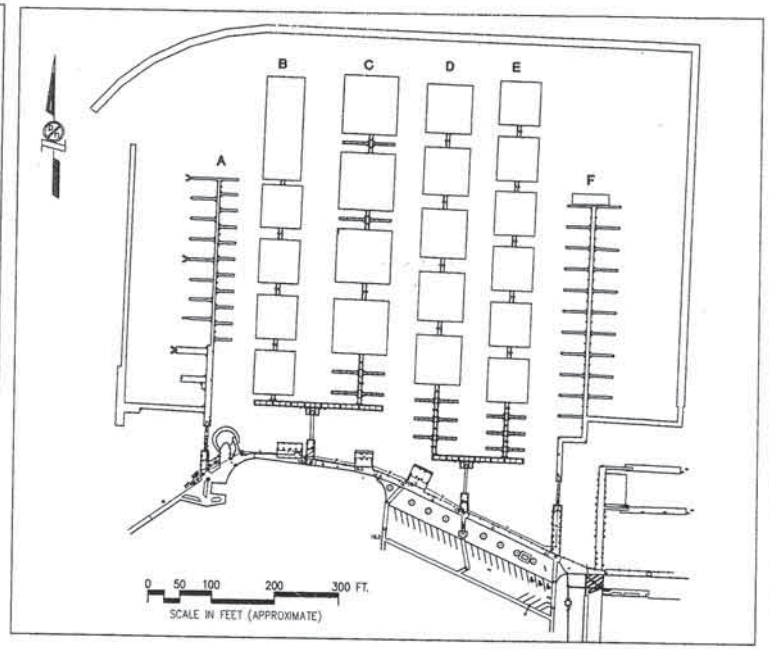
MAY 1997

APPENDIX D.1

ALTERNATE A



LOCATION MAP



VICINITY MAP

SHEET TITLE	SHEET NUMBER
TITLE SHEET AND INDEX	1
EXISTING CONDITIONS AND DEMOLITION	2
EXISTING APPROACH DOCK & GANGWAY	3
BASIN PLAN	4
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MAINWALK D & E	6
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HEADWALK/MAINWALK CONNECTIONS	8
52-FOOT FINGER AND MAINWALK	9
FINGER FLOATS	10
FINGER FLOATS, 3' WIDE	11
TYPICAL FLOAT SECTIONS	12
FLOAT UNITS	13
TRI-BRACES	14
PILE HOOPS	15
UTILIDOR	16
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MAINWALK COLUMN WELDMENT	18
INTERNAL COLUMN WELDMENT	19
DOCK AMENITIES	20
COVER 28 PLAN	21
COVER 28 SECTION	22
COVER 32 PLAN	23
COVER 32 SECTION	24
COVER 36/42 PLAN	25
COVER 36/42 SECTION	26
COVER 52 PLAN	27
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COLUMN AND ROOF	29
COLORS AND SIGNS	30
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GENERAL NOTES	32
WATER AND FIRE SYSTEM, FLOATS B AND C	W1
WATER AND FIRE SYSTEM, FLOATS D AND E	W2
EXISTING APPROACH DOCK & STANDPIPE DETAILS	W3
WATER, FIRE AND MISCELLANEOUS DETAILS	W4
GANGWAY/HEADWALK WATER CONNECTIONS	W5
52-FOOT FINGER AND MAINWALK JUNCTION	W6
GENERAL NOTES AND MISCELLANEOUS DETAILS	W7
ELECTRICAL SITE PLAN	E1
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ONE-LINE DIAGRAM	E4
DETAILS	E5
DETAILS	E6
SPECIFICATIONS	E7
SPECIFICATIONS	E8
SPECIFICATIONS	E9
SPECIFICATIONS	E10

PORT OF BREMERTON

PORT ORCHARD MARINA RECONSTRUCTION

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Designed:
Drawn: DRH
Checked:
Project No.: 97416

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
811 First Avenue, Suite 260
Seattle, Washington, 98104
PH: (206) 624-1387 FAX: (206) 624-1388

Date: MAY '97
Scale: NOTED

TITLE SHEET AND INDEX

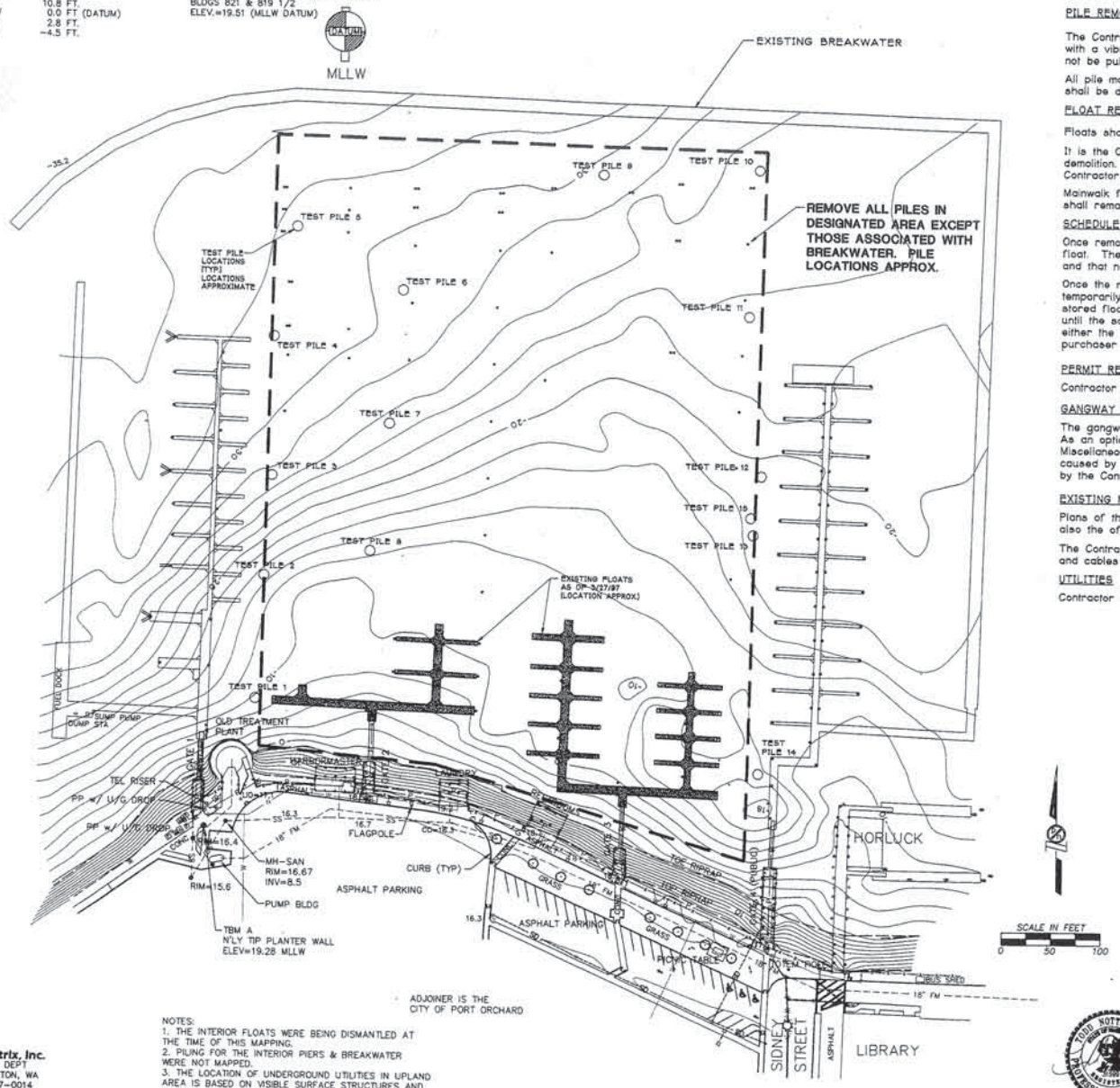
Sheet 1 of 32

G:\ACDATA\DRH\97416\97416-1.DWG
PLOT BY WANCH, PCP 04-30-97

TIDAL INFORMATION

MHHW	11.7 FT.
MHW	10.8 FT.
MLLW	0.0 FT (DATUM)
MLW	2.8 FT.
ELW	-4.5 FT.

VERTICAL: BENCH MARK P255 1944 USC&GS
N. SIDE BAY ST ON FDN WALL BETWEEN
BLDGS 821 & 819 1/2
ELEV.=19.51 (MLLW DATUM)



NOTES:
1. THE INTERIOR FLOATS WERE BEING DISMANTLED AT THE TIME OF THIS MAPPING.
2. PILING FOR THE INTERIOR PIERS & BREAKWATER WERE NOT MAPPED.
3. THE LOCATION OF UNDERGROUND UTILITIES IN UPLAND AREA IS BASED ON VISIBLE SURFACE STRUCTURES AND CITY AS-BUILTS.

Parametrix, Inc.
SURVEY DEPT
BREMERTON, WA
360 377-0014

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PLOT: 11 w/ANCH.PCP 04-30-97

DEMOLITION NOTES

PILE REMOVAL

The Contractor shall remove all timber piles located in the area indicated on the plans. Piles shall be pulled with a vibratory hammer suitable for that type of operation and equipped with suitable jaws. Piles that can not be pulled without excessive breakage may be cutoff at mudline.

All pile material shall become the property of the Contractor and shall be removed from the site. All waste material shall be disposed of at a legally approved disposal site for the type of disposal required.

FLOAT REMOVAL AND SALVAGE

Floats shall be removed in a manner that minimizes damage.

It is the Owners intention that all salvageable attached appurtenances will be removed by the Owner prior to start of demolition. All other appurtenances shall be removed by the Contractor and shall become the property of the Contractor and shall be removed from the site.

Mainwalk float walers shall be cut to provide connected float units of approximately 30-foot lengths. Finger floats shall remain whole with no cutting of the waler. Tribraces shall remain attached to the fingers.

SCHEDULE

Once removed the existing floats for B&C shall be rafted together and securely tied to the end of the existing D float. The Contractor shall monitor the floats during the course of the construction to insure that they remain secure and that no damage is occurring. No demolition of D & E floats shall occur until B float can be occupied.

Once the new mainwalk B is completed all the existing floats may be relocated to the completed Mainwalk B and temporarily stored at this location. The storage of floats shall be such as to minimize the area occupied by the stored floats. The Owner will arrange for the sale of the floats at this time. The Contractor shall monitor the floats until the sale (or end of construction whichever is first) to insure they remain secure and no damage is occurring to either the existing or new floats. The Contractor shall allow reasonable access to the construction site for the purchaser for removal of the floats.

PERMIT REQUIREMENTS

Contractor shall perform allwork in accordance with permit requirements.

GANGWAY REMOVAL AND REUSE

The gangway shall be removed and temporarily stored in a safe location until it can be reinstalled on the new floats. As an option the Contractor may temporarily support the gangway in-place to avoid its temporary removal. Miscellaneous utilities and attachments not required by the new construction shall be removed and any damage caused by the removal repaired. Any damage to the gangway, attachments, supports or other items shall be repaired by the Contractor.

EXISTING FACILITY PLANS

Plans of the existing facility are available for viewing at the office of Peratrovich, Nottingham & Drage Inc. and also the office of the Port of Bremerton.

The Contractor is cautioned to review the plans, particularly of the floating breakwater which is anchored by lines and cables to driven timber stub piles throughout the area.

UTILITIES

Contractor coordinate with utilities for removal, shutoff etc. of all poer, water, etc.

• EXISTING PILES

FLOAT	NUMBER	TYPE
B	18	TIMBER
C	22	TIMBER
B/C	2	TIMBER
D	8 (+1 FLOATING)	TIMBER
E	17	TIMBER
D/E	2	TIMBER
TOTAL	69 (+1 FLOATING)	

* FOR INFORMATION ONLY, CONTRACTOR SHALL VERIFY ALL PILE QUANTITIES

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
811 First Avenue, Suite 260
Seattle, Washington, 98104
PH: (206) 624-1387 FAX: (206) 624-1388

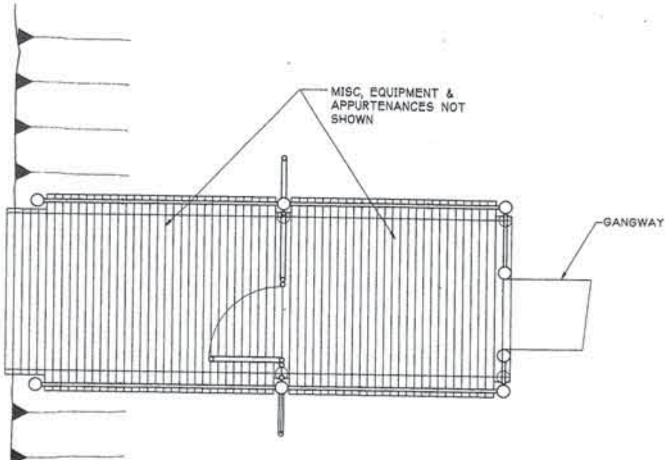
TODD NOTTINGHAM — REGISTERED PROFESSIONAL ENGINEER
EXPIRES 12/16/97

Designed: TN
Drawn: DRH
Checked:
Project No.: 97416

Date: MAY '97
Scale: NOTED

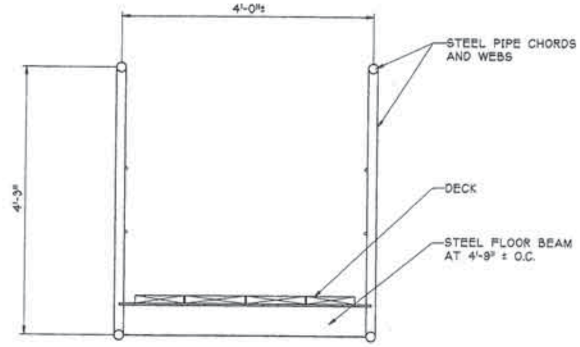
EXISTING CONDITIONS AND DEMOLITION

Sheet 2 of 32

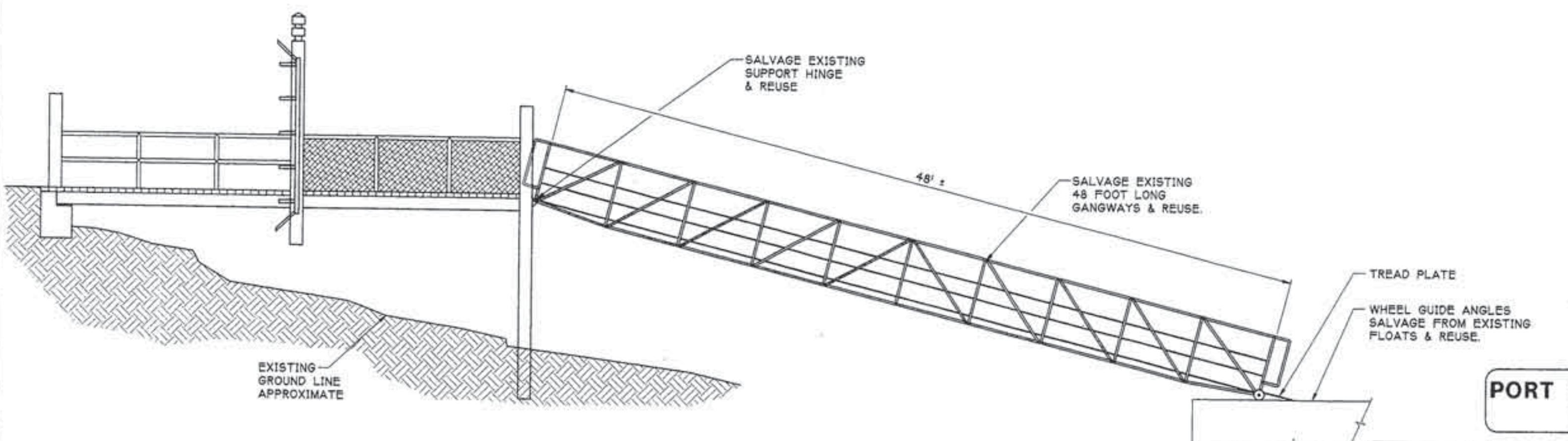


PLAN AT ACCESS GATE TO PIER

(GEOMETRY VARIES SLIGHTLY EACH GATE)



EXISTING RAMP TYPICAL SECTION



EXISTING RAMP TYPICAL ELEVATION

EXPIRES 12/16/97

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PLOT 1:1 W/ANCH.PCP 04-30-97

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Designed: TN
Drawn: DRH
Checked:
Project No.: 97416
Date: MAY '97
Scale:

Peratrovich, Nottingham & Drage, Inc.
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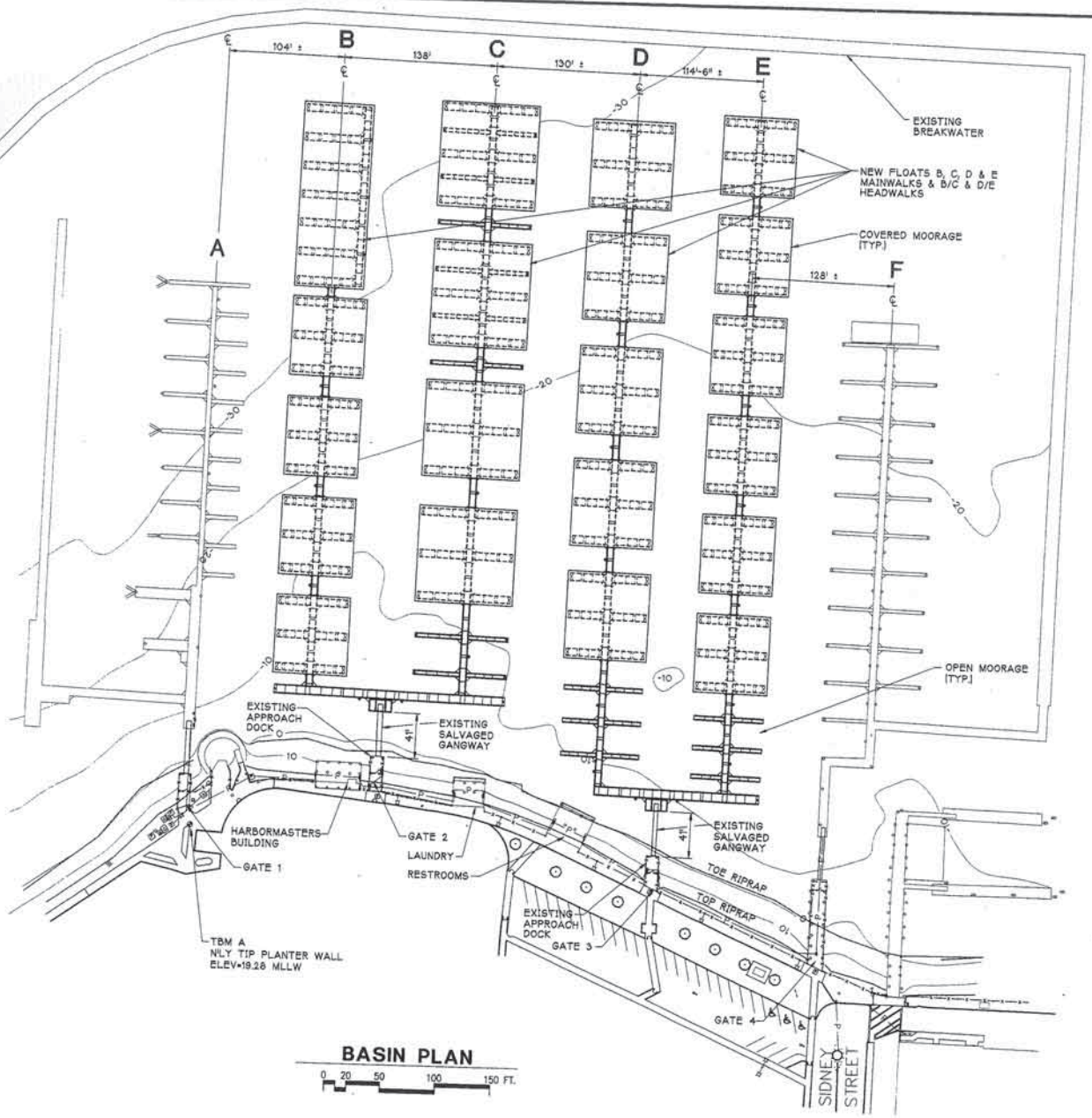
Seattle, Washington, 98104
PH: (206) 624-1387 FAX: (206) 624-1388

EXISTING APPROACH DOCK AND GANGWAY

Sheet 3 of 32



BASIN PLAN

0 20 50 100 150 FT.

PROJECT LAYOUT & CONTROL

1) ESTABLISH CENTERLINE ALIGNMENT OF F FLOAT AND USE AS CENTERLINE OFFSET OF MAINWALKS WITH HEADWALKS PERPENDICULAR TO F ALIGNMENT.

2) ESTABLISH HEADWALK OFFSET BY PERPENDICULAR OFFSET AS SHOWN FROM EXISTING APPROACH TO EDGE OF GANGWAY FLOATS.

3) COORDINATE WITH ENGINEER, SUBMIT SURVEY CONTROL FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

TODD NOTTINGHAM REGISTERED PROFESSIONAL ENGINEER
EXPIRES 12/16/97

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Designed: TN
Drawn: DRH
Checked:
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Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
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Seattle, Washington, 98104
PH: (206) 624-1387 FAX: (206) 624-1388

BASIN PLAN

Sheet 4 of 32

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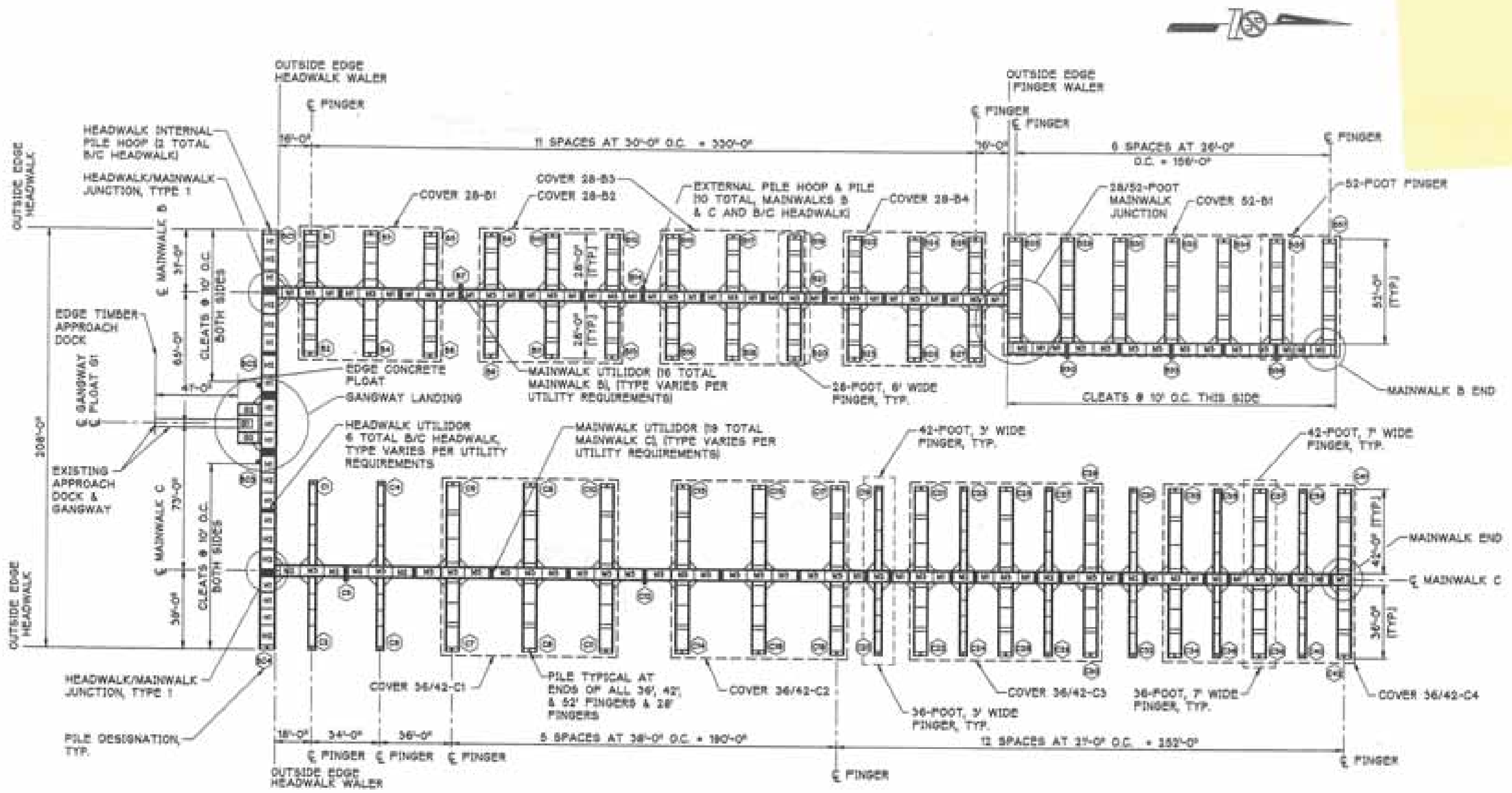
PLOT IN M/ANCH.POP 04-30-97



MAINWALK B & C

0 10 20 30 60 90 FT.

CLEATS- PROVIDE AT HEADWALK & 52' SLIP MAINWALK AS NOTED (56 TOTAL)

PROVIDE ONE MAINWALK CLEAT PER SLIP AT BOW LOCATION OF VESSEL. LOCATE AS APPROVED BY ENGINEER. (108 TOTAL)

GANGWAY/HEADWALK FLOAT UNIT DESIGNATION

FLOAT DESIGNATION	NOMINAL SIZE
G1	8' x 10'
G2	5' x 10'
H1	7' x 8'
H2	7' x 10'

MAINWALK FLOAT UNIT DESIGNATION

FLOAT DESIGNATION	NOMINAL SIZE
M1	5' x 8'
M2	5' x 10'
M3	5' x 12'

Designed: TN
Drawn: DRH
Checked:
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Scale: NOTED

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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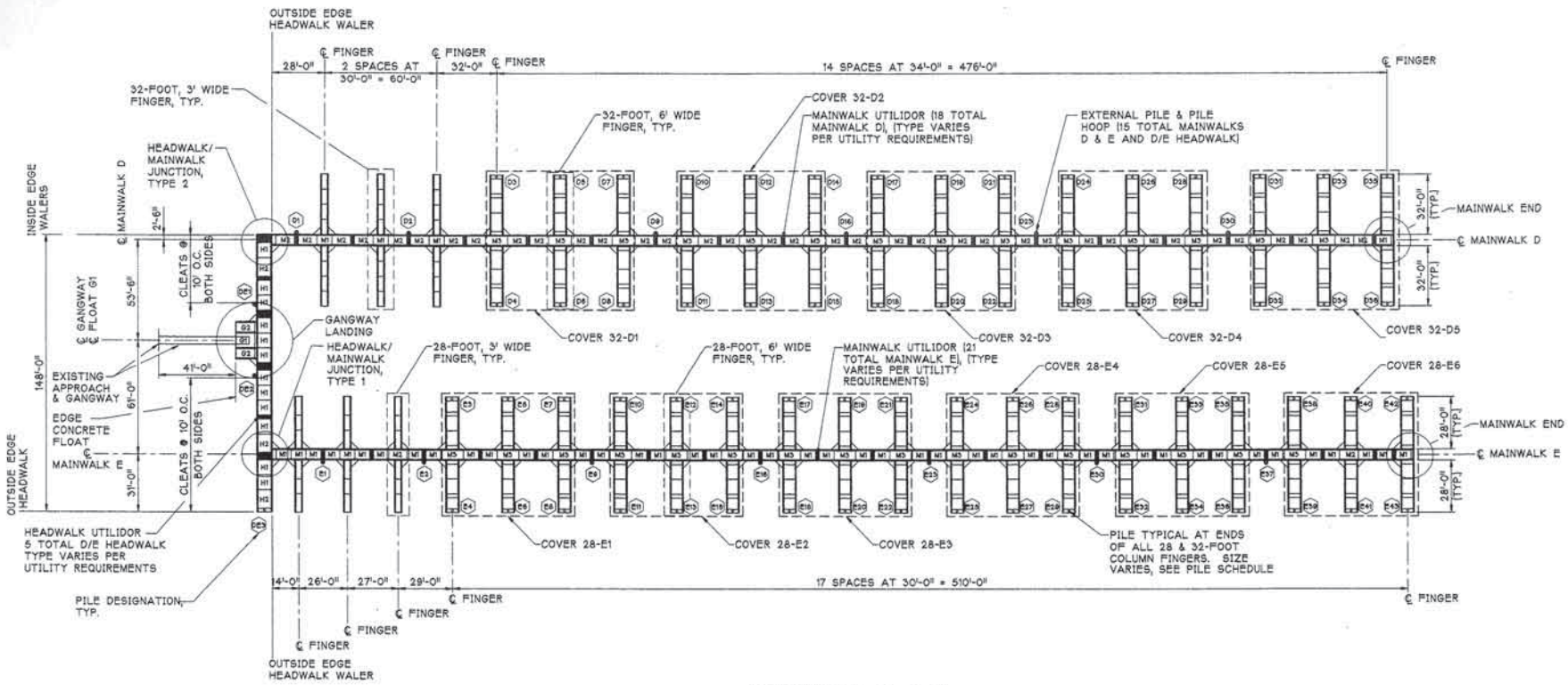
MAINWALK B & C



MAINWALK D & E

0 10 20 30 60 90 FT.

CLEATS- PROVIDE AT HEADWALK LOCATIONS NOTED (24 TOTAL)

PROVIDE ONE MAINWALK CLEAT PER SLIP AT BOW LOCATION AS APPROVED BY ENGINEER (154 TOTAL)

GANGWAY/HEADWALK FLOAT UNIT DESIGNATION

FLOAT DESIGNATION	NOMINAL SIZE
G1	8' x 10'
G2	5' x 10'
H1	7' x 8'
H2	7' x 10'

MAINWALK FLOAT UNIT DESIGNATION

FLOAT DESIGNATION	NOMINAL SIZE
M1	5' x 8'
M2	5' x 10'
M3	5' x 12'

EXPIRES 12/15/97

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Designed: TN
Drawn: DRH
Checked:
Project No.: 97416
Date: MAY '97
Scale: NOTED

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
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Seattle, Washington, 98104
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MAINWALK D & E

Sheet 6 of 32

C:\ACDATA\DRH\1997\97416\97416-6.DWG
PLOT: 11 w/ANCH.PCP 04-30-97

Pile Number	Pile Designation	Pile Size	Hoop Type	12-3/4-Inch Recommended Length (Feet)	16-Inch Recommended Length (Feet)
1	BC1	12.75	Internal	55	
2	BC2	12.75	External	55	
3	BC3	12.75	External	55	
4	BC4	12.75	Internal	55	
5	B1	12.75	Internal	55	
6	B2	12.75	Internal	55	
7	B3	12.75	Internal	55	
8	B4	12.75	Internal	55	
9	B5	12.75	Internal	55	
10	B6	12.75	Internal	55	
11	B7	12.75	External	55	
12	B8	12.75	Internal	55	
13	B9	12.75	Internal	55	
14	B10	12.75	Internal	55	
15	B11	12.75	Internal	55	
16	B12	12.75	Internal	65	
17	B13	12.75	Internal	60	
18	B14	12.75	External	65	
19	B15	12.75	Internal	65	
20	B16	12.75	Internal	60	
21	B17	12.75	Internal	70	
22	B18	12.75	Internal	65	
23	B19	12.75	Internal	80	
24	B20	12.75	Internal	70	
25	B21	12.75	External	75	
26	B22	12.75	Internal	85	
27	B23	12.75	Internal	75	
28	B24	12.75	Internal	90	
29	B25	12.75	Internal	80	
30	B26	12.75	Internal	95	
31	B27	12.75	Internal	85	
32	B28	16	Internal		95
33	B29	16	Internal		100
34	B30	16	External		95
35	B31	16	Internal		105
36	B32	16	Internal		110
37	B33	16	External		100
38	B34	16	Internal		115
39	B35	16	Internal		115
40	B36	16	External		110
41	B37	16	Internal		120
42	C1	16	Internal		60
43	C2	16	Internal		60
44	C3	16	External		60
45	C4	16	Internal		60
46	C5	16	Internal		60
47	C6	16	Internal		60
48	C7	16	Internal		60
49	C8	16	Internal		60
50	C9	16	Internal		60
51	C10	16	Internal		60
52	C11	16	Internal		60
53	C12	16	External		60
54	C13	16	Internal		65
55	C14	16	Internal		60
56	C15	16	Internal		70
57	C16	16	Internal		65
58	C17	16	Internal		70
59	C18	16	Internal		70
60	C19	16	Internal		75
61	C20	16	Internal		70
62	C21	16	Internal		75
63	C22	16	Internal		70
64	C23	16	Internal		80
65	C24	16	Internal		70
66	C25	16	Internal		80
67	C26	16	Internal		75
68	C27	16	Internal		80
69	C28	16	Internal		75
70	C29	16	Internal		85
71	C30	16	Internal		75
72	C31	16	Internal		90
73	C32	16	Internal		80
74	C33	16	Internal		95
75	C34	16	Internal		80
76	C35	16	Internal		95
77	C36	16	Internal		85
78	C37	16	Internal		100
79	C38	16	Internal		90
80	C39	16	Internal		100
81	C40	16	Internal		90
82	C41	16	Internal		105
83	C42	16	Internal		95

Pile Number	Pile Designation	Pile Size	Hoop Type	12-3/4-Inch Recommended Length (Feet)	16-Inch Recommended Length (Feet)
84	DE1	12.75	External	55	
85	DE2	12.75	External	55	
86	DE3	12.75	Internal	55	
87	D1	12.75	External	55	
88	D2	12.75	External	55	
89	D3	12.75	Internal	55	
90	D4	12.75	Internal	55	
91	D5	12.75	Internal	55	
92	D6	12.75	Internal	55	
93	D7	12.75	Internal	55	
94	D8	12.75	Internal	55	
95	D9	12.75	External	55	
96	D10	12.75	Internal	55	
97	D11	12.75	Internal	55	
98	D12	12.75	Internal	55	
99	D13	12.75	Internal	55	
100	D14	12.75	Internal	55	
101	D15	12.75	Internal	55	
102	D16	12.75	External	60	
103	D17	12.75	Internal	60	
104	D18	12.75	Internal	60	
105	D19	12.75	Internal	60	
106	D20	12.75	Internal	65	
107	D21	12.75	Internal	65	
108	D22	12.75	Internal	65	
109	D23	12.75	External	65	
110	D24	12.75	Internal	65	
111	D25	12.75	Internal	65	
112	D26	12.75	Internal	65	
113	D27	12.75	Internal	65	
114	D28	12.75	Internal	65	
115	D29	12.75	Internal	70	
116	D30	12.75	External	70	
117	D31	12.75	Internal	75	
118	D32	12.75	Internal	70	
119	D33	12.75	Internal	80	
120	D34	12.75	Internal	70	
121	D35	12.75	Internal	80	
122	D36	12.75	Internal	80	
123	E1	12.75	External	55	
124	E2	12.75	External	55	
125	E3	12.75	Internal	55	
126	E4	12.75	Internal	55	
127	E5	12.75	Internal	55	
128	E6	12.75	Internal	55	
129	E7	12.75	Internal	55	
130	E8	12.75	Internal	55	
131	E9	12.75	External	55	
132	E10	12.75	Internal	55	
133	E11	12.75	Internal	55	
134	E12	12.75	Internal	55	
135	E13	12.75	Internal	60	
136	E14	12.75	Internal	55	
137	E15	12.75	Internal	60	
138	E16	12.75	External	60	
139	E17	12.75	Internal	60	
140	E18	12.75	Internal	60	
141	E19	12.75	Internal	60	
142	E20	12.75	Internal	60	
143	E21	12.75	Internal	60	
144	E22	12.75	Internal	65	
145	E23	12.75	External	65	
146	E24	12.75	Internal	60	
147	E25	12.75	Internal	65	
148	E26	12.75	Internal	65	
149	E27	12.75	Internal	65	
150	E28	12.75	Internal	65	
151	E29	12.75	Internal	65	
152	E30	12.75	External	65	
153	E31	12.75	Internal	65	
154	E32	12.75	Internal	65	
155	E33	12.75	Internal	65	
156	E34	12.75	Internal	65	
157	E35	12.75	Internal	65	
158	E36	12.75	Internal	65	
159	E37	12.75	External	65	
160	E38	12.75	Internal	70	
161	E39	12.75	Internal	70	
162	E40	12.75	Internal	70	
163	E41	12.75	Internal	70	
164	E42	12.75	Internal	70	
165	E43	12.75	Internal	70	

PILE NOTES

STRUCTURAL STEEL PILES
Steel pile shall conform to ASTM A252, Grade 3 with ASTM A36 chemistry suitable for welding or approved equivalent. All piles shall be galvanized, except the bottom 20 feet of piles need not be galvanized.

GALVANIZING
All steel pile and hardware shall be hot-dipped galvanized per ASTM A123 or A153 after fabrication unless otherwise noted. Damaged galvanizing, including that removed for welding shall be repaired by stick galvanizing with zinc or aluminum alloy sticks to a minimum thickness of 12 mils. Contractor shall submit repair material and methods of repair for review and approval.

STEEL WELDING
Per AWS D1.1. All welders shall be qualified per AWS for the type of welding specified and anticipated. Welds will be spot tested by the Owner by VT, MT, or UT and those failing shall be repaired at the Contractors expense which will also include all costs for retesting. No welding through the galvanized coating will be performed. The galvanizing within one inch of the weld shall be removed and repaired after welding.

PILE INSTALLATION
All float piles shall be driven plumb through the pile hoops in such a manner to allow the float full movement through the tides without binding. Each float pile shall be capable of 10,000 pounds of bearing.

All piles shall be driven with a vibratory hammer, APE 150 or equivalent as required to obtain the necessary embedment. If the pile is driven full length without achieving vibratory hammer refusal, a static load check shall be performed. The static load check shall consist of placing the entire weight of the APE 150 hammer on the pile without vibratory action and monitoring for movement. If movement occurs, the Contractor shall let the pile set for 24 hours and retest the pile with the static load test. If the pile again moves the Contractor shall splice a length of pile (length as determined by the Owner) and redrive the pile to its full length or hammer refusal. If driven full length the static load test shall be performed again, otherwise cutoff to required length can be performed.

If vibratory hammer refusal occurs prior to complete embedment is achieved, the Contractor shall drive the pile with an impact hammer with a minimum energy of 30,000 ft-lbs. The pile shall be driven its full length. If impact hammer refusal occurs prior to driving the pile to grade the pile may be cutoff at grade or the pile may have to be socketed. Determination for cutoff or socketing will be at the sole discretion of the Owner.

Socketing of the pile consists of a method of Contractors choosing that will allow the pile to be placed to the required tip elevation while still providing lateral support for the pile, with methods that are acceptable with permit restrictions and as approved by the Owner. One method of socketing consists of:

1. Drilling a hole of similar diameter to the pile through the pile to the required pile tip elevation.
2. Then redriving the pile into the hole to the required tip elevation.
3. Care shall be taken when drilling the pile that cuttings be captured and not be allowed to enter the water column.
4. Material removed by drilling shall be disposed of off-site.

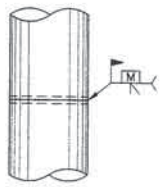
All pile cutoffs shall after the completion of the Project become the property of the Contractor and shall be removed from the site. Prior to completion of the project, pile cutoffs may be designated for use as splice lengths. If cutoff splice lengths are used for splicing no additional compensation for pile length will be provided to the Contractor.

EXISTING SOIL CONDITIONS
Subsurface soil conditions vary significantly within the project site. For available sub-surface data, see the appendices to the Project Manual which include:

Port Orchard Marina Reconstruction Test Pile Report by PN&D dated February 1997.

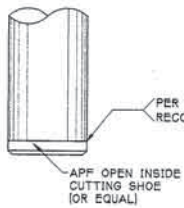
Report of Soil Investigation: Proposed Small Boat Harbor, Revised Location, Port Orchard, Washington by Dames & Moore dated August 24, 1973.

U.S. Army Corps of Engineers drawings for Port Orchard, Washington, Proposed Small Boat Harbor, Foundation Exploration dated February 26, 1970, District File No. 4366-005.



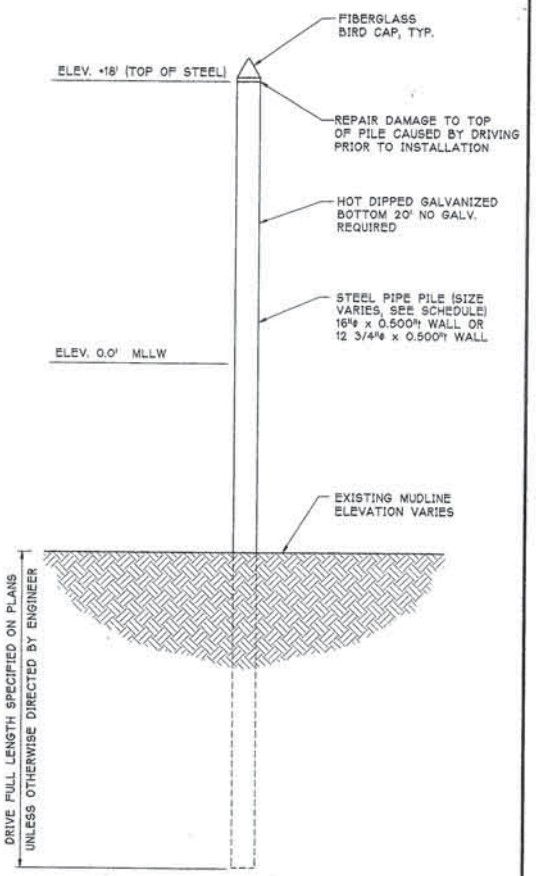
PILE SPLICE

TYPICAL FOR ALL FIELD PIPE PILE SPLICES (SHOP WELDS, IF REQUIRED, SIMILAR)



SHOE

TYPICAL ALL PILES



TYPICAL PILE

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Designed: TN
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Project No.: 97416
Date: MAY '97
Scale:

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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PILES

Sheet 7 of 32

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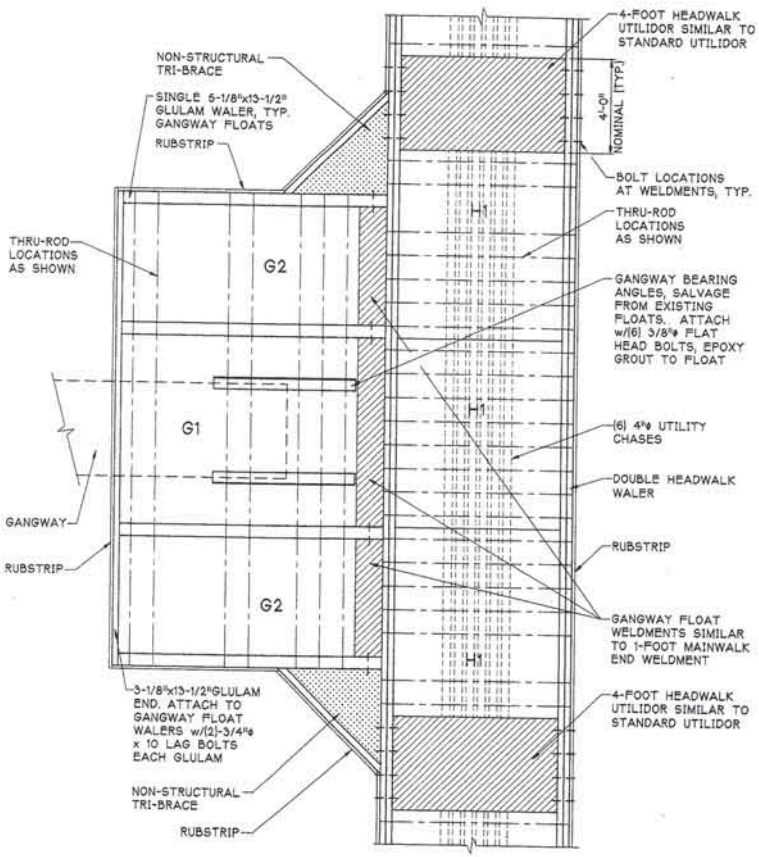
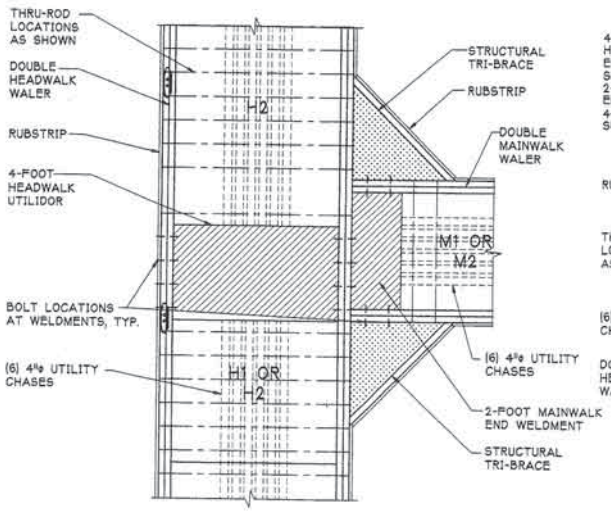
PLOT 11 w/ANCH PCP 04-30-97



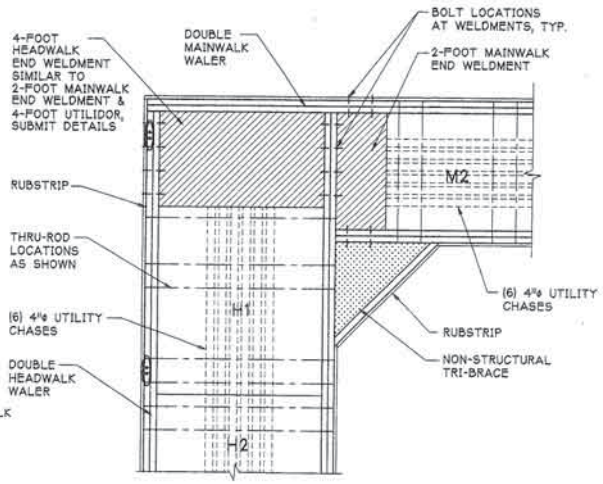
GANGWAY LANDING

NOTE: COORDINATE WITH ELECTRICAL AND WATER UTILITIES FOR UTILITY DEAD LOADS



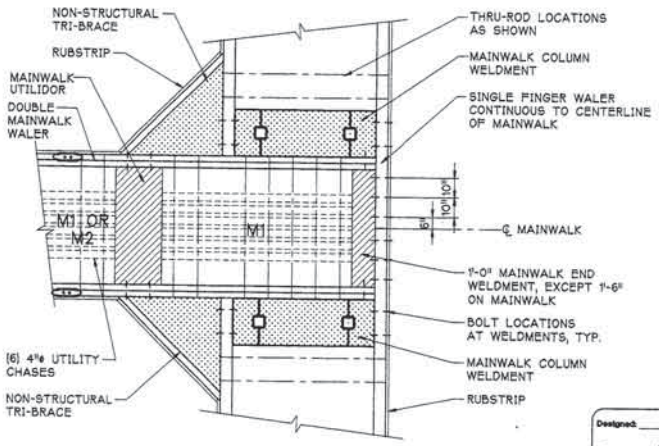
HEADWALK/MAINWALK JUNCTION TYPE 1

(C & E SHOWN, B OPPOSITE HAND)



HEADWALK/MAINWALK JUNCTION TYPE 2

NOTE: PROVIDE FLOATATION BILLETS UNDER CORNER IF NECESSARY FOR LEVELING



MAINWALK END

TODD NOTTINGHAM 15205 REGISTERED PROFESSIONAL ENGINEER

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PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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Project No.: 97416
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HEADWALK/MAINWALK CONNECTIONS

Sheet 8 of 32

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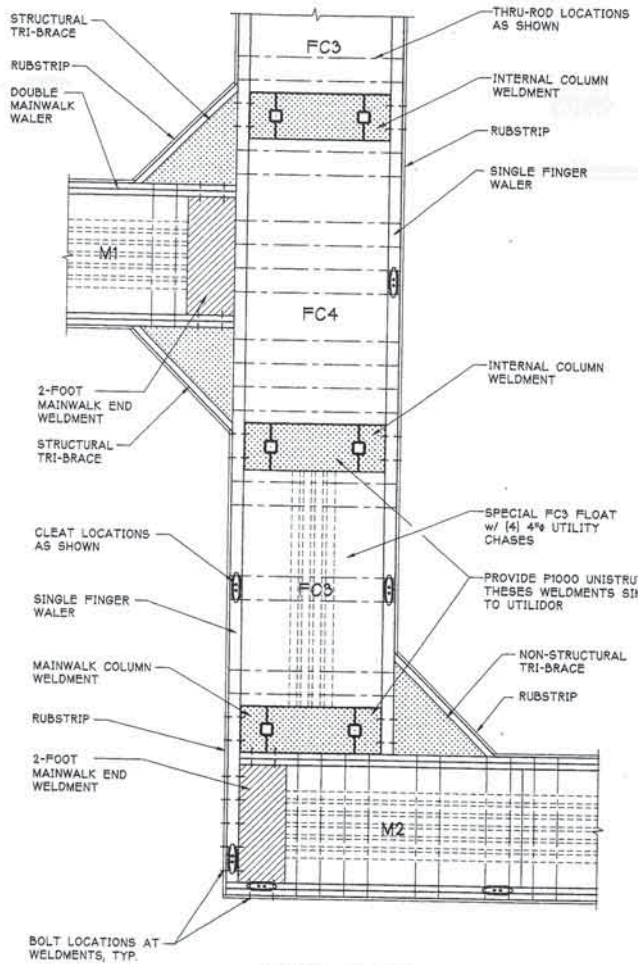
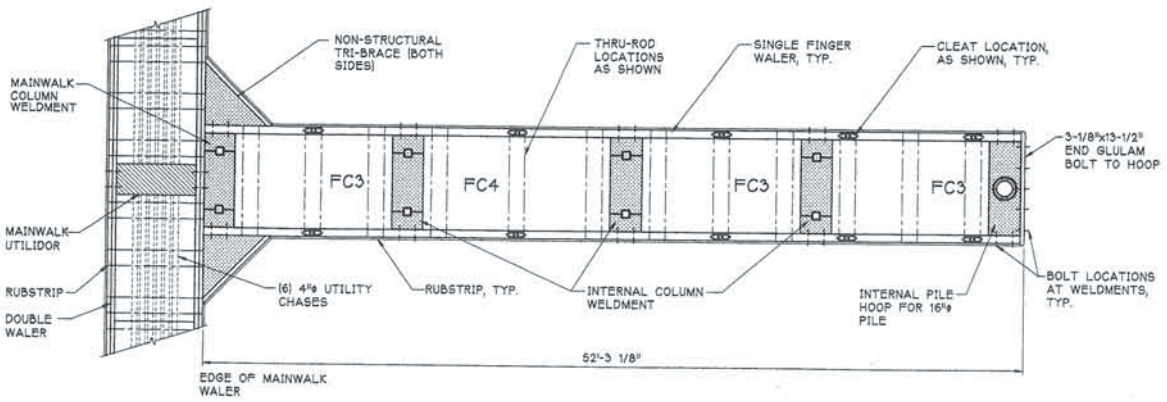
PLOT 1:1 w/ANCH.PCP 04-30-97



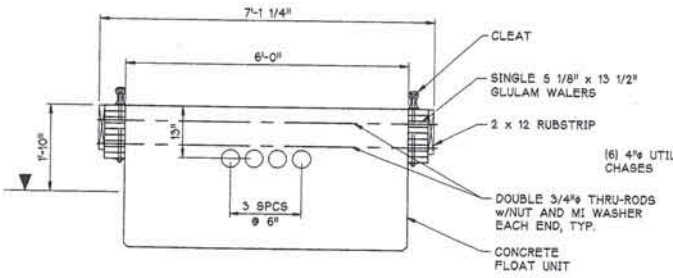
28/52-FOOT MAINWALK JUNCTION

FINGER FLOAT UNIT DESIGNATION

FLOAT DESIGNATION	NOMINAL SIZE
FC3	6' x 10'
FC4	6' x 12'

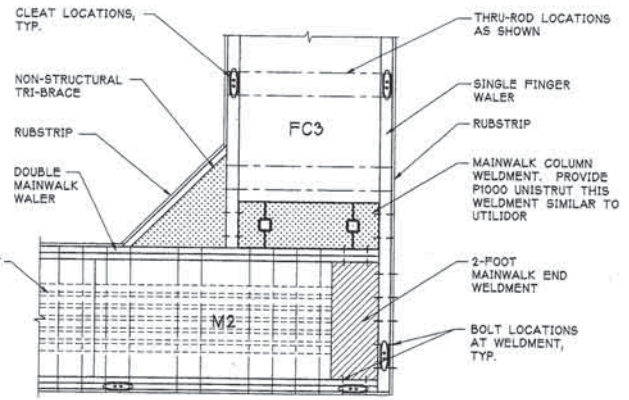


52-FOOT FINGER



SPECIAL FC3 FINGER SECTION

ALL OTHER DETAILS SIMILAR TO STANDARD FC3



MAINWALK B END

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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Date: MAY '97
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52-FOOT FINGER AND MAINWALK

Sheet 9 of 32

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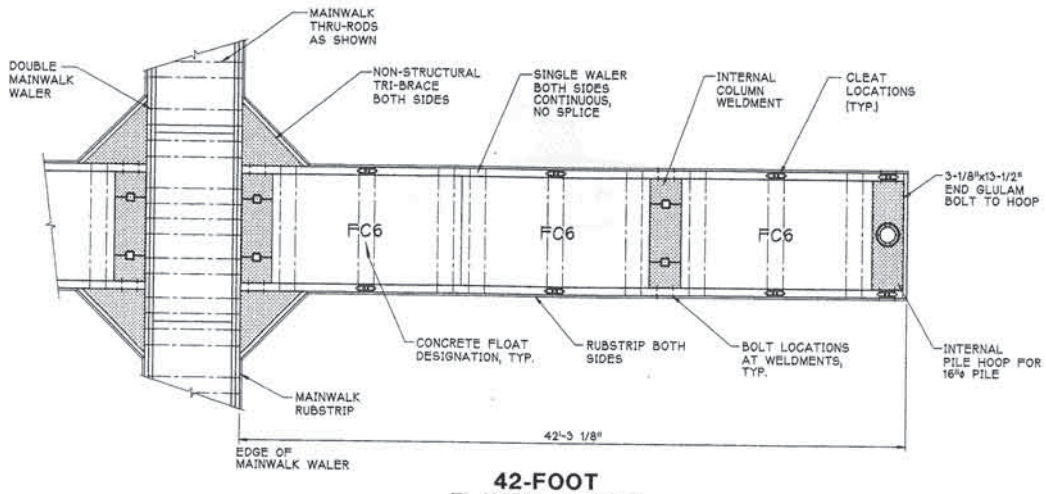
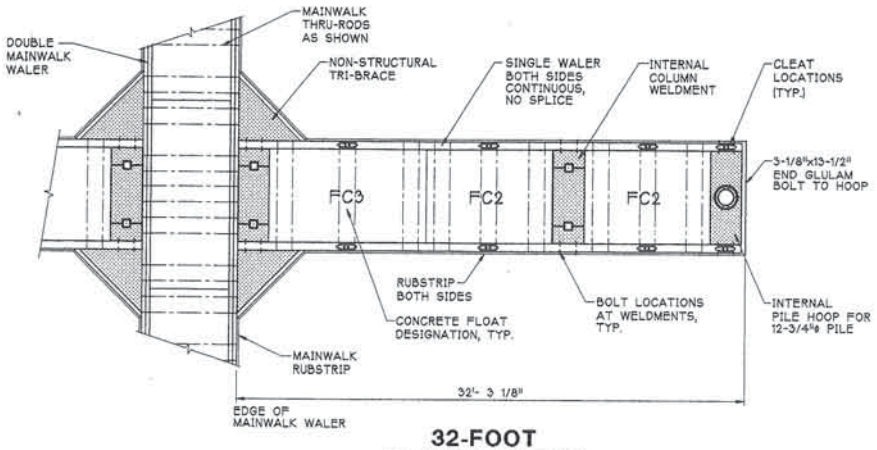
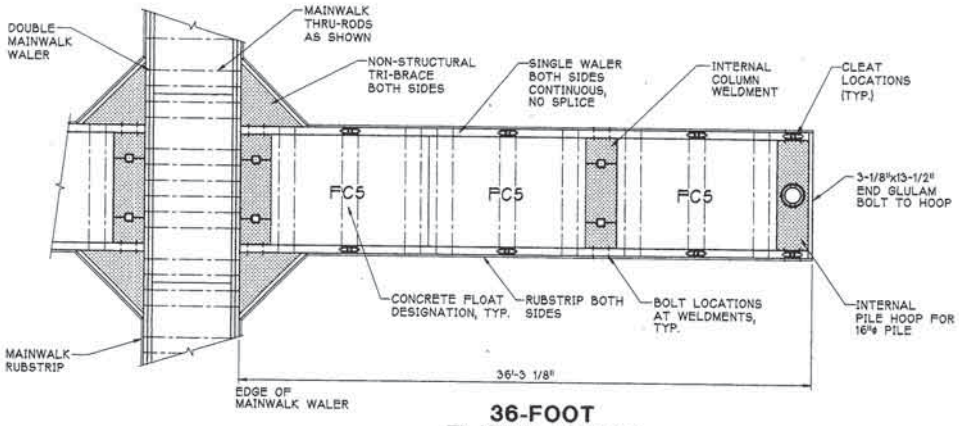
PLOT 11 WACH.PCP 04-30-97



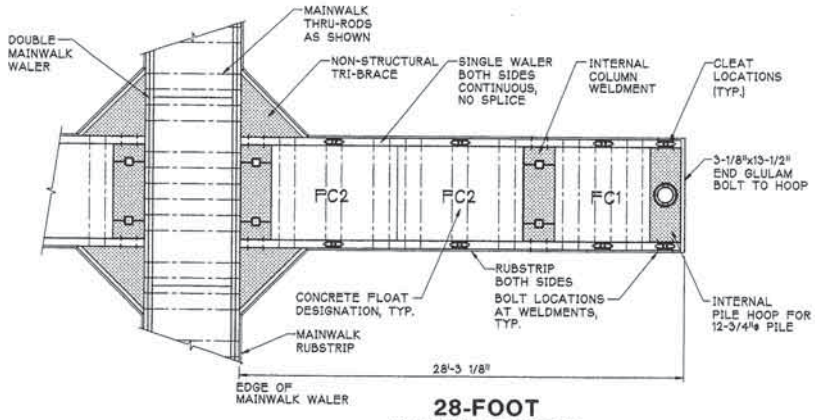
42-FOOT
7' WIDE FINGER



32-FOOT
6' WIDE FINGER



36-FOOT
7' WIDE FINGER



28-FOOT
6' WIDE FINGER

FINGER FLOAT UNIT DESIGNATION

FLOAT DESIGNATION	NOMINAL SIZE
FC1	6' x 6'
FC2	6' x 8'
FC5	7' x 10'
FC6	7' x 12'

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PLOT 1:1 w/ANCH PCP 04-30-97

5/1/97

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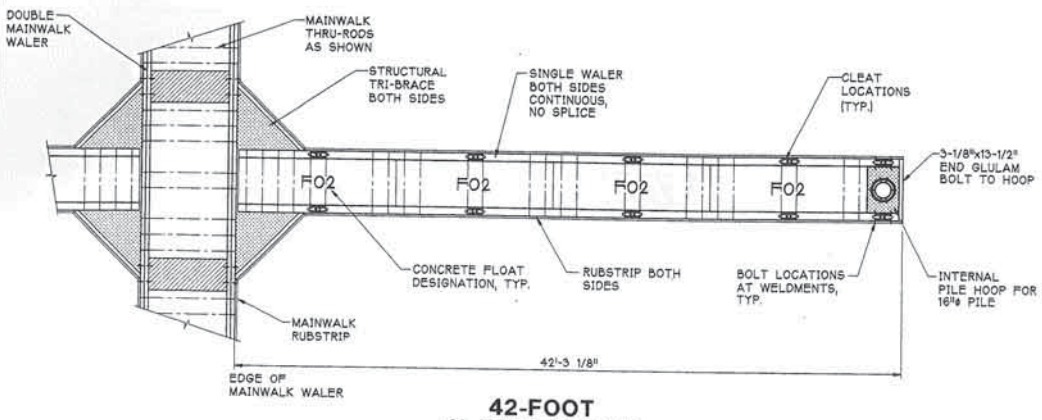
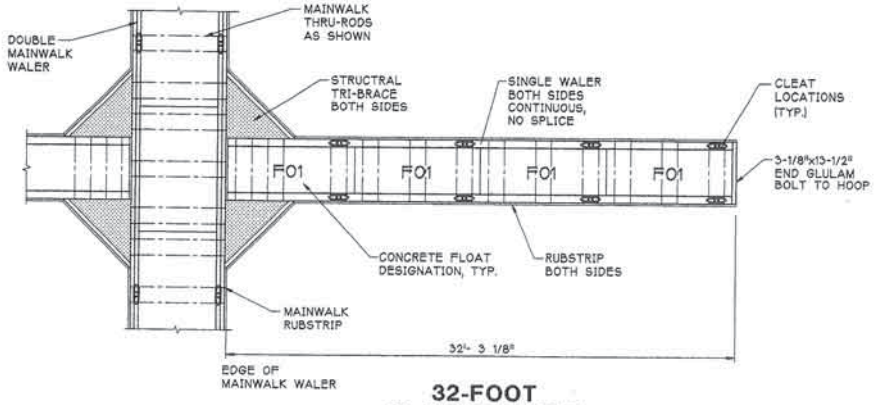
FINGER FLOATS

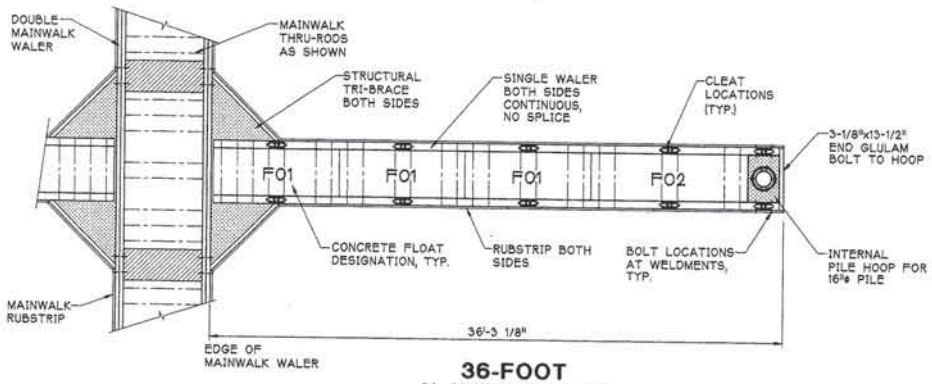
Sheet 10 of 32



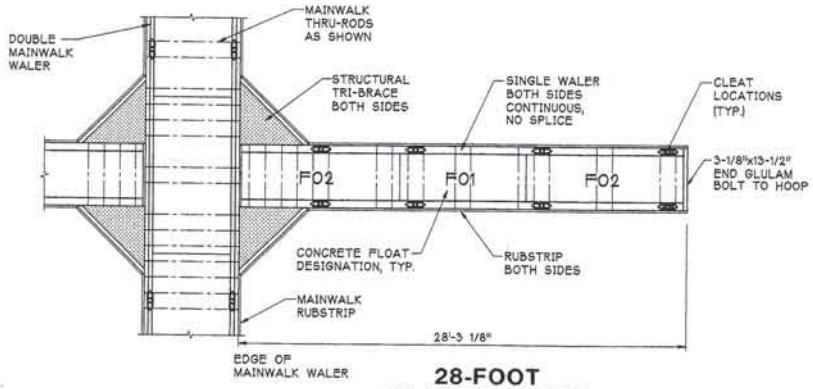
42-FOOT 3' WIDE FINGER



32-FOOT 3' WIDE FINGER



36-FOOT 3' WIDE FINGER



28-FOOT 3' WIDE FINGER

FINGER FLOAT UNIT DESIGNATION

FLOAT DESIGNATION	NOMINAL SIZE
F01	3' x 8'
F02	3' x 10'

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PLOT 11 w/ARCH.PCP 04-30-97

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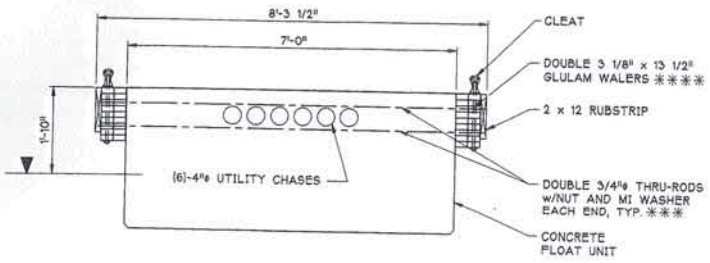
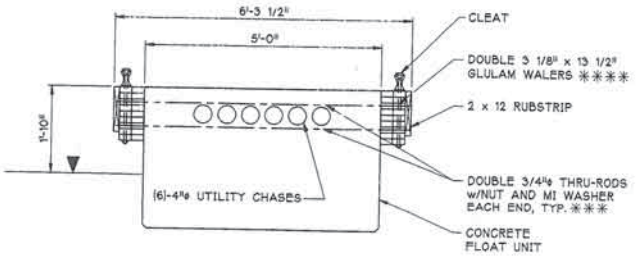
FINGER FLOATS, 3' WIDE

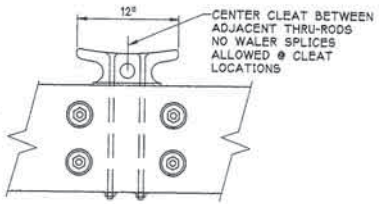
Sheet 11 of 32



HEADWALK

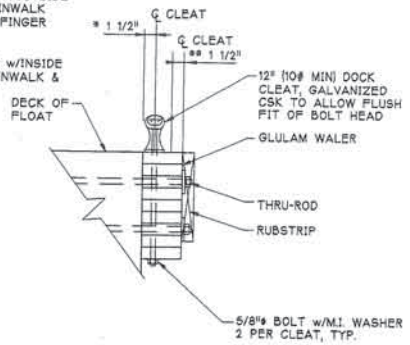


MAINWALK



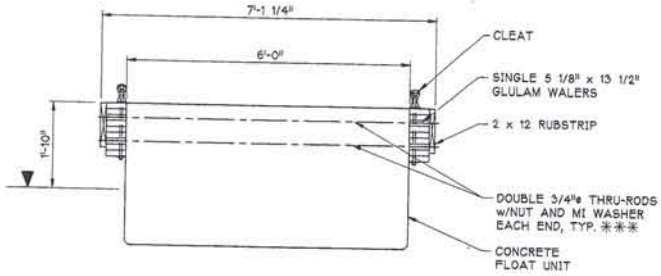
* 1 1/2" AT LOCATIONS w/OUTSIDE WALER SPLICE FOR MAINWALK & HEADWALK AND ALL FINGER FLOATS

** 1 1/2" AT LOCATIONS w/INSIDE WALER SPLICE FOR MAINWALK & HEADWALKS

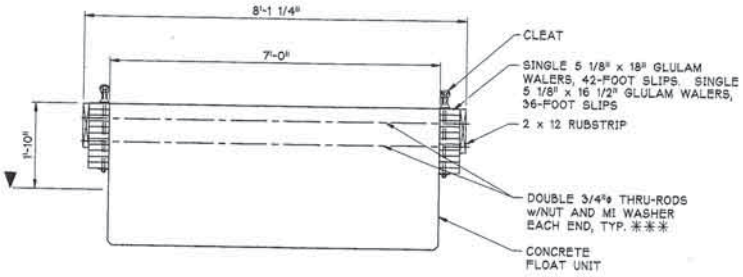


CLEAT ATTACHMENT

(TYPICAL ALL CLEATS)
(SINGLE WALER SHOWN, DOUBLE WALER SIMILAR)



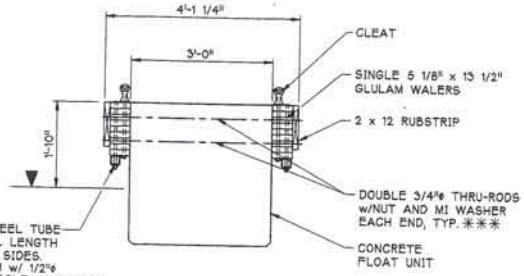
6' WIDE FINGER



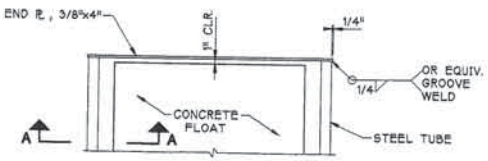
7' WIDE FINGER

*** PROVIDE THRU-RODS AT
1) EACH END, TWO CHASE LOCATIONS
2) EACH CENTERLINE, TWO CHASE LOCATIONS
3) LOCATIONS SPECIFICALLY DETAILED AT INTERSECTIONS & OTHER SPECIAL CASES

**** LAP SPLICE GLULAMS AT CENTERLINE OF FLOAT UNIT. LAYOUT GLULAMS SO NO GLULAM IS LESS THAN 1 1/2 FLOAT UNITS LONG

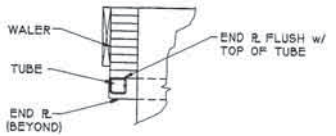


3' WIDE FINGER



TYPICAL STEEL STABILIZER TUBE END

(TYPICAL EACH END OF OPEN FINGERS)



SECTION A-A

EXPIRES 12/16/97

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

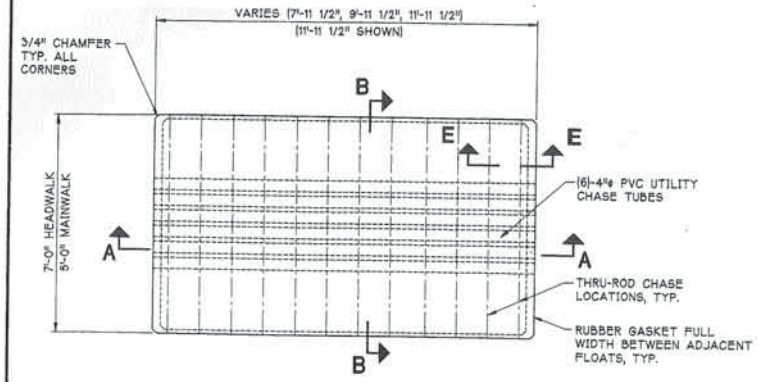
Designed: TN
Drawn: DRH
Checked:
Project No.: 97416
Date: MAY '97
Scale:

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
811 First Avenue, Suite 250
Seattle, Washington, 98104
PH: (206) 624-1387 FAX: (206) 624-1388

TYPICAL FLOAT SECTIONS

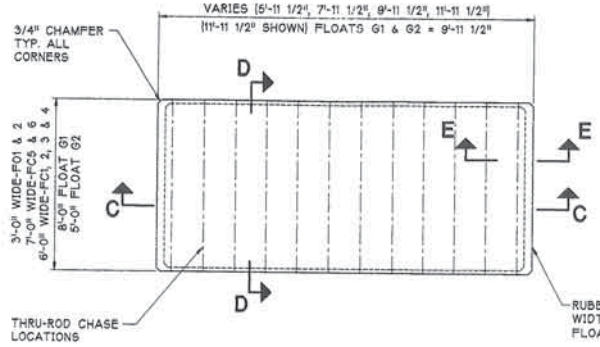
Sheet 12 of 32

C:\ACDATA\DRH\1997\97410\97415-12.DWG
PLOT 11 w/ANCH.PCP 04-30-97

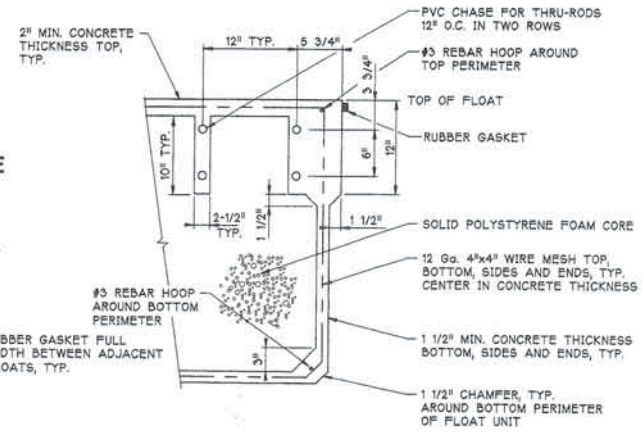


TYPICAL HEADWALK AND MAINWALK FLOAT UNIT

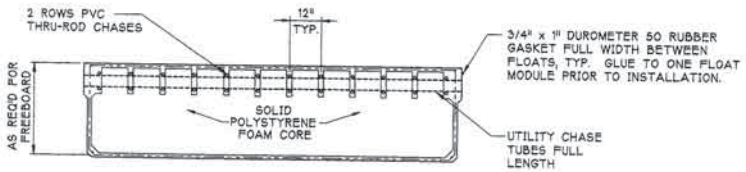
(NOTE: SPECIAL FC3 FLOAT AT 52-FOOT SLIP SIMILAR)



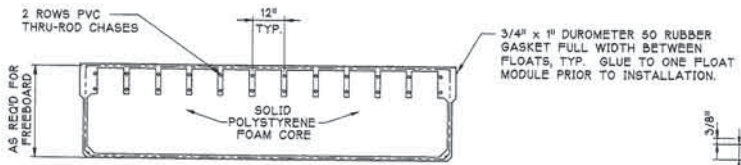
TYPICAL FINGER AND GANGWAY FLOAT UNIT



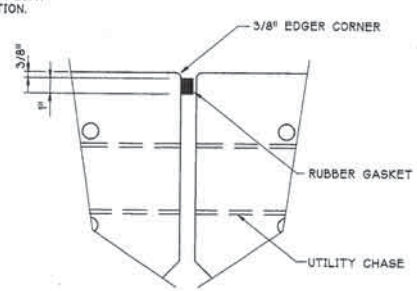
SECTION E-E



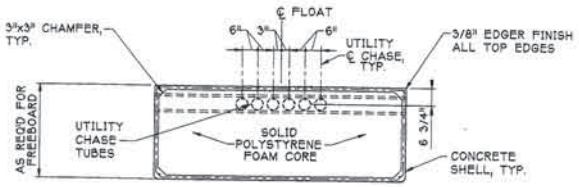
SECTION A-A



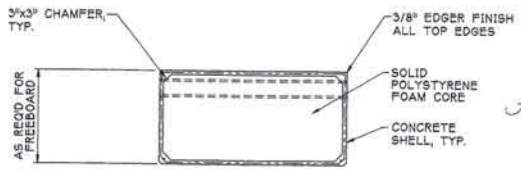
SECTION C-C



GASKET DETAIL



SECTION B-B



SECTION D-D

EXPIRES 12/16/97

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

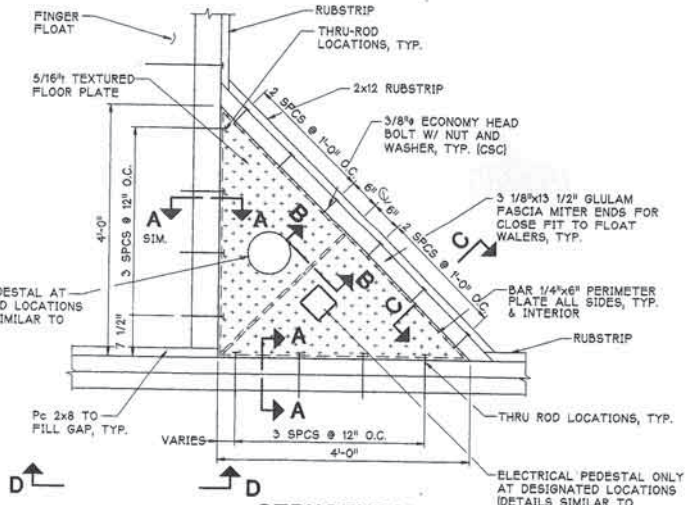
Designed: TN
Drawn: DRH
Checked:
Project No.: 97416
Date: MAY '97
Scale:

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
811 First Avenue, Suite 260
Seattle, Washington, 98104
PH: (206) 624-1387 FAX: (206) 624-1388

FLOAT UNITS

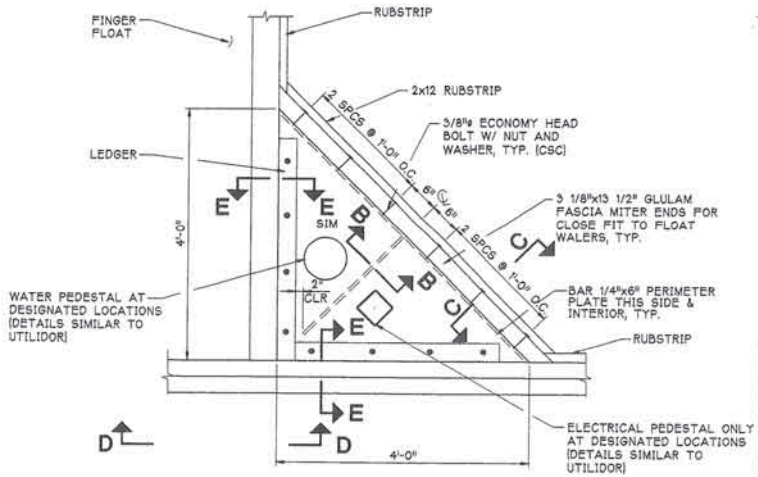
Sheet 13 of 32

C:\ACDATA\DRH\1987\97416\96416-13.DWG
PLOT 11 w/ANCH PCP 04-30-97



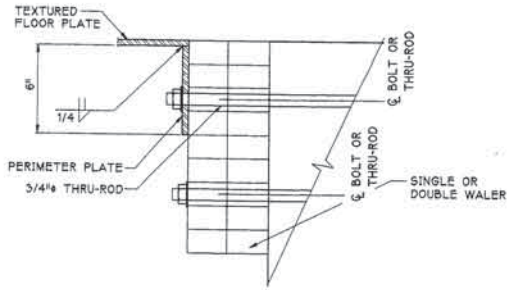
STRUCTURAL TRI-BRACE

NOTE: MAINWALK/HEADWALK STRUCTURAL TRI-BRACE SIMILAR

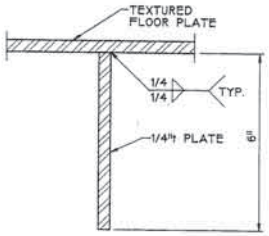


NON-STRUCTURAL TRI-BRACE

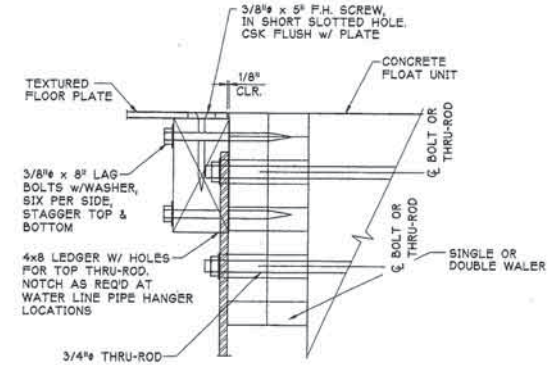
NOTE: 5/16"t TEXTURED FLOOR PLATE NOT SHOWN



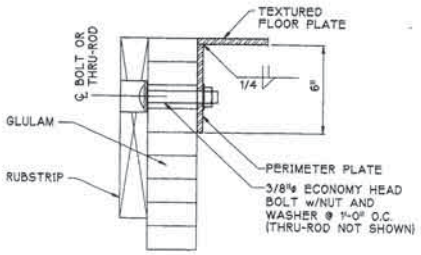
SECTION A-A



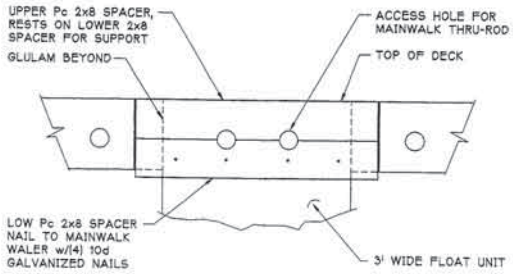
SECTION B-B



SECTION E-E



SECTION C-C



2x8 SPACER VIEW D-D

EXPIRES 12/16/97

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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Engineering Consultants
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Seattle, Washington, 98104
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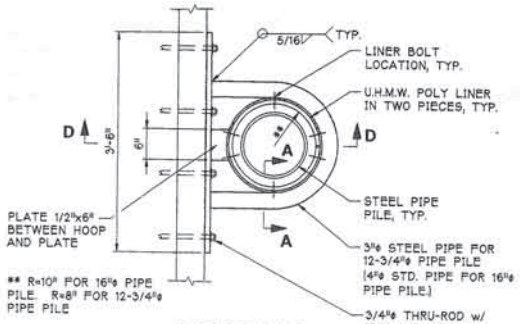
Designed: TN
Drawn: DRH
Checked:
Project No.: 97416
Date: MAY '97
Scale:

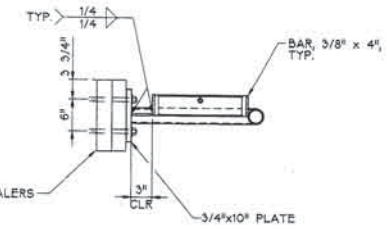
TRI-BRACES

Sheet 14 of 32

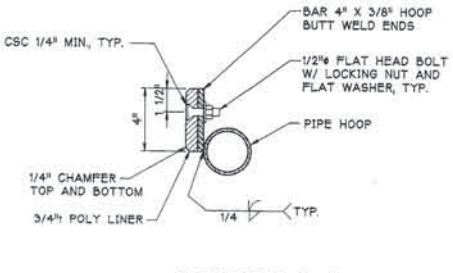
C:\ACDATA\DR\1997\97416\97416-14.DWG
PLOT 11 w/ANCH.PCP 04-30-97



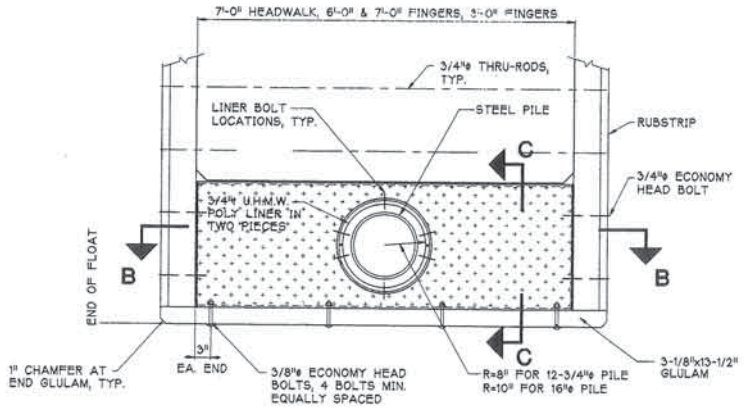
EXTERNAL PILE HOOP



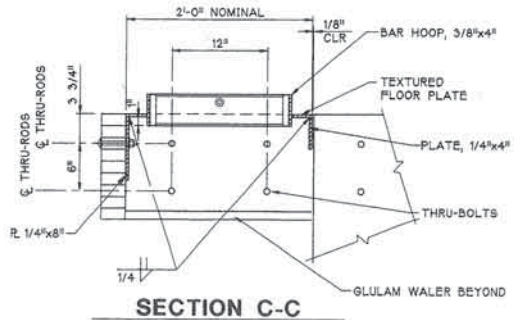
SECTION D-D



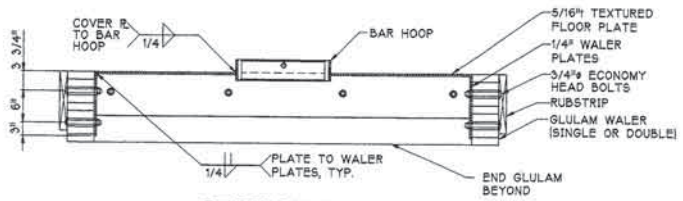
SECTION A-A



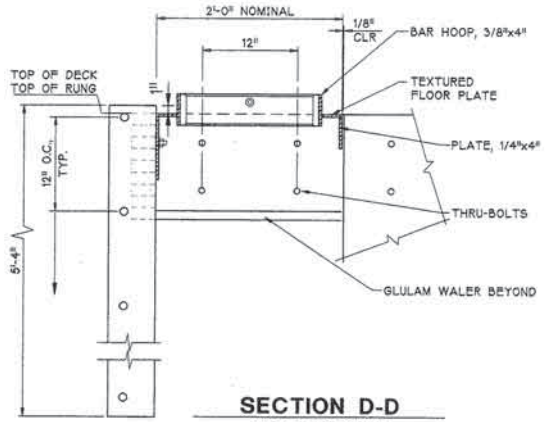
INTERNAL PILE HOOP w/o LADDER



SECTION C-C

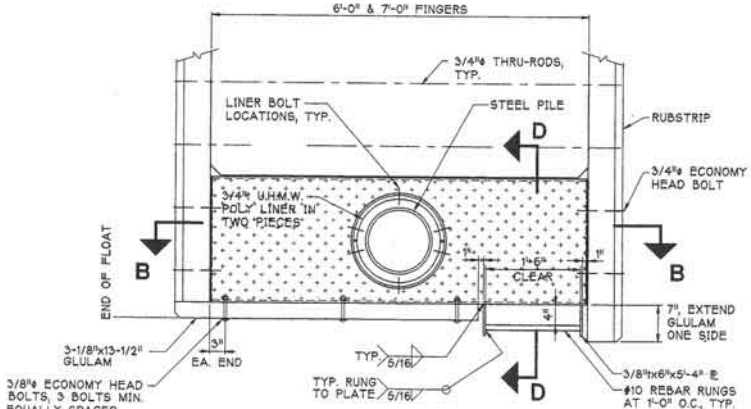


SECTION B-B



SECTION D-D

DETAILS NOT SHOWN SIMILAR TO SECTION C-C



INTERNAL PILE HOOP w/ LADDER

(LADDER TYPE L2)
DETAILS NOT SHOWN SIMILAR TO INTERNAL PILE HOOP w/o LADDER

EXPIRES 12/16/97

Designed: TN
Drawn: DRH
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Project No.: 97416
Date: MAY '97
Scale:

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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Engineering Consultants
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Seattle, Washington, 98104
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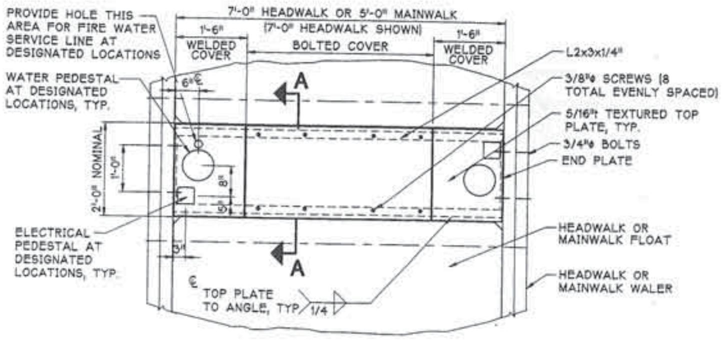
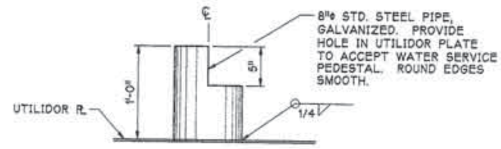
PILE HOOPS

Sheet 15 of 32

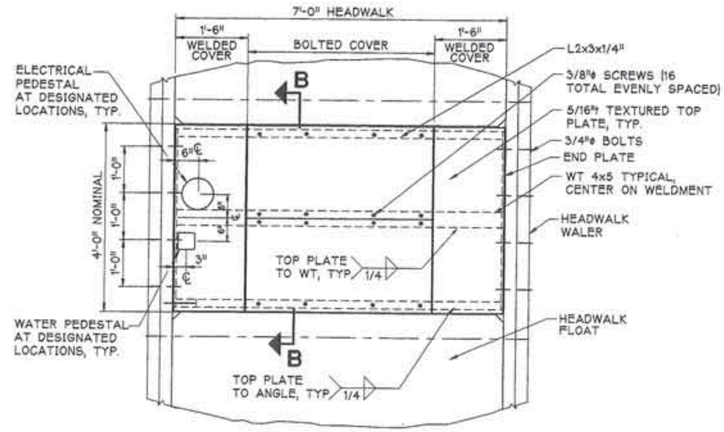
C:\ACDATA\DRH\1997\97416\97416-15.DWG
PLOT: 11 w/ANCH.PCP 04-30-97



PLAN

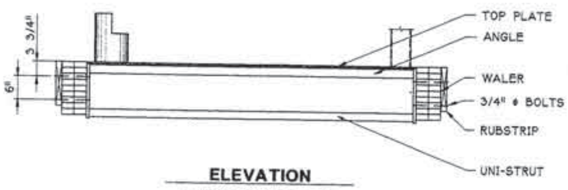


WATER PEDESTAL SUPPORT PIPE



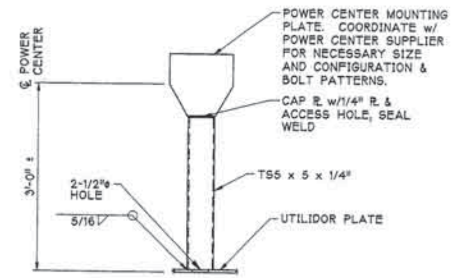
PLAN

4-FOOT HEADWALK UTILIDOR



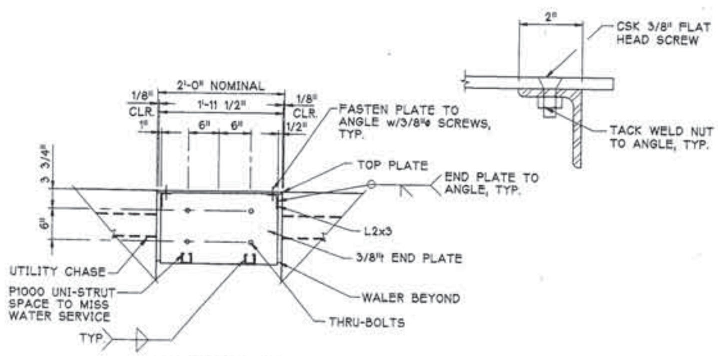
ELEVATION

HEADWALK/ MAINWALK UTILIDOR



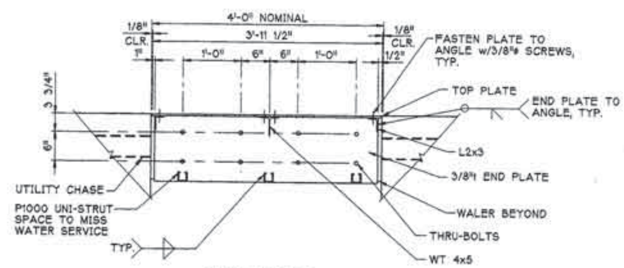
ELEVATION

TYPICAL ELECTRICAL PEDESTAL



SECTION A-A

HEADWALK/ MAINWALK UTILIDOR



SECTION B-B

4-FOOT HEADWALK UTILIDOR

DETAILS NOT SHOWN SIMILAR TO HEADWALK/MAINWALK UTILIDOR

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

EXPIRES 12/16/97

Designed: TN
Drawn: DRH
Checked:
Project No.: 97416
Date: MAY '97
Scale:

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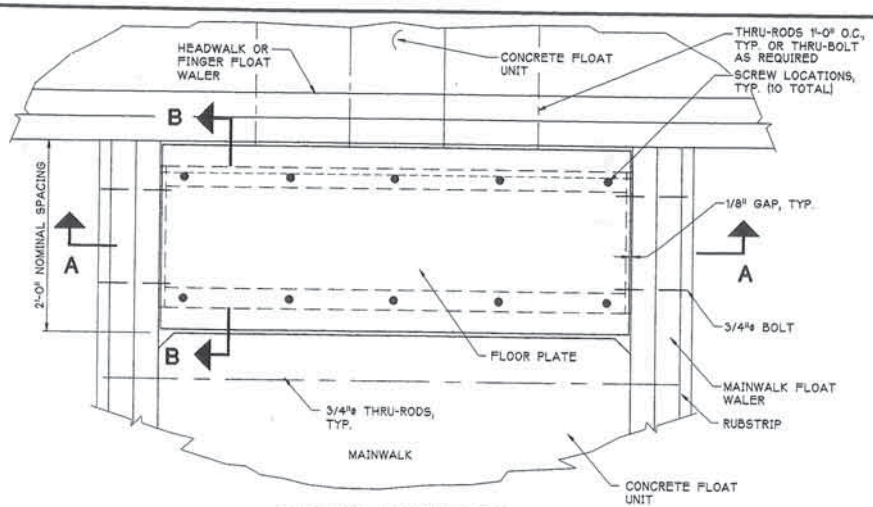
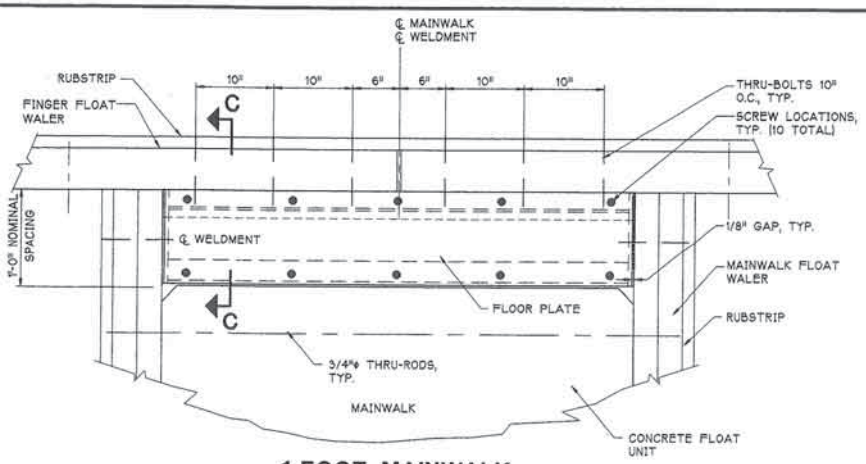
UTILIDOR

C:\ACDATA\DRH\1997\97416\97416-16.DWG
PLOT 1:1 w/ANCH.PCP 04-30-97

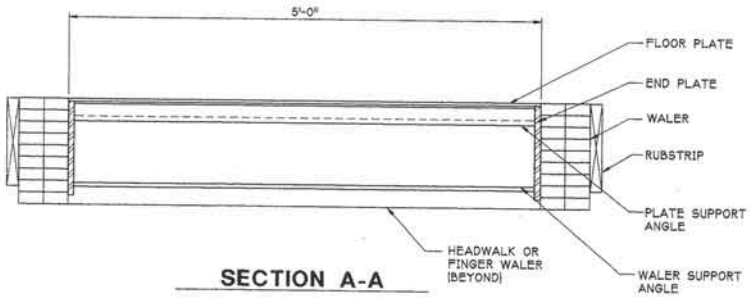


2-FOOT MAINWALK END WELDMENT

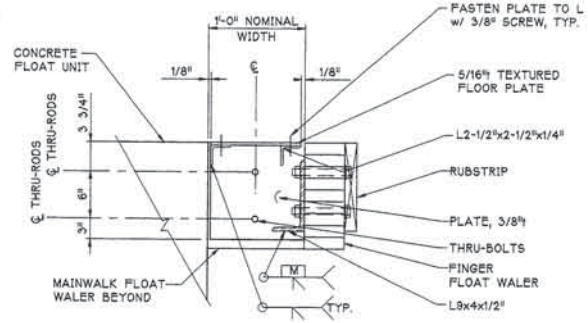


1-FOOT MAINWALK END WELDMENT

(1'-6" MAINWALK END SIMILAR)

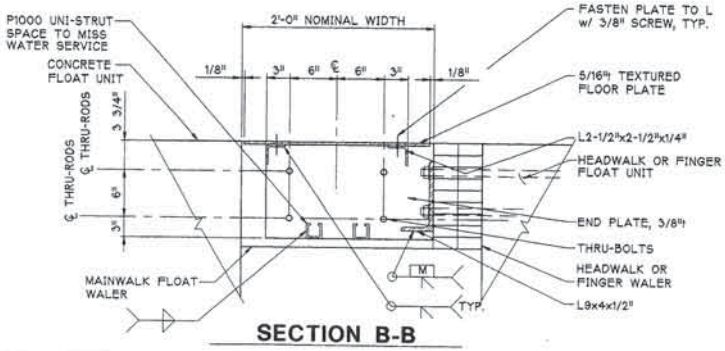


SECTION A-A

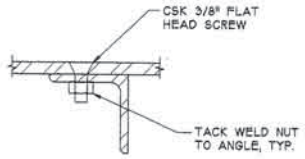


SECTION C-C

NOTE: DETAILS NOT SHOWN SIMILAR TO 2-FOOT MAINWALK END SECTION B-B



SECTION B-B



PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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Engineering Consultants
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Seattle, Washington, 98104
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EXPIRES 12/16/97

Designed:	TN
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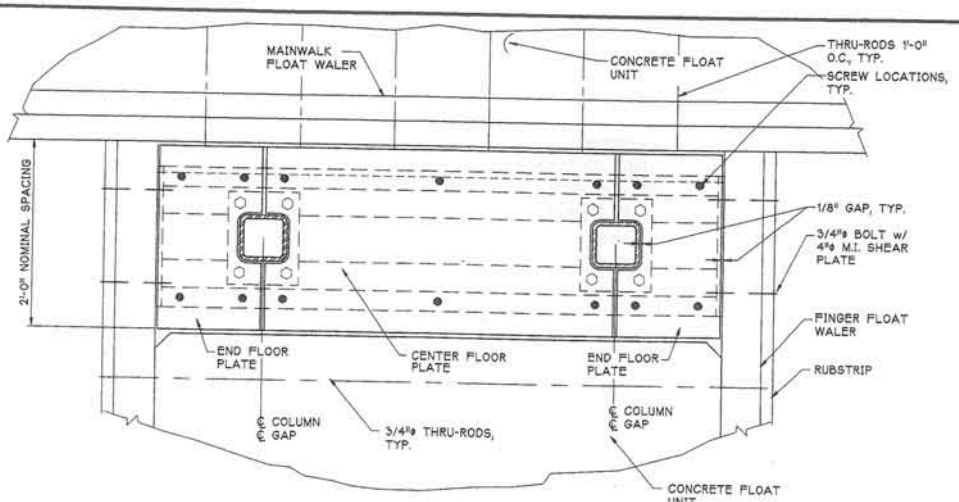
Date:	MAY '97
Scale:	

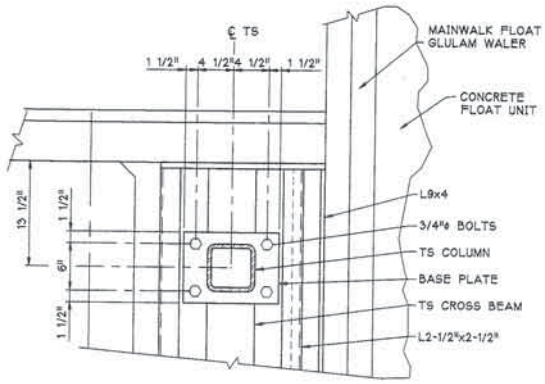
MAINWALK END WELDMENT

Sheet 17 of 32

G:\AGDATA\DRH\1997\97416\97416-17.DWG
PLOT BY w/ANCH.PCP 04-30-97

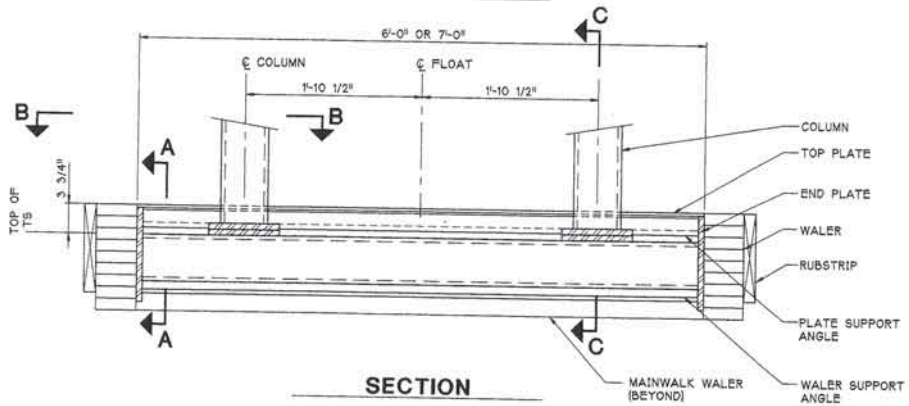


PLAN

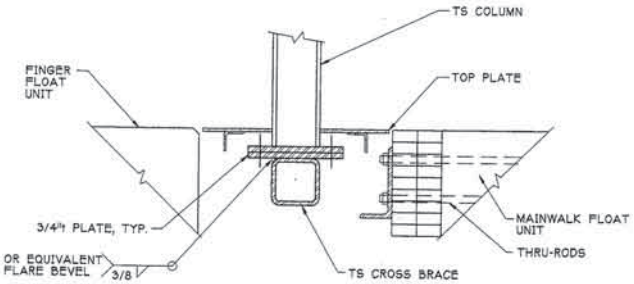


VIEW B-B

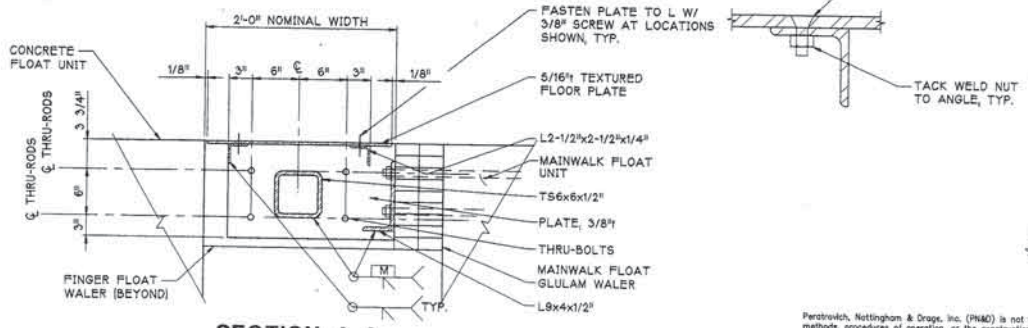
NOTE: TOP PLATE NOT SHOWN FOR CLARITY



SECTION



SECTION C-C



SECTION A-A

PORT OF BREMERTON-PORT ORCHARD
MARINA RECONSTRUCTION

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Engineering Consultants
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Seattle, Washington, 98104
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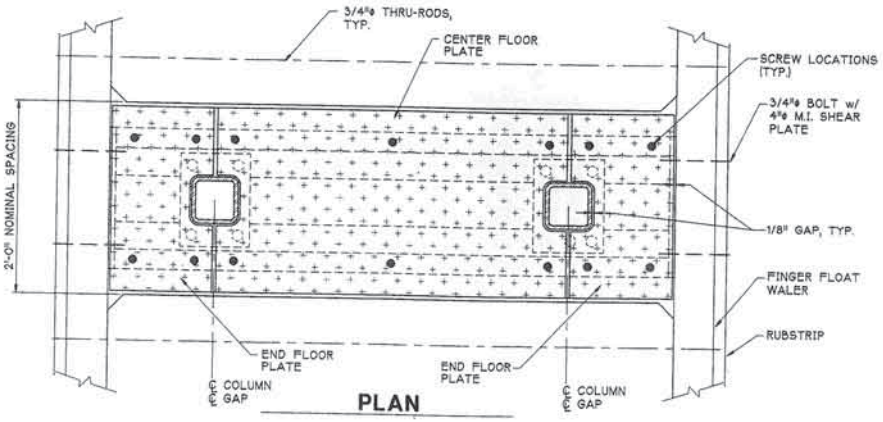
TODD NOTTINGHAM — REGISTERED PROFESSIONAL ENGINEER
EXPIRES 12/16/97

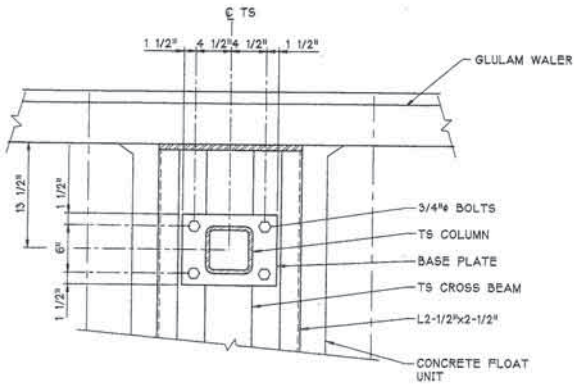
Designed: TN
Drawn: DRH
Checked:
Project No.: 97416
Date: MAY '97
Scale:

MAINWALK COLUMN WELDMENT

Sheet 18 of 32

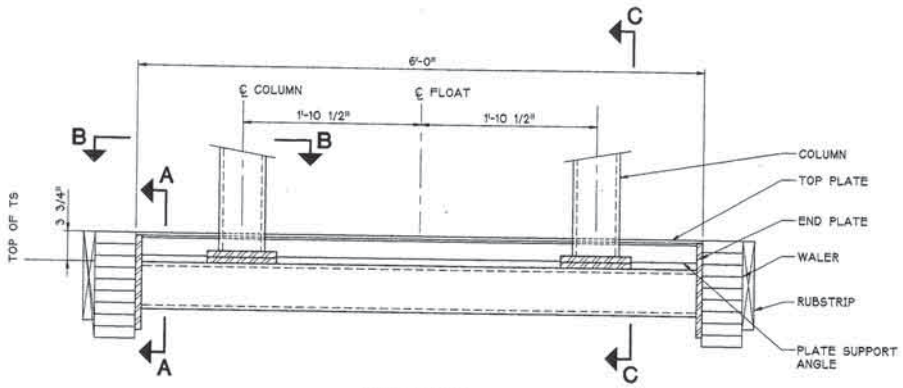


PLAN

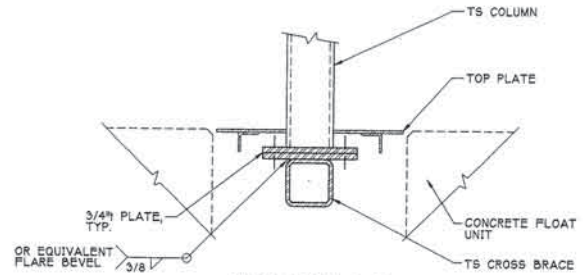


VIEW B-B

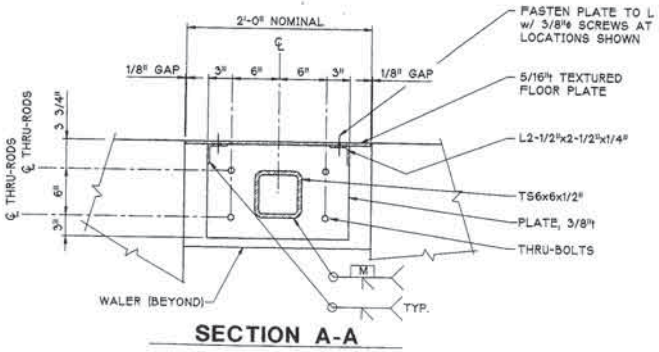
NOTE: TOP PLATE NOT SHOWN FOR CLARITY



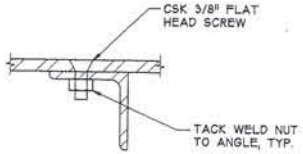
SECTION



SECTION C-C



SECTION A-A



C:\ACDATA\DRH\1997\97416-19.DWG
BLOT IN WINCH BOX 04-30-97

EXPIRES 12/16/97

Designed: TN
Drawn: DRH
Checked:
Project No.: 97416
Date: MAY '97
Scale:

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
811 First Avenue, Suite 260
Seattle, Washington, 98104
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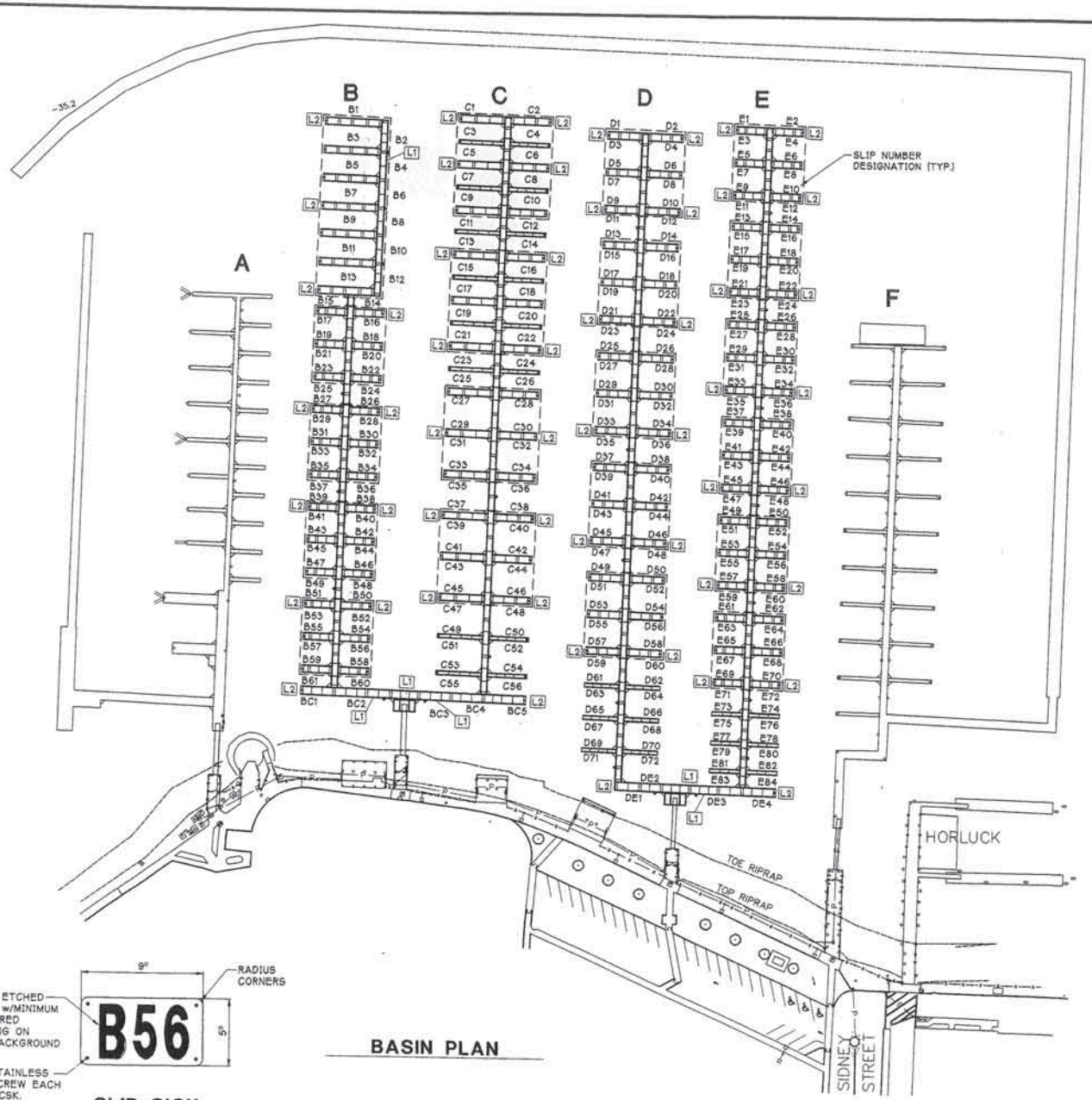
INTERNAL COLUMN WELDMENT

Sheet 19 of 32



BASIN PLAN

SLIP SIGN

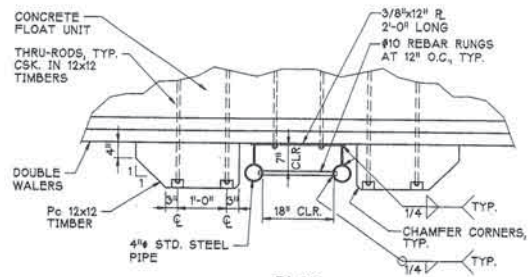
NOTE:

1) PROVIDE AND ATTACH SIGNS WITH SLIP I.D., TWO PER EACH SLIP. ONE TO BE ATTACHED AT END OF FINGER FOR HORIZONTAL VIEWING. THE OTHER TO BE ATTACHED TO MAINWALK FOR HORIZONTAL VIEWING.

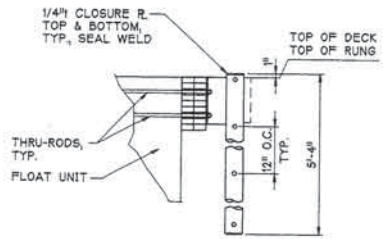
2) PROVIDE AND INSTALL A DOCK BOX FOR EACH SLIP. DOCK BOX TRIANGULAR 20 Cu. Ft. MANUFACTURED BY CHEYENNE LIVESTOCK & PRODUCTS. PROVIDE AT ALL TRI-BRACES THAT DO NOT HAVE UTILITIES. ATTACH PER MANUFACTURERS RECOMMENDATIONS.

3) PROVIDE AND ATTACH LIFE RINGS AS MANUFACTURED BY CHEYENNE w/3-⁄" C.G. APPROVED RING & 90-FOOT ROPE w/ FLOAT. MOUNT TO WALER AS APPROVED BY ENGINEER. LIFE RINGS AT 200' O.C. TO MAINWALK. 4 AT MAINWALK & ONE EACH HEADWALK. (18 TOTAL)

4) PROVIDE LADDERS AT LOCATIONS SHOWN
L1- ATTACH TO MAIN OR HEADWALK (7 TOTAL)
L2- ATTACH TO INTERNAL PILE HOOP (53 TOTAL)



PLAN



SECTION

TYPE L1 LADDER

EXPIRES 12/16/97

Designed: ABC
Drawn: DRH
Checked:
Project No.: 97416

Date: MAY '97
Scale:

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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Engineering Consultants
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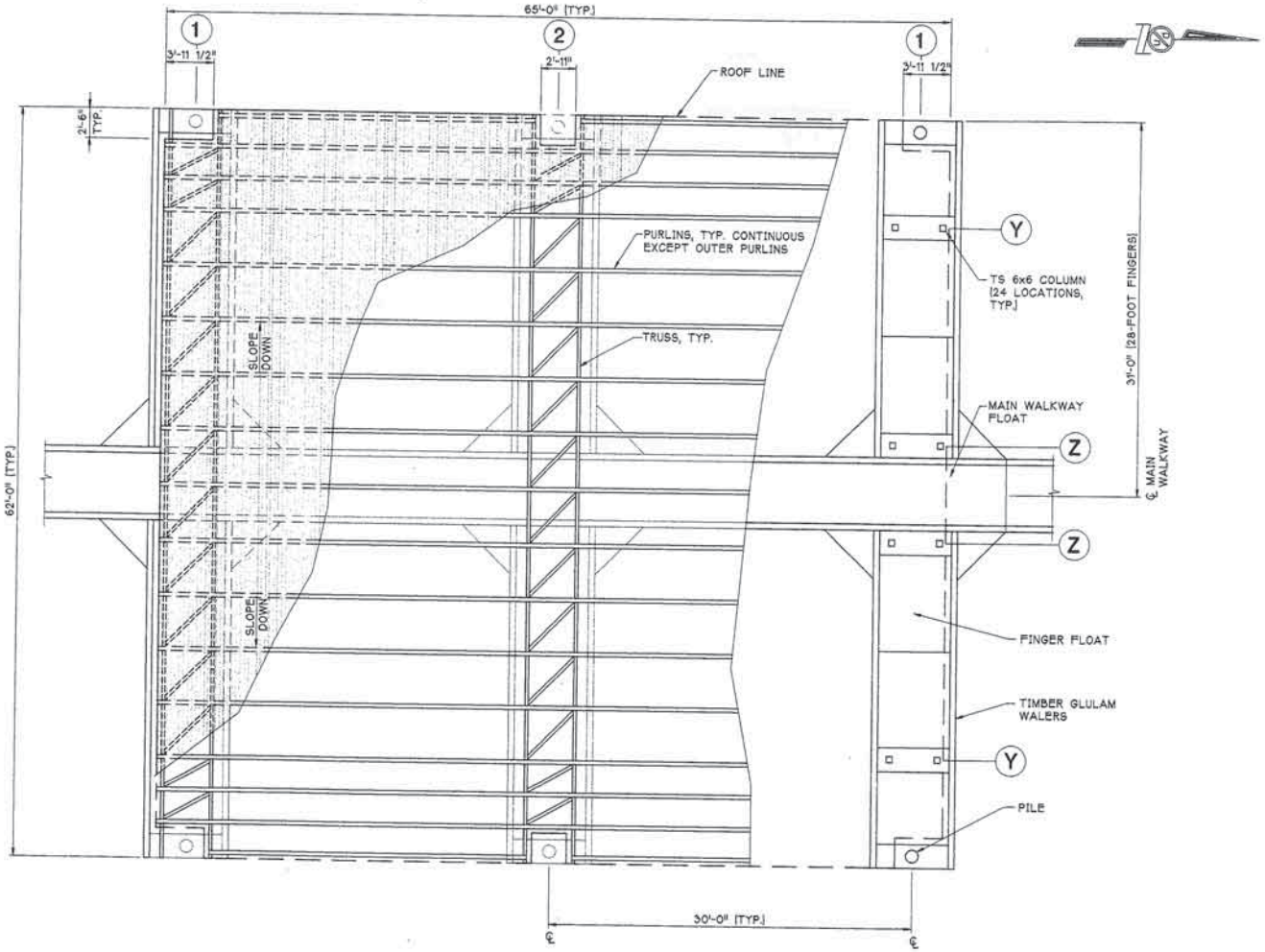
DOCK AMENITIES

Sheet 20 of 32

C:\ACDATA\DRH\97416\97416-20.DWG
PLOT TL w/ARCH.PCP 04-30-97



ROOF | TRUSS/PURLINS | COLUMNS/FLOATS

COVER 28 PLAN

NOTE: SUPPORT POST SAFETY CABLE SYSTEM ON RIDGE PURLIN NOT SHOWN FOR CLARITY

APPROXIMATE DEAD LOAD FLOAT REACTIONS	
LOCATION	COLUMN SET LOAD (KIPS)
1Y	4.9
1Z	3.0
2Y	7.4
2Z	4.2

INCLUDES ESTIMATED COLUMN, TRUSS, PURLIN AND ROOF WEIGHT. CONTRACTOR VERIFY.

NOTE:
COLUMN LOADS ARE FOR THE DOUBLE COLUMN SET AT THE DESIGNATED WELDMENT.

MEMBER SIZES	
COLUMNS	TS 6x6x3/16"
PURLINS	TS 6x4x3/16"

TODD NOTTINGHAM — REGISTERED PROFESSIONAL ENGINEER — STATE OF WASHINGTON

EXPIRES 12/16/97

Designed: MH
Drawn: DRH
Checked:
Project No.: 97416

Date: MAY '97
Scale:

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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Engineering Consultants
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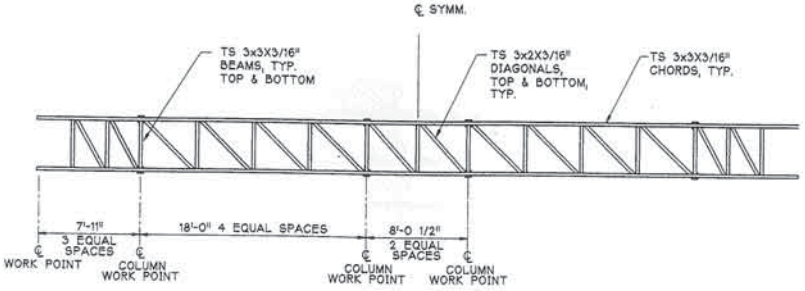
COVER 28 PLAN

Sheet 21 of 32

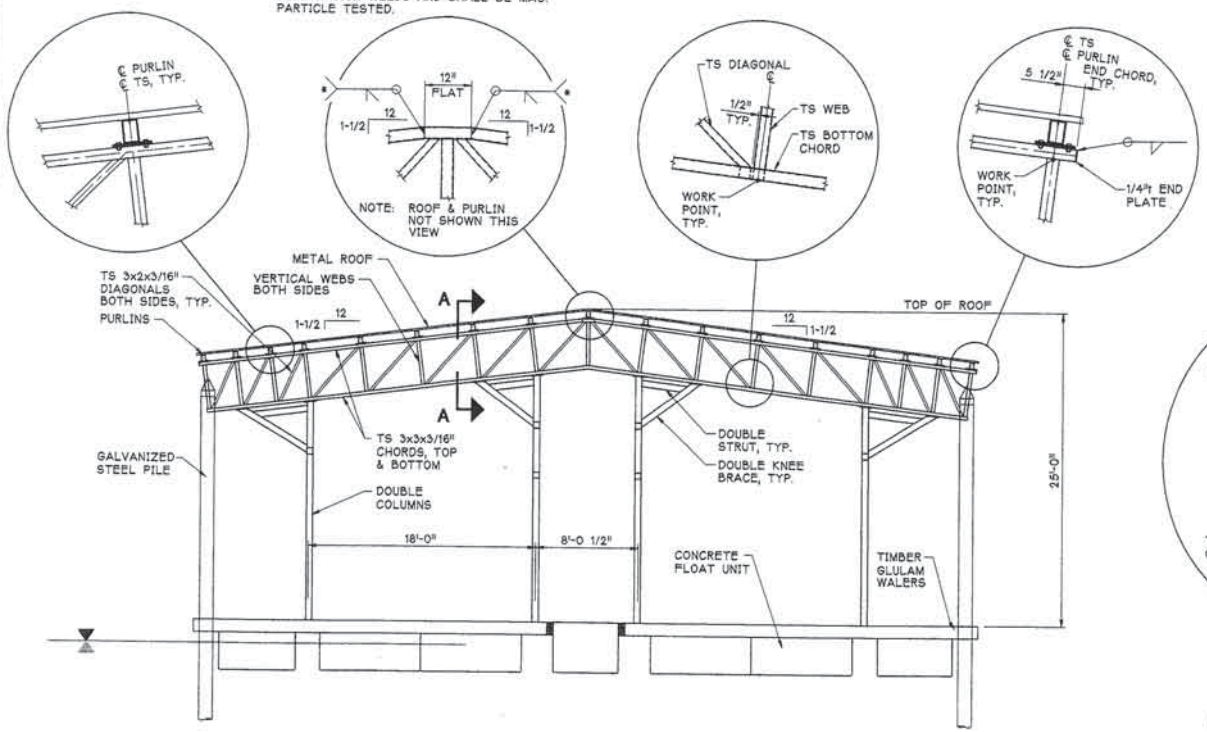
C:\ACDATA\DRH\1997\97416\97416-21.DWG
PLOTTED: WANCHIPP 04-30-97



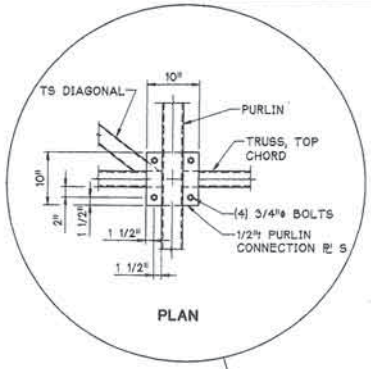
TRUSS PLAN
28-FOOT SLIPS

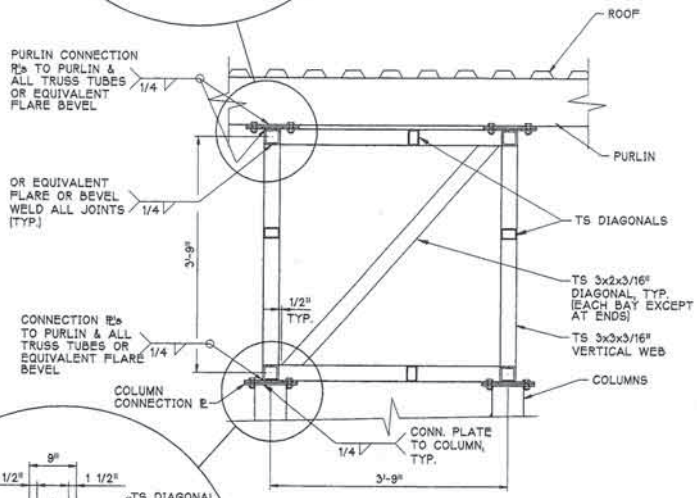
LOW CHORDS & DIAGONALS SHOWN

* ALL CHORD SPLICES SHALL BE COMPLETE PENETRATION WELDS AND SHALL BE MAG. PARTICLE TESTED.

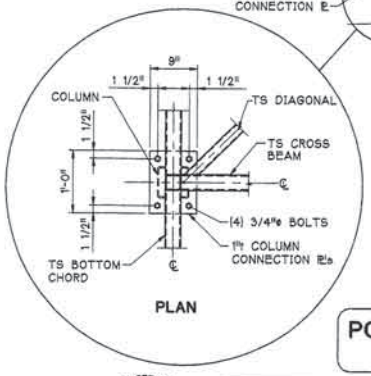


TRUSS SECTION
28-FOOT SLIPS





SECTION A-A



PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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Engineering Consultants
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Seattle, Washington, 98104
PH: (206) 624-1387 FAX: (206) 624-1388

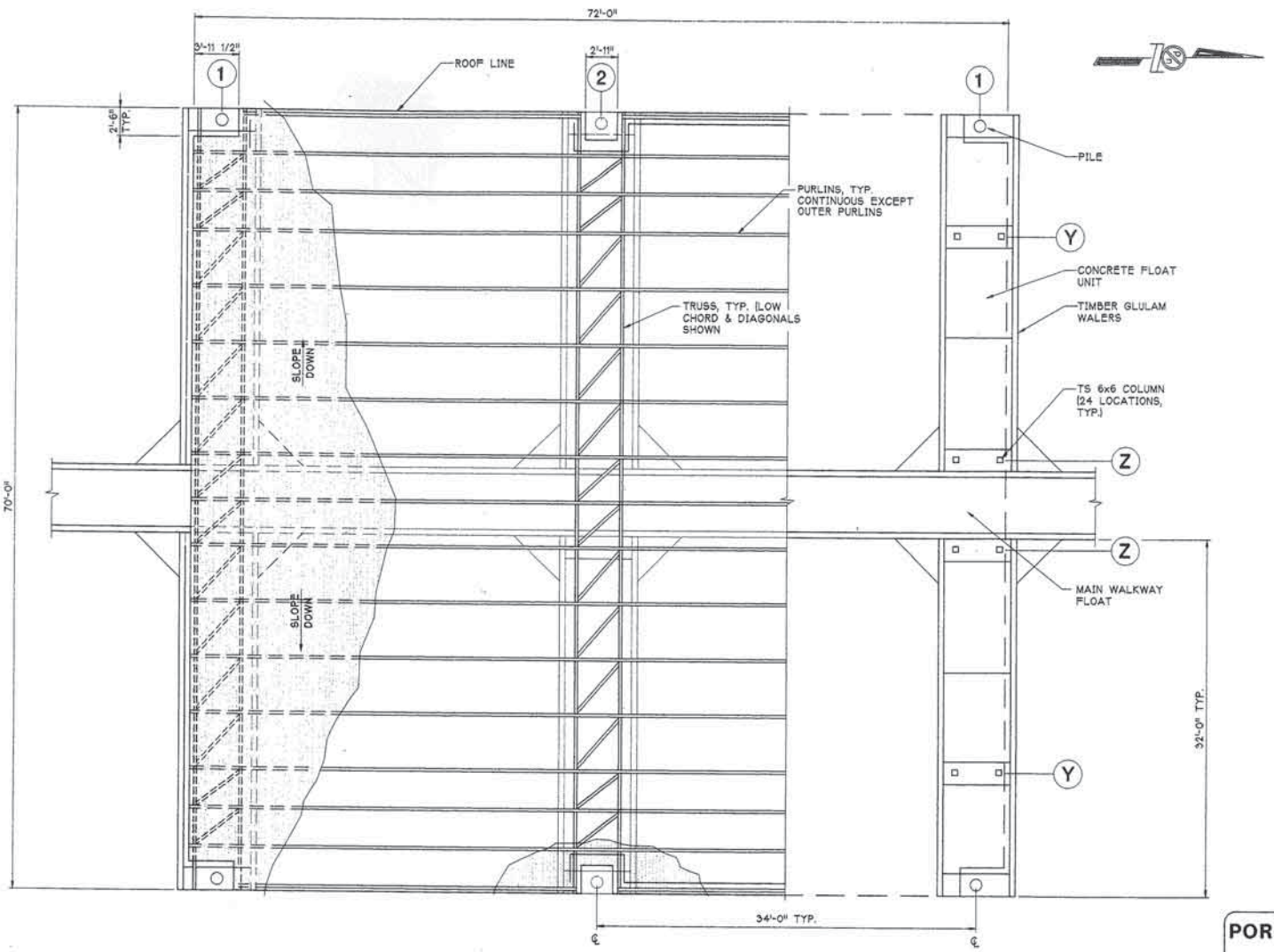
Designed:	MH
Drawn:	DRH
Checked:	
Project No.:	97416
Date:	MAY '97
Scale:	

EXPIRES 12/16/97

COVER 28 SECTION

Sheet 22 of 32

C:\ACDATA\DRA\1997\97417\97416-22.DWG
PLOT 11 w/ARCH.PCP 04-30-97



ROOF

TRUSS/PURLINS

COLUMN/FLOATS

COVER 32 PLAN

APPROXIMATE DEAD LOAD FLOAT REACTIONS	
LOCATION	COLUMN SET LOAD (KIPS)
1Y	4.8
1Z	3.6
2Y	7.5
2Z	5.3

INCLUDES ESTIMATED COLUMN, TRUSS, PURLIN AND ROOF WEIGHT. CONTRACTOR VERIFY.

NOTE:
COLUMN LOADS ARE FOR THE DOUBLE COLUMN SET AT THE DESIGNATED WELDMENT.

MEMBER SIZES	
COLUMNS	TS 6x6x3/16"
PURLINS	TS 6x4x3/16"

EXPIRES 12/18/97

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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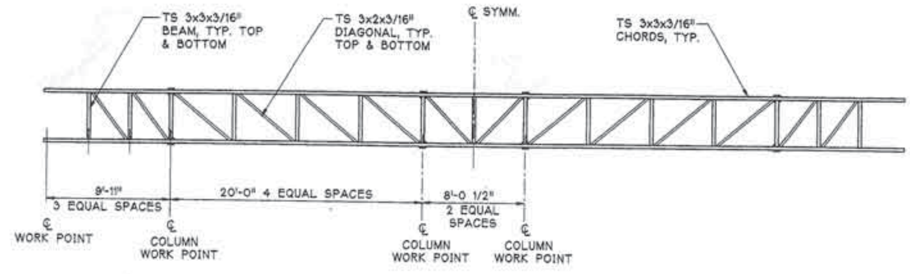
Designed: MH
Drawn: DRH
Checked:
Project No.: 97416
Date: MAY '97
Scale:

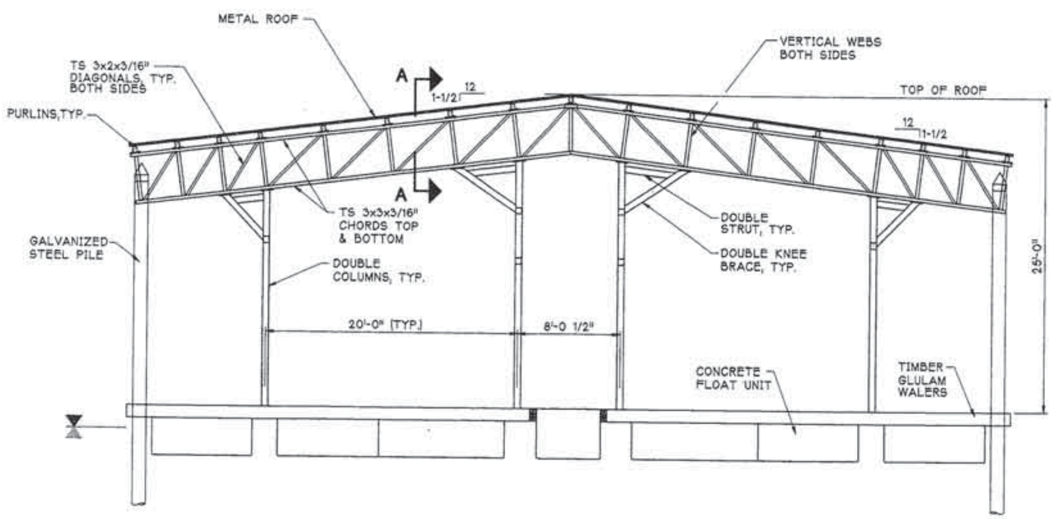
COVER 32 PLAN

Sheet 23 of 32

G:\ACDATA\DRH\1997\97416\97416-23.DWG
PLOT IT w/ANCHPOP 04-30-97



TRUSS PLAN
32-FOOT SLIPS



TRUSS SECTION
32-FOOT SLIPS

NOTE: DETAILS NOT SHOWN SIMILAR TO COVER 28 SECTION

C:\ACDATA\DRH\1997\97416\97416-24.DWG
PLOT 1:1 w/ANCH.PCP 04-30-97

TODD NOTTINGHAM PROFESSIONAL ENGINEER REGISTERED

EXPIRES 12/15/97

Designed: MH
Drawn: DRH
Checked:
Project No.: 97416

Date: MAY '97
Scale:

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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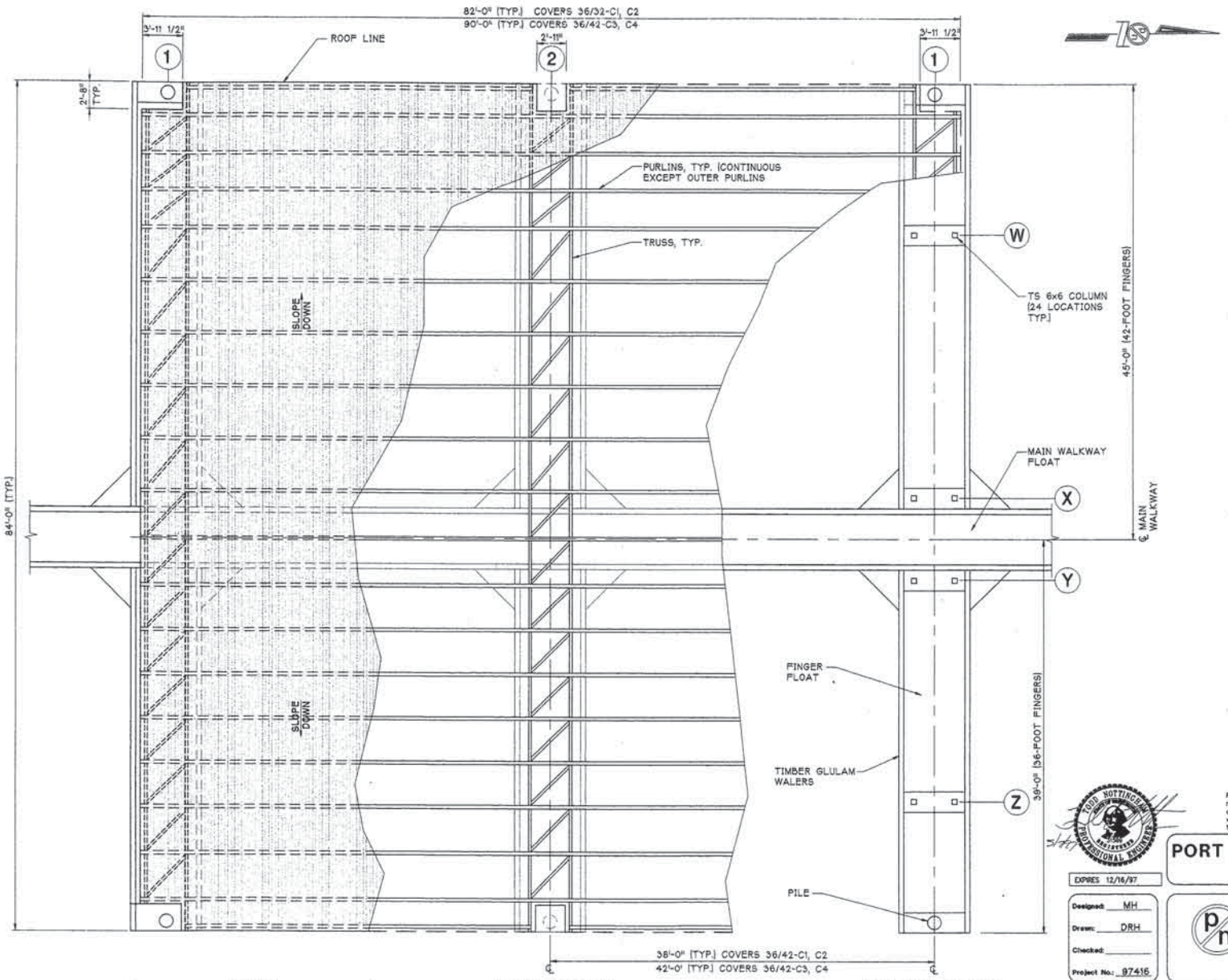
COVER 32 SECTION



ROOF

TRUSS/PURLINS

COLUMNS/FLOATS

COVER 36/42 PLAN

APPROXIMATE DEAD LOAD C1, C2 FLOAT REACTIONS	
LOCATION	COLUMN SET LOAD (KIPS)
1W	8.0
1X	4.1
1Y	3.3
1Z	7.2
2W	14.3
2X	6.7
2Y	5.0
2Z	12.6

APPROXIMATE DEAD LOAD C3, C4 FLOAT REACTIONS	
LOCATION	COLUMN LOAD (KIPS)
1W	8.3
1X	4.3
1Y	3.4
1Z	7.4
2W	15.3
2X	7.1
2Y	5.3
2Z	13.5

INCLUDES ESTIMATED COLUMN, TRUSS, PURLIN AND ROOF WEIGHT. CONTRACTOR VERIFY

NOTE:
COLUMN LOADS ARE FOR THE DOUBLE COLUMN SET AT THE DESIGNATED WELDMENT.

MEMBER SIZES	
COLUMNS	TS 6x6x1/4"
PURLINS	TS 8x4x1/4"

EXPIRES 12/16/97

PORT OF BREMERTON-PORT ORCHARD MARINE RECONSTRUCTION

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
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Seattle, Washington, 98104
PH: (206) 624-1387 FAX: (206) 624-1388

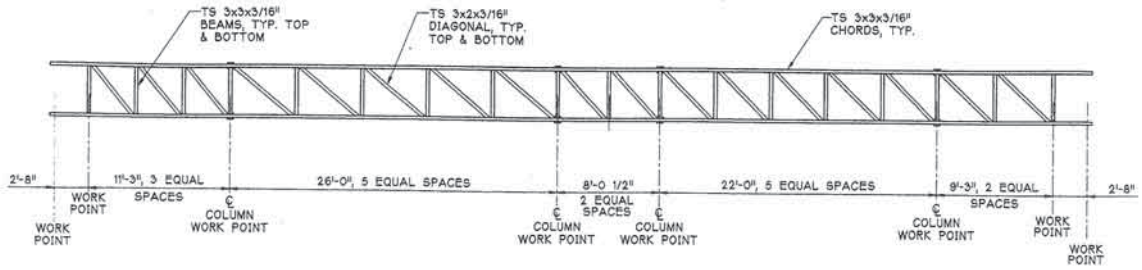
Designed: MH
Drawn: DRH
Checked:
Project No.: 97416

Date: MAY '97
Scale:

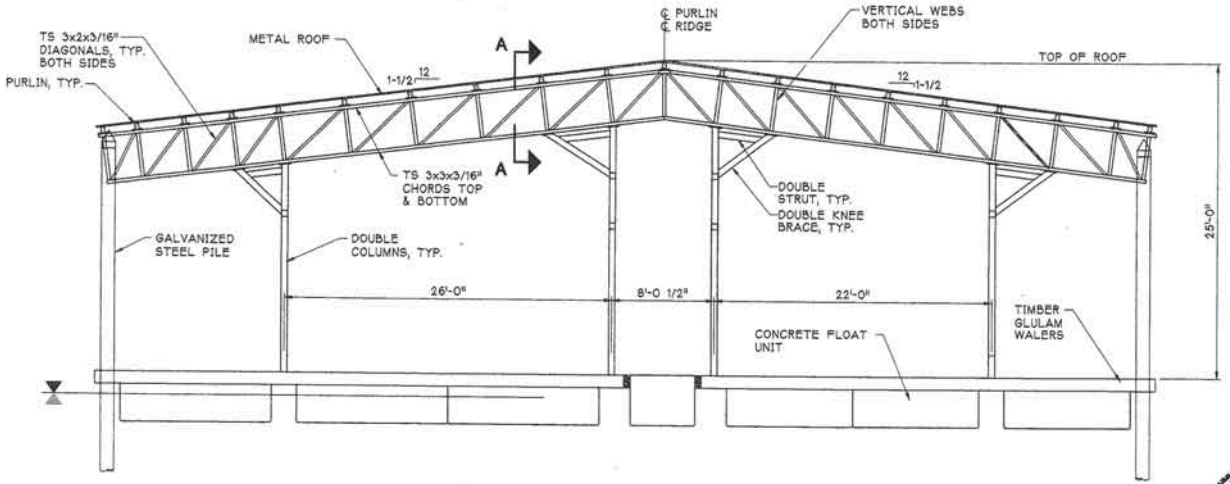
COVER 36/42 PLAN

Sheet 25 of 32

C:\ACDATA\DRH\1997\97416\97416-25.DWG
PLOT-11 w/ANCH.PCP 04-30-97



TRUSS PLAN
36/42-FOOT SLIPS
LOW CHORDS & DIAGONALS SHOWN



TRUSS SECTION
36/42-FOOT SLIPS
NOTE: DETAILS NOT SHOWN SIMILAR TO COVER 28 SECTION

C:\ACDATA\DRH\1997\97416\97416-26.DWG
PLOT 11 w/ANCH.PCP 04-30-97

EXPIRES 12/16/97

Designed: MH
Drawn: DRH
Checked:
Project No.: 97416
Date: MAY '97
Scale:

PORT OF BREMERTON-PORT ORCHARD
MARINA RECONSTRUCTION

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
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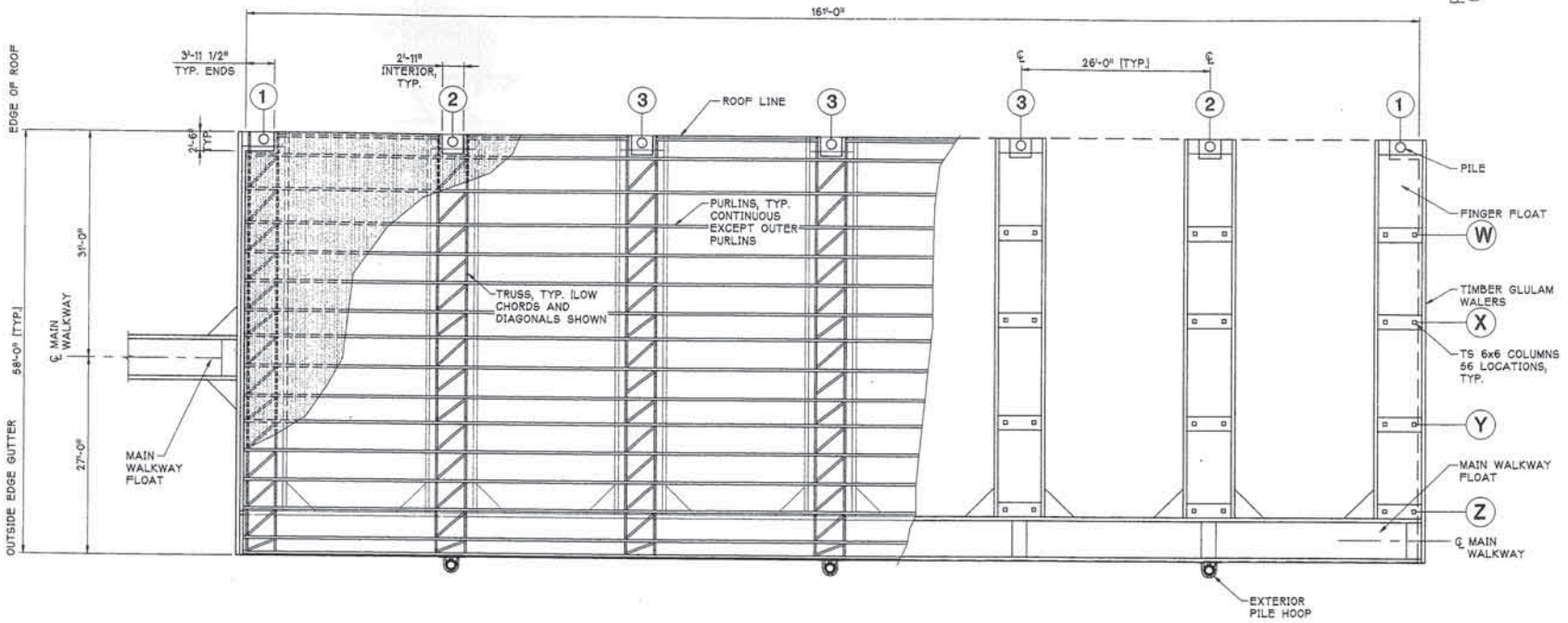
COVER 36/42 SECTION

Sheet 26 of 32

MEMBER SIZES	
COLUMNS	TS 6x6x3/16"
PURLINS	TS 6x4x3/16"



ROOF

TRUSS/PURLINS

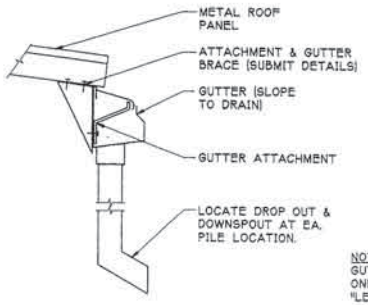
COLUMNS/FLOATS

COVER 52-PLAN

APPROXIMATE DEAD LOAD FLOAT REACTIONS	
LOCATION	COLUMN SET LOAD (KIPS)
1W	5.7
1X	1.9
1Y	3.8
1Z	3.6
2W	7.8
2X	2.2
2Y	5.0
2Z	4.8
3W	7.4
3X	2.1
3Y	4.7
3Z	4.6

INCLUDES ESTIMATED COLUMN, TRUSS, PURLIN AND ROOF WEIGHT. CONTRACTOR VERIFY

NOTE:
COLUMN LOADS ARE FOR THE DOUBLE COLUMN SET AT THE DESIGNATED WELDMENT.



GUTTER DETAIL

NOTE:
GUTTER MATERIAL SHALL BE ONE-PIECE SEAMLESS ALUMINUM "LEAFGUARD"© BY ENGLERT

EXPIRES 12/16/97

Designed: MH
Drawn: DRH
Checked:
Project No.: 97416
Date: MAY '97
Scale:

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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Engineering Consultants
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Seattle, Washington, 98104
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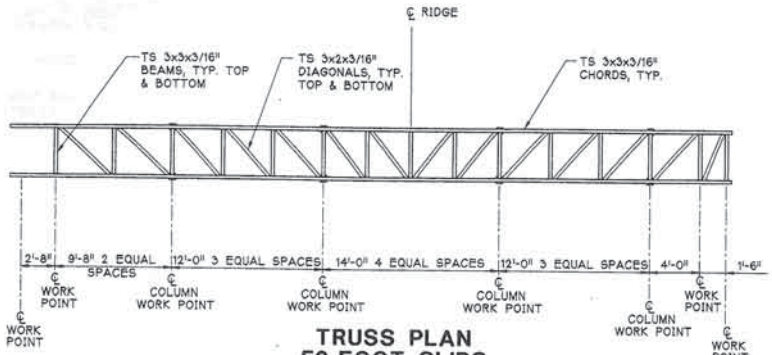
COVER 52 PLAN

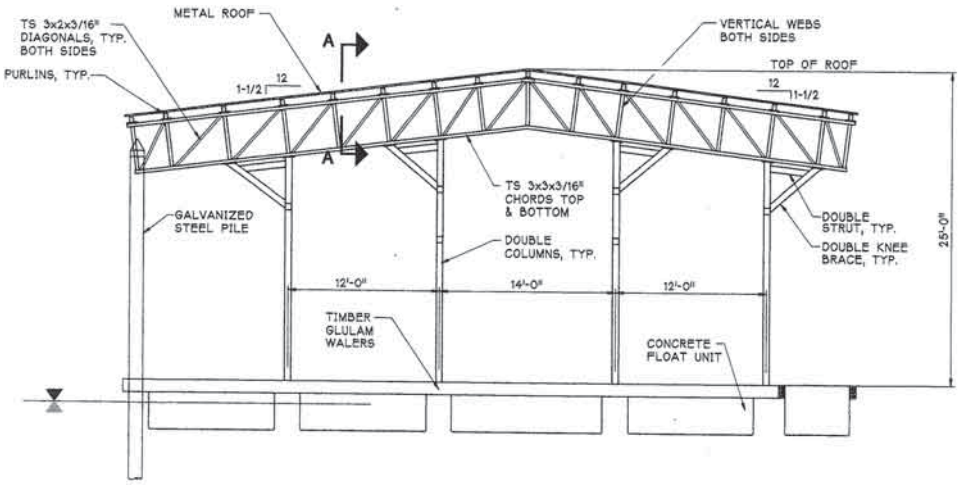
Sheet 27 of 32

C:\ACDATA\DRH\97416\97416-27.DWG
PLOT: 11 w/ANCH.PCP 04-30-97



TRUSS PLAN
52-FOOT SLIPS

LOW CHORDS & DIAGONALS SHOWN



TRUSS SECTION
52-FOOT SLIPS

NOTE: DETAILS NOT SHOWN SIMILAR TO COVER 28 SECTION

C:\ACDATA\DRH\1997\97416\97416-28.DWG
PLOT 11 w/ANCH PCP 04-30-97

TODD NOTTINGHAM REGISTERED PROFESSIONAL ENGINEER

EXPIRES 12/16/97

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Designed: MH
Drawn: DRH
Checked:
Project No.: 97416
Date: MAY '97
Scale:

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
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Seattle, Washington, 98104
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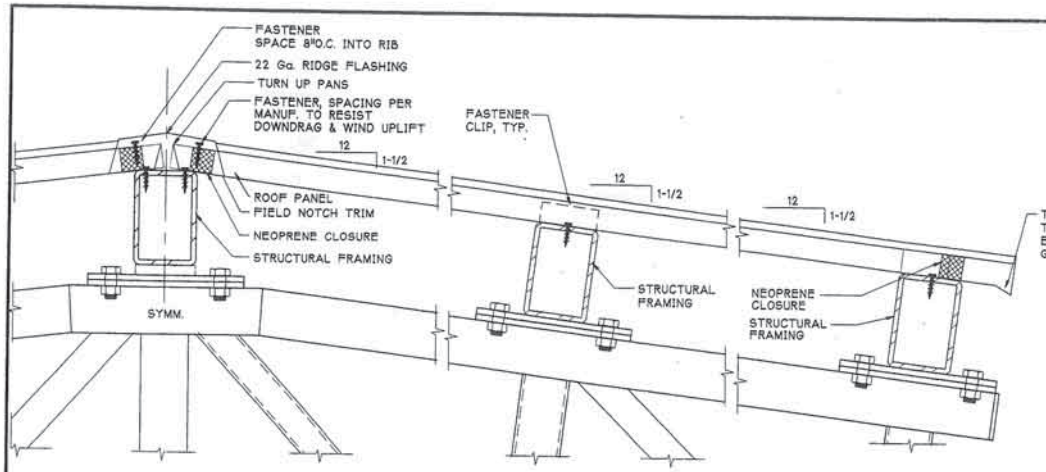
COVER 52 SECTION

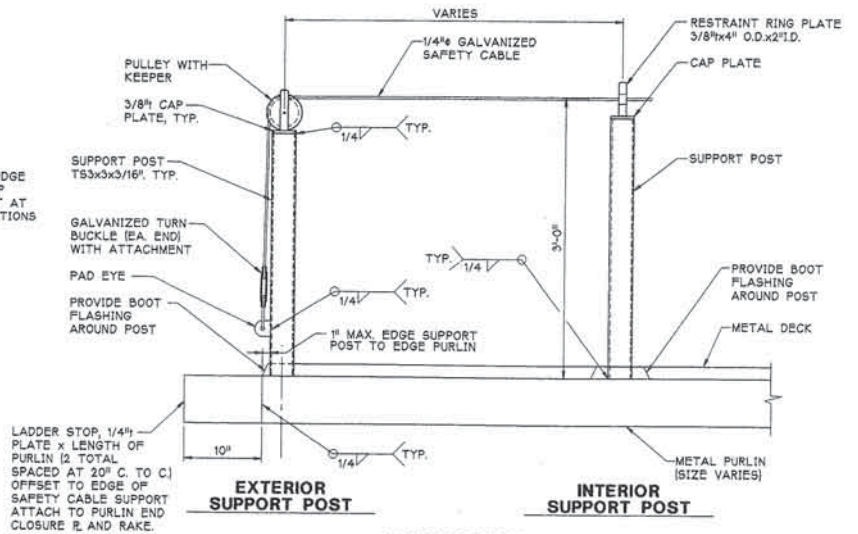
Sheet 28 of 32



RIDGE

CENTRAL PURLIN

EAVE

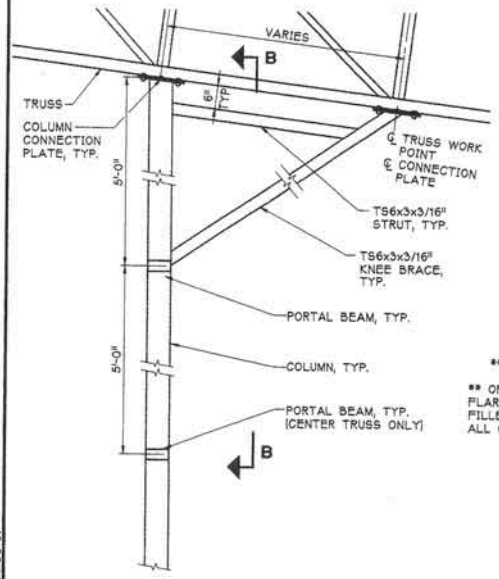


EXTERIOR SUPPORT POST

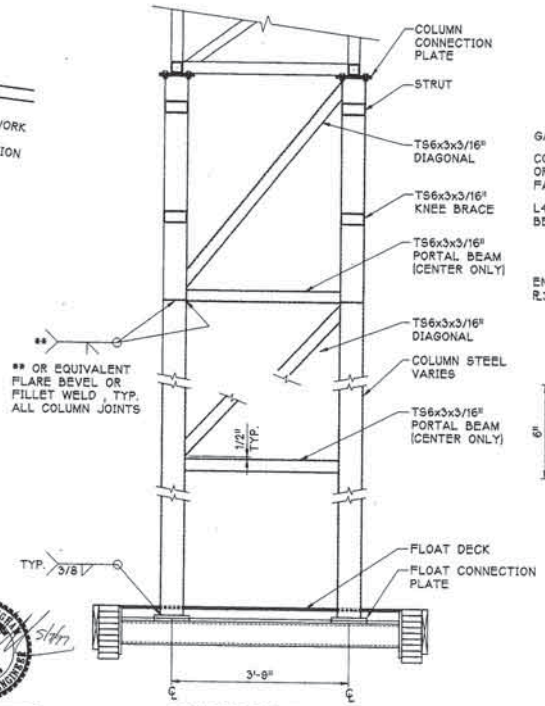
INTERIOR SUPPORT POST

ELEVATION SAFETY CABLE SYSTEM

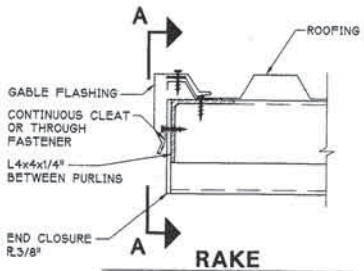
NOTE: EVENLY SPACE SUPPORT POSTS. MAXIMUM SPACING FOR SUPPORT POSTS IS 15'-0"



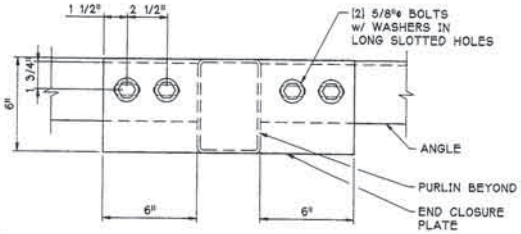
COLUMN



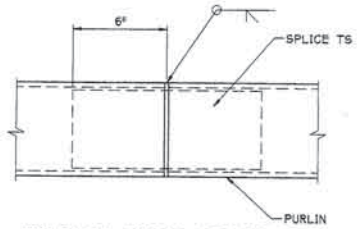
SECTION B-B



RAKE



VIEW A-A



PURLIN SHOP SPLICE

NOTE: CONTRACTOR SHALL SUBMIT SPLICE LOCATIONS ON SHOP DRAWINGS. FIELD SPLICE IF NECESSARY SIMILAR.

EXPIRES 12/16/97

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Designed: TN/GH
Drawn: DRH/GH
Checked:
Project No.: 97416
Date: MAY '97
Scale:

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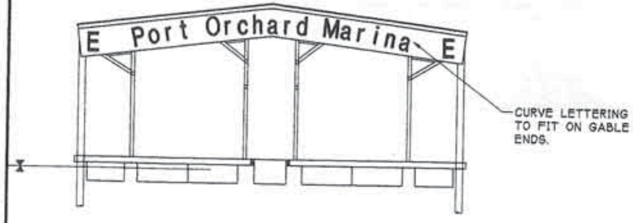
COLUMN & ROOF

Sheet 29 of 32

C:\ACDATA\DRH\1997\97416\97416-29.DWG
PLOT 11 w/ANCI.PCP 04-30-97



END VIEWS
E FLOAT
(28-FOOT COVER)

END VIEWS
C FLOAT
(36/42-FOOT COVER)

ROOF COLOR NOTES

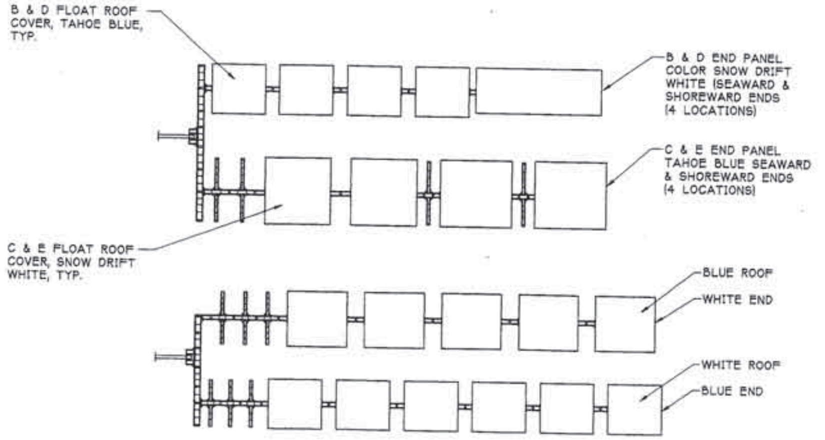
Roof, rake and gutters shall match color specified for each roof cover. Contractor shall submit color samples of roof, rakes, gutters and end panels prior to ordering of material.

END PANEL NOTES

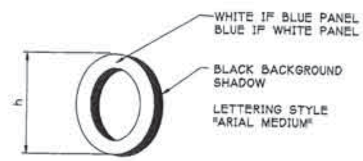
The end panels shall be sheet aluminum with a thickness of 0.125-inches and shall be constructed in accordance with WSDOT Standard Specifications Section 9-28 Signs. Panel color shall match that noted on the plan views (both sides) with lettering style noted on the plans. Individual panel sections shall be sized to splice over truss web locations and shall be full height with a minumum length of 8-feet. Panel sections shall be attached to the truss with 1/4-inch stainless steel thru bolts at a minimum spacing of 12-inches along all edges. The heads of the thru bolts shall match the color of the panel.

END VIEWS
D FLOAT
(32-FOOT COVER)

END VIEWS
B FLOAT
(52-FOOT COVER SHOWN)
(28-FOOT COVER SIMILAR)



PLAN
NOTE: 8 TOTAL END PANELS



TYPICAL LETTER
h= 3'-0" UPPER CASE, LOWER CASE PROPORTIONATE

EXPIRES 12/16/97

Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

Designed: TN
Drawn: DRH
Checked:
Project No.: 97416
Date: MAY '97
Scale:

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
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Seattle, Washington, 98104
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COLORS AND SIGNS

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PLOT 11 W/ANCH.PCP 04-30-97

GENERAL NOTES

APPLICABLE CODES
All local codes plus the following specifications, standards and codes are part of these General Notes:

1) Uniform Building Code 1994 Edition
2) AWS D1.1 Structural Welding Code - current edition
3) ACI-318 Building Code Requirements for Reinforced Concrete
4) ASTM Specifications

In the event that there is a conflict between the above references and these General Notes the following priority will be followed:

1) All project permit requirements
2) These General Notes and Plans
3) Local Codes
4) The specifications, standards and codes listed above in order of precedence

DESIGN CRITERIA
Dead Loads - All
Roof Snow Load - Uniform 25 psf
Float Live Load - Uniform 40 psf, 1000 pound concentrated.
Wind Load - 80 mph, exposure D
Vessel Lengths - Maximum length equal to adjacent finger float length

MATERIALS AND CONSTRUCTION

GENERAL
The following section covers all phases of construction for this project, except electrical requirements which are covered elsewhere. Additional specific requirements are covered in the various sub-sections and on the plans. Requirements covered in the sub-sections supersede those in this section in case of conflict.

Materials not specifically noted in these General Notes or elsewhere on the drawings shall be submitted by the Supplier for approval. Approval will be based on conformance to current standards utilized by the Owner. All materials must conform to good workmanship, acceptable industry standards and manufacturers recommendations.

Construction not mentioned in these General Notes shall be performed using reasonable care and good construction practices. Final inspection and acceptance of all work not specifically included in these General Notes or on the drawings shall be made by the Owner. Approval of all methods and products shall be based upon conformance to the General Notes, drawings, quality of workmanship, applicable industry standards, and pertinent manufacturers recommendations.

STRUCTURAL STEEL
Miscellaneous plates and shapes shall be ASTM A36, galvanized.
Pipe shall be ASTM A53, Grade B, type E or S, galvanized.
Tubes shall be ASTM A 500, Grade B, galvanized.

STEEL WELDING
Per AWS D1.1. All welders shall be qualified per AWS for the type of welding anticipated. Welds will be spot tested by the Engineer by VT, MT, or UT and those failing shall be repaired at the Contractors expense which will also include all costs for retesting. No welding through galvanized coating will be performed. The galvanizing within one inch of the weld shall be removed and repaired after welding.

BOLTS
All bolts connecting steel to concrete or steel to steel connections shall be ASTM A325, galvanized. Washers shall be used under both head and nut of all bolts. Steel to steel bolted connections shall be tightened per AISC turn-of-nut method.

All other bolts, lag screws, nuts, washers, nails and spikes shall meet ASTM A307 or ASTM A36 or similar requirements as approved by the Engineer and shall be hot-dipped galvanized. Malleable iron washers shall be used in all areas where the bolt head or nut shall bear against wood, except under economy heads.

GALVANIZING
All steel, pile and hardware shall be hot-dipped galvanized per ASTM A123 or A153 after fabrication unless otherwise noted. Damaged galvanizing, including that removed for welding shall be repaired by stick galvanizing with zinc or aluminum alloy sticks to a minimum thickness of 12 mills. Contractor shall submit repair material and methods of repair for review and approval.

SPRAY METALIZING
Steel as noted on the plans shall be spray metalized with aluminum or zinc per the Steel Structures Painting Council (SSPC) Guide No. 23. Minimum dry coating thickness of 6 mil is required for steel that is above waterline. For steel located below water a minimum of 12 mil coating is required. Damaged metalizing, including that removed for welding, shall be repaired by stick galvanizing similar to method covered in Galvanizing section.

CONCRETE
Concrete shall be designed, mixed and batched in accordance with ACI A318. Batched concrete shall also conform to ASTM C94. Aggregates shall conform to ASTM C33, with maximum aggregate size of 3/8 inch. Portland cement and silica fume concrete appropriately proportioned to meet or exceed the following minimum requirements for strength and serviceability.

Minimum 28 day compressive strength = 6000 psi
Minimum cement content = 6.5 sack per cubic yard
Minimum Silica Fume content = 50 pounds per cubic yard
3.2 pounds of 1-1/2 inch Forta-Fiber per cubic yard (except sides and bottom which need not have fibers.
Maximum water cement ratio = 0.40
Air Entertainment = 3% to 7%
1 to 2 inch slump delivered to the site prior to addition of superplastizer. Plasticizer shall be POZZ 322N or approved equal, adjust as required to obtain workable consistency.

Admixtures, if used, including water reducers, retarders, and accelerators, shall conform to ASTM C494. Air entraining mixtures shall conform to ASTM C260.

Portland cement shall be ASTM C150 Type II. Type III may be utilized if chemical requirements for saltwater environment are met as approved by the Engineer. Submit for review and approval.

Fill all cracks with crack filler. Concrete crack filler shall be Sikapronto 19.
Seal all concrete with concrete sealer. Concrete sealer shall be Chem-Trete BSM 40.

CONCRETE TESTING
Concrete shall be tested by a Contractor provided independent testing laboratory, as approved by the Owner. All testing shall be performed in accordance with respective ASTM and ACI requirements.

A minimum of three (3) compressive test cylinders shall be taken daily per mix, cured and tested. Test results shall be submitted on seven day and twenty-eight (28) day breaks. Unit weight, entrained air tests shall be taken daily from the same material sampled and used in the compressive strength cylinders.

The Contractor shall submit test results for the concrete in accordance with ACI-318. Items constructed with inferior concrete shall be rejected.

CONCRETE REINFORCING
All reinforcing bar shall be ASTM A615 Deformed Bar, grade 60, galvanized. Bar bend radius shall account for galvanizing embrittlement. Rebar to be welded shall be of weldable quality conforming to ASTM A706, galvanized. Welded wire fabric shall conform to ASTM A185, galvanized.

TIMBER
All sawn timber shall conform to #1 Coast Region Doug Fir or better according to WCLIB Grading Rules, pressure treated.

GLUE-LAMINATED TIMBER
All Glulam members shall be manufactured with Coast Region Douglas Fir that conforms to AITC 117-87 specifications and shall be manufactured in balanced combinations having equal design values for both positive and negative bending. The glulam beams shall have an industrial finish, shall be for exterior use and have design values equal to or exceeding the following when loaded perpendicular to the widest faces of the laminations: Doug-Fir glulams shall be pressure treated.

Bending (Fb) = 2400 psi.
Horizontal Shear (Fv) = 165 psi
Modulus of Elasticity (E) = 1,700,000 psi

TIMBER PRESSURE TREATMENT
All sawn timber and glulaminated timber shall be incised and pressure treated according to AWPA C18 specifications to a net dry salt retention of not less than 0.60 pounds per cubic foot of ACZA (ammoniacal copper zinc arsenate) in the assay zone. Timber components shall be cut to length, drilled, dapped, and shaped as much as practical before pressure treating. Any field fabrication or damage shall be repaired per AWPA M4.

All timber members being manufactured shall be produced in accordance with the current industry BMP (Best Management Practices) to include the following:

1. Manufacturing good housekeeping practice shall be observed to insure a minimum of sawdust, surface residue, and other foreign material on the wood product prior to treatment.

2. After pressure period and the treating solutions has been removed from the retort, the treated material shall be aqua steamed for a minimum of one hour at 212 F with a 2% aqua ammonia solution. After aqua steaming and the aqua ammonia is removed from the retort a final vacuum for two hours at 180 F to 210 F shall be applied.

3. Prior to shipment, material shall be air dried under cover or kiln dried to a maximum final moisture content of 30% in the treated zone by the oven dry method.

SURVEY
All construction surveys shall be performed by or under the supervision of a Surveyor licensed in the State of Washington.

An accurate method of horizontal and vertical control shall be established by the Contractor and approved by the Owner before construction begins. The Contractor shall maintain the control system throughout the project. If at any time the methods utilized fail to provide accurate location the Contractor may be required to suspend work. The Contractor shall lay out the work from established horizontal and vertical control points indicated on the drawings and shall be responsible for all required measurements taken from these points.

The Contractor shall furnish at its own expense all stakes, templates, platforms, equipment, range markers, and labor as may be required to lay out the work from the Control Points furnished by the Owner. It shall be the responsibility of the Contractor to maintain the Control Points until authorized to remove them. If such points are destroyed or disturbed they shall be reestablished by the Contractor at its own expense.

DEMOLITION
Demolition shall be completed as described on the plans and as required by the permits.

STAGING AREA
No upland staging area is available for the Contractors use. Contractor shall provide their own area off site.

SUBMITTALS
The Owners review of submittals will be for general conformance only and it shall remain the responsibility of the Contractor to conform to all requirements of the plans and specifications. Any intended deviation from the plans and specifications must be specifically identified by the Contractor and specifically approved by the Owner to be acceptable.

Shop drawings of all fabricated materials shall be submitted to the Owner for written approval prior to fabrication or mobilization of any item. A minimum of five sets shall be provided for each submittal, of which two will be returned to the Contractor. The Contractor should allow two weeks from the time of receipt for review of submittals by the Owner for a reasonable number of drawings.

Certifications, manufacturers data and other information for all materials, including those not specifically shown in these notes or on individual drawings, shall be submitted to the Owner for written approval to verify conformance with the plans and specifications. In the event that the plans or specifications do not specifically reference a material, the approval of materials will be based on its conformance to the Uniform Building Code. All methods and materials shall conform to these General Notes, good workmanship, generally accepted industry standards, and manufacturers recommendations.

The following is a partial list of required submittals for the Project. This does not constitute a complete list as it will vary depending upon the Contractors methods.

Construction Plans (includes plan drawings and written description of methods):

1. Survey plan and updates
2. Staging area plan - including dates of use, security and pedestrian control plan
3. Pile driving plan and equipment
4. Pile socket plan and equipment
5. Roof erection plan
5. Daily Operation Reports - Furnish weekly (includes personnel and equipment)

Shop Drawing Plans.
1. Structural Steel.
2. Concrete Floats, including floatation calculations, timber and all othe associated items.

Materials Certifications Submittals:
1. Concrete mix and all associated items, including concrete strength tests.
2. Reinforcing steel.
3. Structural Steel.
4. Steel Pipe Piles.
5. Amenities
6. Signs

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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Designed: _____
Drawn: DRH
Checked: _____
Project No.: 97416
Date: MAY '97
Scale: _____

EXPIRES 12/16/97

GENERAL NOTES

Sheet 31 of 32

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PLOT: III w/ACAD.CTB 04-30-97

FLOATS
The work covered under this section is in addition to the work covered under General section. Specific items covered in this section supersede those covered in the General section in case of conflict.

FLOATS - GENERAL
The float manufacturer shall have a minimum of five (5) years experience in the design and manufacturing of concrete floats. The concrete float manufacturing facility shall provide the proper environment and physical conditions necessary for casting high quality concrete float units. The facility shall provide adequate work space, equipment, level casting surfaces, and protection from direct sunlight, wind, moisture, and freezing.

The float system designed by the manufacturer shall consist of modular concrete float units as required to provide the configuration shown on the drawings.

Freeboard under all dead loads shall not be more than one-half (1/2) inch below nor more than one (1) inch above the freeboard shown in the drawings after one year. Dead loads shall consist of the float system, walers, rubstrips, pile guides, utilities, utility pedestals, transformers, roof cover structure and all other attached appurtenances.

Floats with special dead loads shall have the same freeboard as floats without such loading so that no residual stresses or tilting is incurred when the modules are connected. Walking surfaces of float units shall be level and flush with adjoining float units and shall float level under dead load. The maximum slope of the float deck under dead load is one (1) inch per ten (10) feet of float length or width. The maximum height variation between adjoining surfaces such as timber waler and concrete or steel and concrete shall be 1/4-inch..

FLOAT MATERIALS AND FABRICATION

CONCRETE
The concrete floats shall be cast in steel forms capable of maintaining the proper shape, lines, and dimensions of the float units. The dimensions of the finished float unit shall not vary by more than 1/8-inch from the dimensions shown in the approved shop drawings.

The form shall be properly coated with a release agent to allow for the easy removal of the form and to provide for a smooth form finish. The concrete in the float units shall be vibrated internally and/or externally to assure a smooth dense surface finish. Small surface holes caused by air bubbles, normal color variations, normal form joint marks, and minor chipping and spalls shall be tolerated, but should be minimized using good industry practice of cleaning forms and placing concrete. Major imperfections, honeycomb, cold joints or other defects will not be permitted. Acceptable cracks are limited to those of hairline nature that show no tendency to open.

All reinforcement shall be lapped a minimum of twelve (12)-inches at splices and shall have a minimum of three quarters (3/4) inch concrete cover. Welded wire fabric shall be lapped a minimum of 8 inches at all joints and splices and shall be centered in the thickness of the concrete at all locations. Fabricator shall provide means of holding the fabric into position such as staples, chairs, or other means as approved by Owner to facilitate the accurate placement of the fabric.

Float top surfaces shall be struck off after initial set, steel troweled, then broom and 3/8-inch edger finished before curing, unless otherwise approved. All cracks shall be filled with crack filler. All float tops shall be treated with approved concrete sealant after curing.

TIMBER
Lumber shall be fabricated to provide uniform gaps and butt joint connections. Lumber splices shall not exceed 1/2-inch between adjoining ends. All walers, fascia, spacers, plywood or any other member which is subject to foot traffic shall be flush with the concrete walking surface.

POLYSTYRENE
Float inner cores shall be closed-cell expanded polystyrene in accordance with ASTM D-1621. The density of the polystyrene shall be between 1.25 and 1.5 pounds per cubic foot and billets shall not contain greater than 5% regrind material. The foam shall have a maximum adsorption of 3 percent by volume as tested by ASTM C-272. Billets shall have a variation in design dimension of less than 1/8 inch.

The inner cores of the float modules shall be held in a true position during casting with a maximum allowable variation of 1/8-inch from the dimensions shown on the approved shop drawings.

Foam core shall be made of not more than 4 laminated sections. Laminations shall be glued with a low solvent glue, and shall be strapped to prevent delamination during transportation and handling. Leveling billets w/ coating or covering such as 60 mil Polyurethane as approved by the Owner shall be utilized to level floats as necessary.

UTILITY CHASES
Each walkway shall have PVC sleeves embedded as required for the electrical system. Sleeves shall remain above water surface under dead load conditions and shall be designed to facilitate installation, removal, and servicing of the utilities.

THRU-ROD CONNECTIONS
The minimum dimension for all thru rods for structural attachment is 3/4-inch thread diameter. All thru-rods shall be placed within PVC sleeves cast in the float units. The maximum inside diameter of the PVC shall not exceed 7/8-inch. No connecting device shall protrude beyond the fascia in the berth area. Any connecting device protruding above the surface of the deck shall have a low rounded profile.

CAUTION
Floats are not stable until completely assembled & will not float evenly until full dead load is applied.

MARKING AND HANDLING
All floats shall be clearly identified on one side and one end with the date of manufacture, specific float type and job number.

Except as otherwise approved, floats shall be cured a minimum of 7-days before transporting or assembling. The concrete floats shall be lifted and supported during stockpiling, transporting, and assembly only at lifting or supporting points as shown on the approved shop drawings. Floats shall be protected against damage from any cause, any damaged units shall be rejected.

ROOF COVER
The work covered under this section is in addition to the work covered under General section. Specific items covered in this section supersede those covered in the General section in case of conflict.

ROOF COVER - GENERAL
The foundation for the cover consists of floats which have a high deflection/load response compared to normal steel erection. The Contractor shall take into account this condition in performing the work for this project. The Contractor shall provide an erection sequence plan which accounts for the variable support conditions.

For each of the roof structures a dead load reaction at the column locations is shown. This load assumes that the floats are provided level with the dead load column reactions in place. The actual dead load for each structure shall be verified by the Contractor and coordination between suppliers and fabricators performed to insure a workable system.

It will be necessary to ballast the floats during erection to maintain a true and level surface which is needed for erection and bolting of the members. The erected structure shall have balanced reactions to those anticipated for dead loading so that no residual stresses or tilting is incurred when the steel members are connected.

ERECTION
Steel erection shall conform to AISC requirements.

ANTICIPATED COVERED ROOF ERECTION SEQUENCE

1) Fully assemble floats.
2) Ballast floats, stabilize w/ outriggers as necessary.
3) Erect columns.
4) Adjust ballast & place truss.
5) Place purlins, adjust ballast as purlins are added.
6) Add roof material, remove last of ballast.

ROOF PANELS

Roof shall have a minimum 24 gauge thickness, G90 galvanized with a Polyvinylidene Floride (PVF2) coating on both sides. All other roof components including rake trim, eave trim and gutters shall be 22 gauge minimum, G90 galvanized and coated with PVF2. Color shall be as specified on the plans.

Roof shall be capable of supporting both snow load and wind loads as described in these General Notes. Roof shall meet requirements of UL90 and ASTM 330E as applicable. In addition the roof shall be able to support a 250 pound point load without damage to the roof. Maximum deflection under load shall be L/180.

Material shall be connected to the purlins with either clips or screws per manufacturer's recommendations to meet the required loading.

Submit shop drawings showing complete roof system for Owners review and approval. The roof system shall include all roof panels, trim, flashing, miscellaneous shapes, end closures, gutters, seals fasteners, and any other components required to provide a complete roof. Drawings shall specify all materials, finish, dimensions, connection details, panel layout and erection procedures.

Provide and submit documentation for a 15-year minimum warranty life for all moorage roof components for in-service conditions.

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PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

TODD NOTTINGHAM REGISTERED PROFESSIONAL ENGINEER
EXPIRES 12/16/97

Peratrovich, Nottingham & Drage, Inc.
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PH: (206) 624-1387 FAX: (206) 624-1388

Designed:
Drawn: DRH
Checked:
Project No.: 97416
Date: MAY '97
Scale:

GENERAL NOTES

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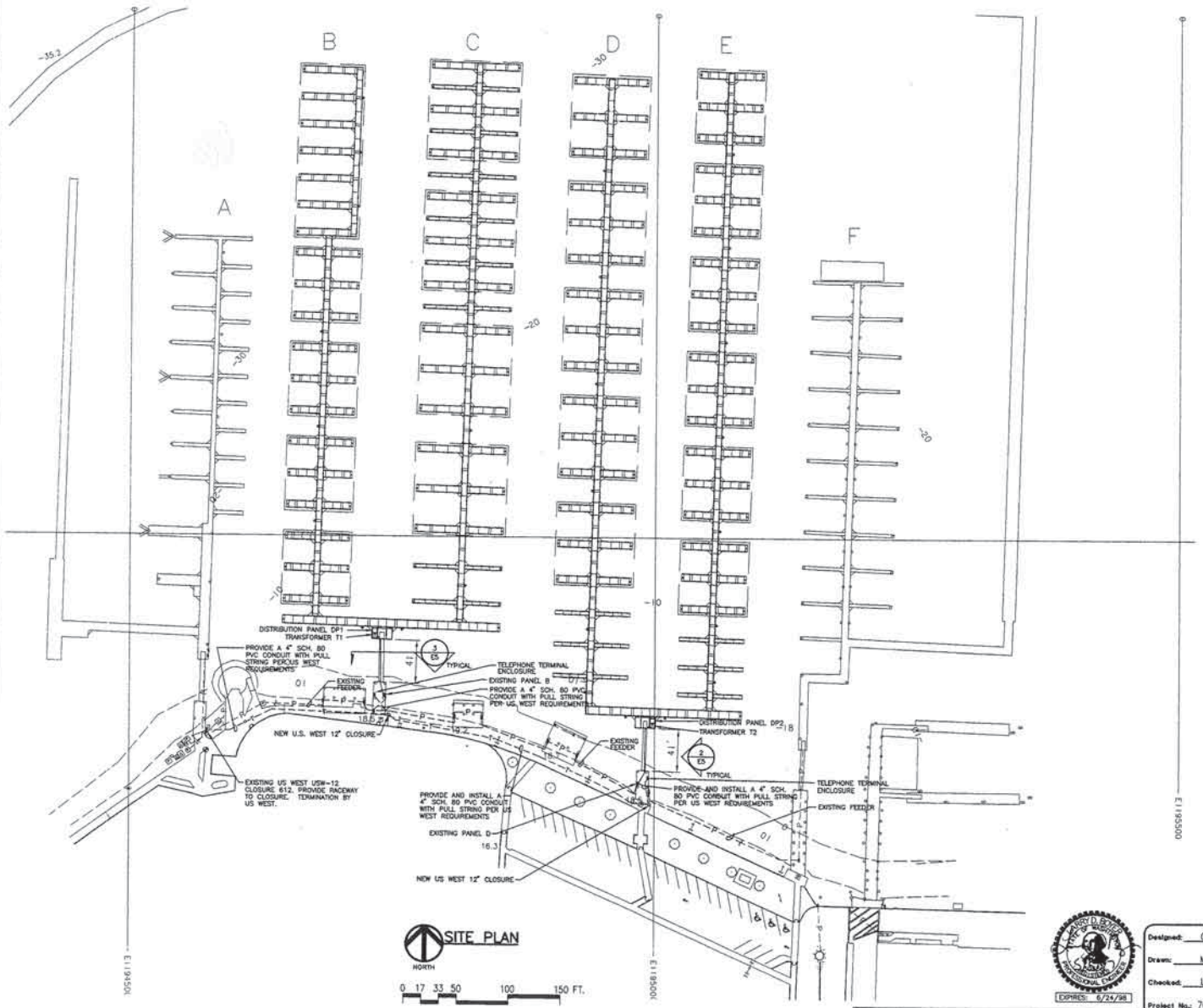

SYMBOL SCHEDULE

- POWER CENTER, 1-30AMP, 120 VOLT RECEPTACLE, 1 METER, 1 TELEPHONE OUTLET, 1 CABLE T.V. OUTLET, 9 WATT FLUORESCENT LIGHT WITH PHOTOCELL. SEATECH TRIMLINE SERIES.
- POWER CENTER, 2-30 AMP, 120 VOLT RECEPTACLES, 2 METERS, 2 TELEPHONE OUTLETS, 2-CABLE T.V.OUTLETS, 9 WATT FLUORESCENT LIGHT WITH PHOTOCELL. SEATECH TRIMLINE SERIES.
- POWER CENTER,1-50 AMP, 120/208 VOLT RECEPTACLE, 1 METER, 1 TELEPHONE OUTLET, 1-CABLE T.V.OUTLET, 9 WATT FLUORESCENT LIGHT WITH PHOTOCELL. SEATECH TRIMLINE SERIES.
- (T) UNIT SUBSTATION TRANSFORMER. SEE ONE-LINE DIAGRAM FOR REQUIREMENTS.
- DISTRIBUTION PANEL. SEE ONE-LINE DIAGRAM FOR REQUIREMENTS.
- (T) HEAT TAPE CONNECTION.
- (H) WEATHERPROOF RATE OF RISE HEAT DETECTOR
- (F) WATERPROOF FIRE ALARM PULL STATION
- (J/SHEET) DETAIL CALLOUT.
- CIRCUIT BREAKER.
- (#) FEEDER SIZE. SEE FEEDER SCHEDULE.
- HIGH PRESSURE SODIUM OVERHEAD LIGHTING FIXTURE, PENDANT MOUNTED. KIM POLE/100 HPS 209 SERIES WITH LOUVER MODULES ON EACH SIDE OF FIXTURE. LAMPS: 1-100W HPS ED17.

GENERAL NOTE:

1. ALL CONDUCTORS SHALL BE COPPER.
2. ALL CONDUIT SHALL BE PVC SCHEDULE 40 EXCEPT RACEWAY ON THE GANGWAY AND ON SHORE WHICH SHALL BE SCHEDULE 80.
3. ALL MOUNTING STEEL AND HARDWARE SHALL BE GALVANIZED.
4. JUNCTION BOXES AND MOUNTING MATERIALS SHALL BE FIBERGLASS AS MANUFACTURED BY ROBROY.
5. ALL SPLICES TO BE MADE WITH CRIMP TYPE CONNECTORS, BURNDY TYPE YGHP-C AND YGHC-C.
6. TAPES TO BE SCOTCH 35, 88, 130C, 2200, 2210 AND 2228.
7. PROVIDE PULL STRING IN ALL EMPTY RACEWAY.
8. CONTRACTOR SHALL PROVIDE ALL EXCAVATION, TRENCHING, BACKFILL PATCHING, ETC. FOR ALL ELECTRICAL WORK.
9. THE CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO STARTING ANY EXCAVATION. ANY DAMAGE DONE TO EXISTING UTILITIES SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
10. CONTRACTOR IS RESPONSIBLE FOR REMOVING AND DISPOSING OF, IN AN APPROVED MANNER, ALL ELECTRICAL SYSTEM COMPONENTS NOT BEING RE-USED.

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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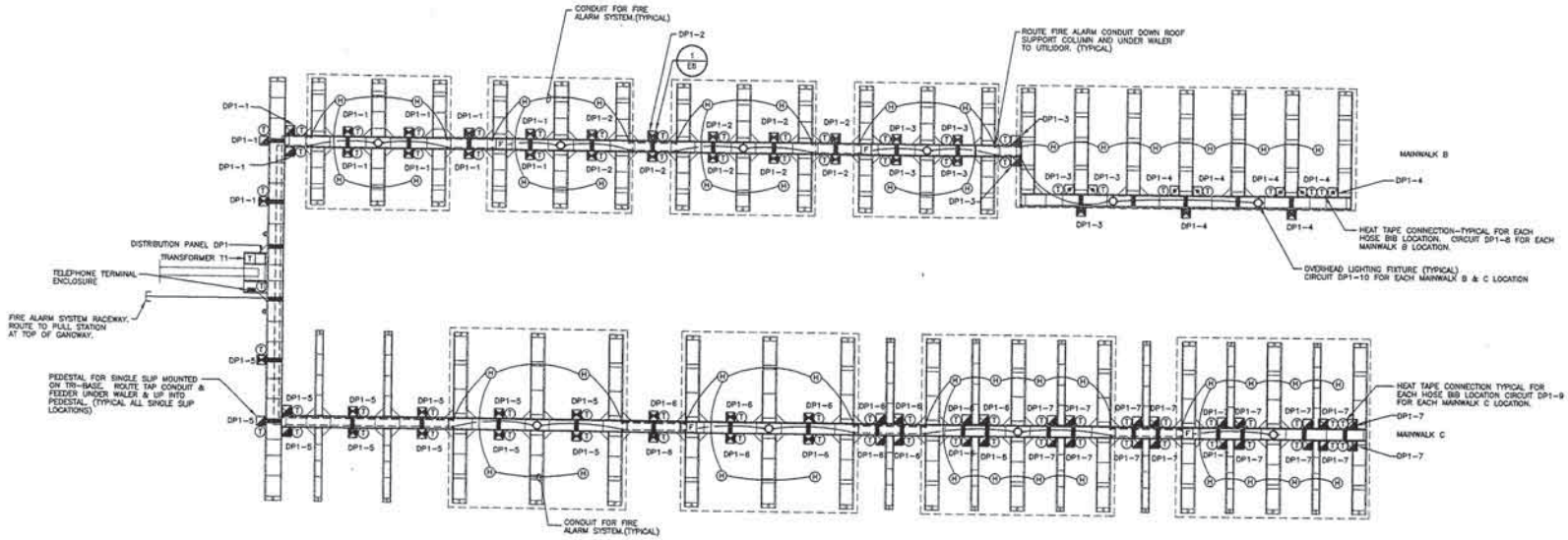
REGISTERED PROFESSIONAL ENGINEER — STATE OF WASHINGTON — EXPIRES: 6/24/98

Designed: CJM
Drawn: MAR
Checked: LDB
Project No.: 7012.01
Date: 5/2/97
Scale: AS NOTED

ELECTRICAL SITE PLAN

Sheet E1 of 10

SEE ONE-LINE DIAGRAM FOR ALL CONDUIT AND FEEDER SIZES



MAINWALK B & C

NORTH

0 10 20 30 60 90 FT.

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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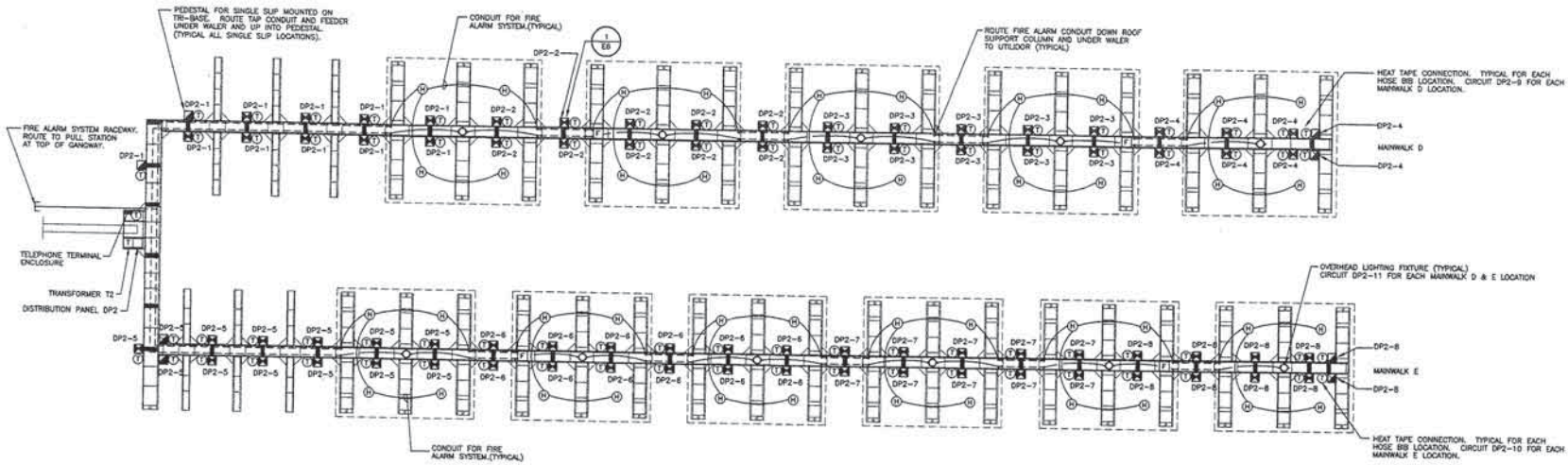
MAINWALK B & C

Sheet E2 of 10

SEE ONE-LINE DIAGRAM FOR ALL CONDUIT AND FEEDER SIZES



MAINWALK D & E

NORTH

0 10 20 30 60 90 FT.

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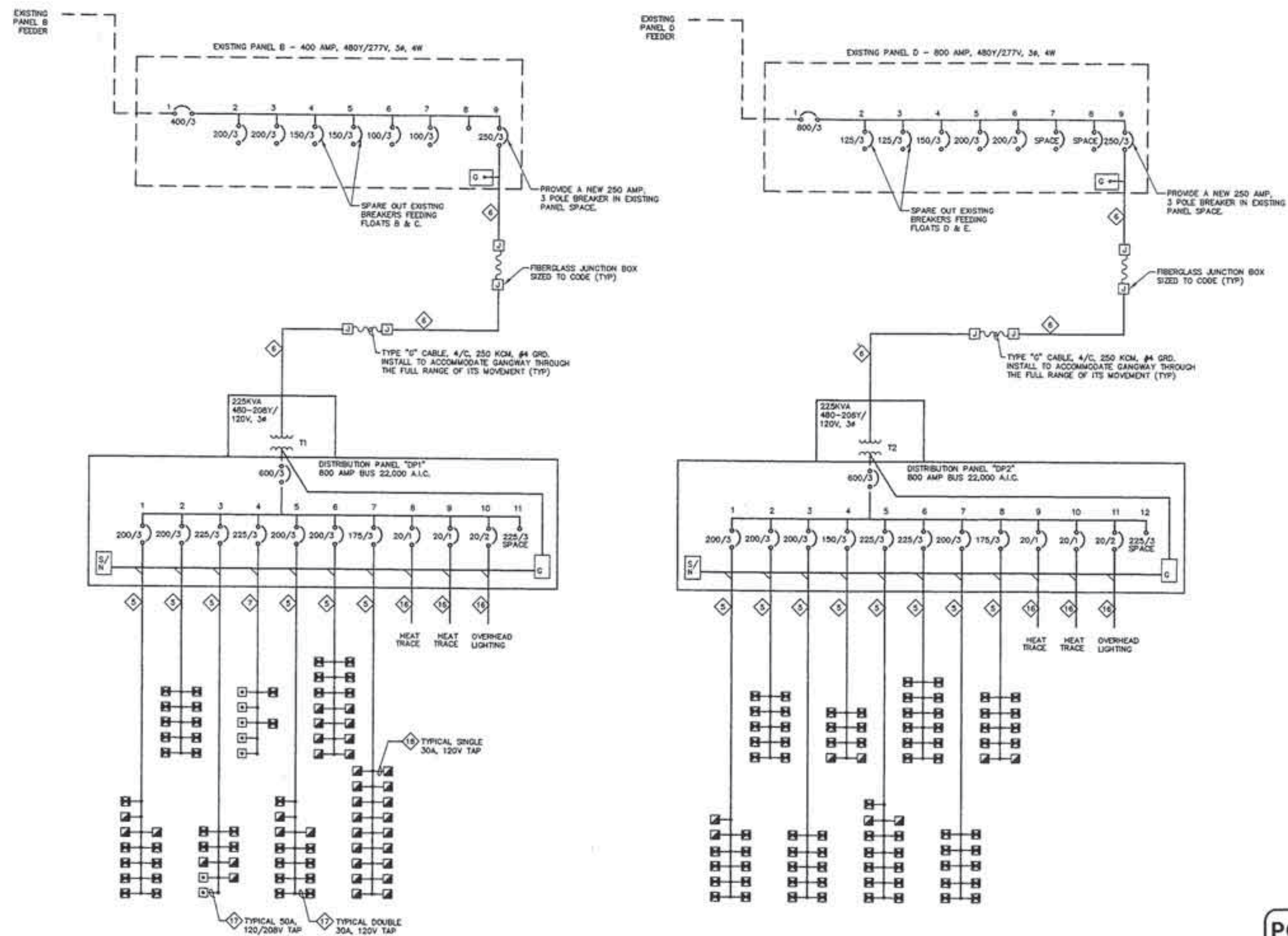
MAINWALK D & E

Sheet E3 of 10



FEEDER SCHEDULE

1	100A,	1 1/4"PVC-4#2, 1#6 GRD.
2	150A,	1-1/2"PVC-4#1/0, 1#6 GRD.
3	175A,	2"PVC-4#2/0, 1#6 GRD.
4	200A,	2"PVC-4#3/0, 1#6 GRD.
5	230A,	2"PVC-4#4/0, 1#4 GRD.
6	250A,	2-1/2"PVC-3#250KCM, 1#4 GRD.
7	275A,	2-1/2"PVC-4#300KCM, 1#4 GRD.
8	300A,	3"PVC-4#350KCM, 1#4 GRD.
9	335A,	3"PVC-4#400KCM, 1#3 GRD.
10	335A,	3"PVC-3#400KCM, 1#3 GRD.
11	380A,	3"PVC-3#500KCM, 1#3/0 GRD.
12	335A,	3"PVC-3#400KCM, 1#1/0 GRD.
13	380A,	3 1/2"PVC-3#500KCM, 250KCM, 1#3/0 GRD.
14	200A,	1 1/2"PVC-3#3/0, 1#6 GRD.
15	300A,	3"PVC-3#350KCM, 1#1/0 GRD.
16	20A,	3/4"PVC-2#10, 1#10 GRD.
17	TAP,	1"C.-3#4, 1#8 GRD.
18	TAP,	1"C.-2#4, 1#8 GRD.

NOTE:
ALL CONDUCTORS ARE COPPER.

ELECTRICAL ONE-LINE DIAGRAM
NO SCALE

EXPIRES: 6/24/98

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Drawn: MAR
Checked: LDB
Project No.: 7012.01
Date: 5/2/97
Scale: NONE

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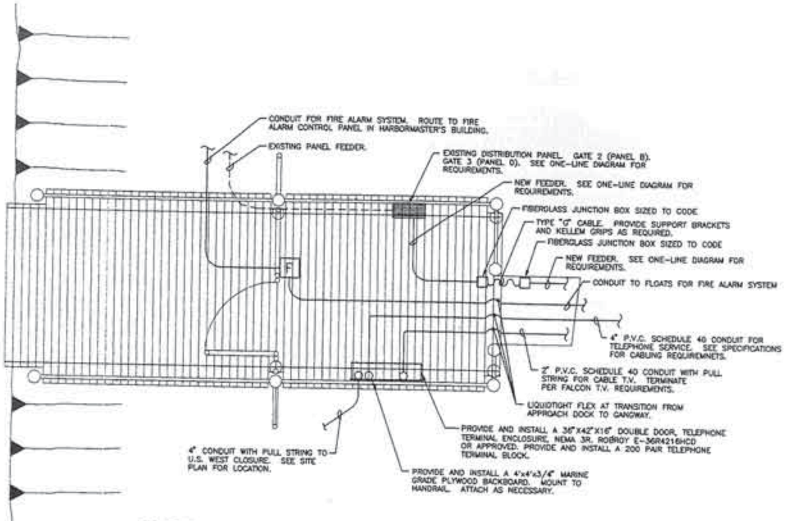
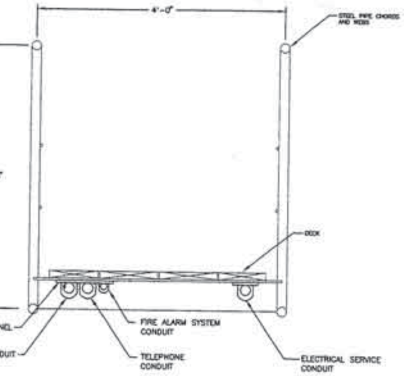
ONE-LINE DIAGRAM

Sheet E4 of 10

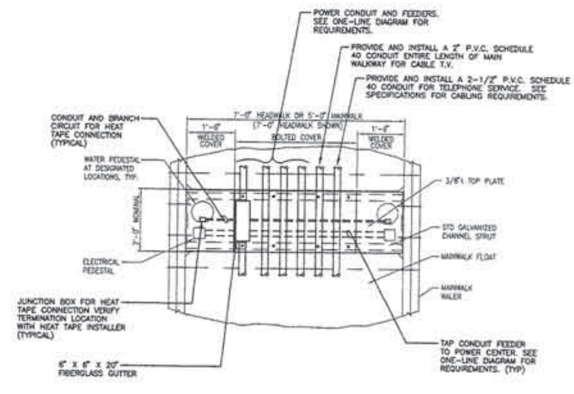


(1/E5) TYPICAL APPROACH DOCK PLAN VIEW
SCALE: NONE

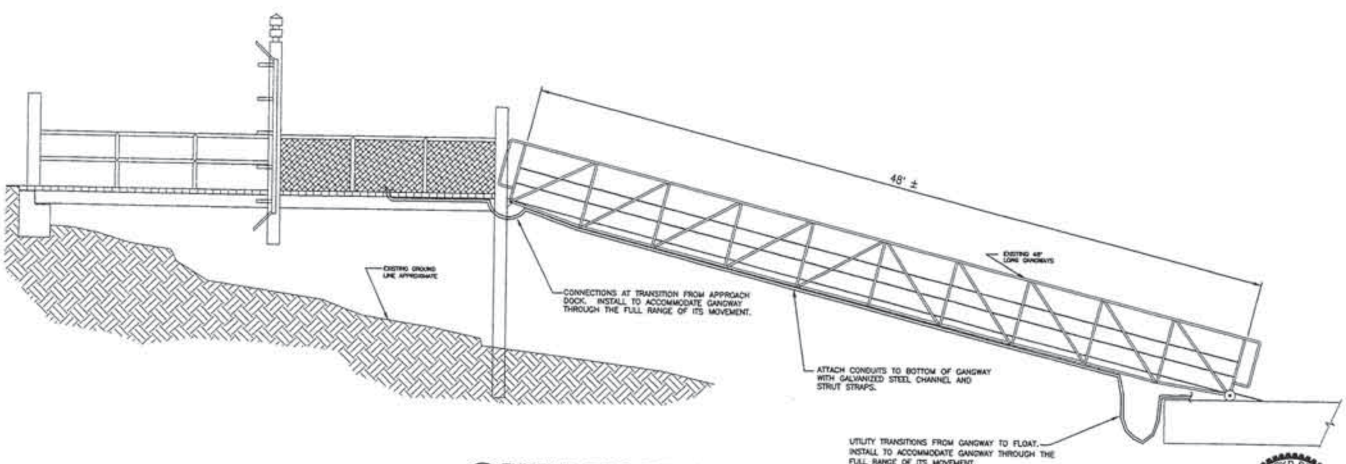


(3/E5) TYPICAL GANGWAY SECTION
SCALE: NONE

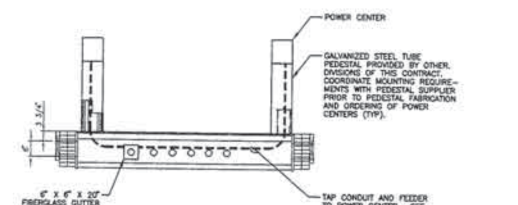
NOTE:
COORDINATE LOCATION OF UTILITIES ON GANGWAY WITH OTHER DIVISIONS PRIOR TO INSTALLATION.



(4/E5) TYPICAL UTILADOR PLAN VIEW
SCALE: NONE



(2/E5) EXISTING RAMP TYPICAL ELEVATION
SCALE: NONE



(5/E5) TYPICAL POWER CENTER MOUNTING DETAIL
SCALE: NONE

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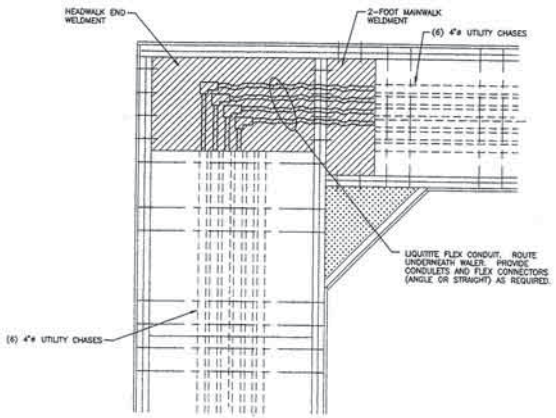
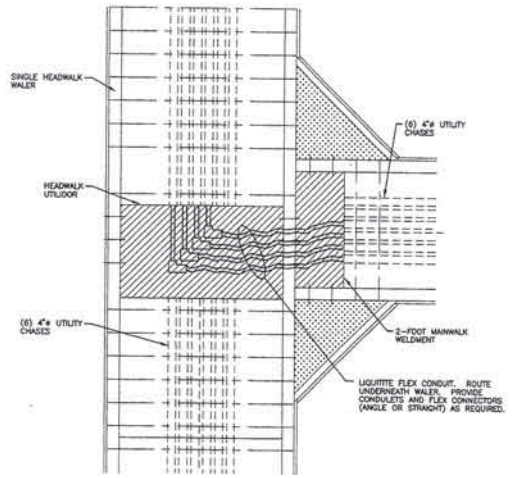
DETAILS

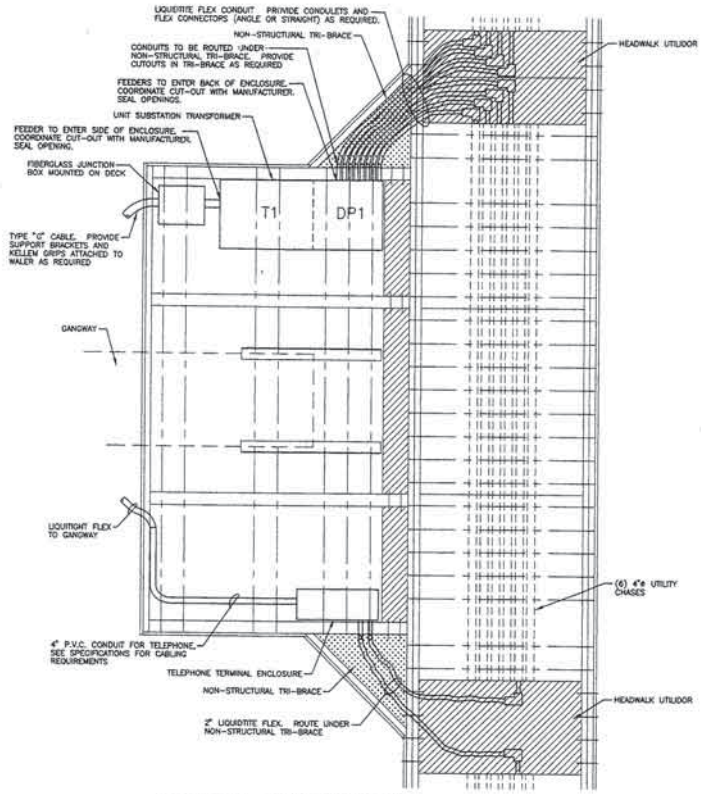
Sheet E5 of 10



1 / E6 HEADWALK/MAINWALK JUNCTION TYPE 1
SCALE: NONE



2 / E6 HEADWALK/MAINWALK JUNCTION TYPE 2
SCALE: NONE



3 / E6 TYPICAL GANGWAY LANDING
SCALE: NONE

NOTE: EQUIPMENT IS ON OPPOSITE SIDE OF GANGWAY FOR FLOATS D & E. CONFIGURATION OF UNIT SUBSTATION TRANSFORMERS WILL BE DIFFERENT. COORDINATE WITH MANUFACTURER PRIOR TO PLACING AN ORDER.

PORT OF BREMERTON-PORT ORCHARD MARINE RECONSTRUCTION

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Scale: AS NOTED

DETAILS

Sheet E6 of 10

ELECTRICAL OUTLINE SPECIFICATIONS

SECTION 16050 – BASIC MATERIALS & METHODS

PART 1 GENERAL

1.1 DESCRIPTION

A. This section includes furnishing all plant, labor, materials and equipment and performing all operations required to provide a complete electrical system; including power, lighting, and grounding.

B. Work included in this section is as follows:

1. Service and Distribution Equipment shown on drawings.
2. Providing, installation and connection of power centers, meter assemblies, distribution panels, and unit substations.
3. Electrical Junction Boxes.
4. Slip Service Center Junction Boxes.
5. Feeders and conduit systems to distribution equipment and power centers.
6. Flexible Type "G" Power cable.
7. Field Start–Up Services.
8. Wiring, conduit, and final power connections for equipment provided by others.
9. Provide and install a complete equipment grounding system bonding all electrical enclosures and extending the system electrode to a shoreside ground.
10. Completely installed and tested telephone service to each slip.
11. Completely installed and tested fire alarm system connected to the existing fire alarm control panel in the Harbormasters Building.
12. Raceway and coordination with Utility for a Cable T.V. system.
13. Remove and dispose of, in an approved manner, all electrical system components not being re–used.

C. Make installation of all items in complete accordance with all Codes or regulations set forth by State and local authorities. In case Drawings or Specifications conflict with Code requirement, the Code governs. Obtain and pay for all permits, licenses and taxes applicable to this project as required by law.

D. Provide all materials, labor, and equipment required to make all systems complete and operable. Materials, labor, and equipment that are not specifically referred to in the plans or specifications but are required to meet the functional intent of any system or to comply with any applicable Code requirement shall be provided without additional cost to the Owner.

1.2 WORK BY OTHERS

A. Pedestals for mounting of power centers provided by other divisions of this contract. Provide coordination with pedestal supplier to determine exact mounting requirements.

1.3 COORDINATION

A. Verify dimensions at the site and coordinate with other trades as necessary to ensure that all systems will be complete and operable, to verify fit, to comply with all applicable Codes, and to preclude interference's before the installation is made. Coordinate progress of all work to conform to progress of work of other trades. Complete the entire installation as soon as the general construction will permit.

B. Coordinate delivery and pay all costs of mounting of all electrical equipment.

C. Coordinate the locations of all penetrations and sleeves through docks, walls, etc., before the docks and walls are built. Pay the cost of core drilling, sawcutting, or framing modifications resulting from failure to coordinate these penetrations.

D. Visit the site and become familiar with conditions affecting work. Verify locations of any new or existing buried and exposed utilities on or near the project. Determine such locations in conjunction with all public and private utility companies and with all authorities having jurisdiction. Existing systems and utility lines indicated on drawings are in accordance with information available at the time of the design. This information may not be complete or accurate. Contractor is responsible for locating, uncovering, disposing of and maintaining existing utilities.

E. The drawings are to some extent diagrammatic and do not attempt to show exact details. Raceways, boxes, and power centers are shown diagrammatically only and indicate the general character. The layout does not show the number of raceways or boxes for the circuits required. The locations and routing of raceways are not intended to show actual routing. The Contractor shall furnish, locate and install all raceways, boxes and conductors as required, and connect complete.

F. Provide coordination with the telephone and cable T.V. utilities for providing services to each slip.

1.4 CODES AND STANDARDS

A. The Contractor is responsible for installation of the electrical system in accordance with state and local codes and standards.

1.5 EQUIPMENT INSTALLATION

A. Install equipment and systems to allow for adequate maintenance and installation clearances and in accordance with manufacturer's recommendations and all applicable Codes and listings. Bring conflicts between such recommendations and drawings to the immediate attention of the Engineer before the installation is made.

B. Check electrical and mechanical drawings and specifications to assure proper location, size, voltage and electrical connections to mechanical and electrical equipment. Coordinate all changes with all trades.

C. Provide all supports, hangers, anchors, seismic restraints, etc. required for mounting of electrical equipment.

1.5 SCAFFOLDING, RIGGING, AND HOISTING

A. Furnish all scaffolding, rigging, hoisting and services necessary for erection and delivery of any equipment to be furnished. Remove the same from the premises when it is no longer required.

1.6 TRENCHING AND BACKFILLING

A. Provide trenching, backfilling, restoration of paving, sidewalk, plants, etc., for electrical systems conduits, cables and ducts.

B. For non–metallic conduit, a minimum 3" cover of sand or clean earth fill shall be placed all around the conduit on leveled trench bottom. Lay all steel conduit on a smooth level trench bottom, so that contact is made for its entire length. Water shall be removed from trench while electrical conduit is being laid.

C. Place backfill in layers not exceeding 8" deep and compact to 95% of maximum density at optimum moisture to preclude settlement. Where higher compaction is called for on the drawings or other sections of the specification, they shall prevail.

1. Under paved areas, sidewalk, and interior slabs use bank sand or pea gravel.
2. Exterior use excavated material, if suitable to obtain compaction with final 8" soil, without rocks.

D. Following backfilling, grade all trenches to the level of surrounding soil. All excess soil shall be disposed of at the site as directed.

E. Saw cut all concrete and paving prior to trenching. Replace concrete and paving to match existing.

F. Replace all plants, grass, etc. damaged with like materials.

PART 2 PRODUCTS

2.1 CATALOG DATA AND SHOP DRAWINGS

A. Furnish catalog data and shop drawings in accordance with these Specifications. Before commencing work and within 30 days after award of Contract furnish six bound copies of complete submittal data on equipment. Submittal data shall be bound in three ring binders and submitted to the Engineer for approval and shall show all pertinent dimensional and rating data. Submittals shall be complete, and shall include all work in Division 16.

B. Submittals shall show sufficient data (sizes, capacities, construction, materials, finishes, etc.) to indicate compliance with the drawings and specifications. Provide an index listing all equipment and material in each submittal, and separate tabs to separate the equipment and material by section. Clearly indicate on each page the equipment schedule designation from the contract documents and model intended for use.

Before submitting to the Engineer, the Contractor shall review all submittals to verify complete conformance with the design documents and shall clearly indicate any variance from the design documents for all equipment in the submittals.

C. Provide detailed shop drawings showing how the power center will be mounted to the pedestal. Coordinate the mounting requirements with the pedestal supplier prior to pedestal fabrication and ordering of the power centers.

D. Do not order, fabricate, or manufacture products until submittals and shop drawings have been approved.

E. The submittal review process by the Engineer is for the Contractor's benefit. Checking is only for general conformance with the design concept of the project and general compliance with the information in the contract documents. The action noted to be taken is subject to the requirements of the plans and specifications. The Contractor is responsible for dimensions which shall be confirmed and correlated at the job site, fabrication processes and techniques of construction, coordination of his work with that of all other trades, and the satisfactory performance of his work.

2.2 OPERATING AND MAINTENANCE MANUALS

A. Furnish operating and maintenance manuals in accordance with these Specifications. Furnish six bound copies to include the following:

1. Manufacturers, suppliers, contractor and electrical subcontractors' names, addresses, and phone numbers.
2. Warranty service contractors' names, addresses, and phone numbers (if different from above).
3. Schedule and description of routine maintenance for each component.
4. Manufacturers' cut sheets for all submittal items.
5. Part numbers of all replaceable items.
6. Written guarantees.
7. Record drawings corrected and completed.

B. Binders:

1. Furnish typewritten or printed index and tabbed dividers between principal categories.
2. Bind each manual in a hard–backed loose–leaf binder.
3. Imprint on cover:
   - Name of job and specification number
   - Owner
   - Location of job
   - Engineer
   - Contractor
   - Year of completion

C. Operating and maintenance manual submittals:

1. Preliminary Copies: Prior to scheduled completion of the job, submit two copies for review by the Engineer.
2. Final Copies: After approval of the preliminary copies, submit six finished copies to the Owner.

2.3 RECORD DRAWINGS

A. Maintain continuously updated redline drawings during progress of the project.

B. Show all changes from the contract documents. Show location of all equipment. Indicate locations of site utility connections. Dimension site utility connections from existing buildings and entrance ramp locations.

2.4 QUALITY ASSURANCE

A. Materials and methods called for shall be considered as minimum, indicative of quality required to satisfy intent of the contract documents. Materials required shall be new, standard, full weight, identical to apparatus or equipment in successful operation for a minimum of two years. Supply materials of similar type by same manufacturer. Materials omitted here but necessary to complete the work shall be of comparable quality.

B. Protect material stored on–site from the weather, water, corrosion and dirt.

C. Provide major components of equipment with manufacturer's name, address, catalog number and capacity indicated on a nameplate securely affixed in a conspicuous place.

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

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REGISTERED PROFESSIONAL ENGINEER — EXPIRES: 5/24/98

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Drawn: CMS
Checked: LDR
Project No.: 7012.01
Date: 5/2/97
Scale: NOTED

SPECIFICATIONS

Sheet E7.1 10

DIVISION 16000
ELECTRICAL OUTLINE SPECIFICATIONS
SECTION 16050 – BASIC MATERIALS & METHODS (CONTI)

2.5 POWER CENTERS

A. Power center shall be provided and installed by the electrical contractor. The contractor shall be responsible for storage and handling at job site.

B. Lighting – The light shall be a 9 watt fluorescent light and shall be controlled by a photoelectric light sensor that automatically turns the light on and off.

C. Receptacles – All receptacles shall be corrosion resistant and be the locking type configuration. Receptacles shall be factory wired and protected by thermal magnetic circuit breakers. See drawings for size of receptacles.

D. Housing – Housing shall be fiberglass, impact and corrosion resistant.

E. Cover – Receptacles shall be equipped with a hinged waterproof cover with strain relief.

F. Warranty – The manufacturer of the power center shall warrant the power center and all components for a period of five years from the date the units were installed.

G. The unit shall be UL listed for all options installed.

H. Spares – Provide three spare power centers, one of each configuration being installed.

I. Meters – Provide one digital electronic kilowatt hour meter with waterproof electromechanical counter for each receptacle installed in the power center.

J. Telephone and Cable T.V. outlets as indicated on drawings.

K. Manufacturer – SeaTech TrimLine Series.

2.6 CONDUIT SYSTEMS

A. Contractor shall furnish and install all conduit shown on the drawings. Unless noted otherwise, all conduit shall be PVC schedule 40 except raceway on the gangway and the approach dock which shall be schedule 80.

B. Contractor shall provide galvanized steel channel and straps, etc. as required for mounting of conduit on approach dock and gangway.

C. Contractor shall include a weep hole in the bottom of each conduit run that does not allow natural drainage due to condensation.

D. Contractor shall be responsible for coordination with deck manufacturer to determine exact hole locations prior to deck fabrication.

D. Contractor is responsible for providing all connectors, conduiets, and other fittings as required.

2.7 FLEXIBLE TYPE "G" POWER CABLE

A. Flexible type "G" cable used at ramps shall have the following minimum features and ratings:

1. Conductor shall be copper stranded type consisting of over 200 strands per conductor.
2. Insulation thickness over conductor shall be a minimum of 4/64 inches for conductor sizes up to #2 AWG and 5/64 inches for larger sizes. Insulation shall be EPR type or approved equal.
3. Conductor insulation shall be rated for 600 volts working voltage, 90 degrees C rated for dry installations and 75 degree C rated for wet or damp locations.
4. Ground conductors shall be included in each cable providing NEC equipment grounding conductor equivalent size.
5. An overall cable jacket that combines flexibility and durability shall be provided. The jacket shall have permanent markings identifying the cable type and size.
6. Four conductor type G flexible cable shall be Carol, Rome or equal.
7. The flexible power shall be connected to junction boxes by the use of properly sized, watertight, strain–relief cord grip hubs.
8. Flexible connections shall be installed to accommodate movement of the gangway through the full range of its movement.

2.8 WIRES AND CABLES

A. Wires and cables required for the power systems shall be complete, connecting all equipment and control components, and shall be of ample size and with insulation as outlined below.

B. Conductors shall be soft–drawn or annealed copper wire, electrical grade.

C. All power cable connections shall be completed using hydraulic compression terminals. Split bolt connectors shall not be used.

D. The insulation for the power wires shall be heat–resistant moisture–resistant, and flame–retardant thermoplastic insulation suitable for dry or wet locations. The insulation type and thickness shall be equal to or greater than the requirements for type THWN in the NEC.

2.9 GROUND CONDUCTORS

A. The ground conductors shall be insulated copper conductors with a continuous outer finish that is either green or green with one or more yellow stripes.

2.10 MARINA SUBSTATION

A. Substation shall be UL listed.

B. Transformer – Copper core and coil dry type transformer with 480 volt primary, 208Y/120 volt secondary three phase with 2–2 1/2% taps above and below. Rated KVA as shown on drawings stated at 150 degree C temperature rise.

C. Enclosure – 50/52 marine grade aluminum housing with bolted, gasketed, NEMA 3R construction. White polyester powder coating finish.

D. All stainless steel external hardware. Lockable door on the panelboard section.

E. Nameplate – Provide black nameplates with white 1"X3" letters, screw on type with holes. Provide a circuit identification schedule in the panel board indicating what circuit number each slip is served from. Coordinate slip numbers with drawings.

F. No live parts less than 12" from ground.

G. Copper ground bus.

H. All bussing and interconnecting cables to be copper.

I. Circuit breakers sized as shown on drawingsSquare D.

J. Utilities will enter through the side or back of the enclosure. Coordinate required cut–outs with manufacturer. Seal openings.

K. Location of transformer and distribution panel within enclosure will change at each location. Coordinate with manufacturer prior to placing order.

L. Manufacturer – Midwest ,Milbank West or I.E.M..

2.11 BOXES AND ENCLOSURES

A. Telephone Terminal Cabinets: 12 gauge galvanized steel, stainless steel handles, standard finish, lockable double doors, NEMA 3R. Robroy E–36R4216HCD.

B. Junction Boxes: Fiberglass reinforced polyester, hinged cover, continuous silicon door gasket, NEMA Type 12. Robroy or approved. Size per code.

C. Troughs: Fiberglass reinforced polyester, snap cover, polyurethane gasket. NEMA Type 12, Robroy FT6620.

D. Provide all connectors, mounting accessories, etc. as required.

2.12 CORROSION CONTROL

A. All enclosures shall be protected from corrosion inside and outside with a prime coat and a minimum of two coats of corrosion resistant finish.

B. Transformer windings shall be dipped a minimum of two times in salt air resistant varnish.

C. All mounting hardware shall be hot dipped galvanized after fabrication.

PART 3 EXECUTION

3.1 GENERAL CLASSIFICATION OF AREAS

A. All construction shall be in compliance with NFPA, Volume 303, Chapter 5, and in the NEC Code, in particular Article 555.

B. NFPA – Damp locations are all areas above pier decking providing deck is at least two (2) feet above the water level.

C. NFPA – Wet locations are all areas below pier decking and/or less than two (2) feet above the water level.

D. NFPA – Hazardous locations are as follows:

1. Class 1, Division 1 locations are any space about a gasoline or fuel dispensing station within four (4) feet in any direction of the outer limits of the dispensing station.
2. Class 1, Division 2 locations are any areas within twenty (20) feet in any direction of the outer limits of the dispensing station (excluding areas already listed in Division 1).

E. All raceways entering or leaving a Class 1, Division 1 or 2 area shall have approved conduit seals.

3.2 WIRES AND CABLES

A. All conductors for power circuits shall be as required by the actual load to be served. The conductors shall be sized to limit the maximum temperature of 75 degrees centigrade. Article 310 of the NEC shall be the guide in determining conductor sizes.

B. All wires shall be pulled into conduit without the use of lubricants, except where they are approved by the cable manufacturers as non–destructive. They shall be carefully handled so as to avoid twists and kinks in the conductors or damage to the insulation. All trapped conduit lines shall be swabbed to remove any accumulated moisture or debris before wires or cables are pulled in.

C. No splicing shall be permitted except in junction boxes. Where splices or junctions are made, they shall be accomplished using only long barrel copper bodied hydraulic compression connectors properly sized for the cable used. Provide and install a silicon RTV sealant on all splices.

3.3 GROUNDING

A. The system is intended to protect the personnel and equipment for possible abnormal voltage conditions. It shall connect the motor frames, all metallic conduit, panelboards, all switchgear and transformer enclosures, junction boxes, and all related items to an adequate and effective ground.

B. Grounding system shall be installed by the Electrical Contractor.

C. Care shall be exercised to ensure a good electrical continuity of conduit systems including connection between the conduits and metallic enclosures of the main service panel, and the like, installing grounding jumpers where necessary to accomplish this. Flexible conduit connections to electrical equipment served by power circuits greater than 20 amperes capacity shall have a separate ground wire connection in addition to the flexible conduit shell connection.

D. A grounding conductor shall be installed in all raceways.

3.4 FIELD START–UP SERVICE

A. Electrical Contractor shall perform the following tests on their respective areas and provide certified test reports to the owner for the following:

1. On completion of the electrical system connections, all electrical sections shall be subjected to a "megger" insulation test and meet the requirements of Section 110–7 of the NEC.
2. A polarity test shall be performed on each outlet of each pier power panel. Polarity shall be corrected as required to comply with Section 200–10 of the NEC.
3. Electrical Contractor shall provide with the record drawings an itemized checklist of all areas to be checked by the owner at 30 day intervals in order to comply with NFPA 303, Chapter 5, Paragraph 5–19.1, latest edition.

B. Electrical Contractor shall make the initial inspection of their respective areas and submit a completed and signed checklist indicating the assembly is ready for energization and public use.

3.5 FINAL APPROVAL

A. Final approval is contingent upon completion of the following in accordance with these specifications:

1. Completion of Engineer's final observation report.
2. Operation and maintenance manuals submitted.
3. Operation instructions given to Owner's representative.
4. Permit submittals.
5. Record drawings submitted.
6. Testing and cleaning.

END OF SECTION 16050

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SPECIFICATIONS

Sheet E8 of 10

FIRE ALARM SYSTEM
SECTION 16721

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Manual fire alarm stations.

B. Automatic heat detectors.

C. Auxiliary fire alarm equipment.

1.2 RELATED SECTIONS

A. Section 16050 – Basic Materials and Methods.

1.3 REFERENCES

A. NFPA 70 – National Electrical Code.

B. NFPA 72 – Installation, Maintenance, and Use of Protective Signaling Systems.

C. NFPA 72E – Automatic Fire Detectors.

D. NFPA 72G – Notification Appliances for Protective Signaling Systems.

E. NFPA 72H – Guide for Test Procedures for Protective Signaling Systems.

F. NFPA 101 – Life Safety Code.

1.4 SYSTEM DESCRIPTION

A. Fire Alarm System: NFPA 72, manual and automatic local fire alarm system with connections to existing Silent Knight Model 5207 fire alarm control panel in Harbormaster Building.

1.5 SUBMITTALS

A. Shop Drawings: Provide annunciator layout and system wiring diagram showing each device and wiring connection required.

B. Product Data: Provide electrical characteristics and connection requirements.

C. Test Reports: Indicate satisfactory completion of required tests and inspections.

D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of products.

1.6 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 16050.

B. Record actual locations of initiating devices, signaling appliances, and end-of-line devices.

1.7 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 16050.

B. Operation Data: Operating instructions.

C. Maintenance Data: Maintenance and repair procedures.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience, and with service facilities within 100 miles of Project. All devices must be compatible with the existing fire alarm control panel.

B. Installer: Company specializing in installing the products specified in this section with minimum three years documented experience.

1.9 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70 and NFPA 101.

B. Furnish products listed and classified by testing firm acceptable to authority having jurisdiction as suitable for purpose specified and indicated.

1.10 MAINTENANCE SERVICE

A. Furnish service and maintenance of fire alarm system for one year from Date of Substantial Completion.

1.11 SCOPE

A. The work covered by this section of the specifications includes the complete design, construction drawings, furnishing of all labor, equipment, materials, and performance of all operations in connection with the installation of the design-build Fire Alarm System.

B. The contract documents indicate the general nature of the fire alarm system and is intended to aid the design-build contractor, subcontractor and/or supplier in providing the system required. Major equipment and majority of devices have been shown. Additional devices may be required. Contractor shall provide additional devices if required by Local Fire Marshall and local jurisdiction as a part of this work.

C. The requirements of the conditions of the Contract, Supplementary Conditions and General Requirements, apply to the work specified in this section.

D. The designed drawings shall be submitted to the Local Fire Marshall and approved, prior to submittal to the Architect for shop drawing review. Design drawings shall consist of complete system plan views indicating equipment layout, device layout, raceway routing and sizing, point-to-point wiring, termination and connection diagrams and wire numbers for all conductors and connections.

E. Contractor shall schedule periodic inspections by local jurisdiction during the course of installation and shall make any corrections, deletions, relocations, or additions to the system as required by local jurisdiction.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Silent Knight or prior approved compatible with existing FACP.

2.2 FIRE ALARM AND SMOKE DETECTION CONTROL PANEL

A. Existing fire alarm control panel (FACP) is a Silent Knight Model 5207, and is located in the Harbormasters building.

2.3 INITIATING DEVICES

A. Manual Station: Waterproof, surface mounted manual station with break-glass rod.

B. Heat Detector: Weather resistant, rate-of-rise.

2.4 FIRE ALARM WIRE AND CABLE

A. Initiating Device and Indicating Appliance Circuits: Non-power limited fire-protective signaling cable, copper conductor, 150 volt insulation rated 60 degrees C.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install manual station with operating handle conforming to the latest edition of the American's with Disabilities Act (ADA).

C. Use 16 AWG minimum size conductors for fire alarm detection and signal circuit conductors. Install wiring in conduit.

D. Mount end-of-line device in control panel.

E. Automatic Detector Installation: Conform to NFPA 72E.

F. Connect complete to existing FACP.

3.2 FIELD QUALITY CONTROL

A. Test in accordance with NFPA 72H and local fire department requirements. Final test to be in the presence of the AHJ.

B. All control equipment shall be listed under UL category UOJZ as a single control unit. Partial listing shall NOT be acceptable.

C. In addition to the UL-UOJZ requirement mentioned above, the system controls shall be UL listed for Power Limited Applications per NEC 760. All circuits must be marked in accordance with NEC article 760-23.

3.3 MANUFACTURER'S FIELD SERVICES

A. Prepare and start systems.

B. Include services of certified technician to supervise installation, adjustments, final connections, and system testing.

3.4 DEMONSTRATION

A. Demonstrate normal and abnormal modes of operation, and required responses to each.

END OF SECTION 16721

SECTION 16742 – TELEPHONE SYSTEM

PART 1 GENERAL

1.1 DESCRIPTION

A. Design, provide, and install a complete, tested, cable distribution network for telephone system interconnections to each slip. The telephone distribution system shall include fully terminated riser and station cables. All cabling shall be routed through the tubes chases in the floats.

B. Provide system design services (development of specific details consistent with the contract documents) as required to complete shop drawings for telephone cable systems including detailed documentation for owner review and detailed documentation of as-built conditions.

C. Cabling from U.S. West closure 612 to Gate 2 and Gate 3 will be provided and installed by U.S. West. Provide coordination.

D. Telephone outlets will be provided in the power centers as indicated on the drawings.

1.2 DESIGN

A. Furnish plans indicating outlet locations, cabling, details showing terminal block and backboard elevations including all cable terminals, station cable routing, and riser cable routing.

B. Outlet Locations: As indicated on drawings.

C. Terminal Schedules: Furnish terminal schedules showing terminal block positions for all station cabling. Terminal schedules shall show proposed labels for station cables.

1.3 SUBMITTALS

A. Project Initiation: Within five (5) days of notice of award, the Contractor shall furnish the following in a single consolidated submittal:

1. The name and phone number of the person who will act as the Contractor's official contact with the Owner.
2. Electrical Permits. The Contractor shall obtain all required permits and provide copies to the Owner.
3. Complete manufacturer's product literature for all cable, cross-connect blocks, cable supports, cable labels and other products to be used in the installation. In addition, whenever substitutions for recommended products are made, samples (when requested by the Owner) and the manufacturer's supporting documentation demonstrating compatibility with other related products shall be included.
4. Shop Drawings.
5. Proposed Contractor test result forms.

B. Project Completion
As a condition for project acceptance, the Contractor shall submit the following for review and approval.

1. Complete manufacturer's product literature and samples (if requested) for all substitutions to the recommended products made during the course of the project.
2. An Exceptions List of deviations (in materials, construction, and workmanship) from that specified in this section and shown on the Project Drawings. The Owner will review this list and declare each item as either an approved exception, or as one the Contractor must correct.
3. Inspection and Test Reports: During the course of the project, the Contractor shall maintain an adequate inspection system and shall perform such inspections to insure that the materials supplied and the work performed conform to Contract requirements. The Contractor shall provide written documentation which indicates materials acceptance testing was conducted as outlined in Part 3 below. The Contractor shall also provide documentation which indicates that all cable termination testing was completed and that all irregularities were corrected.
4. At completion of pulling cable and making terminations but before testing is completed, provide the owner with record as-built drawing of the cabling system installation. In addition, provide a hard copy booklet showing the arrangement of each terminal board, terminal block and the arrangement of the cables with each cable termination labeled.

1.4 SYSTEM INSTALLER

A. The telephone cable system installer shall be a firm normally employed in the low voltage cabling industry with experience with Marine installations.

B. A three (3) year warranty shall be provided by the selected system installer. This warranty shall include defects in material and workmanship. The warranty year shall begin at the date of the Owner's acceptance of the work. Quality and workmanship evaluation shall be solely by the Owner and designated representatives.

C. The selected system installer must be licensed and bonded in the State of Washington.

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BOTHELL, WASHINGTON 98012
CONTACT: CARL MAEHL
481-7735
FAX 481-7692

EXPIRES: 6/24/98

Designed: CJM
Drawn: CMS
Checked: LDB
Project No.: 7012.01
Date: 5/2/97
Scale: NOTED

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
811 First Avenue, Suite 260
Seattle, Washington, 98104
PH: (206) 624-1387 FAX: (206) 624-1388

SPECIFICATIONS

Sheet E9 of 10

1.5 REGULATORY REQUIREMENTS

A. All work shall be performed in accordance with the latest revisions of the following standards and codes:

NEC: National Electrical Code
Uniform Building Code: International Conference of Building Officials (ICBO); Regional Office: 12505 Bellevue– Redmond Road Bellevue, WA 98005

B. Governing Codes and Conflicts: If the requirements of this section of the Project Drawings exceed those of the governing codes and regulations, then the requirements of this section and the Drawings shall govern. However, nothing in this section of the Drawings shall be construed to permit work not conforming codes and regulations.

PART 2 PRODUCTS

2.1 GENERAL WIRING

A. The wiring plan shall be installed per requirements of these specifications utilizing materials meeting applicable EIA/TIA standards.

B. Materials shall be listed or shall be equivalent products of other manufacturers meeting the intent and quality level of the specification. All approved equivalent products will be published by addendum prior to bid.

C. All installed wire shall be tested 100% good after installation by the installer.

D. All products shall be new, and brought to the job site in original manufacturer's packaging. Electrical components shall bear the Underwriter's Laboratories label.

E. Initial Cable Inspection:
The Contractor shall inspect all cable prior to installation to verify that it is identified properly on the reel identification label, that it is of proper gauge, containing correct number of pairs, etc. Note any buckling of the jacket which would indicate possible problems. Damaged cable, or any other components failing to meet specifications shall not be used in the installation. If such items are found during site inspections, the affected device shall be replaced at the contractor's expense.

2.2 STATION WIRING

A. One twisted pair cable for each outlet in the power center at each slip.

2.3 STATION HARDWARE

A. Jacks will be provided in the power center at each slip. Coordinate with supplier. The cable shall be compound filled for use in wet locations.

2.4 RISER CABLE AND TERMINATIONS

A. Telephone Terminals: Standard 110 station block on stand offs mounted in specified telephone terminal enclosure both on the floats and on the approach dock.

B. Telephone Riser Cable: 150 pair to serve Floats B&C, 200 pair to serve Floats D&E. The cable shall be compound filled for use in wet locations.

2.5 GENERAL COMPONENTS/PRODUCTS

A. All material, components, and equipment shall be new and of high quality. The components and equipment furnished must have a proven track record for this particular application, and if requested, the contractor must furnish satisfactory evidence as to the kind and quality of materials and equipment.

2.7 TELEPHONE TERMINAL ENCLOSURE

A. As specified in Section 16050.

PART 3 EXECUTION

3.1 GENERAL

A. Conform to allowable bend radius and pull tension.

B. Cabling shall be install in tube chases provided in Floats. Conform to conduit fill and derating factor codes and requirements.

3.2 LABELS

A. The Contractor will label all outlets following the detailed shop drawing design, using typed labels approved by the Owner. Terminals in the telephone terminal enclosures shall be labeled by the Contractor using designation strips designed for 110 block.

B. The Contractor shall include drawings indicating all outlet jack numbers corresponding to the slip number in the as–built plans.

3.3 STATION WIRING

A. All wiring and associated hardware shall be placed so as to make efficient use of available space in coordination with other uses. All wiring, and associated hardware shall be placed so as to not impair the use or capacity of other systems, equipment or hardware placed by others. All wiring, and associated support structures and hardware shall be placed so as to not impair the Owner's efficient use of their full capacity.

3.4 TWISTED PAIR CABLE TESTING

A. The Owner shall be notified ten days prior to any testing so that the testing may be witnessed. Before requesting a final inspection, the Contractor shall test:

1. All riser cable pairs between telephone terminal enclosures.
2. All station drop cable pairs form termination blocks to outlet devices.

B. Each wire/pair shall be tested for the following:

1. continuity
2. shorts
3. grounds
4. crosses
5. length
6. attenuation
7. near end cross talk (NEXT)

C. When errors are found, the source of each error shall be determined, corrected, and the cable retested. Each defective facility shall be replaced and retested until all facilities are satisfactory.

D. Records shall be maintained using a form approved by the Owner.

END OF SECTION 16721

SECTION 16780
TELEVISION SYSTEM

PART 1 GENERAL

1.1 General Requirements

A. Television service entrance.

B. Raceway and accessories.

1.2 Related Sections

A. Section 16050.

1.3 References

A. NFPA 70 – National Electrical Code.

1.4 System Description

A. Service entrance from local cable utility.

B. Raceway for distribution of television signal to individual outlets at each slip.

1.5 Regulatory Requirements

A. Conform to requirements of NFPA 70.

B. Conform to requirements of cable television utility company.

PART 2 EQUIPMENT

2.1 Equipment

A. Serving utility will provide all necessary wiring, materials and construction needed for a complete cable distribution system to each slip. Contractor is responsible for coordinating with the serving utility.

2.2 Outlets

A. Provided in the power centers at each slip as indicated on the drawings. Coordinate with supplier.

PART 3 INSTALLATION

3.1 Execution

A. Install raceway in accordance with manufacturer's and utility company requirements.

B. Provide proper grounding of television system components and wiring.

C. Coordinate installation with Cable Television Company.

D. Cabling shall be installed in the tube chase provided in the floats.

END OF SECTION 16780

PORT OF BREMERTON-PORT ORCHARD
MARINA RECONSTRUCTION

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LARRY D. BOTHELL — STATE OF WASHINGTON — PROFESSIONAL ENGINEER
EXPIRES: 6/24/98

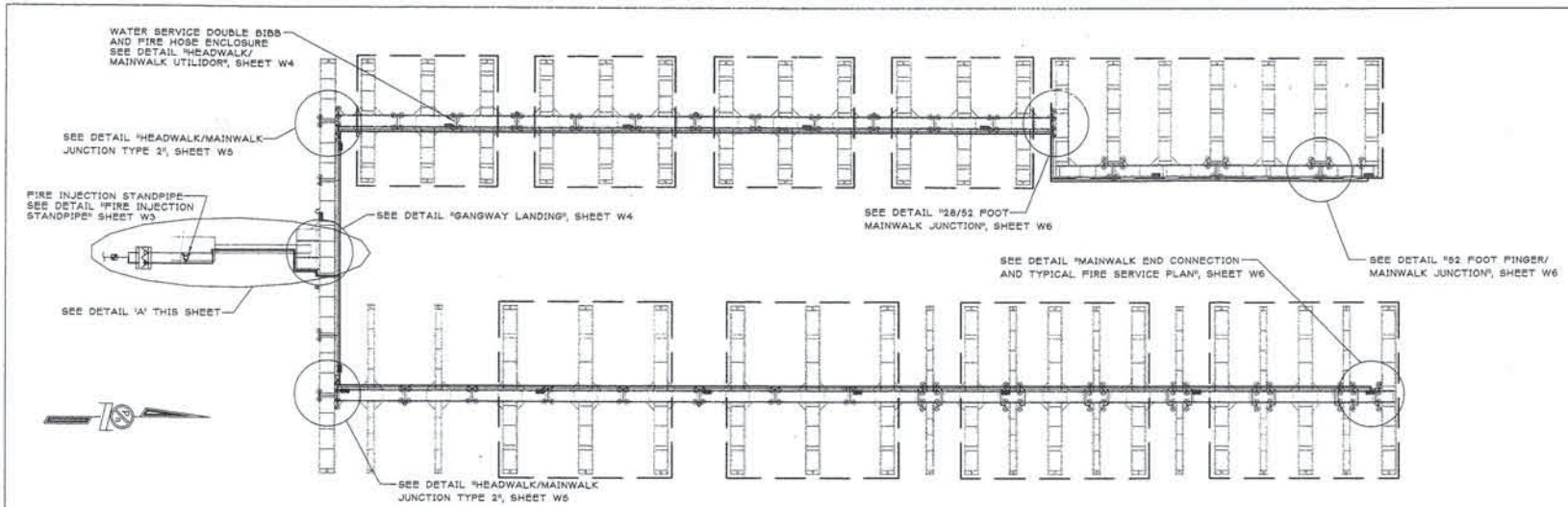
Designed: CJM
Drawn: CMS
Checked: LDB
Project No.: 7012.01

PATH ENGINEERS INC.
17928 BOTHELL EVERETT HWY SE, SUITE H
BOTHELL, WASHINGTON 98012
CONTACT: CARL MAEHL
481-7735
FAX 481-7692

Date: 5/2/97
Scale: NOTED

SPECIFICATIONS

Sheet E10.01 10



NOTE:
CONTRACTOR SHALL ISOLATE AND REMOVE THE EXISTING WATER AND FIRE SYSTEM SEAWARD OF METER VAULT AND DISPOSE OF OR STOCKPILE ITS COMPONENTS AT THE DIRECTION OF THE PORT OF BREMERTON. UNWANTED OR UNUSEABLE MATERIALS BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF IN A STATE OF WASHINGTON APPROVED DISPOSAL SITE AS REQUIRED.

SYSTEM PLAN FLOATS B AND C

0 15 30 60 FEET

NOTES

1. DOUBLE HOSE BIBB AND HYDRANTS ARE TO BE CENTERED TYPICALLY IN TWO-BOAT SLIPS.
2. ALL DOMESTIC WATER LINES SHALL BE 2" DIA. HDPE PER SPECS EXCEPT WHERE NOTED. ALL FIRE SYSTEM LINES SHALL BE 4" DIA. HDPE PER SPECS. EXCEPT WHERE NOTED.

LEGEND

- WATER LINE
- FIRE LINE
- FIRE INJECTION STANDPIPE
- DOUBLE HOSE BIBB
- FIRE HOSE ENCLOSURE
- BALL VALVE
- GATE VALVE
- WATER METER
- REDUCER
- REDUCED PRESSURE BACKFLOW ASSY. (RPBA)
- REDUCED PRESSURE DETECTOR ASSY. (RPDA)

OPERATION NOTES

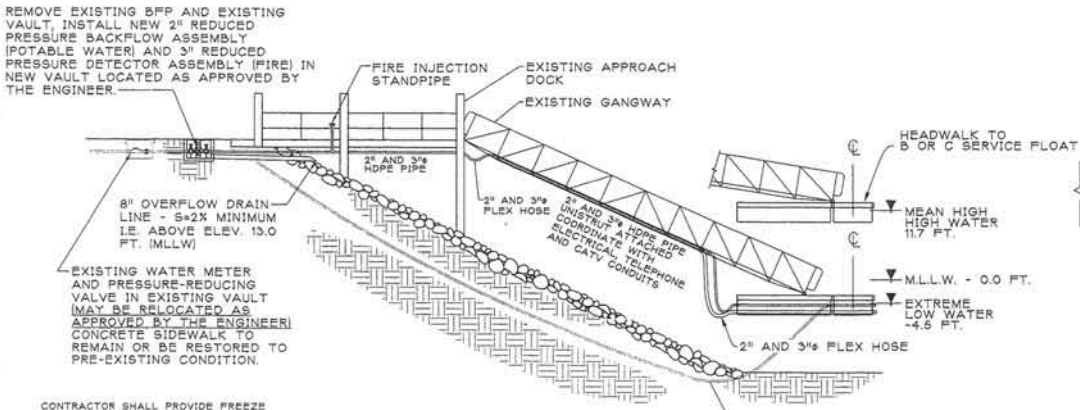
NORMAL OPERATION:
ALL IN-LINE 3" AND 4" VALVES OPEN. ALL DRAIN VALVES CLOSED. POTABLE WATER AVAILABLE AT ALL HOSE BIBBS. FIRE SYSTEM FULL AND CHARGED TO CITY WATER PRESSURE. FIRE DEPARTMENT STANDPIPE READY FOR OPERATION.

TO DRAIN FIRE OR POTABLE WATER SYSTEM: ISOLATE SYSTEM AT CROSS CONNECTION CONTROL VALVES. OPEN REMOTE SUPPRESION STANDPIPE VALVES OR HOSE BIBBS. PRESSURIZE SYSTEM WITH LP AIR. WHEN SYSTEM IS DRAINED, CLOSE ALL VALVES.

DESIGN CRITERIA

WATER SYSTEM:
60 PSI MAXIMUM AND 30 PSI MINIMUM PRV SETTING. 30 PSI MINIMUM PRESSURE AT MOST DISTANT HOSE BIBB.

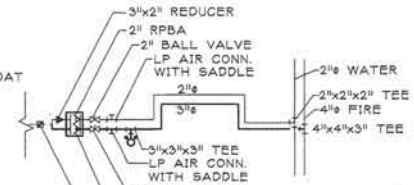
FIRE SYSTEM:
NFPA 14-93 - CLASS III MANUAL DRY STANDPIPE SYSTEM. 250 GPM @ 100 PSI WITH ANY ONE HOSE VALVE OPERATING ON EITHER OR BOTH MAINWALK FLOAT RUNS. 150 GPM @ 100 PSI WITH ANY TWO HOSE VALVES OPERATING ON EITHER OR BOTH MAINWALK FLOAT RUNS. 200 PSI MAXIMUM INPUT PRESSURE AT INJECTION STANDPIPE.



CONTRACTOR SHALL PROVIDE FREEZE PROTECTION TO ALL EXPOSED WATER PIPE AND FITTINGS. ELECTRICAL WORK AND SERVICE CONNECTIONS SHALL BE CONSIDERED AS PART OF THE CONTRACTORS WORK.

TYPICAL ELEVATION FOR FLOATS B AND C

NTS



DETAIL 'A'

(NOT INTENDED TO SHOW LOCATION)

DIANE K. LEWIS — STATE OF WASHINGTON — 20067 — REGISTERED PROFESSIONAL ENGINEER

EXPIRES 5-26-97

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Designed: DC
Drawn: BSB
Checked: DKL
Project No.: 97416

Date: MAY '97
Scale: AS SHOWN

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
811 First Avenue, Suite 260
Seattle, Washington, 98104
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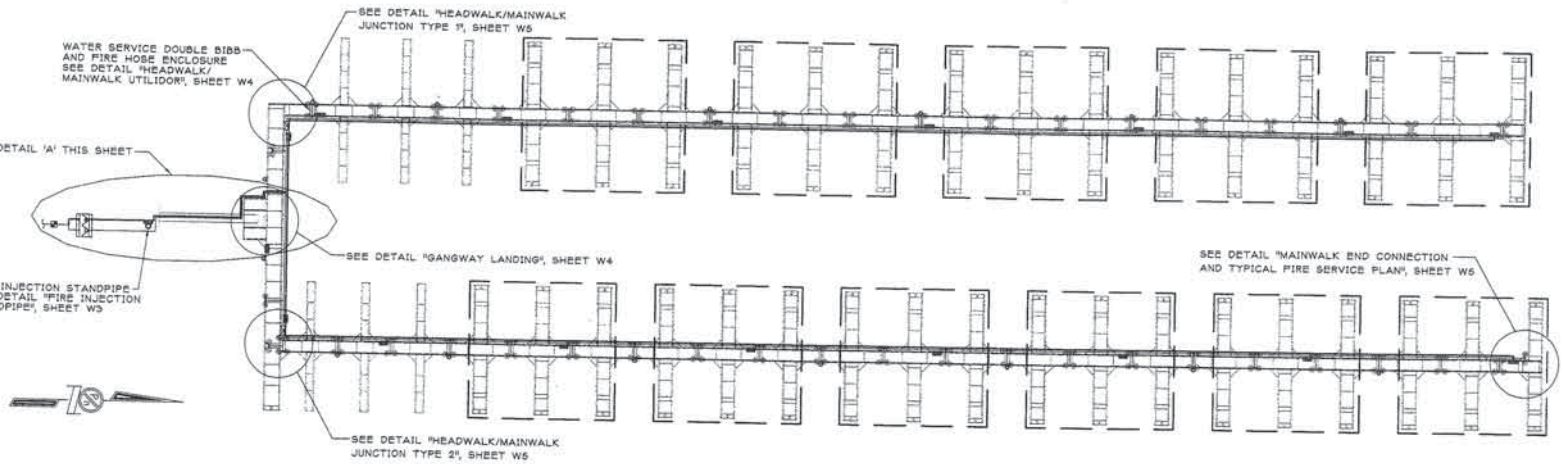
Parametrix, Inc.
WASHINGTON: Sumner, Bremerton, Kirkland, Olympia, Wenatchee
OREGON: Portland
TEXAS: Houston

WATER AND FIRE SYSTEM FLOATS B AND C

Sheet W1 of 7

WPLT-B-C.DWG
PLOT 11 W/PNDPULL.PCP 5-2-97



NOTE:
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SYSTEM PLAN FLOATS D AND E

0 15 30 60 FEET

NOTES

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2. ALL DOMESTIC WATER LINES SHALL BE 2" DIA. HDPE PER SPECS EXCEPT WHERE NOTED. ALL FIRE SYSTEM LINES SHALL BE 4" DIA. HDPE PER SPECS. EXCEPT WHERE NOTED.

LEGEND

- WATER LINE
- FIRE LINE
- FIRE INJECTION STANDPIPE
- DOUBLE HOSE BIBB
- FIRE HOSE ENCLOSURE
- BALL VALVE
- GATE VALVE
- WATER METER
- REDUCER
- REDUCED PRESSURE BACKFLOW ASSY. (RPBA)
- REDUCED PRESSURE DETECTOR ASSY. (RPDA)

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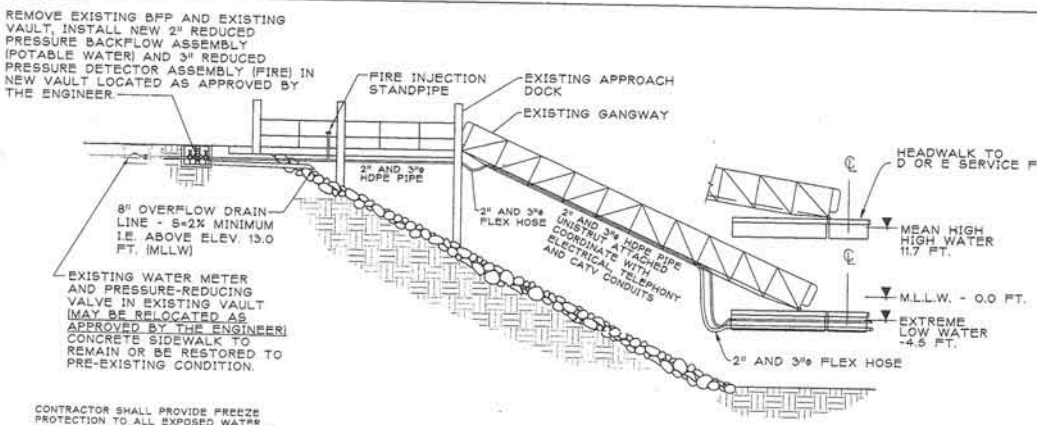
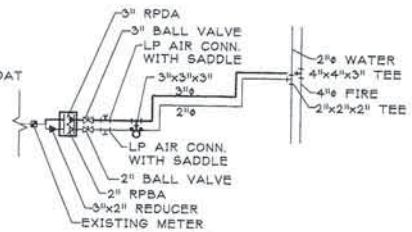
FIRE SYSTEM:
NFPA 14-93 - CLASS III MANUAL DRY STANDPIPE SYSTEM. 250 GPM @ 100 PSI WITH ANY ONE HOSE VALVE OPERATING ON EITHER OR BOTH MAINWALK FLOAT RUNS. 150 GPM @ 100 PSI WITH ANY TWO HOSE VALVES OPERATING ON EITHER OR BOTH MAINWALK FLOAT RUNS. 200 PSI MAXIMUM INPUT PRESSURE AT INJECTION STANDPIPE.



CONTRACTOR SHALL PROVIDE FREEZE PROTECTION TO ALL EXPOSED WATER PIPE AND FITTINGS. ELECTRICAL WORK AND SERVICE CONNECTIONS SHALL BE CONSIDERED AS PART OF THE CONTRACTORS WORK.

TYPICAL ELEVATION FOR FLOATS D AND E

NTS



DETAIL 'A'

(NOT INTENDED TO SHOW LOCATION)

EXPIRES 5-26-97

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Designed: DC
Drawn: BSB
Checked: DKL
Project No.: 95416
Date: MAY '97
Scale: AS SHOWN

Peratrovich, Nottingham & Drage, Inc. Parametrix, Inc.
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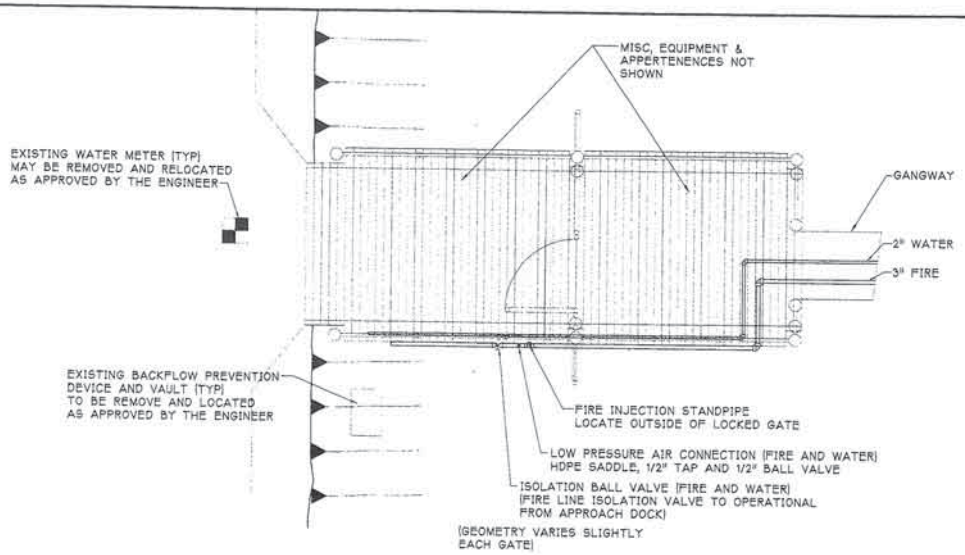
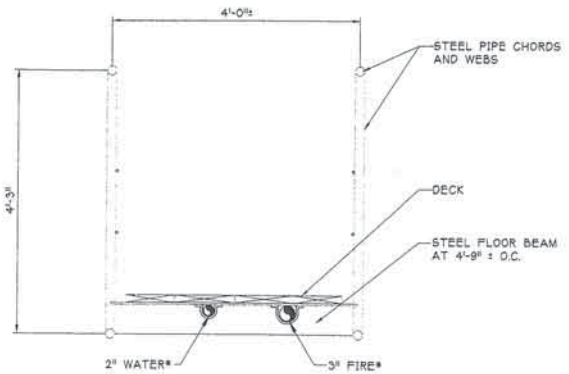
WATER AND FIRE SYSTEM FLOATS D AND E

Sheet W2 of 7

WTR-D-E.DWG
PLOT: 1" W/PNDFULL.PCP 5-2-97

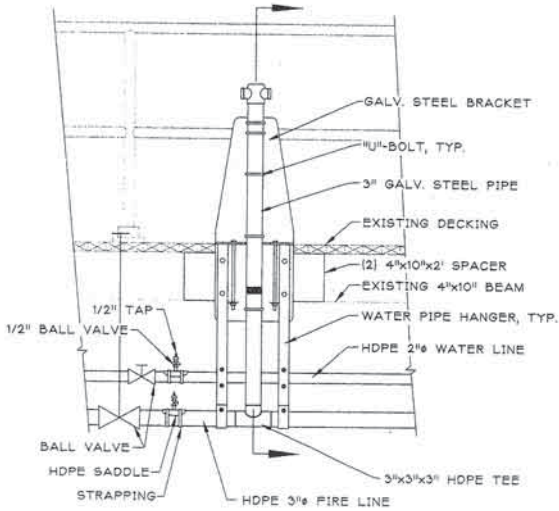


PLAN AT ACCESS GATE TO PIER

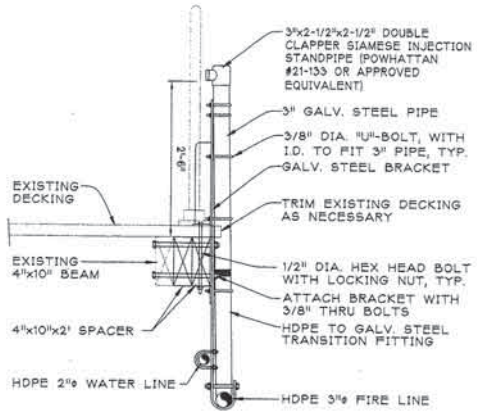


* COORDINATE PLACEMENT OF FIRE AND WATER WITH ELECTRICAL, TELEPHONE AND CATV CONDUITS.

EXISTING RAMP TYPICAL SECTION



FIRE DEPARTMENT INJECTION STANDPIPE



SECTION

DIANE K. MENKE — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER

EXPIRES 5-26-97

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Designed: DC
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Project No.: 97416
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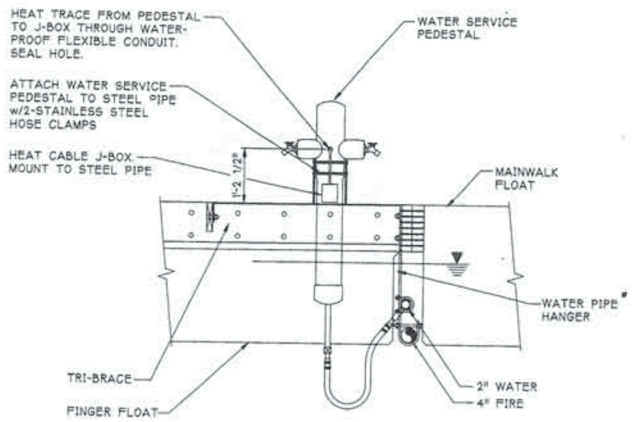
OREGON: Portland
TEXAS: Houston

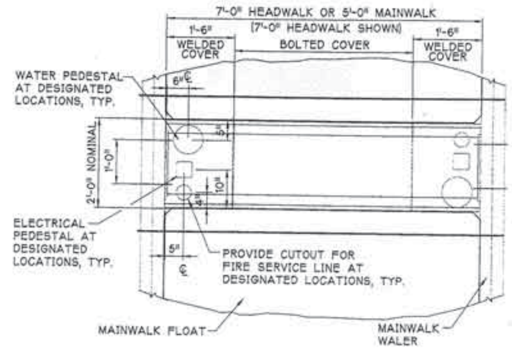
EXISTING APPROACH DOCK AND STANDPIPE DETAILS

Sheet W3 of 7

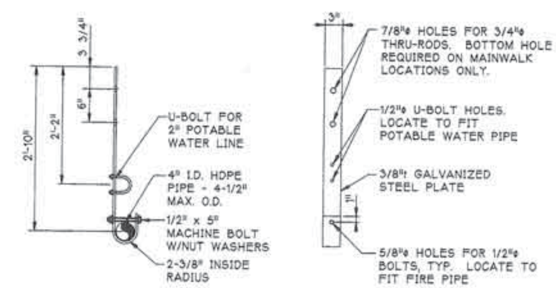
STNDPIPE.DWG
PLOT 1:1 W/PNDFULL.PCP 5-2-97



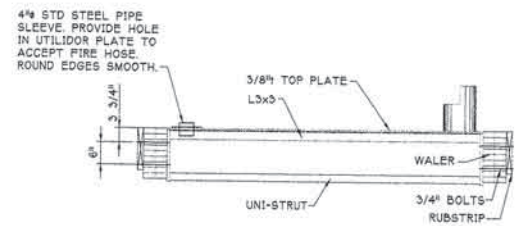
TYPICAL WATER SERVICE PEDESTAL TRI-BRACE MOUNT



PLAN

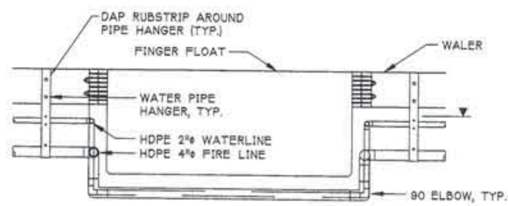


WATER PIPE HANGER

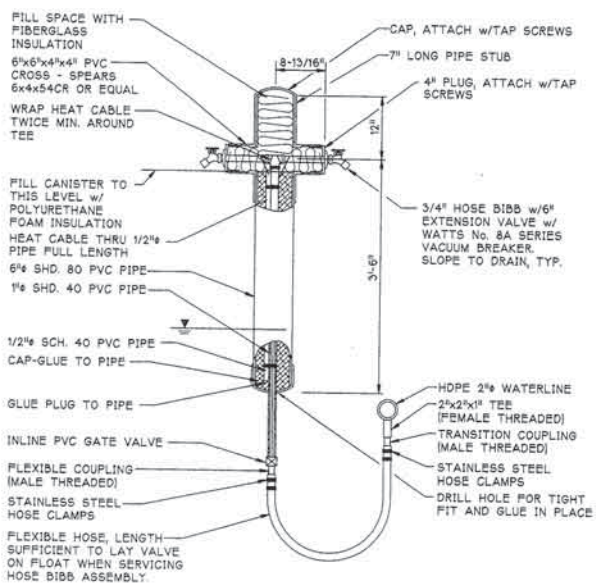


ELEVATION

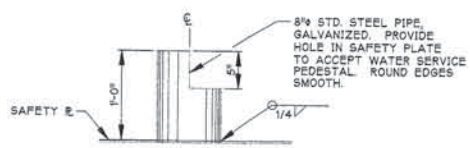
HEADWALK/ MAINWALK UTILIDOR



SECTION POTABLE WATER AND FIRE MAIN UNDER 3' FINGER FLOAT



WATER SERVICE PEDESTALS



WATER PEDESTAL SUPPORT PIPE

EXPIRES 5-26-97

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Designed:	DC
Drawn:	BSB
Checked:	DKL
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Date:	MAY '97
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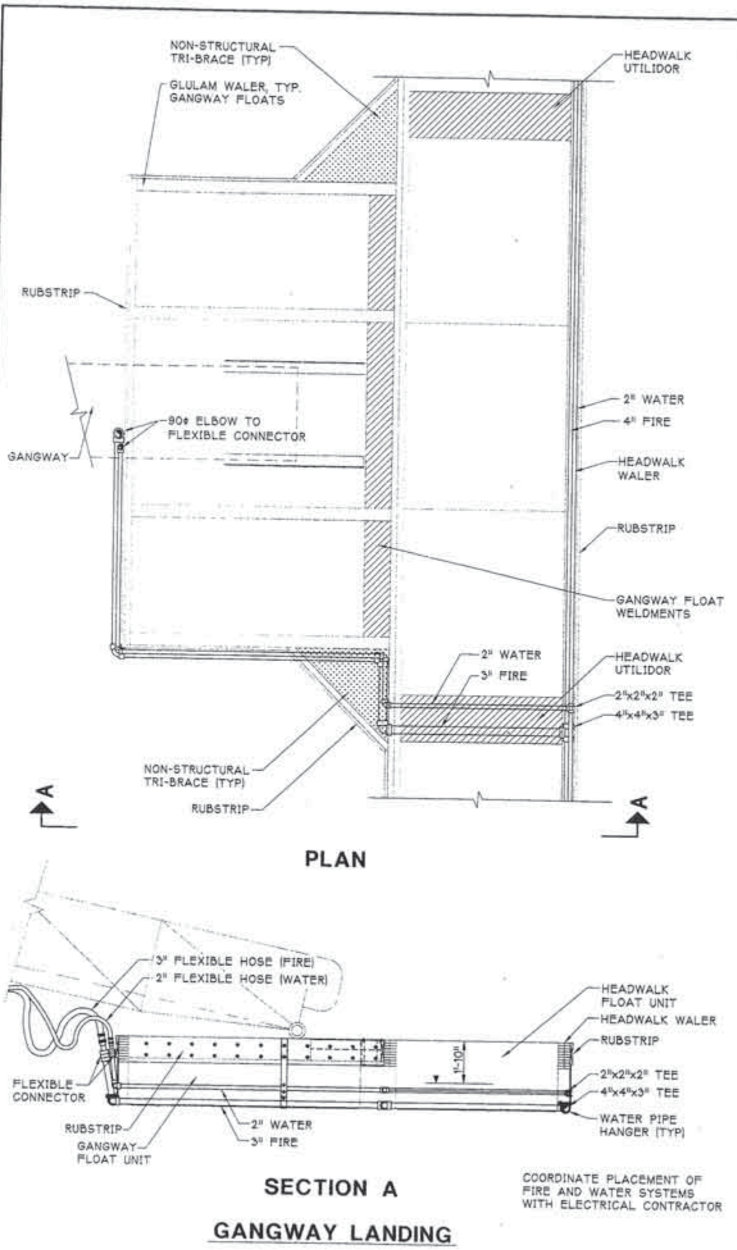
WASHINGTON Sumner Olympia Bremerton Wenatchee Kirkland
OREGON Portland
TEXAS Houston

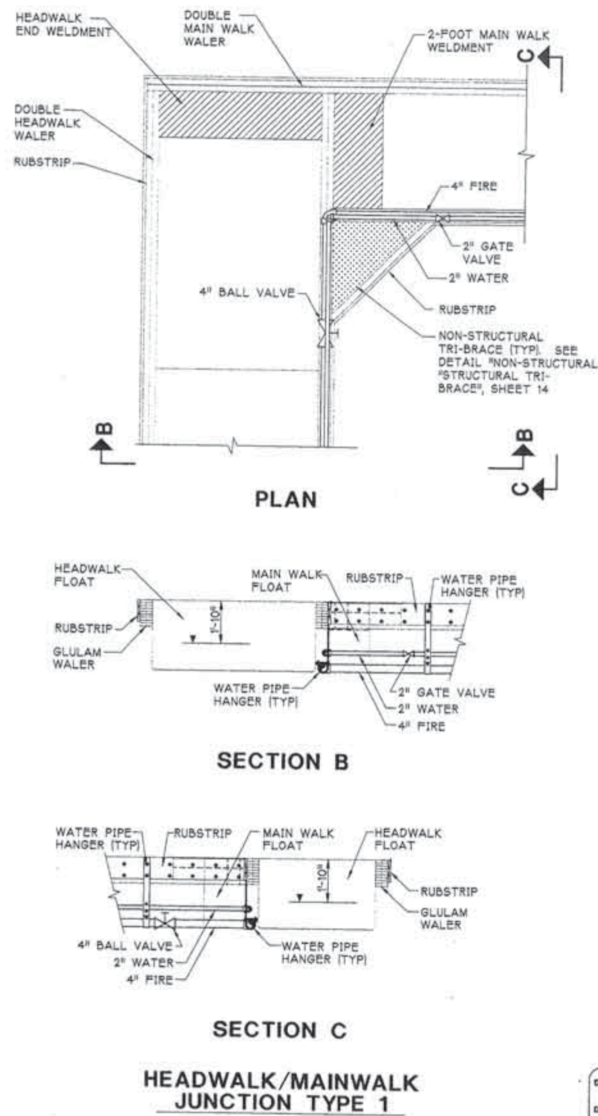
Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

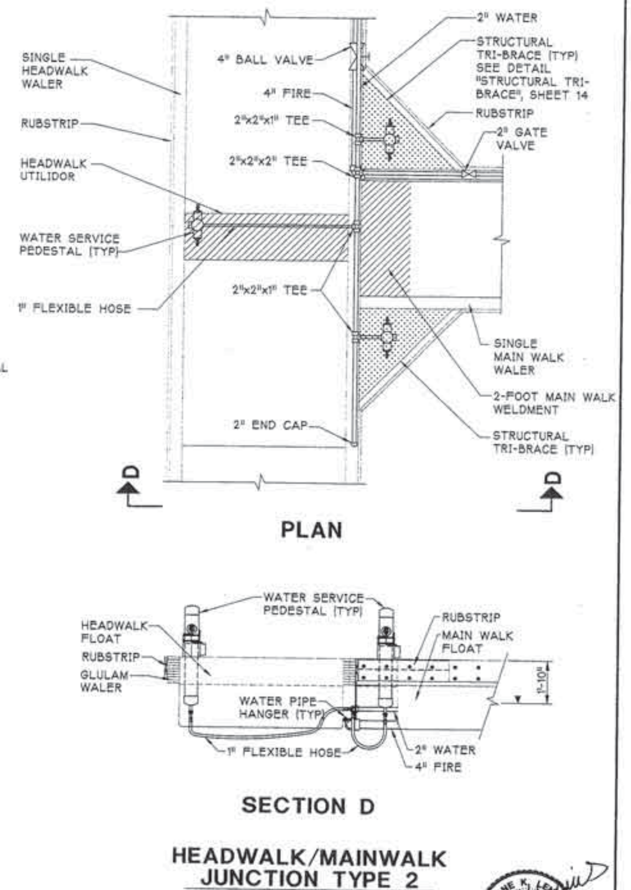
WATER, FIRE AND MISCELLANEOUS DETAILS

Sheet W4 of 7

WTR-DTLS.DWG
PLOT 1:1 W/PND.PCP 5-2-97







DIANE K. LEWIS
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER
EXPIRES 5-26-97

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Designed:	DC
Drawn:	BSB
Checked:	DKL
Project No.:	97416
Date:	MAY '97
Scale:	AS SHOWN

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
811 First Avenue, Suite 260
Seattle, Washington, 98104
PH (206) 624-1387 FAX (206) 624-1388

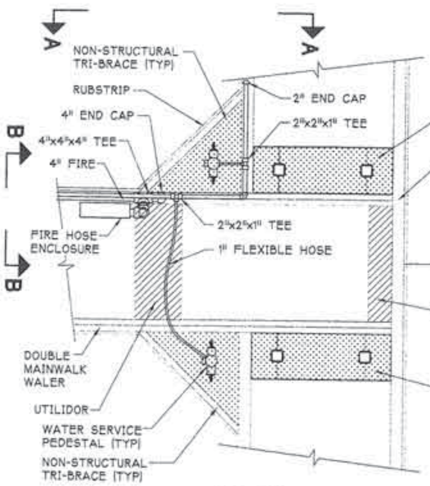
Parametrix, Inc.
WASHINGTON Sumner Bremerton Kirkland Olympia Wenatchee
OREGON Portland
TEXAS Houston

Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

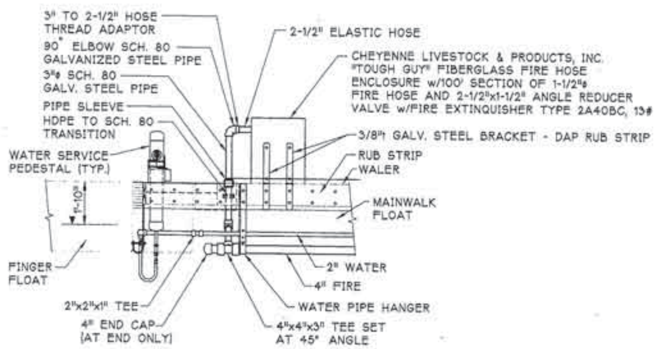
GANGWAY/HEADWALK WATER CONNECTIONS

Sheet W5 of 7

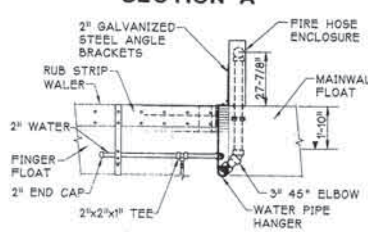
P-HWAYUWG PLOT 1:1 W/PND.PCP 5-2-97



PLAN

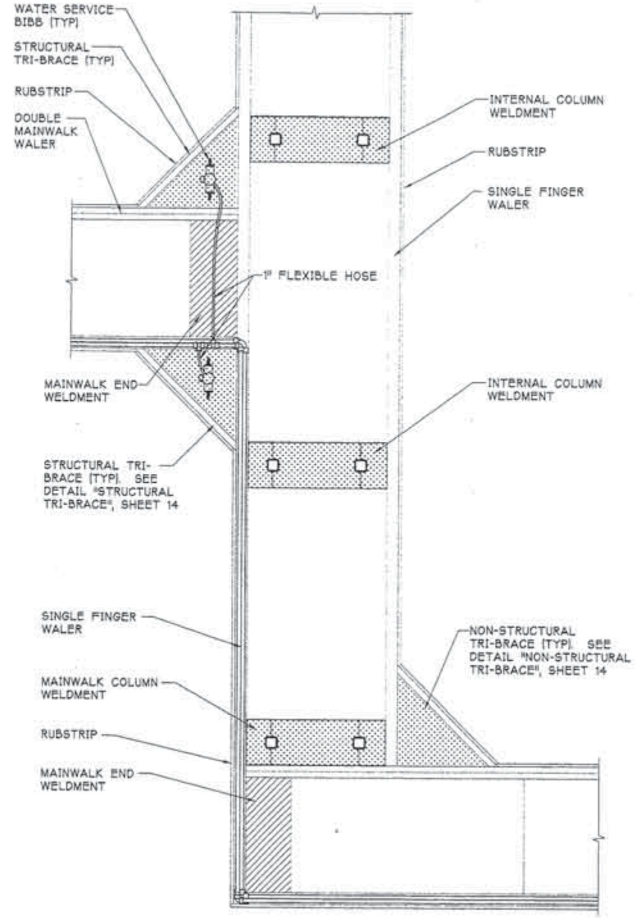


SECTION A

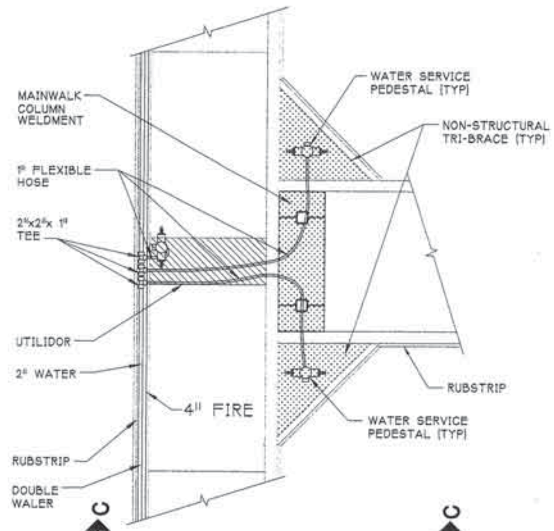


SECTION B

MAINWALK END CONNECTION AND TYPICAL FIRE SERVICE PLAN



28/52 FOOT MAINWALK JUNCTION



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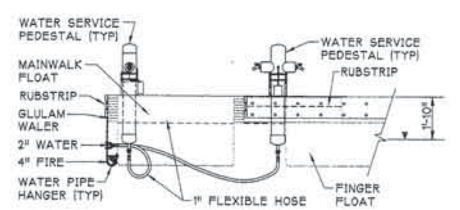

SECTION C

52 FOOT FINGER/ MAINWALK JUNCTION

DIANE K. [professional engineer seal] EXPIRES 5-26-97

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

Designed: DC
Drawn: BSB
Checked: DKL
Project No.: 97416
Date: MAY '97
Scale: AS SHOWN

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
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Parametrix, Inc.
WASHINGTON Sumner Bremerton Kirkland Olympia Wenatchee
OREGON Portland
TEXAS Houston

52 FOOT FINGER AND MAINWALK JUNCTIONS

Sheet W6 of 7

P:\MWALK.DWG PLOT 1:1 W/PND.PCP 5-2-97

GENERAL

APPLICABLE CODES

All local codes plus the following are a part of these general notes:

1) Uniform Plumbing Code
2) NFPA 303. 1995 Edition
3) Uniform Fire Code
4) NFPA 14. 1996 Edition
5) ASTM Specifications
6) NFPA 10. 1996 Edition
7) NFPA 25. 1995 Edition
8) AWWA Cross Connection Control Manual. 1996 Edition

In the event that there is a conflict, the more stringent requirements shall govern.

CERTIFICATIONS

The contractor shall submit catalog cuts, manufacturers data, test results or other information necessary to verify compliance with the project specifications for Engineers approval prior to purchase or installation.

GENERAL REQUIREMENTS FOR WATER & FIRE SYSTEM

The sizes of the various components and the general configuration of the systems are shown on the plans. The Contractor shall provide shop drawings of the actual location and installation of the utility systems (i.e. pipes, fittings, valves, thrust blocks, pipe hangers, plates, angles, bolts, nuts, washers, fasteners and other items for installing and supporting the pipe system) located seaward of the existing water meter vault at the head of the approach dock as shown on the plans.

Four sets of working drawings and/or shop drawings for the water and fire utility systems shall be submitted to the Owner for review and approval prior to fabrication and ordering of materials. Allow a minimum two weeks for review and approval. Contractor is responsible for accuracy of detailing and final fabrication work.

All water and fire related submittals shall be made at one time in a bound volume, organized in a logical manner.

MATERIALS

All materials and equipment incorporated into the Work shall be new, unless otherwise approved by the Owner. Materials not specifically noted in these general notes or elsewhere on the drawings shall be submitted to the Engineer for review and approval. Approval will be based on conformance to current standards utilized by the Owner.

PIPE

All new domestic water pipe, except as noted on the drawings, shall be high density polyethylene (HDPE) Plexco EHMW PE 3408, or approved equal, SDR 9.0, rated 200 PSI, with molded fittings as recommended by the manufacturer. All HDPE pipe joints shall be butt welded. Butt fusion of pipes and fittings shall be performed in accordance with the manufacturer's recommendations as to equipment and technique. All pipe, for the water service shall bear the seal of the National Sanitation Foundation for potable water pipe.

All new fire flow system pipes, except as noted on the drawings, shall be high density polyethylene (HDPE) Plexco EHMW PE 3408, or approved equal, SDR 7.3, rated 255 PSI, with molded fittings as recommended by the manufacturer. All HDPE pipe joints shall be butt welded. Butt fusion of pipes and fittings shall be performed in accordance with the manufacturer's recommendations as to equipment and technique. All pipe, for the water service shall bear the seal of the National Sanitation Foundation for potable water pipe.

All galvanized steel pipe less than or equal to 2 inch diameter shall be standard strength (schedule 40), hot-dipped galvanized steel pipe conforming to the requirements of ASTM A 53, with galvanized, malleable iron screwed couplings in accordance with ANSI Specification B16.3 unless noted. Galvanized steel pipe fittings for pipe less than or equal to 2 inch diameter shall be 150#, malleable iron screwed fittings conforming to U.S. Federal Specification WW-P-521.

All galvanized steel pipe greater than 2 inch diameter shall be extra strength (schedule 80), hot-dipped galvanized steel pipe conforming to the requirements of ASTM A 53, with galvanized, malleable iron screwed couplings in accordance with ANSI Specification B16.3. Galvanized steel pipe fittings for pipe greater than 2 inch diameter shall be 300#, malleable iron screwed fittings.

All PVC pipe shall comform to ASTM D-2466 and ASTM D-1784.

VALVES, COUPLINGS, UNIONS, AND MISCELLANEOUS FITTINGS

Flexible hose and fittings shall meet the same pressure and integrity standard as rigid pipe. Hose shall be flexible and of length to adjust to max. and min. tides. All valves 2" dia. or greater in-line with HDPE pipe system shall be polyethylene ball valves, with pressure rating equal to the piping system on which they are used.

Miscellaneous fittings, including reducers and adapters, shall conform to the pipe manufacturer's recommendation and shall be of the same strength and pressure rating as the pipe on which they are used.

PIPE HANGERS, PLATES AND ACCESSORIES

Pipe hangers, plates, angles, bolts, nuts, washers, fasteners and other metal items for supporting the pipe system shall be either stainless steel, Type 316, or hot-dipped galvanized steel conforming to the requirements of ASTM A36, or as specified in the Drawings.

Heat trace shall be Omegalux sel regulating freeze protection heating cable, model SRF 3-1 CR, 3 watt per foot heating cable with model RTAS-2-EP thermostat for SRF-CR cable, or approved equal.

Hose clamps shall be Bond-it Juniro Preformed Clamps, Type 316 Stainless Steel or approved equal.

BACKFLOW PREVENTERS AND VAULTS

Reduced pressure backflow prevention assemblies shall meet the requirements of AWWA C511-89, Febco Model Number 825 or approved equal.

All reduced pressure backflow preventers shall be approved for use as cross-connection control devices by the Washington State Department of Social and Health Services, Health Services Division, Water Supply and Waste Section.

Vaults shall provide clearances as required by the AWWA Cross Connection Control Manual. Size shall be approved by the Engineer before procurement. Vaults shall be fitted with a water tight lid and be set flush with existing ground. Location of vaults shall be approved the the Engineer before placement. Vault drain shall be bore sighted in accordance with the AWWA Cross Connection Control Manual.

LUMBER

Lumber for blocking, spacers, bumpers, etc. shall be Douglas Fir (Pacific Coast) No. 1, surface dry, S4S. All lumber shall be pressure treated with ACZA in accordance with AWPA C-1, C-2, and C-9 and AWPB Standard LP-22 (min. retention of 0.6 pounds per cubic foot).

EXECUTION

PIPE

All HDPE pipe shall be installed snaked in a manner sufficient to accommodate for thermal expansion and contraction. The HDPE pipe shall be installed in a temperature dependent manner. All pipe joints shall be either butt welded or flanged. The pipe shall be fused by an individual who has a demonstrated ability to fuse polyethylene pipe in the manner recommended by the pipe supplier and/or the fusion machine manufacturer. Butt welded connections shall be kept to a minimum. There shall not be more the an average of one welded connection for every 20 feet of pipe unless otherwise approved by the Engineer. Butt welded joints shall exhibit small, smooth, well-rounded joint beads. Joints with sharp edged, irregular or particularly large beads will be rejected and replaced.

Prior to construction, the Contractor shall provide details to the Engineer for approval showing how all new domestic water and fire protection pipe will be installed and supported on the floats. Pipe hangers shall be placed at intervals not to exceed ten (10) feet along the floats unless otherwise approved by the Engineer. Provisions shall be made to ensure that where metal hangers, clamps or brackets may contact metals with different galvanic potential, the different metals are well insulated to minimize corrosion. Rub strip shall be dapped adjacent to hangers.

The contractor shall install water and fire protection system piping parallel to the float walers between risers.

The contractor shall install all piping, fixtures, equipment, and accessories in strict accordance with the plumbing laws, rules, and regulations of the State and of the County, whichever represents the higher standard. All work shall be approved by the jurisdictional municipality plumbing inspectors.

The Drawings do not attempt to show complete details of all piping, structures and utilities. No extra payment will be allowed for changes in piping locations or qualities due to local obstructions, or to obstruction of work by other trades. The Contractor shall be responsible for verifying all measurements and dimensions at the site, and for restoring any conflicting or disrupted utilities to a condition satisfactory to the Engineer.

FIRE SUPPRESSION SYSTEM AND HOSE BIBB LOCATIONS

The fire suppression standpipes, fire enclosures and hose bibb assemblies shall be located as shown on the drawings.

Each fire hose enclosure will contain a 13 pound fire extinguisher type 2A40BC.

The Contractor shall coordinate all standpipe, fire hose enclosures and hose bibb locations such that they do not interfere with any other utilities, piles, finger piers and any other structural elements of the marina. Contractor shall confirm enclosure and bibb locations with the engineer prior to installing.

HOSE BIBB REPAIR/REPLACEMENT

Eight additional water service pedestals, completely assembled, shall be furnished by the Contractor for future replacements.

OTHER CONSTRUCTION

Other construction not mentioned in these general notes shall be performed using reasonable care and good construction practices. Final inspection and acceptance of all work shall be made by the Owner. Approval of all methods and products shall be based on conformance to the general notes, drawings, quality of workmanship, applicable industry standards and pertinent manufacturers recommendations.

All compaction of soil shall be 90% relative unless otherwise specified.

Surface treatment replacement will be to the pre-existing condition as determined by the Engineer.

Contractor is responsible for coordinating and connecting to existing water main system.

NOTIFICATION

The Contractor shall notify owners of all affected underground utilities for field locating their facilities prior to beginning construction.

TESTING AND DISINFECTION

The Contractor shall provide plugs and temporary blow off assemblies for pressure testing and disinfection, and shall conduct testing and disinfection under the supervision of the Engineer prior to final connection to the existing water main. Testing and disinfection shall be conducted in accordance with the Uniform Plumbing Code and with local fire marshal requirements.

CORROSION PROTECTION

All ferrous metal pipe threads and other exposed ferrous metal where the protective hot-dipped galvanizing coating has been broken, shall be cleaned of all oil, grease and dirt, and coated with cold-applied galvanizing material approved by the Engineer.

SIGNS

The Contractor shall provide and install fire system informational signs as shown. The signs shall be made of long-lasting, corrosion resistant materials with permanent block lettering. All signs shall be secured to the device or railing with substantial and corrosion resistant fasteners or chain.

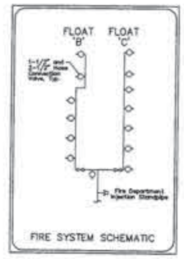
The Contractor shall provide all valves with signs identifying the type of valve and the area affected by the valve.

Signs shall be three layer etched plastic with minimum 1/4" high red letters on a white background.

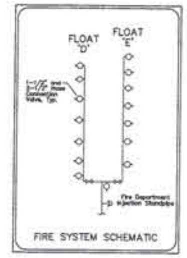
Signs shall be mounted on to timber portion of float deck above and adjacent to valve.

"AS-BUILT" PLANS

Upon completion of the water and fire utility systems, the Contractor shall provide two sets of complete "as-built" plans to the Owner.



FIRE SYSTEM SCHEMATIC



FIRE SYSTEM SCHEMATIC

USE RESPECTIVE SIGN AT THE HEAD OF FLOATS "B" AND "C" AND AT THE HEAD OF FLOATS "D" AND "E".

LOCATE AT HEAD OF EACH GANGWAY

(1 REQ'D)

MANUAL STANDPIPE
FOR FIRE DEPT. USE ONLY
200 PSI MAX.

USE ONE SIGN AT EACH INJECTION STANDPIPE.

LOCATE AT INJECTION STANDPIPE

(2 REQ'D)

SIGNAGE SHALL BE SIZED TO MEET AND MATCH EXISTING SIGNAGE AT FLOATS B AND C.

FIRE SUPPRESSION SYSTEM SIGNAGE

EXPIRES 5-26-97

PORT OF BREMERTON-PORT ORCHARD MARINA RECONSTRUCTION

Designed: DC
Drawn: BSB
Checked: DKL
Project No.: 97416

Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants
811 First Avenue, Suite 280
Seattle, Washington, 98104
PH: (206) 624-1387 FAX: (206) 624-1388

Parametrix, Inc.
WASHINGTON: Sumner, Bremerton, Kirkland, Olympia, Wenatchee
OREGON: Portland
TEXAS: Houston

Date: MAY '97
Scale: NO SCALE

GENERAL NOTES AND MISCELLANEOUS DETAILS

Sheet W7 7

PLOT 1:1 W/PND.PCP 5-2-97

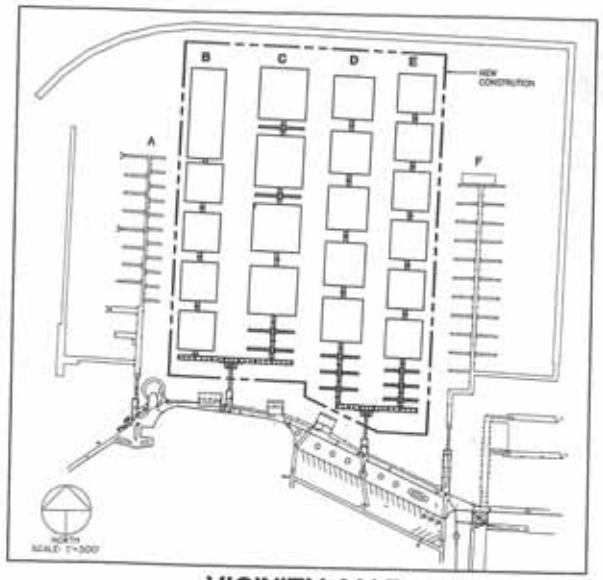
APPENDIX D.2

ALTERNATE B

SECTION 26, TOWNSHIP 24 N, RANGE 1 E

PORT OF Bremerton

PORT ORCHARD MARINA RECONSTRUCTION ALTERNATE 'B'



VICINITY MAP

LOCATION MAP

PORT COMMISSIONERS

MARY ANN HUNTINGTON
DICK FEEK
FRED S. SCHONEMAN

EXECUTIVE DIRECTOR

RICHARD BRANDENBURG

DIRECTOR OF MARINE FACILITIES

GENE BAKER

SHEET INDEX

PORT OF Bremerton

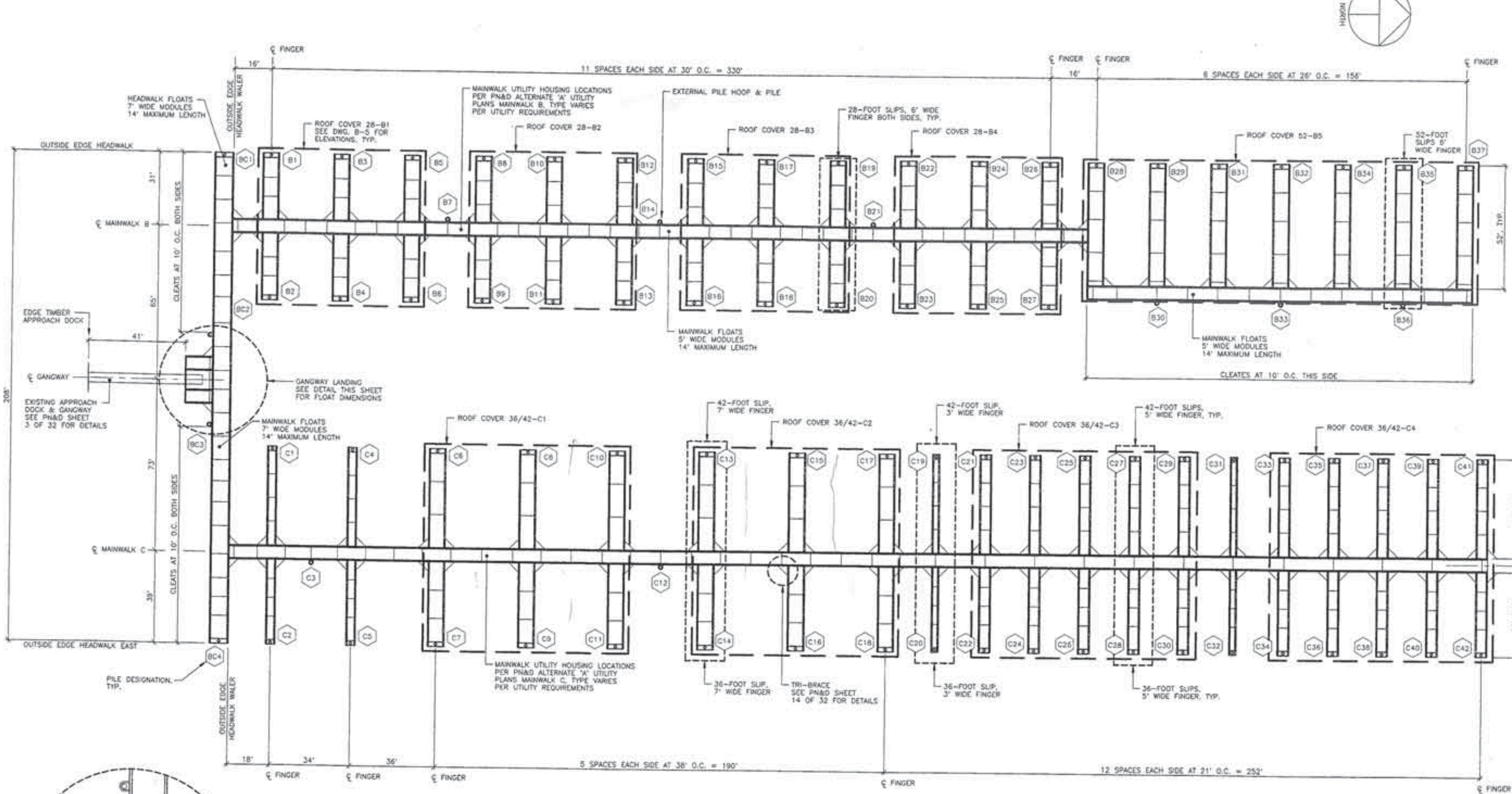
JOB NO.	1-H1042
DATE	May 5, 1997
DESIGNED	JPD
DRAFTED	GHD
CHECKED	
SCALE	AS SHOWN

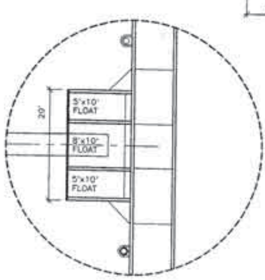
REVISIONS

TITLE SHEET AND INDEX

DRAWING NO. B-1

SHEET NO.





NOTES:

1. ONLY MINIMAL CHANGES TO FLOAT LAYOUT PLAN GEOMETRY ALLOWED.
2. FLOAT LENGTH DELINEATION SHOWN IN THE PLANS ARE CONCEPTUAL. CONTRACTOR TO PROVIDE FLOAT MODULE SCHEDULE FOR B AND C SHOWING LENGTH AND DEPTH FOR HEADWALK, MAINWALK AND FINGER FLOATS.
3. ALTERNATE TRI-BRACE FRAME MAY BE PROVIDED IF ADEQUATE STRENGTH IS DEMONSTRATED. 1/4" MINIMUM MATERIAL THICKNESS. 4' WIDE BY 6' ALONG FINGER FLOAT MAXIMUM DIMENSIONS.
4. PROVIDE CLEATS AT HEADWALK AND 52' SLIP MAINWALK AS NOTED (56 TOTAL). PROVIDE ONE MAINWALK CLEAT PER SLIP AT BOW LOCATION OF VESSEL. LOCATE AS APPROVED BY ENGINEER. (108 TOTAL)

PORT OF Bremerton

JOB NO.	1-97042
DATE	May 5, 1997
DESIGNED	JPO
DRAFTED	GMD
CHECKED	
SCALE	1"=20'

0 10 20 40 FEET

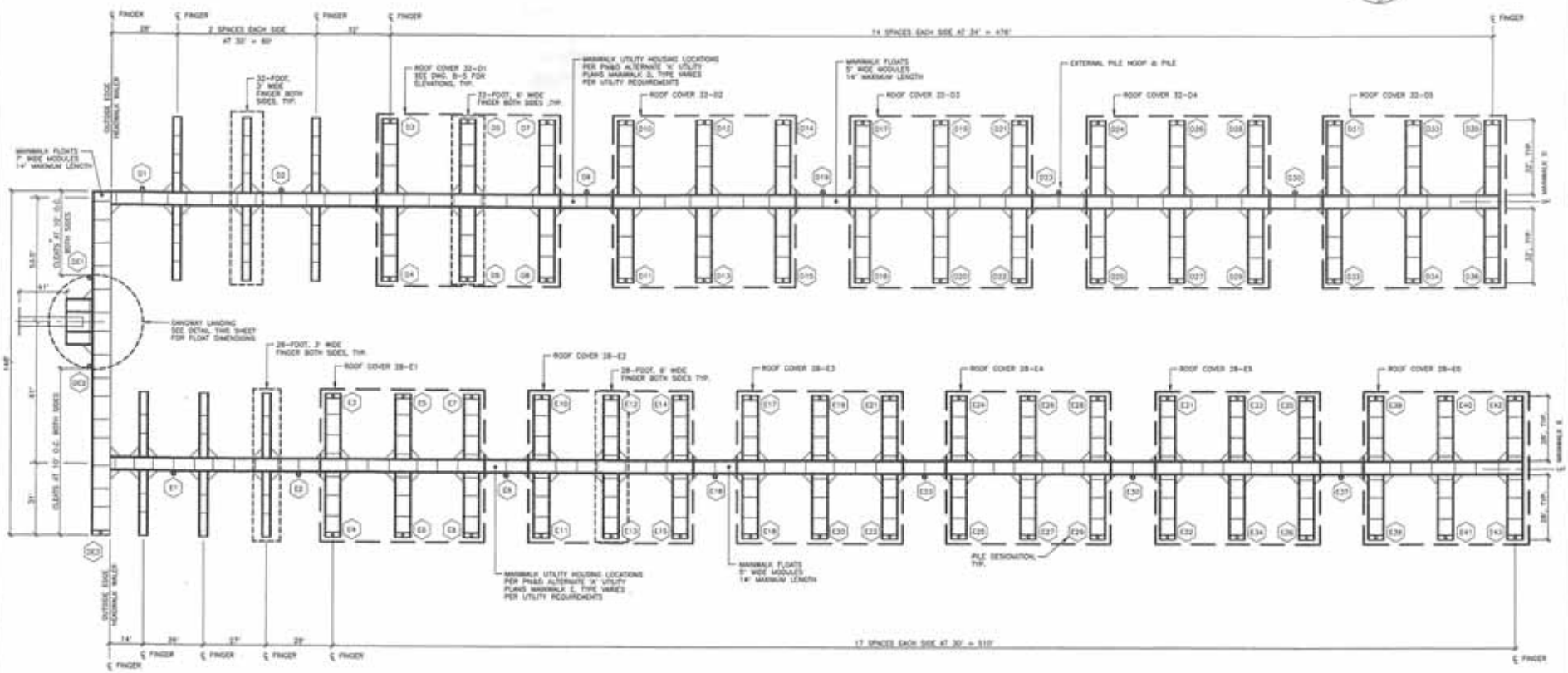
revisions

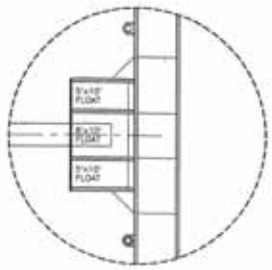
FLOAT MODULE LAYOUT
PLAN B AND C

DRAWING NO. **B-2**

SHEET NO. 2 of 6

Plotted by GMD-Seattle on 07 May 1997 - 9:25am





NOTES:

1. ONLY MINIMAL CHANGES TO FLOAT LAYOUT PLAN GEOMETRY ALLOWED.
2. FLOAT LENGTH DELINEATION SHOWN IN THE PLANS ARE CONCEPTUAL. CONTRACTOR TO PROVIDE FLOAT MODULE SCHEDULE FOR D AND E SHOWING LENGTH AND DEPTH FOR HEADWALK, MARINALIK AND FINGER FLOATS.
3. ALTERNATE TRI-BRACE FRAME MAY BE PROVIDED IF ADEQUATE STRENGTH IS DEMONSTRATED. 1/4" MINIMUM MATERIAL THICKNESS. 4" WIDE BY 6" ALONG FINGER FLOAT MAXIMUM DIMENSIONS.
4. PROVIDE CLEATS AT HEADWALK AND 32' SLIP MARINALIK AS NOTED (36 TOTAL). PROVIDE ONE MARINALIK CLEAT PER SLIP AT BOW LOCATION OF VESSEL. LOCATE AS APPROVED BY ENGINEER. (168 TOTAL)

PORT OF Bremerton

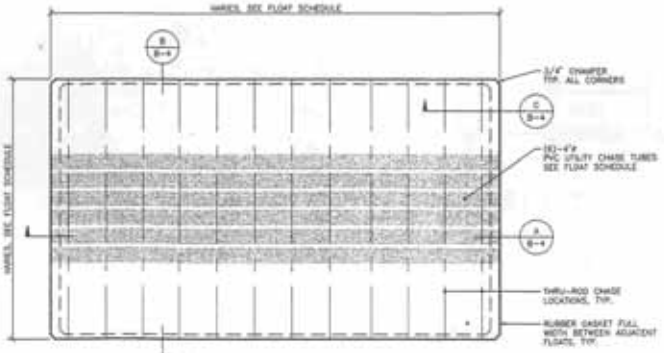
JOB NO.	S-970242
DATE	May 5, 1997
DESIGNED	JFC
DRAFTED	GPD
CHECKED	
SCALE	1"=20'

0 10 20 40 FEET

FLOAT MODULE LAYOUT PLAN D AND E

DRAWING NO. B-3

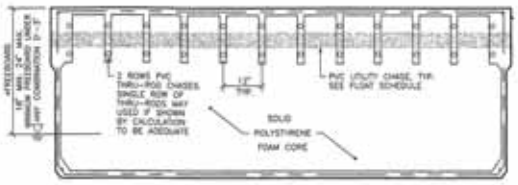
SHEET NO. 3 OF 6



TYPICAL FLOAT UNIT

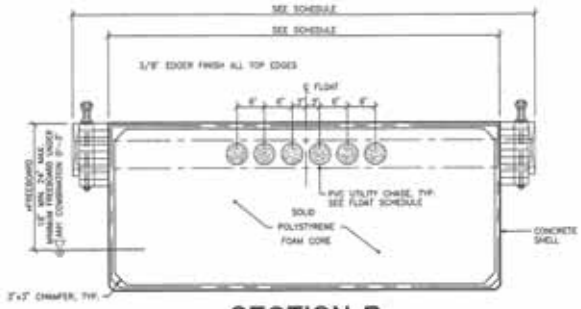
FLOAT SCHEDULE

DESCRIPTION	FLOAT WIDTH (NOMINAL)	OVERALL WIDTH WITH GLULAMS (± 1/4")	6-4" ø PVC UTILITY CHASE	DEPTH	LENGTH
HEADWALK	7'-0"	8'-3 1/2"	YES	PER DEAD/LIVE LOAD REQ'T.	PER OPTIMUM FAB. REQ'T.
MAINWALK	5'-0"	6'-3 1/2"	YES	PER DEAD/LIVE LOAD REQ'T.	PER OPTIMUM FAB. REQ'T.
GANGWAY	8'-0"	8'-6 1/2"	YES	PER DEAD/LIVE LOAD REQ'T.	10'-0"
GANGWAY	5'-0"	5'-6 1/2"	NO	PER DEAD/LIVE LOAD REQ'T.	10'-0"
FINGER	7'-0"	8'-1 1/4"	NO	PER DEAD/LIVE LOAD REQ'T.	PER OPTIMUM FAB. REQ'T.
FINGER	6'-0"	7'-1 1/4"	NO	PER DEAD/LIVE LOAD REQ'T.	PER OPTIMUM FAB. REQ'T.
FINGER	5'-0"	6'-1 1/4"	NO	PER DEAD/LIVE LOAD REQ'T.	PER OPTIMUM FAB. REQ'T.
FINGER	3'-0"	4'-1 1/4"	NO	PER DEAD/LIVE LOAD REQ'T.	PER OPTIMUM FAB. REQ'T.



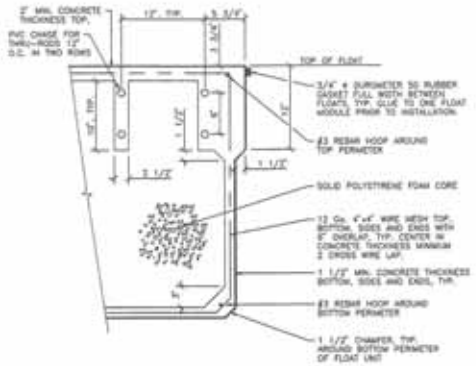
SECTION A

*PROVIDE FREEBOARD AS REQUIRED TO SUPPORT SNOW LOADS. FREEBOARD SHALL BE CONSISTENT THROUGHOUT NEW CONSTRUCTION.

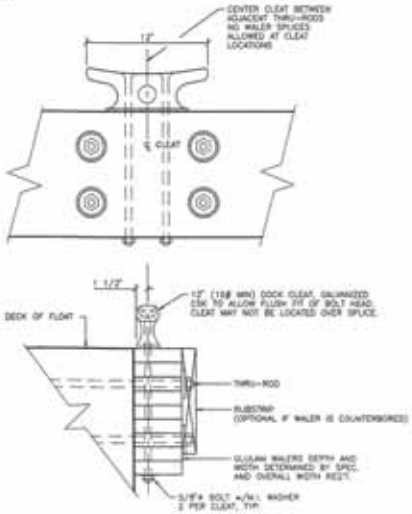


SECTION B

*PROVIDE FREEBOARD AS REQUIRED TO SUPPORT SNOW LOADS. FREEBOARD SHALL BE CONSISTENT THROUGHOUT NEW CONSTRUCTION.



SECTION C



CLEAT ATTACHMENT

FLOATS

GENERAL

The float manufacturer shall have a minimum of five (5) years experience in the design and manufacturing of concrete floats. Alternative float designs will be considered.

The floatation system shall consist of modular sections designed in such a manner that modules may be replaced with standard modules in case of repairs. Individual float modules must not be longer or wider than fourteen (14) feet.

Float modules shall be structurally connected by a treated timber water system that will allow replacement without affecting the float modules. Connection methods that create structural failure of the float module when overstressed will not be allowed.

Float modules shall be structurally capable of supporting a 40 psf deck live load as well as any concentrated dead or live loads introduced by superstructure.

Dead loads shall consist of the float system, waters, rubstrips, pile guides, utilities, utility pedestals, transformers, superstructure and roof cover and all other attached appurtenances.

Floats with special dead loads shall have the same freeboard as floats without such loading so that residual stresses are kept to a minimum in the waters when the modules are connected.

Walking surfaces of float units shall be level and flush with adjoining float units and shall float level under dead load. The decks of the floats shall have a tolerance of being level at a maximum transverse slope for of one (1) inch per ten (10) feet of width and a tolerance of being level at a maximum longitudinal slope one (1) inch per ten (10) feet.

The maximum height variation between adjoining surfaces such as timber water and concrete or steel and concrete shall be 1/4-inch.

Floatation units shall be located within the structure so as to be capable of supporting a 300 pound point load moving in any area on a float without excessive rolling or tilting on the deck. When a 400 pound load is applied one foot from the end of the finger, that finger will loose no more than four inches of freeboard. When a 300 pound load is applied to an one outer corner of the finger there should be no more than 2 inches in freeboard differential per three feet of width between the outer corners of the finger. This should be done once the system is totally connected and in its final intended condition.

SHOP DRAWINGS

Prior to fabrication or construction, the Contractor shall furnish sufficient information to describe his floating dock system, and shall submit complete shop drawings and calculations for approval by the Owner. Dock and anchorage shop drawings and calculations shall be affixed with the appropriate stamps and signatures of a registered structural engineer, licensed in the state of Washington maintaining professional liability insurance with a minimum policy limit of $1,000,000. Drawings and calculations shall be coordinated with the superstructure and roof cover and shall be under the same seal. The engineer shall have a minimum of 5 years prior experience in engineering float supported roof systems and shall provided evidence of prior successful projects subject to similar environmental conditions.

Shop drawings shall show the layout of the dock system, layout of complete mooring/anchoring system, details of all connections, water sizing and splice pattern, anchorage connections, utility routings and all other details necessary and pertinent to the construction of the floating dock system.

All design calculations shall assume that all slips are filled and all reasonable dead loads have been incorporated into the system.

In addition to sizing all members for these codes and specifications, the following calculations shall be submitted for the dock system:

A. Anchorage attachment points to insure reactions shall be appropriately and rationally distributed throughout the system.

B. Finger lateral loads from current and wind in the shielded and unshielded condition for each finger length. Calculations will provide transfer assumptions for both cantilever and noncantilever type fingers, including finger-to-walk connections.

C. Overall system loads under full occupancy with consideration for shielding factors and deflections of the system and its effects on anchor loading.

D. Anchorage system capacity for individual and overall load consideration.

E. Vertical loading due to wave action and live load requirements including both walkways and fingers.

The Contractor shall examine the jobsite before preparing his shop drawings to verify all physical conditions and surroundings.

PORT OF Bremerton

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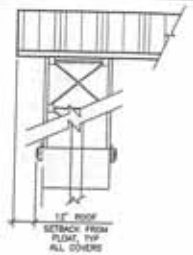
DATE	May 5, 1997
DESIGNED	JFG
DRAFTED	GHS
CHECKED	
SCALE	NOT TO SCALE

TYPICAL FLOAT SECTIONS

DRAWING NO. B-4

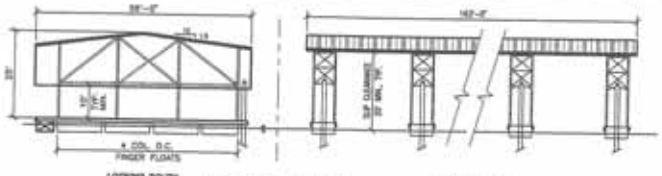
SHEET NO. 4 OF 6



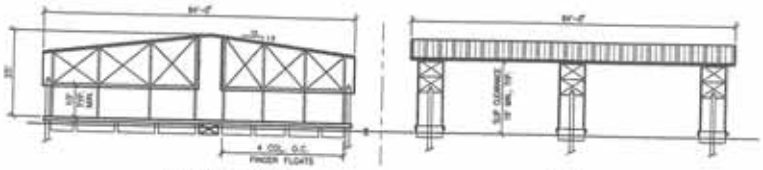
ROOF COVER ELEVATIONS
28', COVERS B1, B2, B3 AND B4

INDEPENDENT SUPERSTRUCTURE BETWEEN MAINWALK FLOATS – CONTRACTOR TO PROVIDE ROOF PANEL DETAILS TO ACCOUNT FOR DEFLECTIONS. RIDGE CAP NOT SHOWN. GUTTER AND DOWNSPOUT SYSTEM REQUIRED (BUT NOT SHOWN). SEE SPECS.
METAL SHORT AT FAR ENDS 'A' & 'B' ONLY. SEE PH&D DRAWINGS FOR SIGNAGE DETAILS

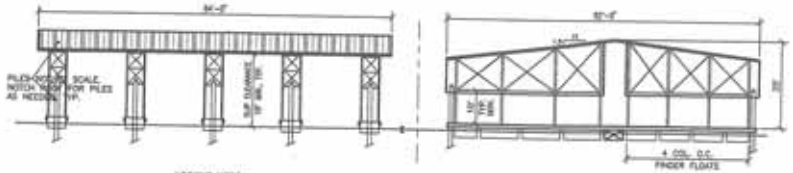
MAIN FLOAT
FINGER FLOAT



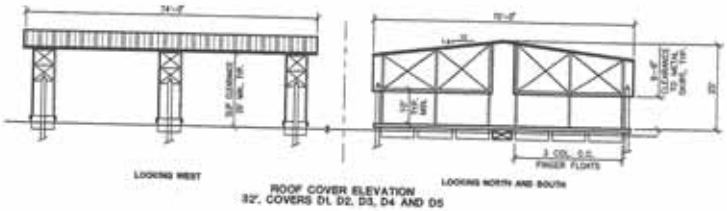
ROOF COVER ELEVATION
52', COVER B5



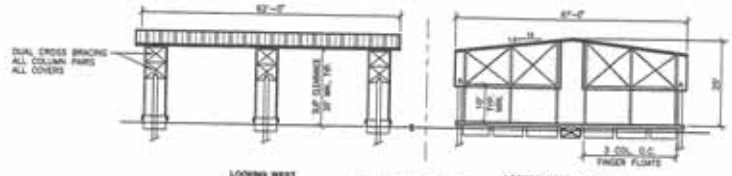
ROOF COVER ELEVATION
36'/42', COVERS C1 AND C2



ROOF COVER ELEVATION
36'/42' COVERS C3 AND C4



ROOF COVER ELEVATION
32', COVERS D1, D2, D3, D4 AND D5



ROOF COVER ELEVATION
28', COVERS E1, E2, E3, E4, E5 AND E6

SUPERSTRUCTURE & ROOF COVER
GENERAL
The float system for the superstructure and roof cover consists of floats which have a high deflection/load response compared to normal steel structure. The Contractor shall take into account this condition in performing the work for this project. The Contractor shall provide an erection sequence plan which accounts for the variable support conditions. This load assumes that the floats are provided level after the dead load column reactions in place. The actual dead load for each structure shall be verified by the Contractor and coordination between suppliers and fabricators performed to insure a workable system. It may be necessary to ballast the floats during erection to maintain a true and level surface which is needed for erection and bolting of the members. The erected structure shall have balanced reactions to those anticipated for dead loading so that minimal residual stresses are incurred when the steel members are connected.

DESIGN CRITERIA
The applicable codes and design criteria shown in the general notes shall apply.

SHOP DRAWINGS
Prior to fabrication or construction, the Contractor shall furnish erection, installation, and assembly drawings sufficient information to describe their superstructure and roof cover system, including float connection details, roof plan, elevation cross sections and other information as required to assemble all parts, components and accessories of the roof system. Shop drawings shall indicate the piece marks of all parts to be erected or assembled.

Superstructure and roof cover system drawings and calculations shall be affixed with the appropriate stamp and signature of a professional structural engineer, licensed in the state of Washington, maintaining professional liability insurance with a minimum policy limit of $1,000,000.00. Drawing and calculations shall be coordinated with the float structure and shall be under the same seal. The engineer shall have a minimum of 5 years prior experience engineering float supported roof systems and shall provide evidence of prior successful projects subject to similar environmental conditions.

Calculations shall be prepared in accordance with AISI and AISC specifications and guidelines. All engineering calculations shall be done in accordance with these guidelines using the appropriate allowable capacities and safety factors. ("Ultimate Strength Engineering" methods are not allowed). The roof deck shall be capable of supporting a 300 lb. concentrated load at mid-span. Lateral deflection of the structure shall be based upon a P delta specified wind load as required by the applicable codes.

STRUCTURAL STEEL FABRICATION
GENERAL
The work shall include all primary and secondary framing members, sheeting, connection bolts, flashing, fasteners, sealant and other miscellaneous items.

GENERAL FABRICATION
All structural steel members shall be cut, formed, punched, welded, and galvanized by the manufacturer prior to field assembly. As much as practical all components shall be shop fabricated complete with proper connection holes.

All pieces and parts shall carry an identifying mark for field identification.

PRIMARY STRUCTURAL MEMBERS
Steel used in fabrication of built-up primary structural members shall have a minimum yield of 36,000 psi.

Primary framing shall be shop fabricated and shall include welding if necessary as well as holes required for attachment of secondary members and bracing.

All steel shall be hot-dipped galvanized per ASTM A123 or A153 after fabrication unless otherwise noted. Damaged galvanizing, including that removed for welding shall be repaired by zinc galvanizing with zinc or aluminum alloy sticks to a minimum thickness of 12 mils. Contractor shall submit repair material and methods of repair for review and approval.

SECONDARY STRUCTURAL FRAMING
Steel used in the fabrication of cold formed structural members shall have a minimum yield of 50,000 psi.

Purlins and rafters shall be bolted to primary framing and be of the appropriate gauge as determined by calculations outlined in these specifications.

Purlins and rafters shall be made of form sections of a depth determined by the design calculations.

Diaphragm action of panels may be used for wind bracing in lieu of diagonal bracing when sufficient. When required, diagonal bracing for lengthwise rigidity against wind and longitudinal forces shall be provided and indicated on the shop drawings.

All secondary framing shall be galvanized in accordance with ASTM A-525.

CONNECTORS AND FASTENERS
All bolts connecting steel to steel shall be ASTM A325 slip critical and shall be hot dipped galvanized. Hardened washers shall be used under both head and nut of all bolts. Steel to steel bolted connections shall be tightened per AISC approved method. All other bolts, lag screws, nuts, washers, nails and spikes shall meet ASTM A307 or ASTM 429 or similar requirements as approved by the Engineer and shall be hot-dipped galvanized. Malleable iron washers shall be used in all areas where the bolt head or nut shall bear against wood, except under economy heads.

STEEL WELDING
Per AWS D1.1. All welders shall be qualified per AWS for the type of welding anticipated. Welds will be spot tested by the Engineer by UT, MT, or LP and those holding shall be repaired at the Contractors expense which will also include all costs for retesting. No welding through galvanized coating will be performed. The galvanizing within one inch of the weld shall be removed and restored after welding.

ROOF PANELS
GENERAL
Roof panels shall be a minimum 24 gauge steel (G90 Galvanized) with a minimum yield of 80,000 psi and shall have Kynar finish.

All other roof components including rake trim, eave trim, gutters, and downspouts shall be 24 gauge minimum, G90 galvanized, with Kynar 500 Teflon coat or equivalent, and a minimum PY=40 kst.

Submit shop drawings showing complete roof system for Owners review and approval. The roof system shall include all roof panels, trim, flashing, miscellaneous sheetmetal, and closures, gutters, seals, fasteners, and any other components required to provide a complete roof. Drawings shall specify all materials, finish, dimensions, connection details, panel layout and erection procedures. Color shall be as specified on the plans

Submit warranty life for all moorage roof components for in-service conditions. A 15-year minimum warranty is required.

The configuration of the prothecturely designed panels shall have a rib pattern that allows span capabilities in accordance with the dead and live loads for this specific application.

Panels shall be hot dipped galvanized in accordance with ASTM A525 or have a Zincalume substrate.

APPLICATION
Roof panels shall be fastened to framing with hex washer head self-drilling fasteners located 6 inches on center at terminal ends and end laps, sized to meet load requirements. Screws shall be located 12 inches on center at intermediate purlin. Screws shall be 0.0003 inch minimum thickness zinc applied by the electroplating or mechanical plating process.

Fasteners used for attaching panels seams shall be hex washer head self-drilling stitch screws located a minimum of 24 inches on center or as required for snow loads. Screws shall be coated with 0.0003 inch minimum thickness zinc applied by the electroplating or mechanical plating process. All roof panel screws shall be double gasketed.

All screws shall be color-coated to match the color of the underlying roof sheeting.

Roof panels shall be continuous for a maximum length of approximately 40 feet. Where end laps are required, they shall be a minimum of 6 inches and occur at a purlin.

FLASHING AND TRIM
A formed ridge cap matching the slope and profile of adjoining roof panels shall be provided along the roof ridge when gable style roof is used. Rake facia and other trim as deemed necessary by Contractor shall be provided for a finished appearance. Trim shall have the same finish specification and color as the roof panels unless otherwise requested by the Owner. Flashing and trim shall be attached with hex washer head steel metal screws 12 inches maximum on center. Screw head color shall match the color of the underlying trim.

METAL ROOF COLUMN BUMPERS
MATERIALS
Column bumpers are to be molded polyethylene with UV inhibitors or other marine grade nonferrous material as approved by Owner.

INSTALLATION
Vertical column bumpers are to be installed on all columns exposed to boats. Bumpers shall be attached to using bolts or structural hex head self-drilling fasteners of a size recommended by the manufacturer

PORT OF Bremerton

JOB NO. 1-97042	revisions
DATE May 5, 1997	
DESIGNED JFO	
DRAFTED GPD	
CHECKED	
SCALE NOT TO SCALE	

SUPERSTRUCTURE AND ROOF COVER ELEVATIONS

DRAWING NO.
B-5
SHEET NO.
5 OF 6

GENERAL NOTES

GEOMETRY
Only minimal changes in the geometry will be allowed. Float widths, superstructure height, roof slope, roof areas, and vertical heights from the water surface shall not substantially vary from the plans. Headwalls, mainwalls, and overall plan geometry shall remain identical.

APPLICABLE CODES
All local codes plus the following specifications, standards and codes are part of these General
Notes:
1) Uniform Building Code (UBC) 1994 Edition, and applicable addenda
2) AWS, D1.1 Structural Welding Code – current edition
3) ACI–318 Building Code Requirements for Reinforced Concrete
4) ASTM Specifications
5) AISC requirements for steel erection

In the event that there is a conflict between the above references and these General Notes the more stringent will govern.

DESIGN CRITERIA
Dead Loads – All
Roof Snow Load – Uniform 25 psf
Float Live Load – Uniform 40 psf, 1000 pound concentrated.
Wind Load – 85 mph, exposure D
Vessel Lengths – Maximum length equal to adjacent finger float length

For the purposes of windload calculation, vessel profile heights shall be assumed to be 15ft of the vessel length. Vessel width shall be the slip width minus one foot.

MATERIALS AND CONSTRUCTION
GENERAL
The following section covers all phases of construction for this project, except electrical requirements which are covered elsewhere. Additional specific requirements are covered in the various sub–sections and on the plans. Requirements covered in the sub–sections supersede those in this section in case of conflict. Materials not specifically noted in these General Notes or elsewhere on the drawings shall be submitted by the Supplier for approval. Approval will be based on conformance to current standards utilized by the Owner. All materials must conform to good workmanship, acceptable industry standards and manufacturers recommendations. Construction not mentioned in these General Notes shall be performed using reasonable care and good construction practices. Final inspection and acceptance of all work not specifically included in these General Notes or on the drawings shall be made by the Owner. Approval of all methods and products shall be based upon conformance to the General Notes, drawings, quality of workmanship, applicable industry standards, and pertinent manufacturers recommendations.

SURVEY
All construction surveys shall be performed by or under the supervision of a Surveyor licensed in the State of Washington.
An accurate method of horizontal and vertical control shall be established by the Contractor and approved by the Owner before construction begins. The Contractor shall maintain the control system throughout the project. If at any time the methods utilized fail to provide accurate location the Contractor may be required to suspend work. The Contractor shall lay out the work from established horizontal and vertical control points indicated on the drawings and shall be responsible for all required measurements taken from these points. The Contractor shall furnish at its own expense all stakes, templates, platforms, equipment, range markers, and labor as may be required to lay out the work from the Control Points furnished by the Owner. It shall be the responsibility of the Contractor to maintain the Control Points until authorized to remove them. If such points are destroyed or disturbed they shall be reestablished by the Contractor at its own expense.

Construction field survey shall be considered incidental and already a part of the items bid.

SUBMITTALS
The Owners review of submittals will be for general conformance only and it shall remain the responsibility of the Contractor to conform to all requirements of the plans and specifications. Any intended deviation from the plans and specifications must be specifically identified by the Contractor and specifically approved by the Owner to be acceptable. Shop drawings of all fabricated materials shall be submitted to the Owner for written approval prior to fabrication or mobilization of any item. A minimum of five sets shall be provided for each submittal, of which two will be returned to the Contractor. The Contractor should allow ten weeks from the time of receipt for review of submittals by the Owner for a reasonable number of drawings.

Certifications, manufacturers data and other information for all materials, including those not specifically shown in these notes or on individual drawings, shall be submitted to the Owner for written approval to verify conformance with the plans and specifications. In the event that the plans or specifications do not specifically reference a material, the approval of materials will be based on its conformance to the Uniform Building Code. All methods and materials shall conform to these General Notes, good workmanship, generally accepted industry standards, and manufacturers recommendations. The following is a partial list of required submittals for the Project. This does not constitute a complete list as it will vary depending upon the Contractors methods. Construction Plans (includes plan drawings and written description of methods):

1. Survey plan and updates
2. Pile driving plan and equipment
3. Roof erection plan
4. Daily Operation Reports – Furnish weekly (Includes personnel and equipment)

Shop Drawing Plans.

1. Structural Steel (see notes for Superstructure & Roof Cover drawings)
2. Concrete Floats, including flotation calculations, timber and all other associated items (see notes for Float Module drawings)

Materials Certifications Submittals:
1. Concrete mix and all associated items, including concrete strength tests.
2. Reinforcing steel.
3. Structural Steel.
4. Steel Pipe Piles.
5. Anodizes
6. Signs

FLOAT MATERIALS AND FABRICATION
Concrete Mix Design
Prior to the manufacturing of any flotation units, the concrete mix design shall be approved by the Owner. Concrete shall have a minimum twenty–eight (28) day compressive strength of 4000 psi, per ASTM C–94. The mix shall contain a minimum of 564 pounds (six sacks) of Portland Cement per cubic yard, either Type I or Type II modified, and low alkali. Type III cement may be used if the Tri–Calcium Aluminate of the cement is certified by the manufacturer to be between five (5) and eight (8) percent, and alkali content (Na2O) and (K2O) is less than 0.6 percent. Concrete for the top surface of the flotation units shall contain polypropylene fibrous reinforcement at a rate recommended by its supplier. The theoretical concrete unit weight shall not be more than 120 pounds per cubic foot. Course and fine aggregates shall conform to ASTM C–33–88, ASTM C–330 lightweight aggregates for structural concrete. All concrete shall be air–entrained from four (4) to seven (7) percent and shall be tested in accordance with ASTM C–138, C–173, or C–231. Water/cement ratio shall not exceed 0.45 for light–weight concrete. Slump range shall be three (3) inches to six (6) inches when tested in accordance with ASTM C–143–78.

Concrete Testing
All concrete testing shall be done under the guidance by certified personnel. Certification shall be in accordance with the National Ready Mix Concrete Association guidelines or equivalent. All concrete testing methods shall be done in accordance with the respective ASTM specifications. Three (3) compressive test cylinders shall be taken daily per mix, cured, and tested by either an independent testing laboratory or by an on–site, Owner approved, certified testing facility. Test results will be submitted on one (1) each, seven (7) day; one (1) each, twenty–eight (28) day; and one (1) held cylinder. Unit weight and entrained air tests will be taken daily from the same material sample used for the compressive test cylinders. Daily concrete cylinder test reports shall be submitted to the Owner on a job complete basis.
All concrete testing shall be done at the Contractor's expense.

Concrete Reinforcement
Galvanized wire mesh shall meet ASTM A–185 and shall be as detailed on sheet B–4.

Rebar shall be grade 40 or 60, conform to ASTM 615, and shall be epoxy coated in accordance with ASTM A775.

Expanded Polystyrene Core (EPS)
The closed cell expanded polystyrene core used inside the concrete unit shall meet Federal Specification: C–578–85 which supersedes Federal Specification HH–I–524C.

EPS to have a maximum absorption of three (3) percent by volume as tested by ASTM Method C–272.

The foam core shall be held in a true position during the casting operation with an allowable variation of 1/8 inch from the dimensions shown on the shop drawings.

Foam billets will have a dimensional tolerance of plus 0.125 inch and minus 0.125 inch.

Foam core may not have more than ten (10) percent reground EPS foam material. Reground foam pieces shall not exceed 3/8 inch in diameter.

Foam core shall be made up of not more than four (4) laminated sections.

The laminated foam core shall be glued with a low solvent glue, and shall be strapped to prevent delamination during transportation and handling.

No horizontal lamination may occur in the upper ten (10) inches of the foam core unless approved by the Engineer.

Utility Raceways
Each walkway shall have PVC sleeves embedded as required for electrical system with appropriate pull–boxes. Pullboxes shall be submitted for approval and meet the requirements of all applicable electrical codes. Contractor responsible for the cost, if two pullboxes are required to meet the applicable electrical code.

Pullboxes shall be flush with the walking surface. Pullboxes shall have a one (1) inch nominal concrete bottom with a smooth or light brushed, slip–resistant finish. Bottom shall level with inserts of the PVC sleeves. All bolts for lids on pullboxes shall be stainless steel.

Both sleeves and piping shall remain above the water surface under dead load conditions and shall be designed to facilitate installation, removal, and servicing of the utilities. Access openings shall be provided at convenient locations if required for special access.

Thru–Rod Connections
The minimum dimension for all thru–rods for structural attachment is 3/4 inch thread diameter. All thru–rods shall be placed within PVC sleeves cast in the float units. The maximum inside diameter of PVC shall not exceed 7/8 inch.

All cast in inserts will be stainless steel, 3/4 inch diameter, with a welded loop or horizontal restraining bar.

Walers shall be securely fastened to the concrete floats using galvanized thru–rods, plate washers, spur locker washers, and nuts.

No connecting device shall protrude beyond the fascia into the berth area. Any connecting device protruding above the surface of the deck shall have a low, rounded profile.

All nuts at triangle frame connections shall be re–tightened immediately before receiving utility covers.

Deck Finish
The float deck surface shall be trowel finished with a steel trowel and a slip–resistant finish applied transversely to the walking surface.

Contractor shall establish finishing methods and procedures to insure an even and consistent broomed or screed finish on all deck surfaces.

All top edges shall have a 3/8 inch tooled radius with a minimum 1–1/2 inch wide smooth hard steel finished face.

Outside top edges and corners shall be filed smooth.

All work shall be performed by workpersons experienced and skilled in their trade.

Curing, Handling, and Storage
Except as otherwise approved, floats shall be cured for a minimum of seven (7)days before transporting or assembling.

The Contractor shall select his own method of curing and be responsible for the result, except that all curing shall be under cover and with complete protection from direct sunlight, wind, and freezing for a period of three (3) days.

Contractor shall take care in establishing handling methods to avoid damage to floats during form removal, storage, assembly, and installation.

Storage of flotation units shall be on level surfaces, and it shall be the responsibility of the Contractor to determine how high to stack units to avoid damage. Care shall be taken to avoid damage caused by overstacking.

Floats shall be protected against damage from any cause.
Any damaged units shall be rejected and removed from the assigned job.

Cracks
Cracks located below the structural deck that do not indicate migration to the deck surface may be repaired with the approval of the Owner.

Cracks which are open or which exceed two (2) feet in length shall be V–cut out and patched with a non–shrink patching compound approved by the Owner.

Excessive cracking in a single flotation unit shall be cause for rejecting that unit. Any frequently recurring patterns of cracking shall be considered indications of inadequate design or improper handling. It shall be corrected by replacement and appropriate changes in design or procedures.

Rock pockets exceeding one (1) inch in diameter and/or 3/8 inch in depth and/or honeycombing, shall be patched with an approved non–shrink grout of a color similar to the cured concrete. Any pockets which expose mesh or rebar shall be chipped out, cleaned, and filled with an approved epoxy patching compound.

Float Weight
The weight of the complete flotation units shall not vary from the theoretical weight or mean weight of all similar units by more than six (6) percent.

Submit program to verify actual float weights, quantity to be weighed, and method of record keeping.

Float Identification
All floats are to be clearly identified on one side and one end between the bottom of the water and the waterline with the date of manufacture, specific float type, and job number.

Materials delivered and stored at either the manufacturing facility, staging area, or jobsite shall be properly stored on dunnage or by other appropriate means to prevent direct contact with the ground and unnecessary damage.

LUMBER

GLULAM WALES
Glulam whalers shall be coastal DFL, combination 24f–v8 and shall be treated with ACZA per the general notes and bid alternate 'A'. Single whalers or finger piers shall be continuous for the full finger length. Double whalers or walkways shall have staggered slices and shall run a minimum of one float module length. Splices shall occur at the center of a float module.

Miscellaneous timber shall be of Coast Region Douglas Fir; "No. 1" or better per West Coast Lumber Inspection Bureau (WCLIB) grading rules no. 16, paragraph 123 or paragraph 124 as applicable.

Plywood to be 3/4 inch Signal Grade Medium Density Overlayed Plywood with two (2) coats slip–resistant paint. Radius top edges 1/4 inch and seal edges with slip–resistant paint. Plywood shall be pressure treated to .4 pound retention with ACZA prior to application of paint.

Lumber shall be fabricated accurately to provide uniform gaps and butt joint connections. Lumber splices shall not exceed 1/2 inch between adjoining ends.

All waters, fascia, spacers, plywood, or any other member which is subject to foot traffic, shall be flush with the concrete walking surface.

LUMBER TREATMENT
All lumber shall be pressure preservative treated with ACZA to .6 pound retention.

All lumber will be cut to length and bolt holes drilled prior to pressure treatment as far as is possible.

Tie bands used for delivery must have slotes between the bands and the wood to prevent crushing. Bundle identification shall be done so as not to stain lumber surfaces.

All field cuts and bored holes exposed after pressure treatment shall be brush coated with the preservative solution per AWPA M–4.

STEEL
All structural steel channels, angles, and plates shall be fabricated from mild steel conforming to ASTM A–36, and shall be hot dipped galvanized after fabrication per ASTM A 123.

GALVANIZED COATING
A hot dipped galvanized coating shall be required on all thru–rods, bolts, miscellaneous hardware, cleats, steel plates, angles, and shapes in accordance with either ASTM A– 1 23 or ASTM A– 1 53 as the process applies to the specific material.
Zinc coating thickness to be a minimum of three (3) mils.

HARDWARE
Unless otherwise noted, bolts, nuts, washers, and thru–rods shall be mild steel, in accordance with ASTM A–307, and have a minimum of 1– 1 /2 inch of thread.

All hardware shall be hot dipped galvanized in accordance with ASTM A123–78.

Washers shall be used with all nuts and bolts which bear on wood or steel. Round plate washers shall be used on all thru–rods bearing on wood surfaces. Cut washers shall be used on all surfaces bearing on steel surfaces.

PORT OF Bremerton

JOB NO. 1–97042	revisions	
DATE May 5, 1997		
DESIGNED JFD		
DRAFTED GPD		
CHECKED		
SCALE NOT TO SCALE		

GENERAL AND ADDITIONAL FLOAT NOTES

DRAWING NO. B-6
SHEET NO. 6 OF 6

Exhibit C

PNO COPY

Peratrovich, Nottingham & Drage, Inc.

Engineering Consultants

811 First Avenue, Suite 260 • Seattle, WA 98104 • (206) 624-1387 • Fax (206) 624-1388

October 17, 1997

PN&D 97416.03

Mr. Joseph P. O'Leary
Director, Engineering and Airport Operations
Port of Bremerton
8850 SW State Hwy. 3
Port Orchard, WA 98367

Re: Port Orchard Marina Inspection

Dear Joe:

Attached, please find one stamped original of the full size design drawings from Bellingham Marine for the **roof construction**. I have retained one set and one set is at the field office at Port Orchard. These plans have been reviewed for conformance with the B-Alternate Bid. The plans have been stamped "Approved as Noted". All submitted plan sheets were signed and sealed with professional engineer stamps by Craig S. Funston and David E. Peyton.

The attached memo provides specific comments regarding the design drawings, all of these comments were presented in the last submittal, which was returned September 12, but have not been addressed in this submittal.

It is recommended that the Port consider not allowing construction of the roof to proceed until technical specifications and erection requirements are provided as the memo notes. PN&D is concerned that without technical erection and material requirements that the roof will not be constructed as required by design. Also, without this information, PN&D has no means to verify correct installation as part of a quality assurance program.

If you have any questions, please feel free to contact me.

Sincerely,

PERATROVICH, NOTTINGHAM & DRAGE INC.

Todd Nottingham, P.E.
Project Manager

Bellingham Marine Roof Design Drawing Review Comments
10/17/97

These plans have been reviewed for geometric conformance with the B-Alternate Bid, constructability and for design intent. The plans have been marked "Approved as Noted".

Calculations

A complete calculation package has not been submitted for review. Various calculation summaries and assurances by the design engineer have been provided. Based upon review of the submitted information, it appears that the design engineers have accounted for most of the structural issues. However, PN&D still recommends that a complete comprehensive set of design calculations be provided to the Port.

Plan Set Review Comments

The following comments were noted on the last submittal with no response. These submittals are required.

1) Technical specifications are needed that address such items as material types and installation requirements. All standard specific items need to be addressed such as bolting requirements, welding, galvanizing, erection sequences etc.

2) Information on the roof deck and manufacturers recommendations for installation requirements is needed. Specific items that need to be addressed include allowable clear span and cantilever that will meet required uniform and concentrated loads. Also, details for splicing, lapping, sealant, screws etc. need to be provided.

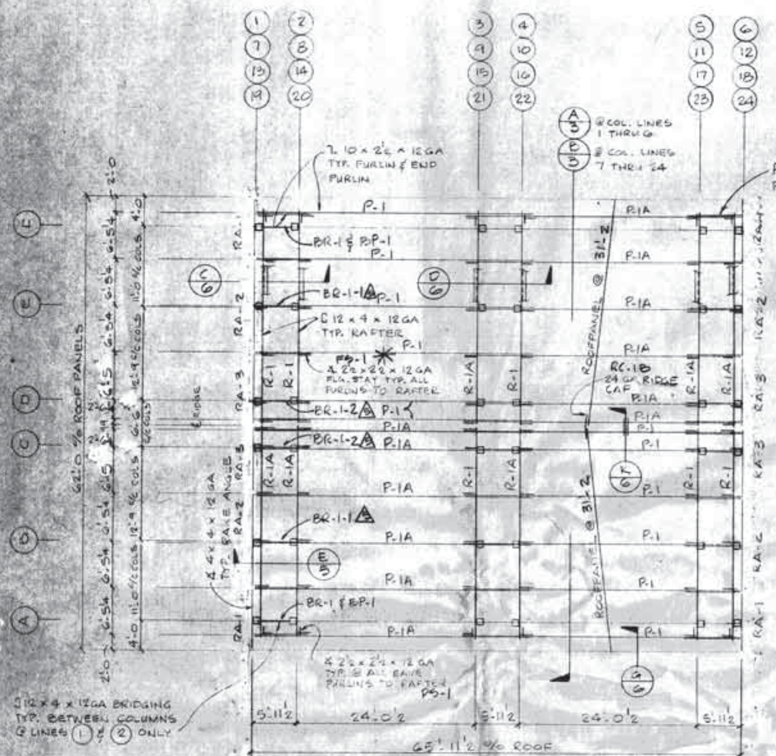
3) Bumpers to protect columns and vessels from impacts were required by the Alternate B Bid Set Plans (see sheet B-5).

4) Roof panel cutouts details sheet 1 of 1 show edge purlin offset at 2'6" Section details throughout remainder of plan set show 2'-0", for example G/4 on C-Dock.

5) Detail correction for C/2 and D/2 as previously noted and as described below were not addressed.

   Dock C sheet 2 of 6 - Section C/2 - This detail shows a gap between the rub strip and finger waler. What is gap? - Comment typical on all roof cover plans.

   Dock C sheet 2 of 6 - Section D/2 - The base plate needs to be sized. There appears to be a conflict between finger thru rods and column base plate bolts. Comment typical on all roof cover plans.

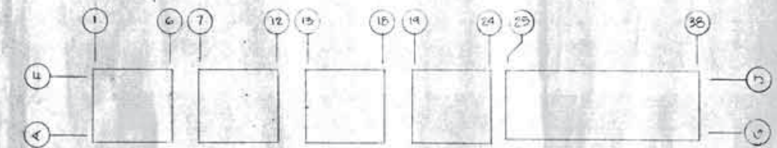


ROOF FRAMING PLAN

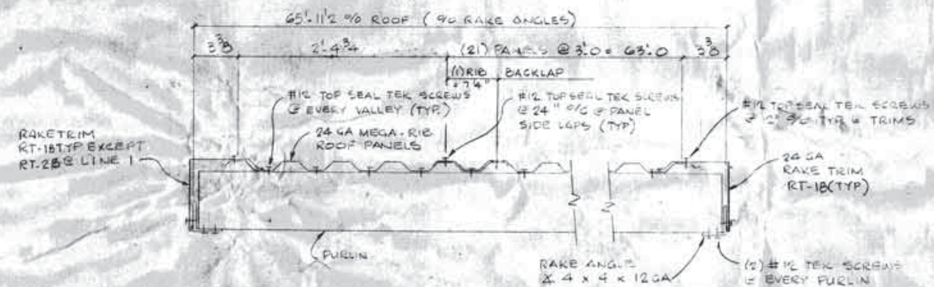
@ 28' SLIPS

NOTE: USE FLG. STAY FS-1-1 TYP @ LINES (C) & (D)

NOTE: USE PURLINS P-1-1 AND P-1-1A IN LIEU OF P-1 AND P-1A @ ROOF W/ E.W. LINES 1 ~ 6.



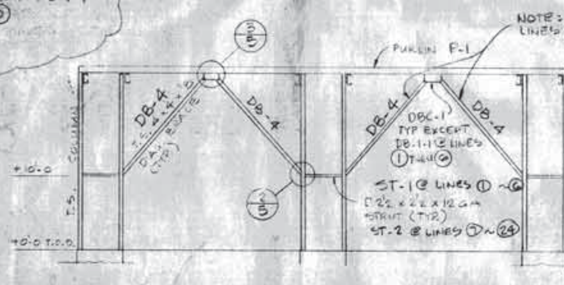
DOCK 'B' KEY PLAN



ROOF PANEL APPLICATION

@ 28' SLIPS

NOTE: USE DB-4-1 @ LINES (1) THRU (6)



WALKWAY BRACING ELEVATION

TYP. @ LINES (C) & (D)

COLUMN PIECE MARKS

COL LINE	1	2	3	4	5	6
F	C-1-1A	C-1-2A	C-1A	C-1	C-1A	C-1
E	C-2-1A	C-2	C-2A	C-2	C-2A	C-2
D	C-3-1A	C-3-2	C-3-2A	C-3-2	C-3-2A	C-3-2
C	C-3-1	C-3-2A	C-3-2	C-3-2A	C-3-2	C-3-2A
B	C-2-1	C-2A	C-2	C-2A	C-2	C-2A
A	C-1-1	C-1-2A	C-1	C-1A	C-1	C-1A

COL. LINE	7 13 19	8 14 20	9 15 21	10 16 22	11 17 23	12 18 24
F	C-1A	C-1	C-1A	C-1	C-1A	C-1
E	C-2A	C-2	C-2A	C-2	C-2A	C-2
D	C-3A	C-3	C-3A	C-3	C-3A	C-3
C	C-3	C-3A	C-3	C-3A	C-3	C-3A
B	C-2	C-2A	C-2	C-2A	C-2	C-2A
A	C-1	C-1A	C-1	C-1A	C-1	C-1A

JOB NO. 97418 DATE 10/17/97
PERATROVICH, NOTTINGHAM & DRAGE, INC.
☐ APPROVED
☑ APPROVED AS NOTED See attached note
☐ REVISE AND RESUBMIT
☐ REJECTED
CHECKED BY TN

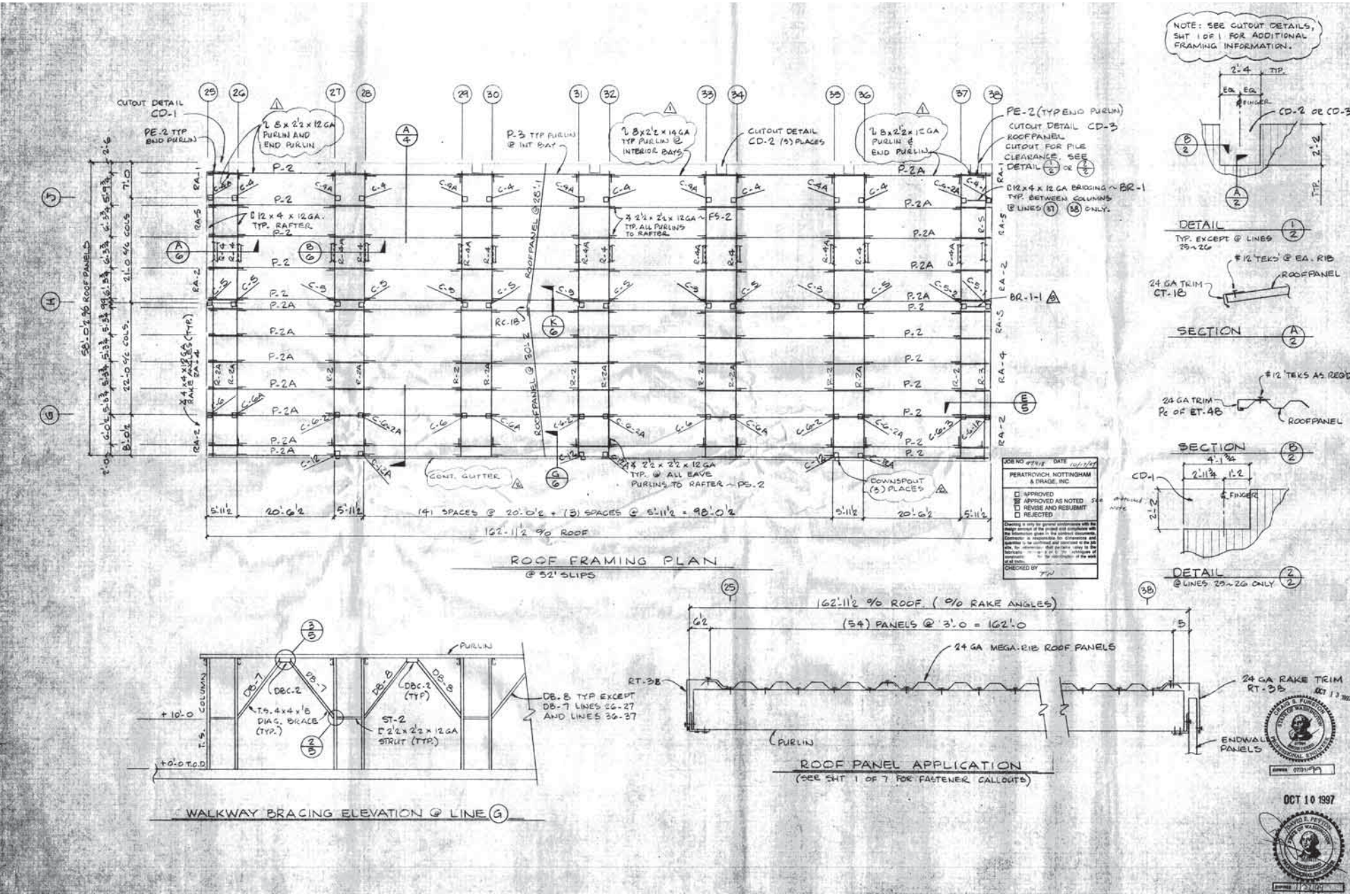
ORIGINAL ?

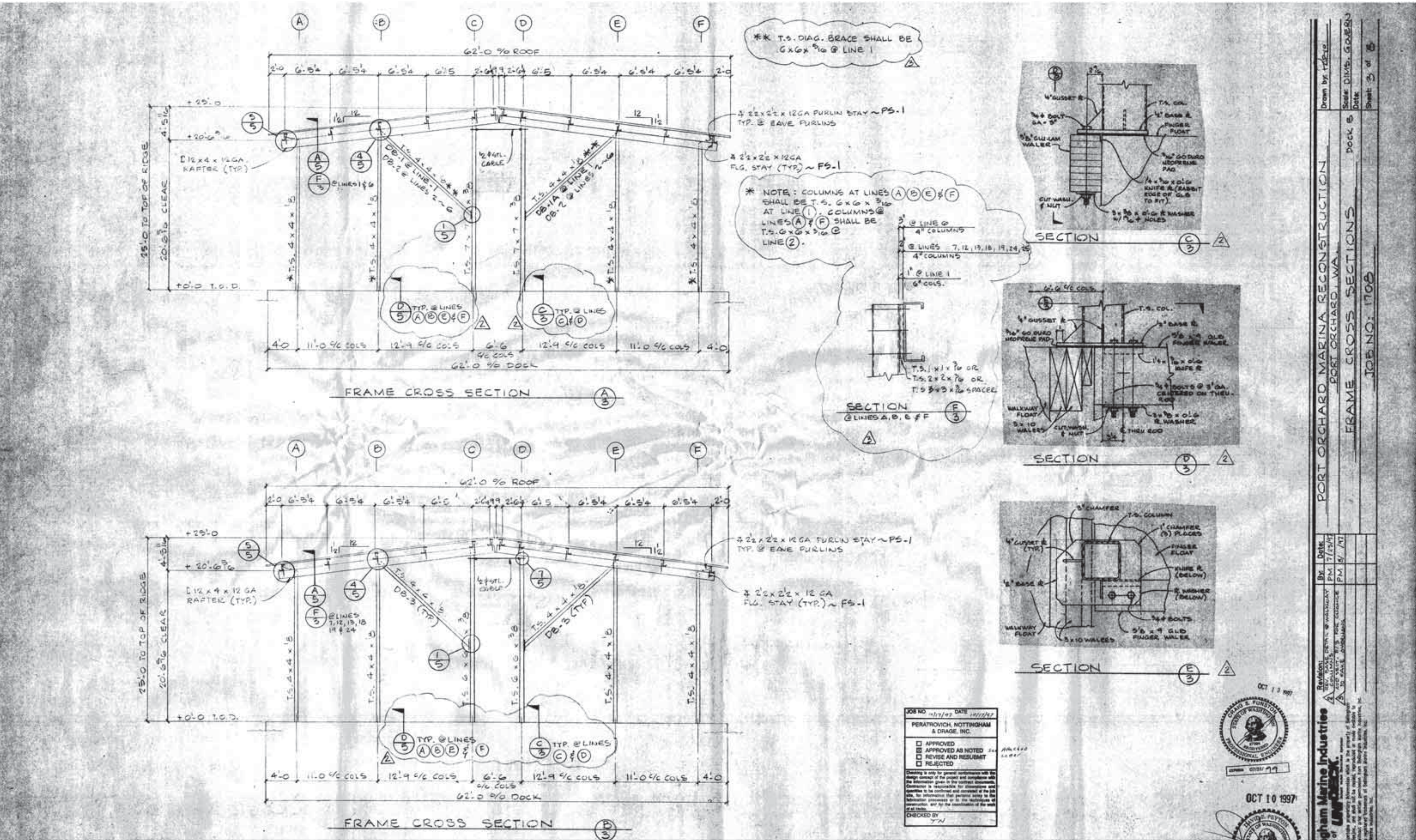
OCT 10 1997

PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
DOCK 'B' ROOF FRAMING PLAN - 28' SLIPS
JOB NO.: 1708

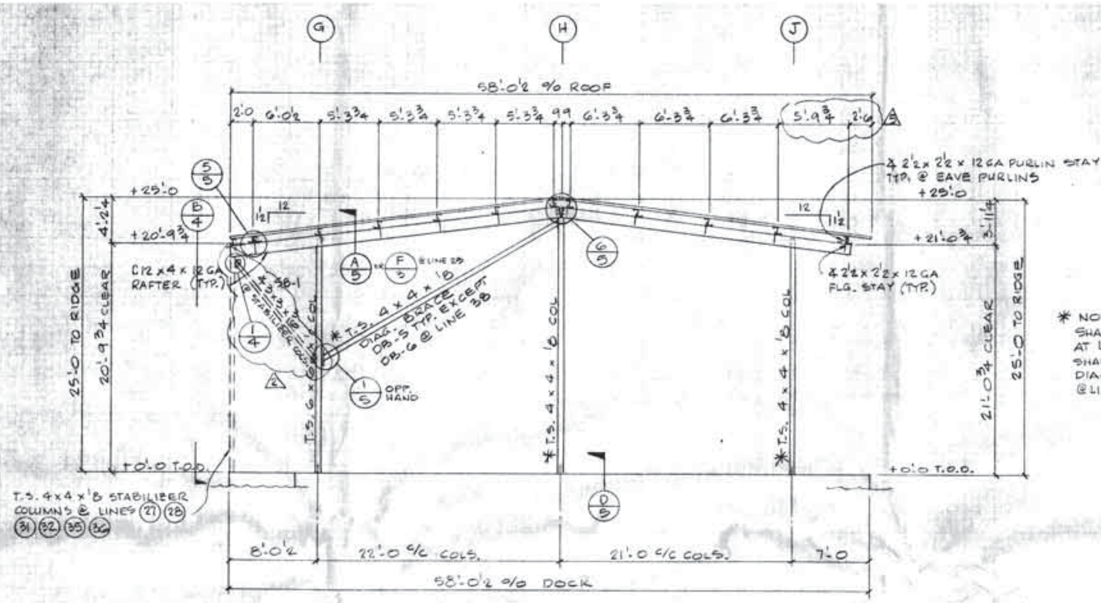
Drawn by:
Scale: DIMS. GOVERN
Date:
Sheet: 1 of 8

Bellingham Marine Industries
Builders of UNIDECK


CUTOUT DETAIL CD-1
PE-2 TYP END PURLIN
2 8x2½x12GA PURLIN AND END PURLIN
P.3 TYP PURLIN @ INT BAY
2 8x2½x14GA TYP PURLIN @ INTERIOR BAYS
CUTOUT DETAIL CD-2 (9) PLACES
2 8x2½x12GA PURLIN @ END PURLIN
PE-2 (TYP END PURLIN)
CUTOUT DETAIL CD-3
ROOF PANEL CUTOUT FOR PILE CLEARANCE, SEE DETAIL 1/2 OR 2/2
C12x4x12GA BRIDGING ~ BR-1 TYP. BETWEEN COLUMNS @ LINES 37 38 ONLY.
C 12x4x12GA. TYP. RAFTER P-2
2½x2½x12GA ~ FS-2 TYP. ALL PURLINS TO RAFTER
ROOF PANEL @ 25:1
ROOF PANEL @ 30:12
RC-1B
BR-1-1
CONT. GUTTER
2½x2½x12GA TYP. @ ALL EAVE PURLINS TO RAFTER ~ PS-2
DOWNSPOUT (3) PLACES
141 SPACES @ 20'-0½ + (3) SPACES @ 5'-11½ = 98'-0½
162'-11½ o/o ROOF
ROOF FRAMING PLAN @ 52' SLIPS
JOB NO 97918 DATE 10/1/97
PERATROVICH, NOTTINGHAM & DRAKE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
CHECKED BY TJN
NOTE: SEE CUTOUT DETAILS, SHT 1 OF 1 FOR ADDITIONAL FRAMING INFORMATION.
2'-4 TYP.
EQ. EQ.
4" FINGER
CD-2 OR CD-3
2'-2
DETAIL 1/2 TYP. EXCEPT @ LINES 25~26
#12 TEKS @ EA. RIB
ROOF PANEL
24 GA TRIM CT-1B
SECTION A/2
#12 TEKS AS REQ'D
24 GA TRIM PC OF ET-4B
ROOF PANEL
SECTION B/2
4'-1¾
2'-11¾
1'-2
4" FINGER
CD-1
2'-2
DETAIL 2/2 @ LINES 25~26 ONLY
PURLIN
DB-7
DBC-2
DB-8
DBC-2 (TYP)
DB-8
T.S. 4x4x⅛ DIAG. BRACE (TYP.)
ST-2 C2½x2½x12GA STRUT (TYP)
DB-8 TYP EXCEPT DB-7 LINES 26-27 AND LINES 36-37
+10'-0 COLUMN
T.S.
+0'-0 T.O.D
WALKWAY BRACING ELEVATION @ LINE G
162'-11½ o/o ROOF. (o/o RAKE ANGLES)
(54) PANELS @ 3'-0 = 162'-0
24 GA MEGA-RIB ROOF PANELS
RT-3B
24 GA RAKE TRIM RT-3B
PURLIN
ENDWALL PANELS
ROOF PANEL APPLICATION
(SEE SHT 1 OF 7 FOR FASTENER CALLOUTS)
OCT 10 1997
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
DOCK 'B' ROOF FRAMING PLAN ~ 52' SLIPS
JOB NO: 1708
Sheet: 2 of 8
Bellingham Marine Industries
Builders of Uniflote

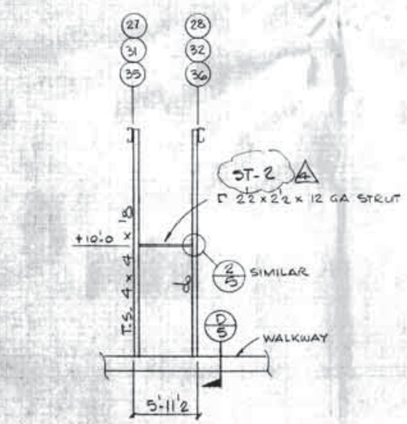


FRAME CROSS SECTION A/3
FRAME CROSS SECTION B/3
62'-0 o/o ROOF
62'-0 o/o DOCK
25'-0 TO TOP OF RIDGE
20'-6 3/16 CLEAR
+0'-0 T.O.D.
** T.S. DIAG. BRACE SHALL BE 6x6x 5/16 @ LINE 1
* NOTE: COLUMNS AT LINES A, B, E & F SHALL BE T.S. 6x6x 5/16 AT LINE 1. COLUMNS @ LINES A & F SHALL BE T.S. 6x6x 5/16 @ LINE 2.
4 2½x2½x 12GA PURLIN STAY ~ PS-1 TYP. @ EAVE PURLINS
4 2½x2½ x 12GA FLG. STAY (TYP.) ~ FS-1
[12x4x 12GA RAFTER (TYP.)
SECTION C/3
SECTION D/3
SECTION E/3
SECTION F/3 @ LINES A, B, E & F
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
FRAME CROSS SECTIONS
JOB NO. 1708
DOCK 6
Sheet: 3 of 8
Bellingham Marine Industries
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
OCT 10 1997

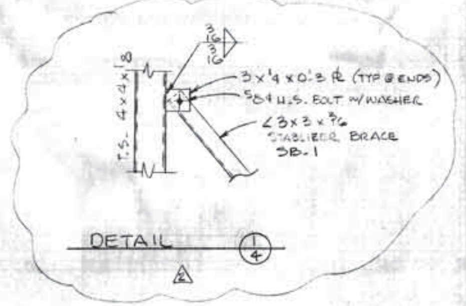


FRAME CROSS SECTION (A/4)

* NOTE: COLUMNS AT LINES (H) & (J) SHALL BE T.S. 6 x 6 x 5/16 AT LINE (38). COLUMN @ LINE (J) SHALL BE T.S. 6x6x 5/16 @ LINE (37). DIAG. BRACE SHALL BE T.S. 6x6x5/16 @ LINE (38).



SECTION (B/4)



DETAIL (1/4)

JOB NO. 97918 DATE 10/17/97
PERATROVICH, NOTTINGHAM & DRAGE, INC.
☐ APPROVED
☒ APPROVED AS NOTED — See Attached Letter
☐ REVISE AND RESUBMIT
☐ REJECTED
CHECKED BY TN

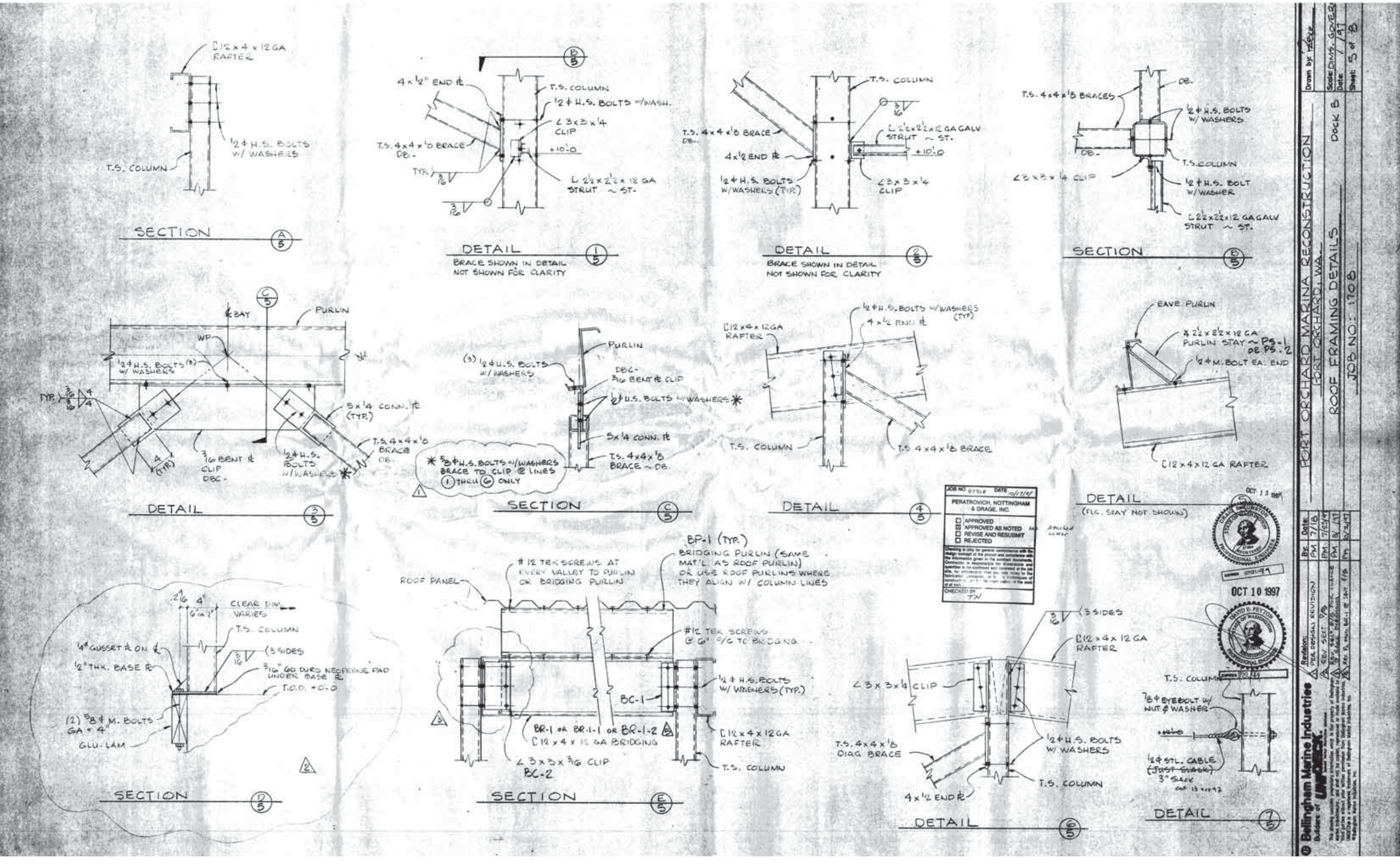
OCT 1 7 1997

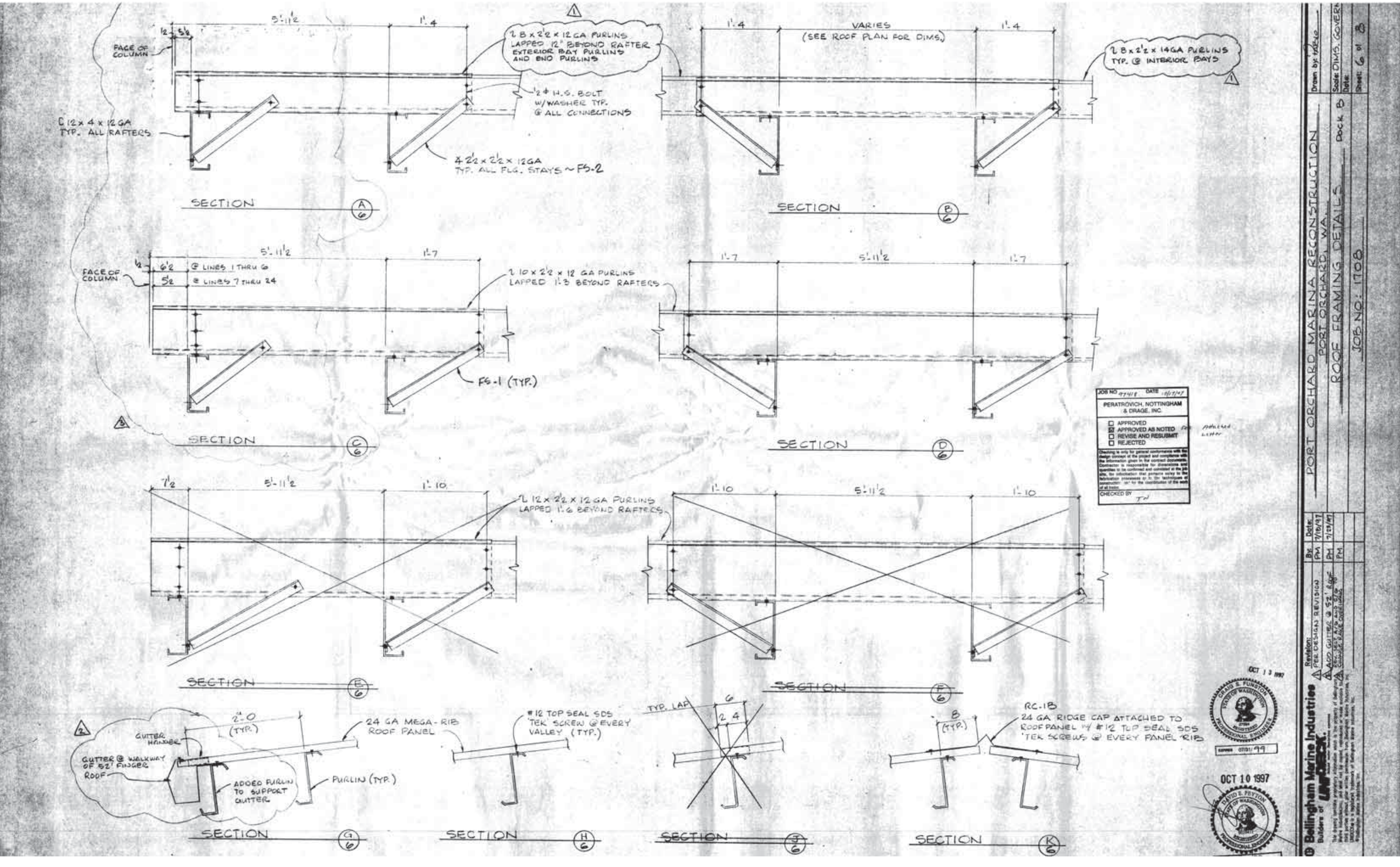
OCT 10 1997

Bellingham Marine Industries

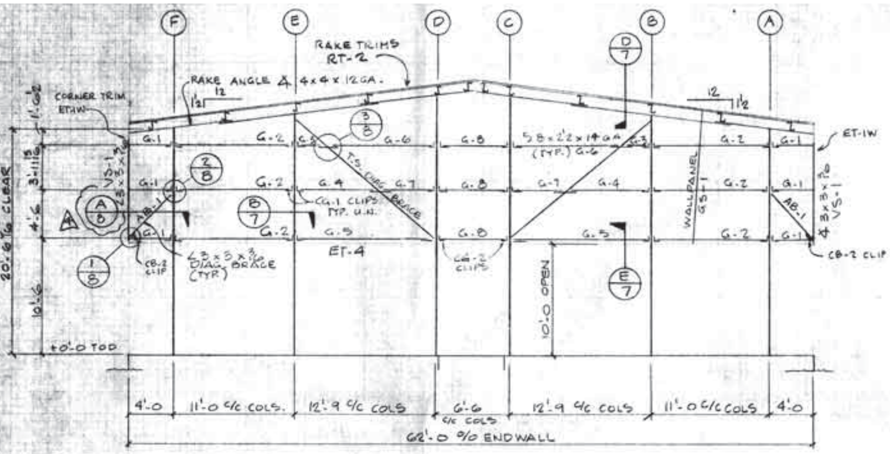
Revisions:
1. ADD BRACE — PM 7/29/97
2. ADD SHEET PE ... — PM 9/4/97
3. REV. PURLIN SPLICES — PM 10/8/97

PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
FRAME CROSS SECTIONS
JOB NO: 1708
DOCK B
Scale: DIMS. GOVERN
Sheet: 4 of 8

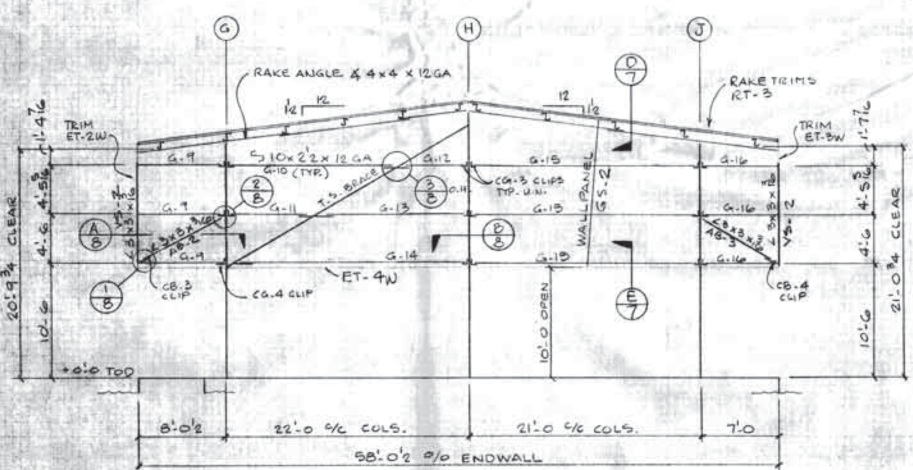

[ ]12 x 4 x 12 GA RAFTER
1/2 ф H.S. BOLTS W/ WASHERS
T.S. COLUMN
SECTION A/5
4 x 1/2" END PL
T.S. COLUMN
1/2 ф H.S. BOLTS W/WASH.
∠ 3x3x1/4 CLIP
T.S. 4x4x1/8 BRACE DB.
+10'-0
L 2 1/2 x 2 1/2 x 12 GA STRUT ~ ST-
DETAIL 1/5
BRACE SHOWN IN DETAIL NOT SHOWN FOR CLARITY
T.S. COLUMN
T.S. 4x4x1/8 BRACE DB.
4x1/2 END PL
1/2 ф H.S. BOLTS W/WASHERS (TYP.)
L 2 1/2 x 2 1/2 x 12 GA GALV STRUT ~ ST.
+10'-0
∠ 3x3x1/4 CLIP
DETAIL 2/5
BRACE SHOWN IN DETAIL NOT SHOWN FOR CLARITY
T.S. 4x4x1/8 BRACES
DB.
1/2 ф H.S. BOLTS W/ WASHERS
T.S. COLUMN
∠ 3x3x1/4 CLIP
1/2 ф H.S. BOLT W/ WASHER
[ ]2 1/2 x 2 1/2 x 12 GA GALV STRUT ~ ST.
SECTION B/5
℄ BAY
PURLIN
WP
1/2 ф H.S. BOLTS (3) W/ WASHERS
5x1/4 CONN. PL (TYP.)
T.S. 4x4x1/8 BRACE DB.
3/16 BENT PL CLIP DBC-
1/2 ф H.S. BOLTS W/WASHERS
DETAIL 3/5
PURLIN
(3) 1/2 ф H.S. BOLTS W/ WASHERS
DBC- 3/16 BENT PL CLIP
1/2 ф H.S. BOLTS W/WASHERS *
5x1/4 CONN. PL
T.S. 4x4x1/8 BRACE ~ DB.
* 5/8 ф H.S. BOLTS W/WASHERS BRACE TO CLIP @ LINES 1 THRU 6 ONLY
SECTION C/5
1/2 ф H.S. BOLTS W/WASHERS (TYP)
4x1/2 END PL
[ ]12x4x12GA RAFTER
T.S. COLUMN
T.S. 4x4x1/8 BRACE
DETAIL 4/5
EAVE PURLIN
∠ 2 1/2 x 2 1/2 x 12 GA PURLIN STAY ~ PS-1 OR PS-2
1/2 ф M. BOLT EA. END
[ ]12 x 4 x 12 GA RAFTER
DETAIL 7/5
(FLG. STAY NOT SHOWN)
JOB NO. DATE
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
CHECKED BY TN
OCT 10 1997
CLEAR DIM. VARIES
T.S. COLUMN
1/4" GUSSET PL ON ℄
1/2" THK. BASE PL
(3 SIDES)
3/16" 60 DURO NEOPRENE PAD UNDER BASE PL
T.O.D. +0'-0
(2) 5/8 ф M. BOLTS GA = 4"
GLU-LAM
SECTION D/5
BP-1 (TYP.)
BRIDGING PURLIN (SAME MAT'L AS ROOF PURLIN) OR USE ROOF PURLINS WHERE THEY ALIGN W/ COLUMN LINES
12 TEK SCREWS AT EVERY VALLEY TO PURLIN OR BRIDGING PURLIN
ROOF PANEL
#12 TEK SCREWS @ 6" O/C TO BRIDGING
1/2 ф H.S. BOLTS W/ WASHERS (TYP.)
BC-1
BR-1 OR BR-1-1 OR BR-1-2
[ ]12 x 4 x 12 GA BRIDGING
[ ]12x4x12GA RAFTER
∠ 3x3x3/16 CLIP BC-2
T.S. COLUMN
SECTION E/5
(3 SIDES)
[ ]12 x 4 x 12 GA RAFTER
∠ 3x3x1/4 CLIP
T.S. 4x4x1/8 DIAG BRACE
1/2 ф H.S. BOLTS W/ WASHERS
T.S. COLUMN
4x1/2 END PL
DETAIL 6/5
T.S. COLUMN
7/8 ф EYEBOLT W/ NUT & WASHER
1/2 ф STL. CABLE (JUST SLACK) 3" SLACK
DETAIL 7/5
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ROOF FRAMING DETAILS
DOCK B
JOB NO: 1708
Bellingham Marine Industries
Builders of UNIDECK
Sheet: 5 of 8



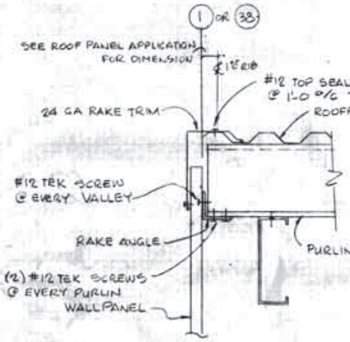
5'-11½
1'-4
FACE OF COLUMN
2 8 x 2½ x 12 GA PURLINS LAPPED 12" BEYOND RAFTER EXTERIOR BAY PURLINS AND END PURLINS
½ϕ H.S. BOLT W/WASHER TYP. @ ALL CONNECTIONS
C 12 x 4 x 12 GA TYP. ALL RAFTERS
4 2½ x 2½ x 12GA TYP. ALL FLG. STAYS ~ FS-2
SECTION A/6
VARIES (SEE ROOF PLAN FOR DIMS.)
2 8 x 2½ x 14GA PURLINS TYP. @ INTERIOR BAYS
SECTION B/6
6½ @ LINES 1 THRU 6
5½ @ LINES 7 THRU 24
1'-7
2 10 x 2½ x 12 GA PURLINS LAPPED 1'-3 BEYOND RAFTERS
FS-1 (TYP.)
SECTION C/6
SECTION D/6
7½
1'-10
2 12 x 2½ x 12 GA PURLINS LAPPED 1'-6 BEYOND RAFTERS
SECTION E/6
SECTION F/6
2'-0 (TYP.)
GUTTER HANGER
GUTTER @ WALKWAY OF 52' FINGER ROOF
ADDED PURLIN TO SUPPORT GUTTER
24 GA MEGA-RIB ROOF PANEL
PURLIN (TYP.)
SECTION G/6
#12 TOP SEAL SDS TEK SCREW @ EVERY VALLEY (TYP.)
SECTION H/6
TYP. LAP
6
2 4
SECTION J/6
8 (TYP.)
RC-1B
24 GA RIDGE CAP ATTACHED TO ROOF PANEL W/ #12 TOP SEAL SDS TEK SCREWS @ EVERY PANEL RIB
SECTION K/6
JOB NO 97418 DATE 10/7/97
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
CHECKED BY
OCT 13 1997
OCT 10 1997
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ROOF FRAMING DETAILS
DOCK B
JOB NO: 1708
Sheet: 6 of 8
Bellingham Marine Industries
Revision:
PER DESIGN REVISION
By: PM Date: 7/18/97



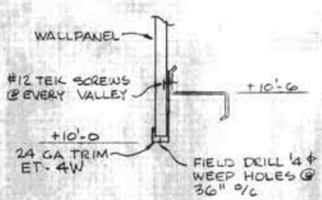
ENDWALL ELEVATION @ LINE (1)



ENDWALL ELEVATION @ LINE (38)



SECTION (D/7)



SECTION (E/7)

PERATROVICH, NOTTINGHAM & DRAGE, INC.

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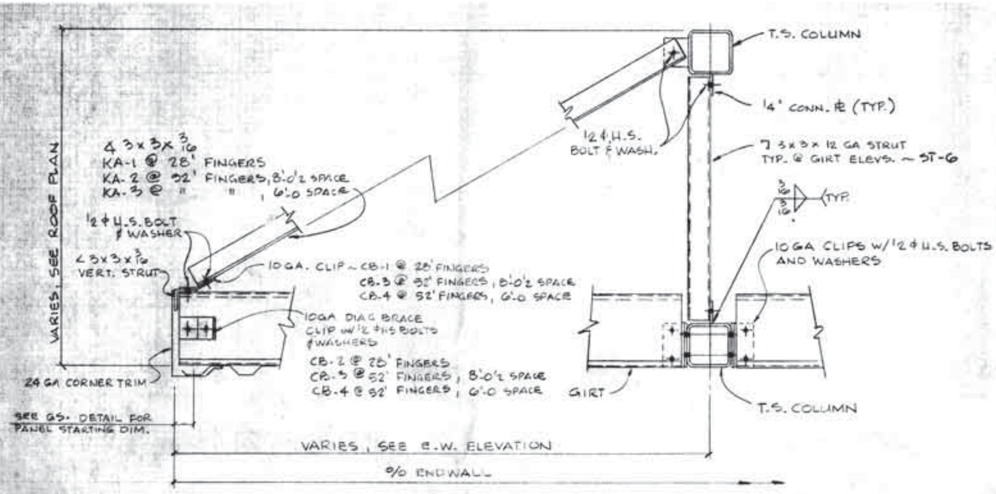
☐ REVISE AND RESUBMIT
☐ REJECTED

CHECKED BY

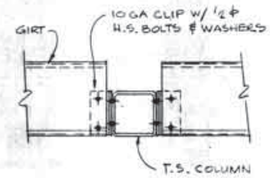
OCT 10 1997

Bellingham Marine Industries

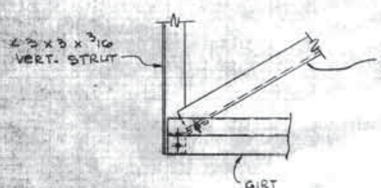
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ENDWALL ELEVATIONS
JOB NO: 1708
DOCK B
Sheet: 7 of 8


T.S. COLUMN
1/4" CONN. ℞ (TYP.)
1/2 ϕ H.S. BOLT & WASH.
7 3x3x12 GA STRUT TYP. @ GIRT ELEVS. ~ ST-6
∠ 3x3x3/16
KA-1 @ 28' FINGERS
KA-2 @ 32' FINGERS, 8'-0 1/2 SPACE
KA-3 @ " , 6'-0 SPACE
1/2 ϕ H.S. BOLT & WASHER
∠ 3x3x3/16 VERT. STRUT
VARIES, SEE ROOF PLAN
10 GA. CLIP ~ CB-1 @ 28' FINGERS
CB-3 @ 32' FINGERS, 8'-0 1/2 SPACE
CB-4 @ 32' FINGERS, 6'-0 SPACE
10 GA CLIPS W/ 1/2 ϕ H.S. BOLTS AND WASHERS
10GA DIAG BRACE CLIP W/ 1/2 ϕ H.S BOLTS & WASHERS
CB-2 @ 28' FINGERS
CB-3 @ 32' FINGERS, 8'-0 1/2 SPACE
CB-4 @ 32' FINGERS, 6'-0 SPACE
24 GA CORNER TRIM
GIRT
T.S. COLUMN
SEE GS- DETAIL FOR PANEL STARTING DIM.
VARIES, SEE E.W. ELEVATION
O/O ENDWALL

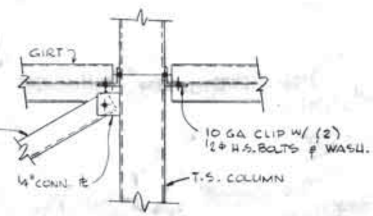
SECTION (A/8)



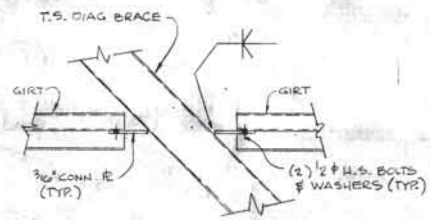
SECTION (B/8)



DETAIL (1/8)



DETAIL (2/8)



DETAIL (3/8)

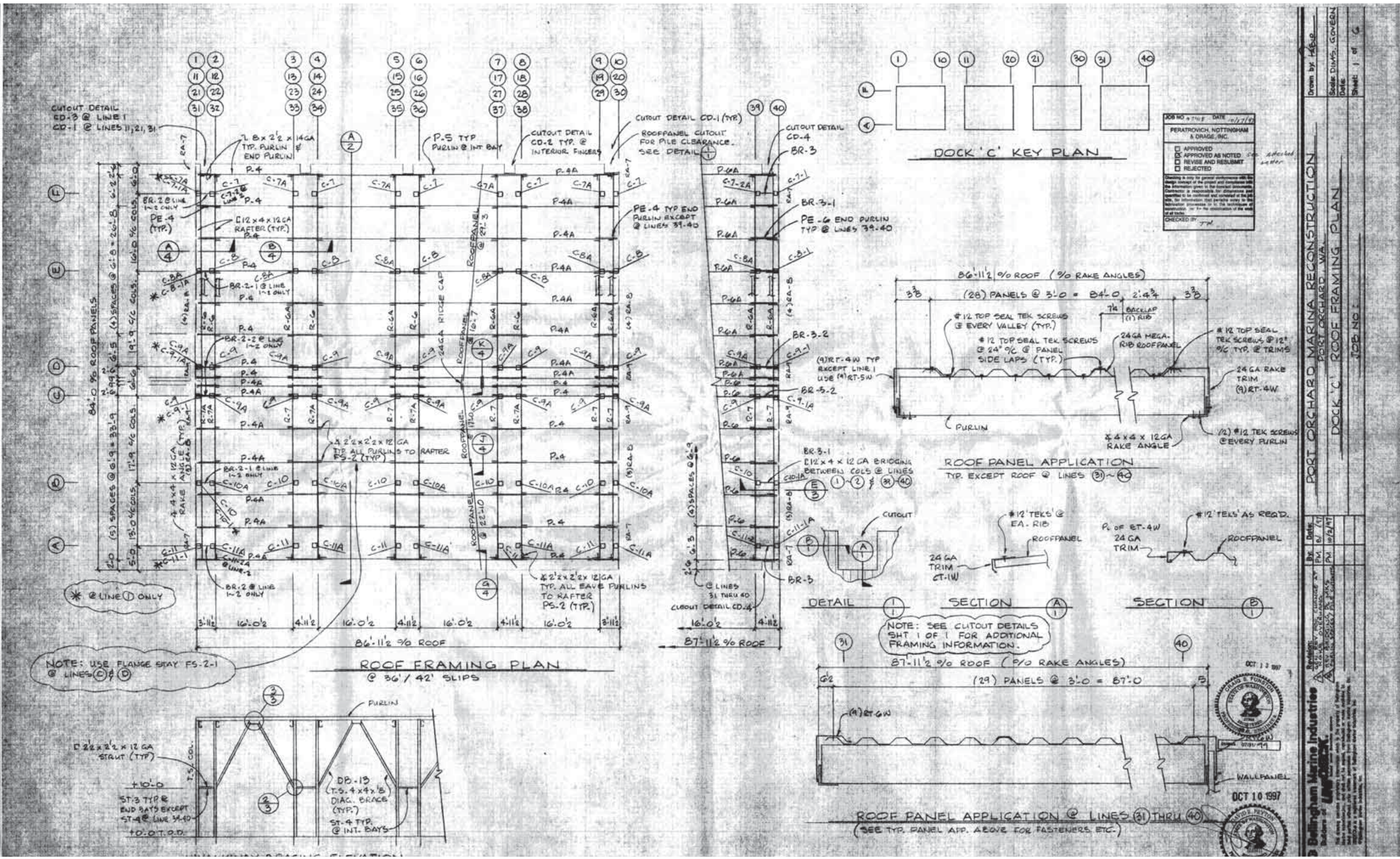
JOB NO. 97418 DATE 10/17/97
PERATROVICH, NOTTINGHAM & DRAGE, INC.
☐ APPROVED
☒ APPROVED AS NOTED
☐ REVISE AND RESUBMIT
☐ REJECTED
CHECKED BY TH

OCT 10 1997

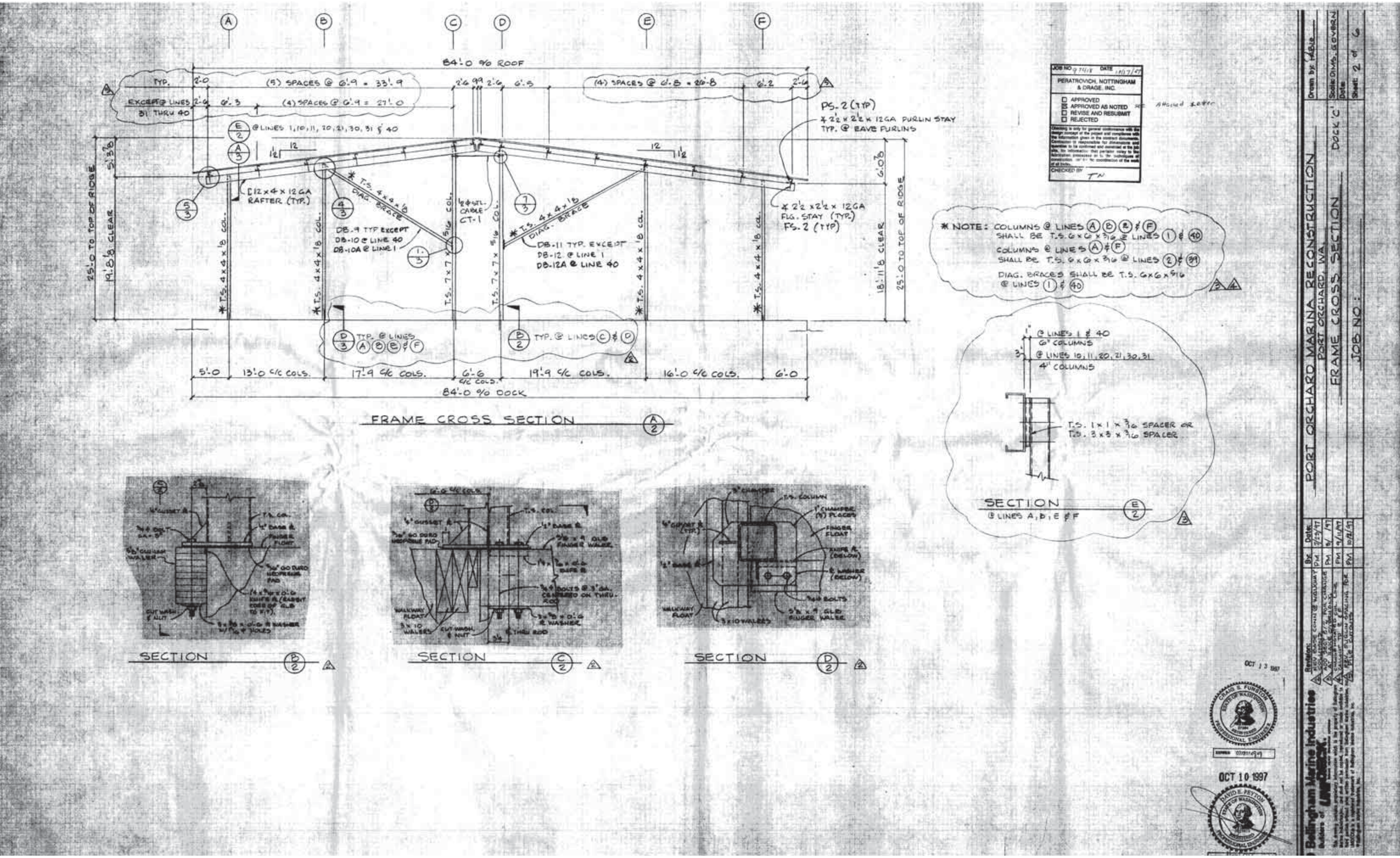
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ENDWALL FRAMING DETAILS
DOCK 'B'
JOB NO. 1708

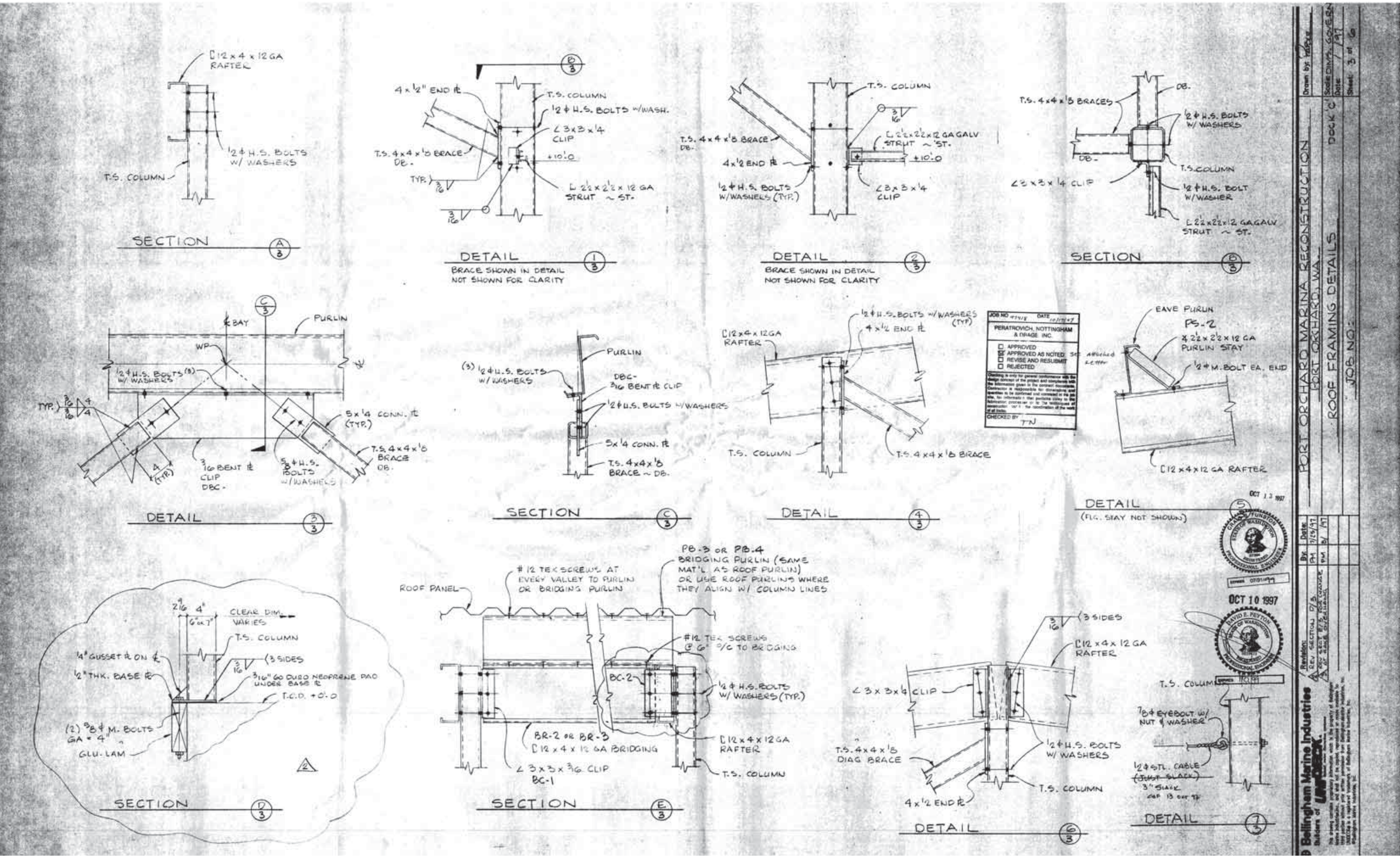
Drawn by:
Scale: DIMS. GOVERN
Date:
Sheet: 8 of 8

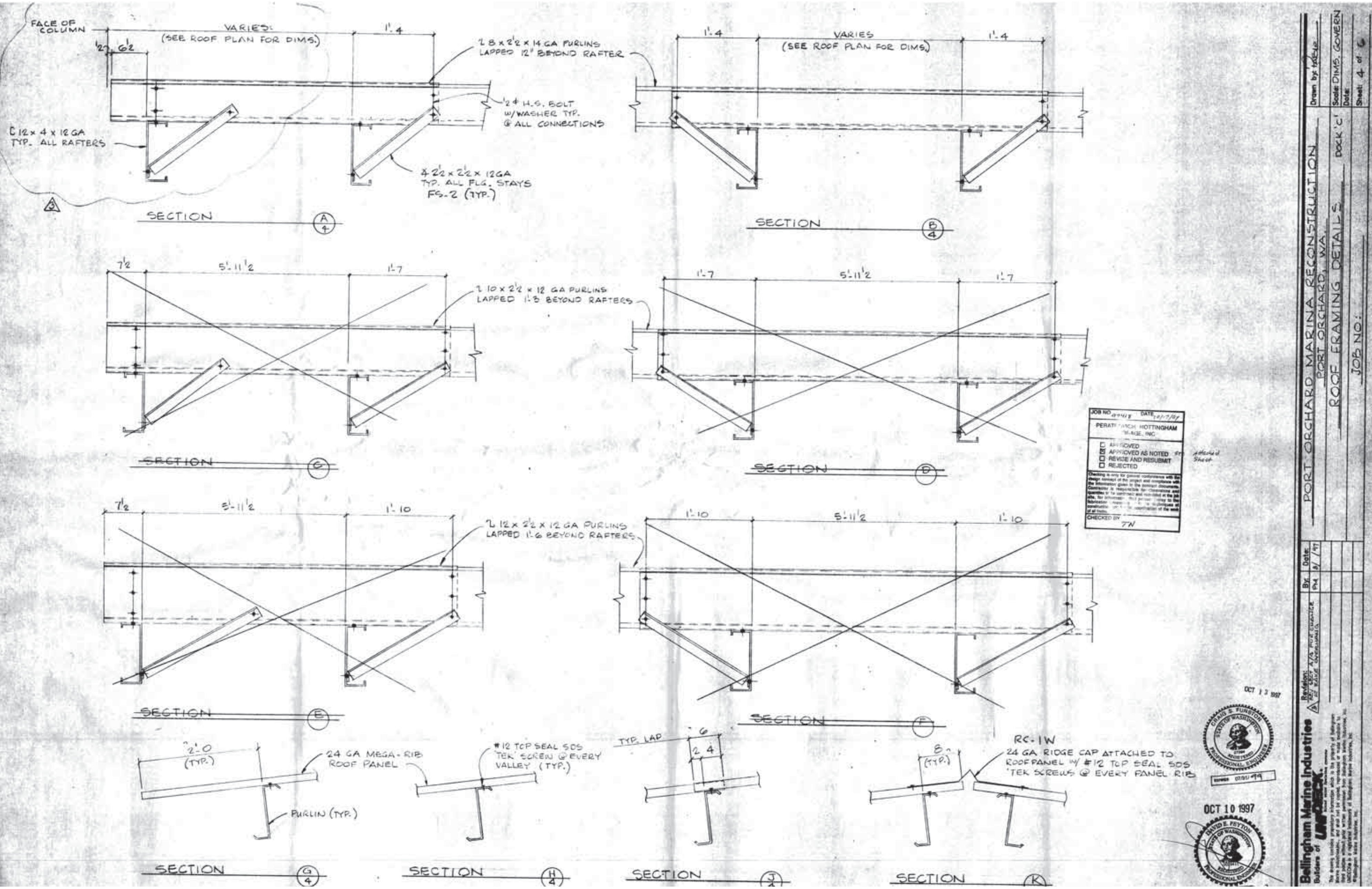
Bellingham Marine Industries
Builders of UNIFLOAT

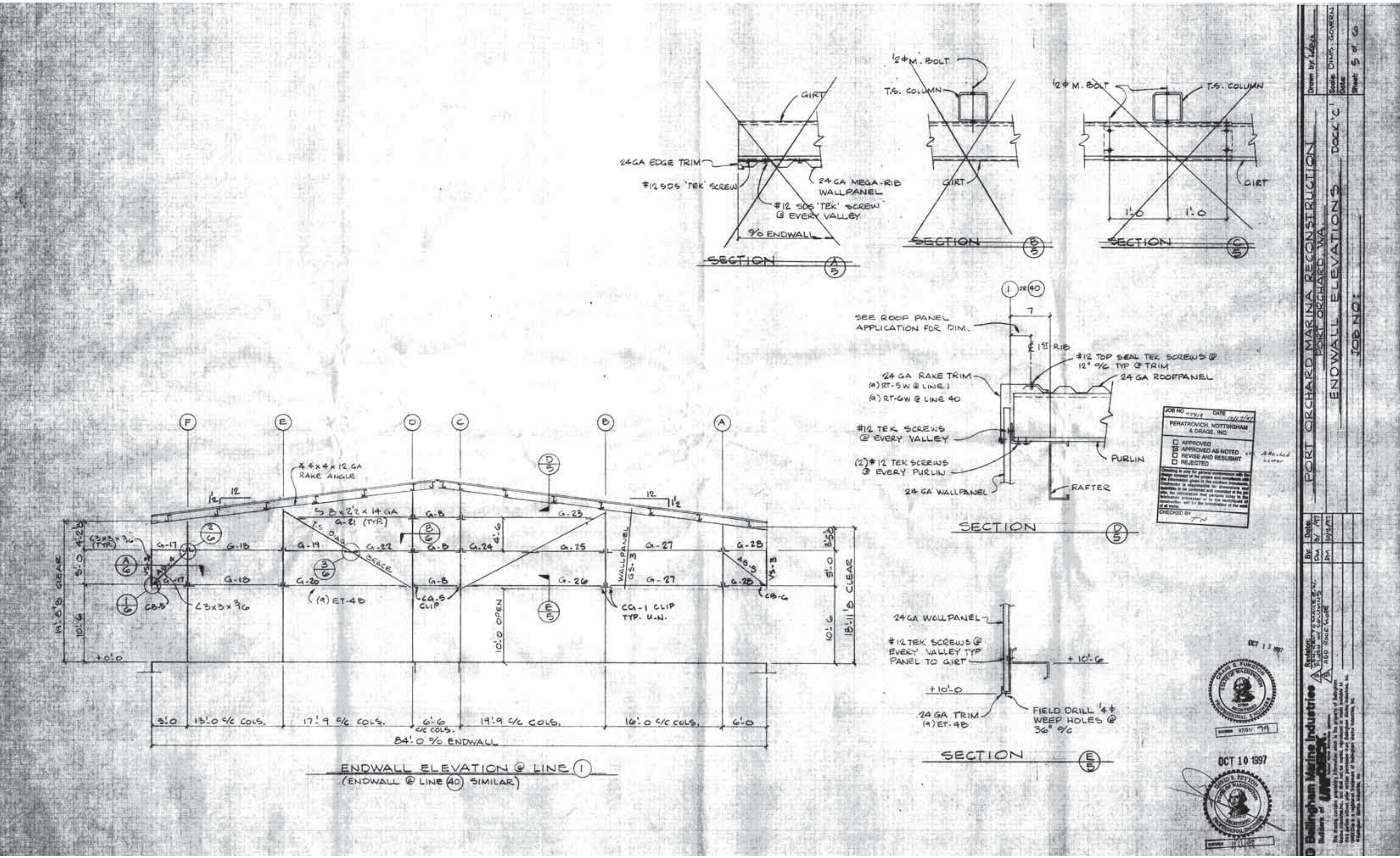


ROOF FRAMING PLAN
@ 36' / 42' SLIPS
DOCK 'C' KEY PLAN
ROOF PANEL APPLICATION
TYP. EXCEPT ROOF @ LINES 31 ~ 40
ROOF PANEL APPLICATION @ LINES 31 THRU 40
(SEE TYP. PANEL APP. ABOVE FOR FASTENERS ETC.)
86'-11½ o/o ROOF (o/o RAKE ANGLES)
(28) PANELS @ 3'-0 = 84'-0
87'-11½ o/o ROOF (o/o RAKE ANGLES)
(29) PANELS @ 3'-0 = 87'-0
86'-11½ o/o ROOF
87'-11½ o/o ROOF
DETAIL 1
SECTION A
SECTION B
NOTE: SEE CUTOUT DETAILS SHT 1 OF 1 FOR ADDITIONAL FRAMING INFORMATION.
NOTE: USE FLANGE STAY FS-2-1 @ LINES C & D
* @ LINE 1 ONLY
CUTOUT DETAIL CD-3 @ LINE 1
CD-1 @ LINES 11, 21, 31
CUTOUT DETAIL CD-1 (TYP)
ROOFPANEL CUTOUT FOR PILE CLEARANCE. SEE DETAIL
CUTOUT DETAIL CD-2 TYP. @ INTERIOR FINGERS
P-5 TYP PURLIN @ INT BAY
PE-4 TYP END PURLIN EXCEPT @ LINES 39-40
PE-6 END PURLIN TYP @ LINES 39-40
24 GA RIDGE CAP
#12 TOP SEAL TEK SCREWS @ EVERY VALLEY (TYP.)
#12 TOP SEAL TEK SCREWS @ 24" o/c @ PANEL SIDE LAPS (TYP.)
24 GA MEGA-RIB ROOFPANEL
24 GA RAKE TRIM (9) RT-4W
(2) #12 TEK SCREWS @ EVERY PURLIN
4x4x12GA RAKE ANGLE
PURLIN
ROOFPANEL
WALLPANEL
OCT 10 1997
DOCK 'C' ROOF FRAMING PLAN
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
Bellingham Marine Industries

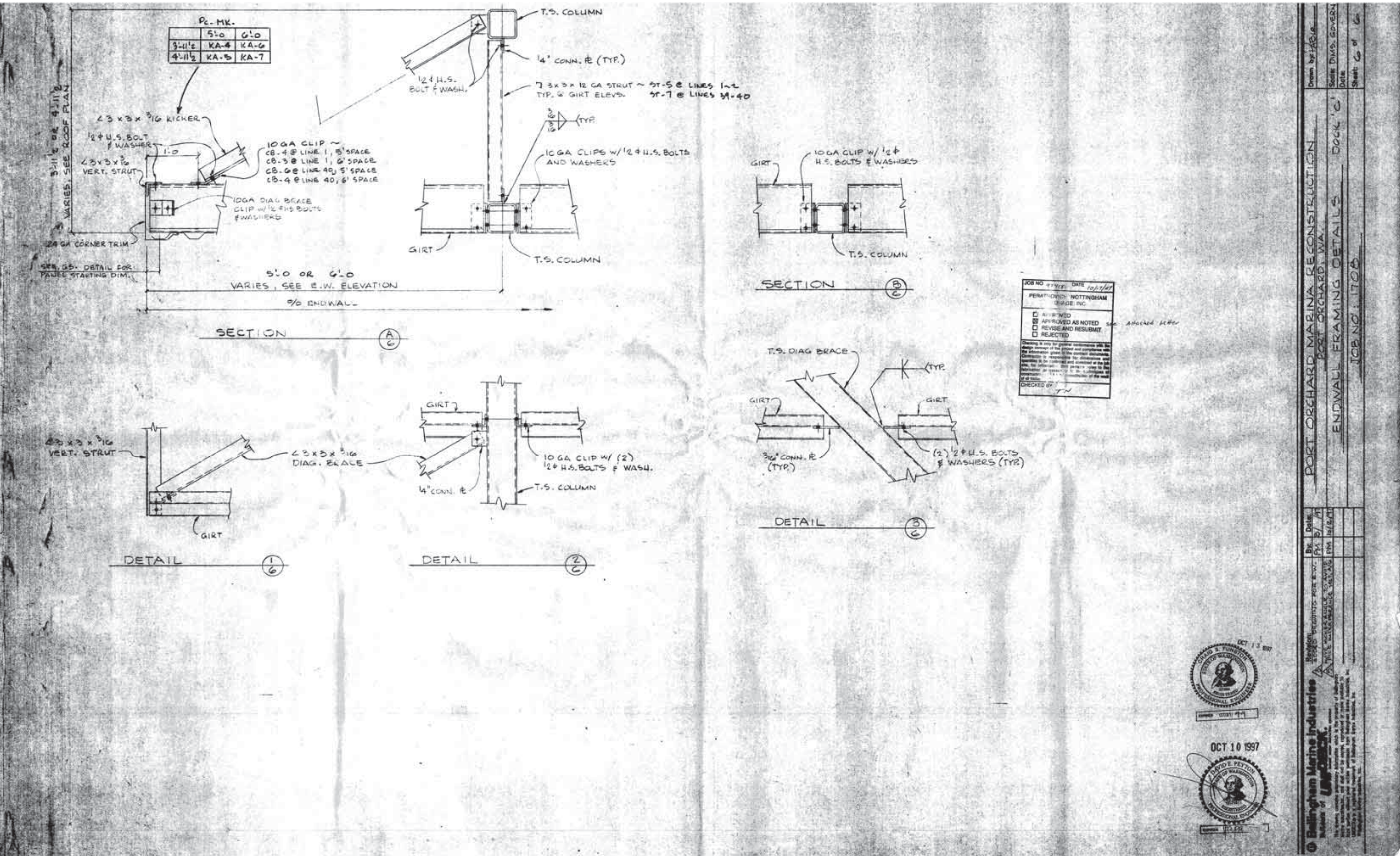

84'-0 o/o ROOF
(5) SPACES @ 6'-9 = 33'-9
(4) SPACES @ 6'-8 = 26'-8
EXCEPT @ LINES 31 THRU 40
(4) SPACES @ 6'-9 = 27'-0
@ LINES 1, 10, 11, 20, 21, 30, 31 & 40
PS-2 (TYP)
& 2½ x 2½ x 12GA PURLIN STAY TYP. @ EAVE PURLINS
[12 x 4 x 12 GA RAFTER (TYP.)
25'-0 TO TOP OF RIDGE
19'-8⅜ CLEAR
T.S. 4x4x⅛ DIAG. BRACE
DB-9 TYP EXCEPT
DB-10 @ LINE 40
DB-10A @ LINE 1
CABLE CT-1
T.S. 4x4x⅛ DIAG. BRACE
DB-11 TYP. EXCEPT
DB-12 @ LINE 1
DB-12A @ LINE 40
& 2½ x 2½ x 12GA FLG. STAY (TYP.) FS-2 (TYP)
18'-11⅛ CLEAR
25'-0 TO TOP OF RIDGE
* T.S. 4x4x⅛ COL.
T.S. 7x7x 5/16 COL.
TYP. @ LINES A B E & F
TYP. @ LINES C & D
5'-0
13'-0 c/c COLS.
17'-9 c/c COLS.
6'-6 c/c COLS.
19'-9 c/c COLS.
16'-0 c/c COLS.
6'-0
84'-0 o/o DOCK
FRAME CROSS SECTION
* NOTE: COLUMNS @ LINES A D E & F SHALL BE T.S. 6x6x5/16 @ LINES 1 & 40
COLUMNS @ LINES A & F SHALL BE T.S. 6x6x5/16 @ LINES 2 & 39
DIAG. BRACES SHALL BE T.S. 6x6x5/16 @ LINES 1 & 40
@ LINES 1 & 40 6" COLUMNS
@ LINES 10, 11, 20, 21, 30, 31 4" COLUMNS
T.S. 1x1x3/16 SPACER OR T.S. 3x3x3/16 SPACER
SECTION @ LINES A, D, E & F
SECTION
SECTION
SECTION
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
CHECKED BY
OCT 10 1997
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
FRAME CROSS SECTION
DOCK 'C'
JOB NO:
Bellingham Marine Industries
Sheet: 2 of 6


C12 x 4 x 12 GA RAFTER
1/2 ϕ H.S. BOLTS W/ WASHERS
T.S. COLUMN
SECTION A/3
4 x 1/2" END PL
T.S. COLUMN
1/2 ϕ H.S. BOLTS W/WASH.
∠3x3x1/4 CLIP
T.S. 4x4x1/8 BRACE - DB.
+10'-0
L 2 1/2 x 2 1/2 x 12 GA STRUT ~ ST.
DETAIL 1/3
BRACE SHOWN IN DETAIL NOT SHOWN FOR CLARITY
T.S. COLUMN
T.S. 4x4x1/8 BRACE DB.
L 2 1/2 x 2 1/2 x 12 GA GALV STRUT ~ ST.
+10'-0
4x1/2 END PL
1/2 ϕ H.S. BOLTS W/WASHERS (TYP.)
∠3x3x1/4 CLIP
DETAIL 2/3
BRACE SHOWN IN DETAIL NOT SHOWN FOR CLARITY
T.S. 4x4x1/8 BRACES
DB.
1/2 ϕ H.S. BOLTS W/ WASHERS
T.S. COLUMN
∠3x3x1/4 CLIP
1/2 ϕ H.S. BOLT W/WASHER
L 2 1/2 x 2 1/2 x 12 GA GALV STRUT ~ ST.
SECTION B/3
℄ BAY
PURLIN
WP
1/2 ϕ H.S. BOLTS (8) W/ WASHERS
5x1/4 CONN. PL (TYP.)
T.S. 4x4x1/8 BRACE DB.
3/16 BENT PL CLIP DBC-
5/8 ϕ H.S. BOLTS W/WASHERS
DETAIL 3/3
PURLIN
(3) 1/2 ϕ H.S. BOLTS W/ WASHERS
DBC- 3/16 BENT PL CLIP
1/2 ϕ H.S. BOLTS W/WASHERS
5x1/4 CONN. PL
T.S. 4x4x1/8 BRACE ~ DB.
SECTION C/3
1/2 ϕ H.S. BOLTS W/WASHERS (TYP)
4x1/2 END PL
C12x4x12GA RAFTER
T.S. COLUMN
T.S. 4x4x1/8 BRACE
DETAIL 4/3
JOB NO 97418 DATE 10/17/97
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
CHECKED BY TN
EAVE PURLIN
PS-2
L 2 1/2 x 2 1/2 x 12 GA PURLIN STAY
1/2 ϕ M. BOLT EA. END
C12 x4x12 GA RAFTER
DETAIL 5
(FLG. STAY NOT SHOWN)
OCT 13 1997
OCT 10 1997
1/4" GUSSET PL ON ℄
1/2" THK. BASE PL
CLEAR DIM. VARIES
T.S. COLUMN
(3 SIDES)
3/16" 60 DURO NEOPRENE PAD UNDER BASE PL
T.O.C. +0'-0
(2) 5/8 ϕ M. BOLTS GA = 4"
GLU-LAM
SECTION D/3
ROOF PANEL
12 TEK SCREWS AT EVERY VALLEY TO PURLIN OR BRIDGING PURLIN
PB-3 OR PB-4 BRIDGING PURLIN (SAME MAT'L AS ROOF PURLIN) OR USE ROOF PURLINS WHERE THEY ALIGN W/ COLUMN LINES
#12 TEK SCREWS @ 6" O/C TO BRIDGING
BC-2
1/2 ϕ H.S. BOLTS W/ WASHERS (TYP.)
BR-2 OR BR-3 C12 x 4 x 12 GA BRIDGING
C12x4x12GA RAFTER
∠3x3x3/16 CLIP BC-1
T.S. COLUMN
SECTION E/3
(3 SIDES)
C12 x4x 12 GA RAFTER
∠3x3x1/4 CLIP
T.S. COLUMN
T.S. 4x4x1/8 DIAG BRACE
1/2 ϕ H.S. BOLTS W/ WASHERS
4x1/2 END PL
DETAIL 6/3
T.S. COLUMN
7/8 ϕ EYEBOLT W/ NUT & WASHER
1/2 ϕ STL. CABLE
(JUST SLACK)
3" SLACK
DETAIL 7/3
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ROOF FRAMING DETAILS
JOB NO:
DOCK C
Sheet: 3 of 6
Bellingham Marine Industries
Builders of UNIFLOTE

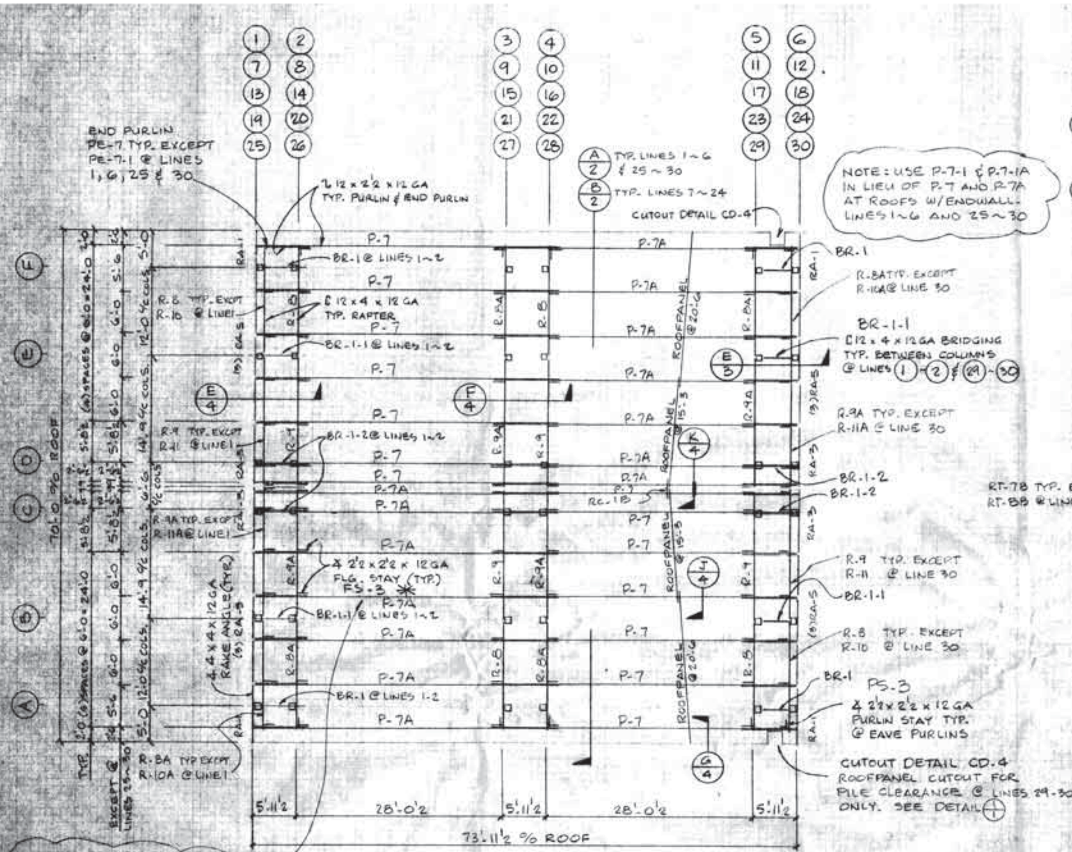

FACE OF COLUMN
VARIES
(SEE ROOF PLAN FOR DIMS.)
1'-4
2 8 x 2½ x 14 GA PURLINS LAPPED 12" BEYOND RAFTER
½ϕ H.S. BOLT W/WASHER TYP. @ ALL CONNECTIONS
C 12 x 4 x 12 GA TYP. ALL RAFTERS
∡ 2½ x 2½ x 12GA TYP. ALL FLG. STAYS FS-2 (TYP.)
SECTION A/4
SECTION B/4
7½
5'-11½
1'-7
2 10 x 2½ x 12 GA PURLINS LAPPED 1'-3 BEYOND RAFTERS
SECTION C
SECTION D
1'-10
2 12 x 2½ x 12 GA PURLINS LAPPED 1'-6 BEYOND RAFTERS
SECTION E
SECTION F
2'-0 (TYP.)
24 GA MEGA-RIB ROOF PANEL
PURLIN (TYP.)
#12 TCP SEAL SDS TEK SCREW @ EVERY VALLEY (TYP.)
TYP. LAP
6
2 4
8 (TYP.)
RC-1W
24 GA RIDGE CAP ATTACHED TO ROOF PANEL W/ #12 TCP SEAL SDS TEK SCREWS @ EVERY PANEL RIB
SECTION G/4
SECTION H/4
SECTION J
SECTION K
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
CHECKED BY
OCT 10 1997
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ROOF FRAMING DETAILS
DOCK 'C'
JOB NO:
Drawn by
Scale DIMS. GOVERN
Sheet 4 of 6
Bellingham Marine Industries
Builders of UNIFLOTE



24GA EDGE TRIM
#12 SDS 'TEK' SCREW
GIRT
24 GA MEGA-RIB WALLPANEL
#12 SDS 'TEK' SCREW @ EVERY VALLEY
O/O ENDWALL
SECTION A/5
1/2Φ M. BOLT
T.S. COLUMN
GIRT
SECTION B/5
1/2Φ M. BOLT
T.S. COLUMN
GIRT
1'-0
1'-0
SECTION C/5
1 OR 40
7
SEE ROOF PANEL APPLICATION FOR DIM.
℄ 1ST RIB
#12 TOP SEAL TEK SCREWS @ 12" O/C TYP @ TRIM
24 GA RAKE TRIM
(4) RT-5W @ LINE 1
(4) RT-6W @ LINE 40
24 GA ROOFPANEL
#12 TEK SCREWS @ EVERY VALLEY
(2) #12 TEK SCREWS @ EVERY PURLIN
PURLIN
24 GA WALLPANEL
RAFTER
SECTION D/5
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
CHECKED BY
4x4x12 GA RAKE ANGLE
8x2 1/2x14 GA G-21 (TYP.)
T.S. DIAG. BRACE
L3x3x3/16 (TYP.)
L3x3x3/16
(4) ET-4B
CG-5 CLIP
CG-1 CLIP TYP. U.N.
WALLPANEL GS-3
10'-0 OPEN
17'-8 CLEAR
18'-11 CLEAR
+0'-0
5'-0
13'-0 C/C COLS.
17'-9 C/C COLS.
6'-6 C/C COLS.
19'-9 C/C COLS.
16'-0 C/C COLS.
6'-0
84'-0 O/O ENDWALL
ENDWALL ELEVATION @ LINE 1
(ENDWALL @ LINE 40 SIMILAR)
24GA WALLPANEL
#12 TEK SCREWS @ EVERY VALLEY TYP PANEL TO GIRT
+10'-6
+10'-0
24 GA TRIM (4) ET-4B
FIELD DRILL 1/4Φ WEEP HOLES @ 36" O/C
SECTION E/5
OCT 10 1997
Bellingham Marine Industries
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ENDWALL ELEVATIONS
DOCK 'C'
JOB NO:
Scale: DIMS. GOVERN
Sheet: 5 of 6

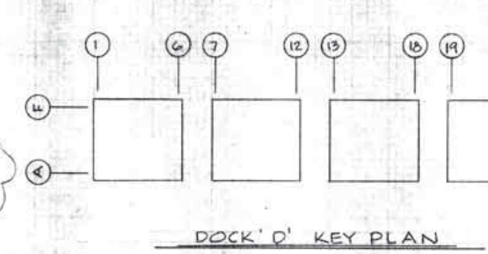


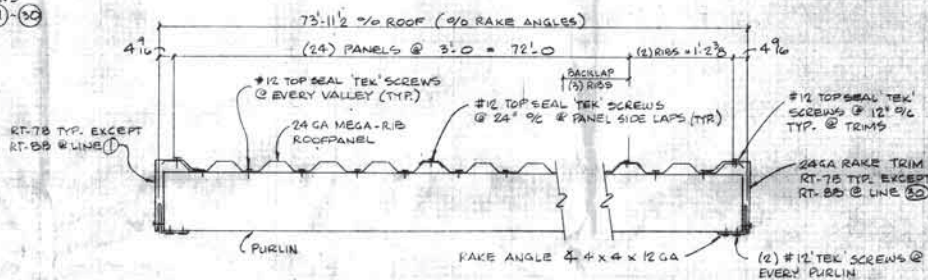
T.S. COLUMN
PC. MK.
5'-0 | 6'-0
3'-11½ KA-4 KA-6
4'-11½ KA-5 KA-7
¼" CONN. ℄ (TYP.)
½ ⌀ H.S. BOLT & WASH.
7 3x3x12 GA STRUT ~ ST-5 @ LINES 1-2
TYP. @ GIRT ELEVS. ST-7 @ LINES 39-40
3'-11½ OR 4'-11½
VARIES, SEE ROOF PLAN
∠3x3x 3/16 KICKER
½ ⌀ H.S. BOLT & WASHER
1'-0
∠3x3x 3/16 VERT. STRUT
10 GA CLIP ~
CB-4 @ LINE 1, 5' SPACE
CB-3 @ LINE 1, 6' SPACE
CB-6 @ LINE 40, 5' SPACE
CB-4 @ LINE 40, 6' SPACE
(TYP.)
10 GA CLIPS W/ ½ ⌀ H.S. BOLTS AND WASHERS
10GA DIAG BRACE CLIP W/ ½ ⌀ HS BOLTS & WASHERS
24 GA CORNER TRIM
SEE G5. DETAIL FOR PANEL STARTING DIM.
GIRT
T.S. COLUMN
5'-0 OR 6'-0
VARIES, SEE E.W. ELEVATION
O/O ENDWALL
SECTION A/6
GIRT
10 GA CLIP W/ ½ ⌀ H.S. BOLTS & WASHERS
T.S. COLUMN
SECTION B/6
∠3x3x 3/16 VERT. STRUT
∠3x3x 3/16 DIAG. BRACE
GIRT
DETAIL 1/6
GIRT
10 GA CLIP W/ (2) ½ ⌀ H.S. BOLTS & WASH.
¼" CONN. ℄
T.S. COLUMN
DETAIL 2/6
T.S. DIAG BRACE
(TYP.)
GIRT
GIRT
3/16" CONN. ℄ (TYP.)
(2) ½ ⌀ H.S. BOLTS & WASHERS (TYP.)
DETAIL 3/6
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
CHECKED BY
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ENDWALL FRAMING DETAILS
DOCK 'C'
JOB NO. 1708
Scale: DIMS. GOVERN
Sheet: 6 of 6
Bellingham Marine Industries
OCT 10 1997



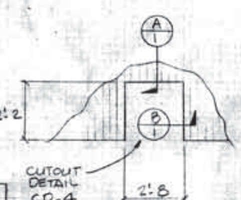
*FLANGE STAY NOTE: USE FS-3-1 TYP. @ LINES C & D EXCEPT:

ROOF FRAMING PLAN



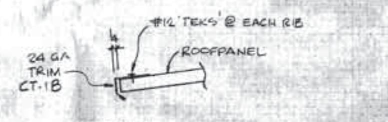


ROOF PANEL APPLICATION

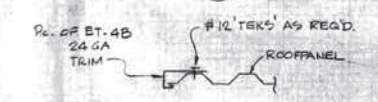


DETAIL 1/1

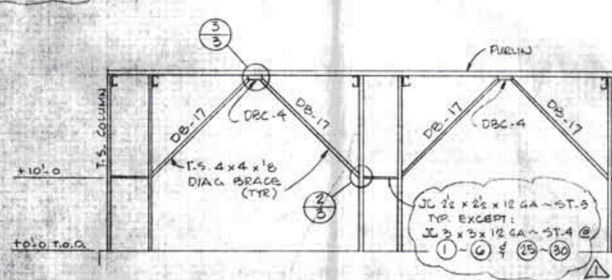
NOTE: SEE CUTOUT DETAILS, SHT. 1 OF 1 FOR ADDITIONAL FRAMING INFORMATION.



SECTION A/1



SECTION B/1



WALKWAY BRACING ELEVATION

TYP. @ LINES C & D

COLUMN PIECE MARKS

COL. LINE	1 / 25	2 / 26	3 / 27	4 / 28	5 / 29	6 / 30
F	C-13-1A / C-13A	C-13-2 / C-13	C-13A	C-13	C-13A / C-13-2A	C-13 / C-13-1
E	C-14-1A / C-14A	C-14-2 / C-14	C-14A	C-14	C-14A / C-14-2A	C-14 / C-14-1
D	C-15-2A / C-15-1A	C-15-1	C-15-1A	C-15-1	C-15-1A	C-15-1 / C-15-2
C	C-15-2 / C-15-1	C-15-1A	C-15-1	C-15-1A	C-15-1	C-15-1A / C-15-2A
B	C-14-1 / C-14	C-14-2A / C-14A	C-14	C-14A	C-14 / C-14-2	C-14A / C-14-1A
A	C-13-1 / C-13	C-13-2A / C-13A	C-13	C-13A	C-13 / C-13-2	C-13A / C-13-1A

COL. LINE	7 13 19	8 14 20	9 15 21	10 16 22	11 17 23	12 18 24
F	C-13A	C-13	C-13A	C-13	C-13A	C-13
E	C-14A	C-14	C-14A	C-14	C-14A	C-14
D	C-15A	C-15	C-15A	C-15	C-15A	C-15
C	C-15	C-15A	C-15	C-15A	C-15	C-15A
B	C-14	C-14A	C-14	C-14A	C-14	C-14A
A	C-13	C-13A	C-13	C-13A	C-13	C-13A

JOB NO. 97918 DATE 10/17/97
PERATROVICH, NOTTINGHAM & DRAGE, INC.
☐ APPROVED
☒ APPROVED AS NOTED
☐ REVISE AND RESUBMIT
☐ REJECTED
CHECKED BY TN

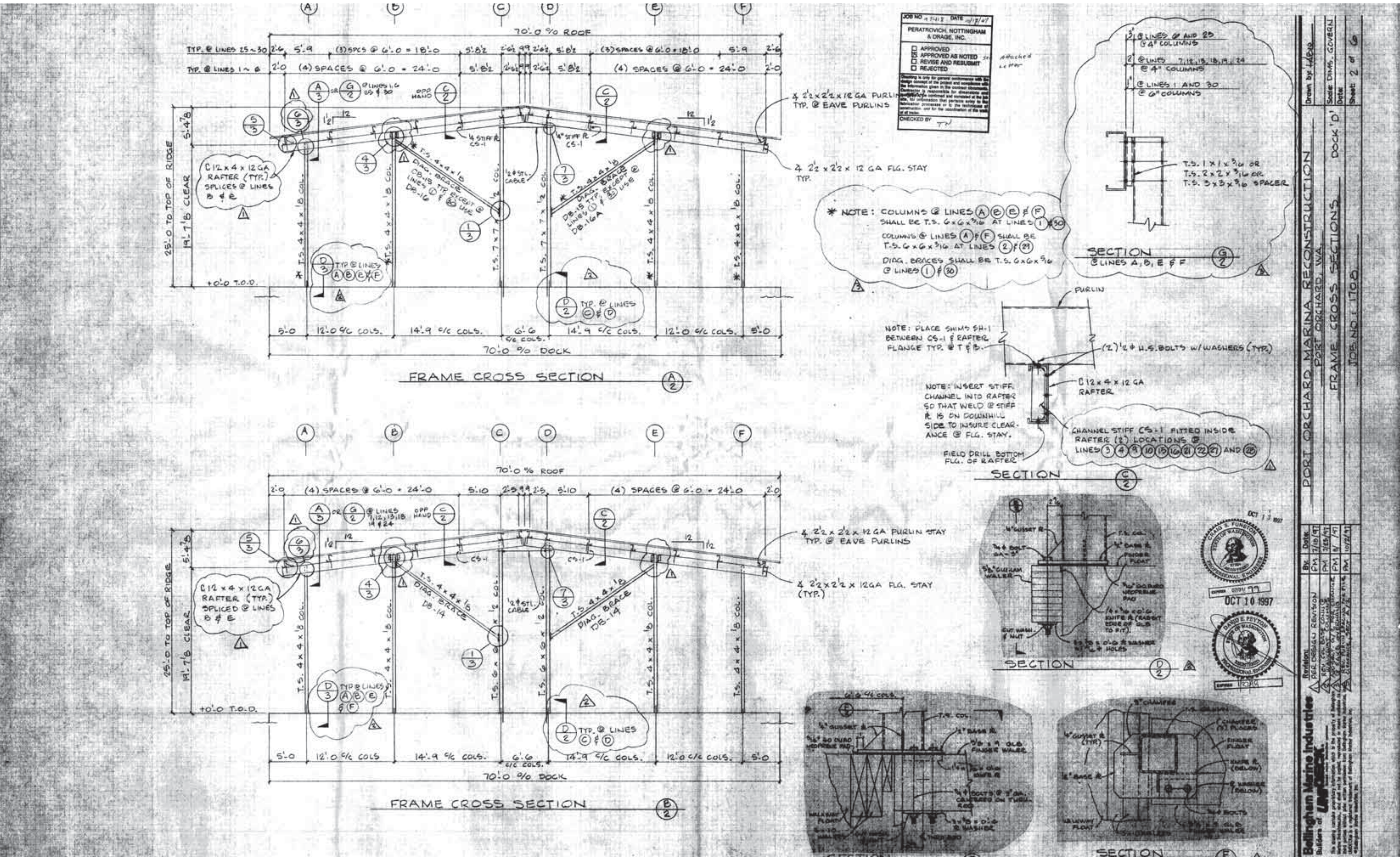
OCT 13 1997

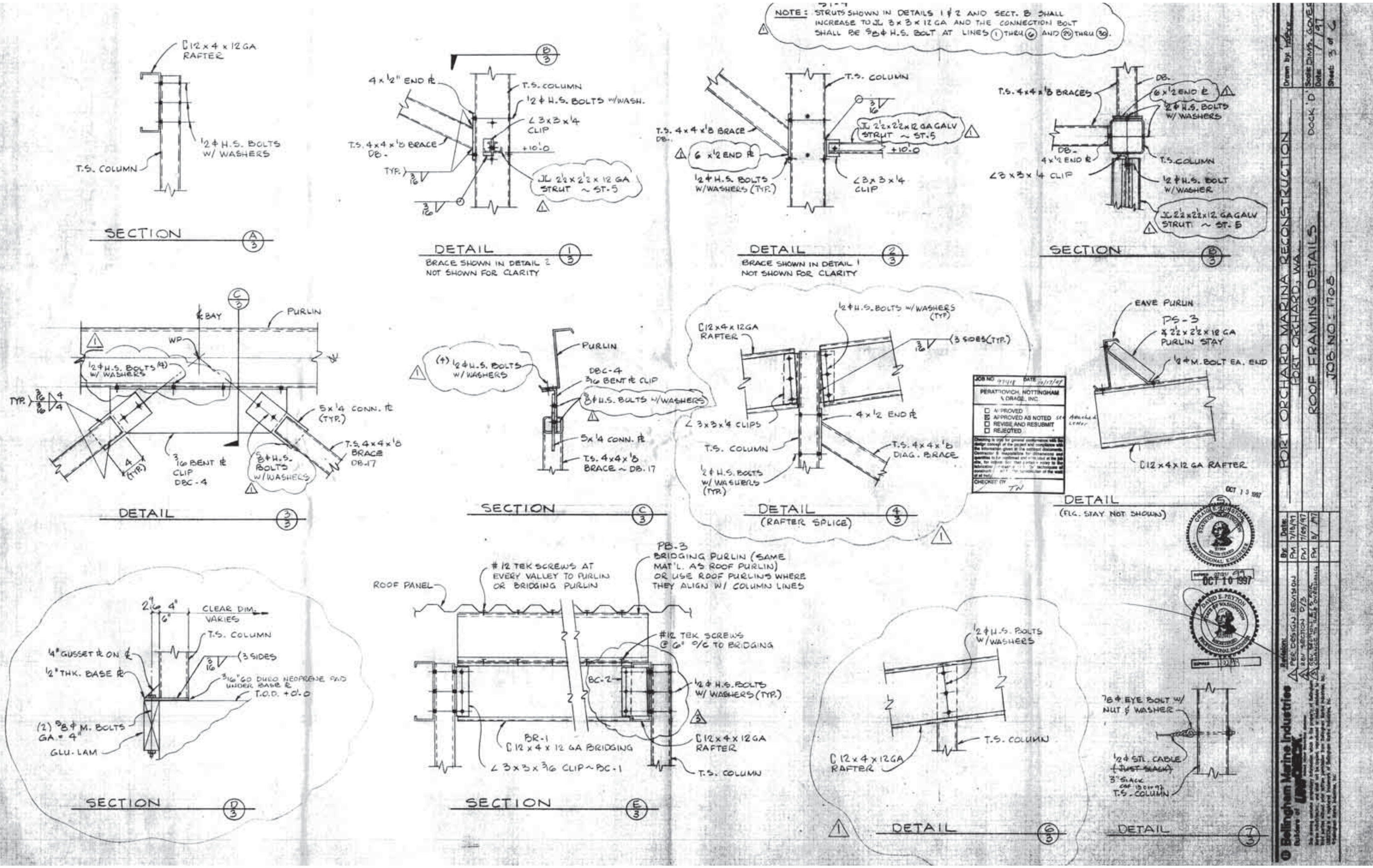
OCT 10 1997

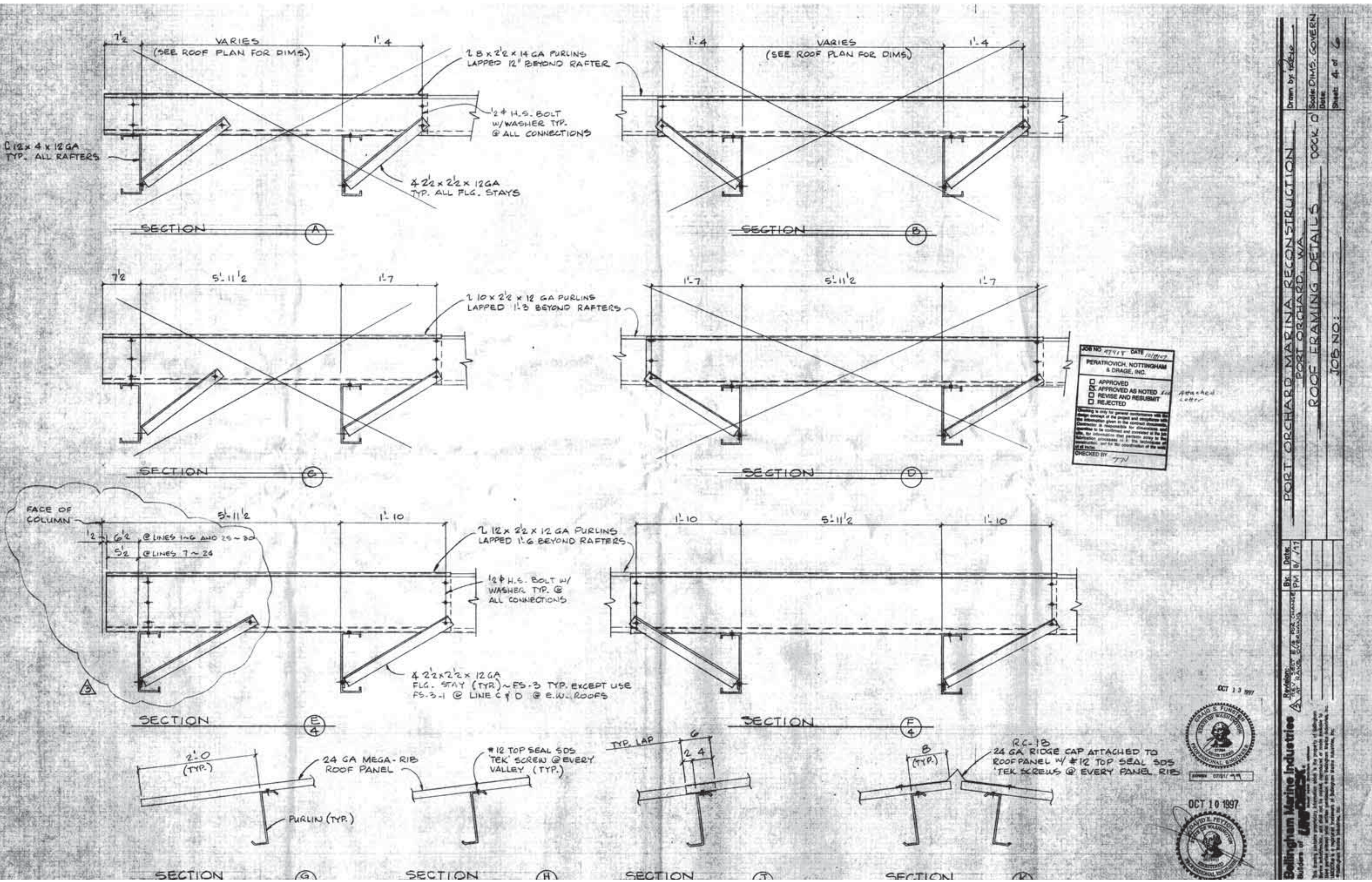
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
DOCK 'D' ROOF FRAMING PLAN
JOB NO: 1708

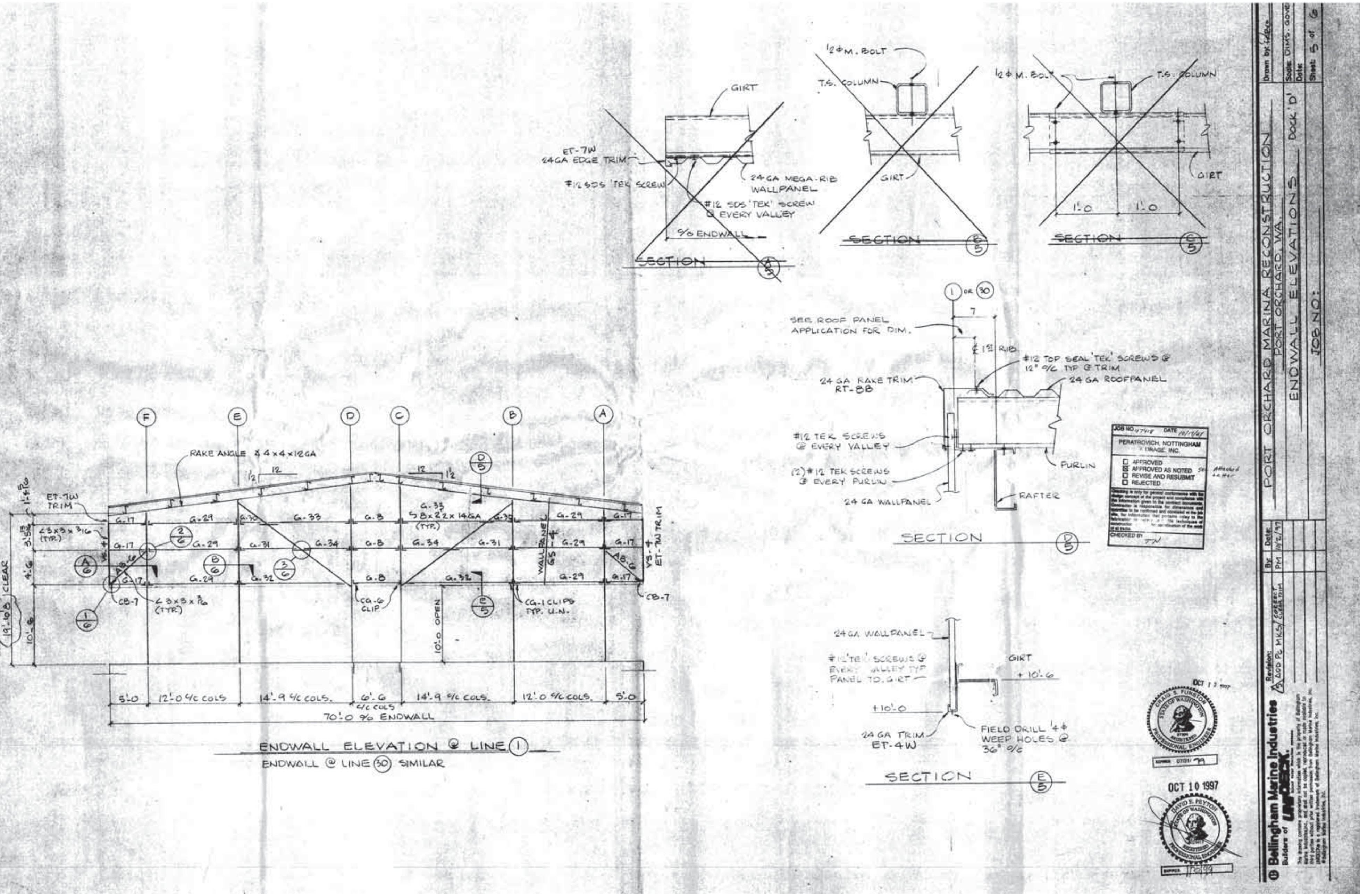
Scale: DIMS. GOVERN
Sheet: 1 of 6

Bellingham Marine Industries
Builders of UNIFLOTE

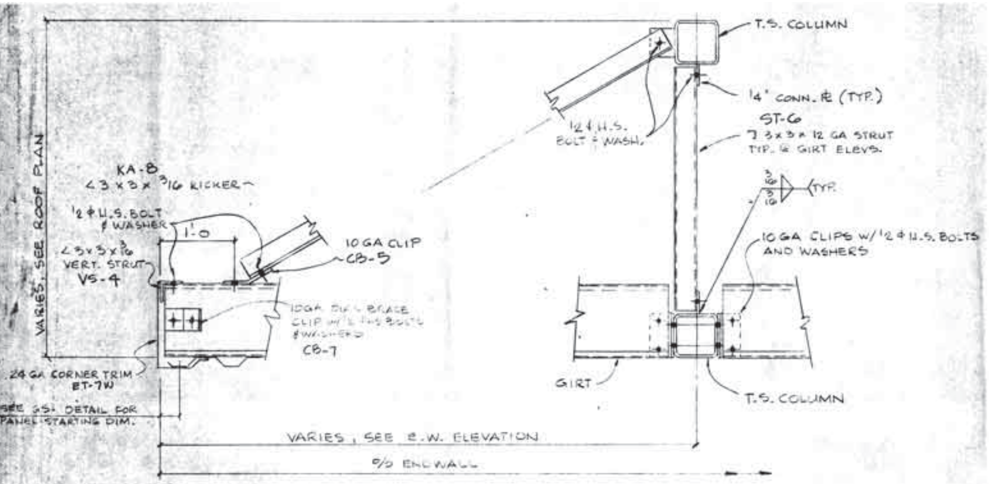

70'-0 O/O ROOF
FRAME CROSS SECTION
70'-0 O/O DOCK
25'-0 TO TOP OF RIDGE
19'-7 1/8 CLEAR
+0'-0 T.O.D.
C12 x 4 x 12 GA RAFTER (TYP.) SPLICES @ LINES B & E
2 1/2 x 2 1/2 x 12 GA PURLIN STAY TYP. @ EAVE PURLINS
2 1/2 x 2 1/2 x 12 GA FLG. STAY TYP.
* NOTE: COLUMNS @ LINES A, B, E & F SHALL BE T.S. 6x6x3/16 AT LINES 1 & 30
COLUMNS @ LINES A & F SHALL BE T.S. 6x6x3/16 AT LINES 2 & 29
DIAG. BRACES SHALL BE T.S. 6x6x5/16 @ LINES 1 & 30
SECTION
@ LINES A, B, E & F
T.S. 1 x 1 x 3/16 OR T.S. 2 x 2 x 3/16 OR T.S. 3 x 3 x 3/16 SPACER
PURLIN
NOTE: PLACE SHIMS SH-1 BETWEEN CS-1 & RAFTER FLANGE TYP. @ T & B.
(2) 1/2 ø H.S. BOLTS W/ WASHERS (TYP.)
C12 x 4 x 12 GA RAFTER
NOTE: INSERT STIFF. CHANNEL INTO RAFTER SO THAT WELD @ STIFF PL IS ON DOWNHILL SIDE TO INSURE CLEARANCE @ FLG. STAY.
CHANNEL STIFF CS-1 FITTED INSIDE RAFTER (2) LOCATIONS @ LINES 3, 4, 9, 10, 15, 16, 21, 22, 27 AND 28
FIELD DRILL BOTTOM FLG. OF RAFTER
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
CHECKED BY
OCT 10 1997
Bellingham Marine Industries
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
FRAME CROSS SECTIONS
DOCK 'D'
JOB NO.: 1706
Sheet: 2 of 6


NOTE: STRUTS SHOWN IN DETAILS 1 & 2 AND SECT. B SHALL INCREASE TO JL 3 x 3 x 12 GA AND THE CONNECTION BOLT SHALL BE 5/8 ϕ H.S. BOLT AT LINES 1 THRU 6 AND 29 THRU 30.
C 12 x 4 x 12 GA RAFTER
1/2 ϕ H.S. BOLTS W/ WASHERS
T.S. COLUMN
SECTION A/3
4 x 1/2" END PL
T.S. COLUMN
1/2 ϕ H.S. BOLTS W/WASH.
∠ 3 x 3 x 1/4 CLIP
T.S. 4 x 4 x 1/8 BRACE DB.
+10'-0
JL 2 1/2 x 2 1/2 x 12 GA STRUT ~ ST-5
DETAIL 1/3
BRACE SHOWN IN DETAIL 2 NOT SHOWN FOR CLARITY
T.S. COLUMN
T.S. 4 x 4 x 1/8 BRACE DB.
6 x 1/2 END PL
JL 2 1/2 x 2 1/2 x 12 GA GALV STRUT ~ ST-5
+10'-0
∠ 3 x 3 x 1/4 CLIP
1/2 ϕ H.S. BOLTS W/WASHERS (TYP.)
DETAIL 2/3
BRACE SHOWN IN DETAIL 1 NOT SHOWN FOR CLARITY
T.S. 4 x 4 x 1/8 BRACES
DB.
6 x 1/2 END PL
2 ϕ H.S. BOLTS W/ WASHERS
DB. 4 x 1/2 END PL
∠ 3 x 3 x 1/4 CLIP
T.S. COLUMN
1/2 ϕ H.S. BOLT W/WASHER
JL 2 1/2 x 2 1/2 x 12 GA GALV STRUT ~ ST-5
SECTION B/3
PURLIN
BAY
WP
1/2 ϕ H.S. BOLTS (4) W/ WASHERS
5 x 1/4 CONN. PL (TYP.)
3/16 BENT PL CLIP DBC-4
5/8 ϕ H.S. BOLTS W/WASHERS
T.S. 4 x 4 x 1/8 BRACE DB-17
DETAIL 3/3
(4) 1/2 ϕ H.S. BOLTS W/ WASHERS
PURLIN
DBC-4 3/16 BENT PL CLIP
5/8 ϕ H.S. BOLTS W/WASHERS
5 x 1/4 CONN. PL
T.S. 4 x 4 x 1/8 BRACE ~ DB. 17
SECTION C/3
C 12 x 4 x 12 GA RAFTER
1/2 ϕ H.S. BOLTS W/ WASHERS (TYP)
(3 SIDES (TYP.)
4 x 1/2 END PL
∠ 3 x 3 x 1/4 CLIPS
T.S. COLUMN
T.S. 4 x 4 x 1/8 DIAG. BRACE
1/2 ϕ H.S. BOLTS W/ WASHERS (TYP.)
DETAIL 4/3 (RAFTER SPLICE)
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
EAVE PURLIN
PS-3
2 1/2 x 2 1/2 x 12 GA PURLIN STAY
1/2 ϕ M. BOLT EA. END
C 12 x 4 x 12 GA RAFTER
DETAIL 5/3
(FLG. STAY NOT SHOWN)
OCT 10 1997
2 1/2 4"
CLEAR DIM. VARIES
T.S. COLUMN
1/4" GUSSET PL ON CL
1/2" THK. BASE PL
(3 SIDES
3/16" 60 DURO NEOPRENE PAD UNDER BASE PL
T.O.D. +0'-0
(2) 5/8 ϕ M. BOLTS GA = 4"
GLU-LAM
SECTION D/3
ROOF PANEL
12 TEK SCREWS AT EVERY VALLEY TO PURLIN OR BRIDGING PURLIN
PB-3 BRIDGING PURLIN (SAME MAT'L. AS ROOF PURLIN) OR USE ROOF PURLINS WHERE THEY ALIGN W/ COLUMN LINES
#12 TEK SCREWS @ 6" O/C TO BRIDGING
BC-2
1/2 ϕ H.S. BOLTS W/ WASHERS (TYP.)
BR-1 C 12 x 4 x 12 GA BRIDGING
∠ 3 x 3 x 3/16 CLIP ~ BC-1
C 12 x 4 x 12 GA RAFTER
T.S. COLUMN
SECTION E/3
1/2 ϕ H.S. BOLTS W/ WASHERS
T.S. COLUMN
C 12 x 4 x 12 GA RAFTER
DETAIL 6/3
7/8 ϕ EYE BOLT W/ NUT & WASHER
1/2 ϕ STL. CABLE
T.S. COLUMN
DETAIL 7/3
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ROOF FRAMING DETAILS
JOB NO.: 1708
DOCK 'D'
Bellingham Marine Industries
Revision:
PER DESIGN REVISION
Sheet: 3 of 6

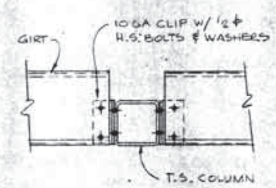

VARIES
(SEE ROOF PLAN FOR DIMS.)
1'-4
2 8 x 2½ x 14 GA PURLINS
LAPPED 12" BEYOND RAFTER
½ϕ H.S. BOLT
W/WASHER TYP.
@ ALL CONNECTIONS
C 12 x 4 x 12 GA
TYP. ALL RAFTERS
∡ 2½ x 2½ x 12 GA
TYP. ALL FLG. STAYS
SECTION A
SECTION B
5'-11½
1'-7
2 10 x 2½ x 12 GA PURLINS
LAPPED 1'-3 BEYOND RAFTERS
SECTION C
SECTION D
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
CHECKED BY
FACE OF COLUMN
1'-10
6'2 @ LINES 1~6 AND 25~30
5'2 @ LINES 7~24
2 12 x 2½ x 12 GA PURLINS
LAPPED 1'-6 BEYOND RAFTERS
½ϕ H.S. BOLT W/
WASHER TYP. @
ALL CONNECTIONS
∡ 2½ x 2½ x 12 GA
FLG. STAY (TYP.) ~ FS-3 TYP. EXCEPT USE
FS-3-1 @ LINE C & D @ E.W. ROOFS
SECTION E 4
SECTION F 4
2'-0 (TYP.)
24 GA MEGA-RIB ROOF PANEL
PURLIN (TYP.)
#12 TOP SEAL SDS
'TEK' SCREW @ EVERY
VALLEY (TYP.)
TYP. LAP
6
2 4
8 (TYP.)
RC-18
24 GA RIDGE CAP ATTACHED TO
ROOF PANEL W/ #12 TOP SEAL SDS
'TEK' SCREWS @ EVERY PANEL RIB
SECTION G
SECTION H
SECTION J
SECTION K
OCT 13 1997
OCT 10 1997
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ROOF FRAMING DETAILS
DOCK 'D'
JOB NO:
Scale: DIMS. GOVERN
Sheet: 4 of 6
Bellingham Marine Industries



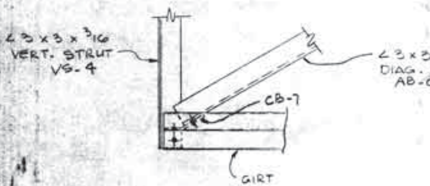
SECTION A/5
ET-7W 24GA EDGE TRIM
#12 SDS 'TEK' SCREW
GIRT
24 GA MEGA-RIB WALLPANEL
#12 SDS 'TEK' SCREW @ EVERY VALLEY
O/O ENDWALL
SECTION B/5
1/2 Φ M. BOLT
T.S. COLUMN
GIRT
SECTION C/5
1/2 Φ M. BOLT
T.S. COLUMN
GIRT
1'-0 1'-0
SECTION D/5
1 OR 30
SEE ROOF PANEL APPLICATION FOR DIM.
℄ 1ST RIB
#12 TOP SEAL 'TEK' SCREWS @ 12" O/C TYP @ TRIM
24 GA ROOFPANEL
24 GA RAKE TRIM RT-8B
#12 TEK SCREWS @ EVERY VALLEY
(2) #12 TEK SCREWS @ EVERY PURLIN
PURLIN
RAFTER
24 GA WALLPANEL
SECTION E/5
24 GA WALLPANEL
#12 TEK SCREWS @ EVERY VALLEY TYP PANEL TO GIRT
GIRT
+10'-6
+10'-0
24 GA TRIM ET-4W
FIELD DRILL 1/4 Φ WEEP HOLES @ 36" O/C
ENDWALL ELEVATION @ LINE 1
ENDWALL @ LINE 30 SIMILAR
F E D C B A
RAKE ANGLE 4x4x12GA
ET-7W TRIM
ET-7W TRIM
VS-4
G-17 G-29 G-30 G-33 G-8 G-35 G-29 G-17
G-31 G-34 G-8 G-34 G-31
G-32 G-8 G-32
58x22x14GA (TYP.)
∠3x3x3/16 (TYP.)
∠3x3x3/16 (TYP.)
CB-7
CG-6 CLIP
CG-1 CLIPS TYP. U.N.
WALLPANEL GS-4
10'-0 OPEN
19'-10 CLEAR
5'-0 12'-0 O/C COLS 14'-9 O/C COLS. 6'-6 O/C COLS 14'-9 O/C COLS. 12'-0 O/C COLS. 5'-0
70'-0 O/O ENDWALL
JOB NO 97-48 DATE 10/17/97
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
CHECKED BY
OCT 10 1997
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ENDWALL ELEVATIONS
DOCK 'D'
JOB NO:
Sheet: 5 of 6
Bellingham Marine Industries
Builders of UNIDECK



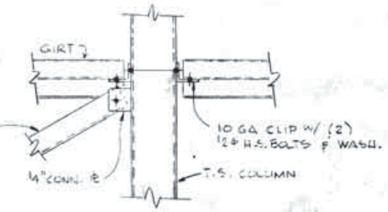
SECTION A/6



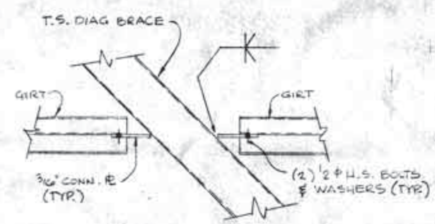
SECTION B/6



DETAIL 1/6



DETAIL 2/6



DETAIL 3/6

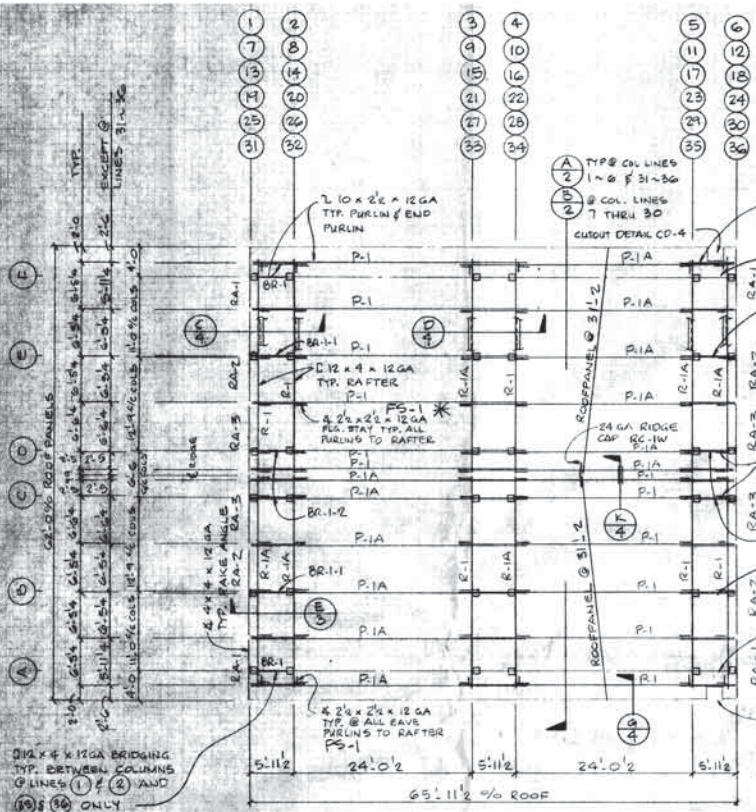
PERATROVICH, NOTTINGHAM & DRAGE, INC.
- ☐ APPROVED
- ☒ APPROVED AS NOTED
- ☐ REVISE AND RESUBMIT
- ☐ REJECTED

CHECKED BY TN

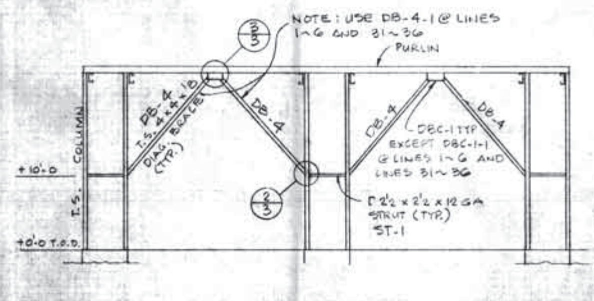
OCT 10 1997

PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ENDWALL FRAMING DETAILS
DOCK D
JOB NO. 1708

Bellingham Marine Industries

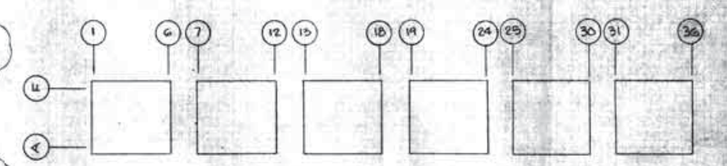


ROOF FRAMING PLAN
@ 28' SLIPS



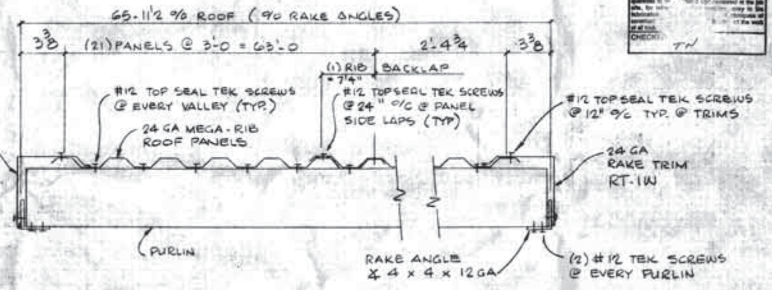
WALKWAY BRACING ELEVATION
TYP. @ LINES C & D

COLUMN PIECE MARKS						
COL. LINE	1 31	2 32	3 33	4 34	5 35	6 36
F	C-1-1A / C-1A	C-1-2 / C-1	C-1A	C-1	C-1A / C-1-2A	C-1 / C-1-1
E	C-2-1A / C-2A	C-2	C-2A	C-2	C-2A	C-2 / C-2-1
D	C-3-1A / C-3-2A	C-3-2	C-3-2A	C-3-2	C-3-2A	C-3-2 / C-3-1
C	C-3-1 / C-3-2	C-3-2A	C-3-2	C-3-2A	C-3-2	C-3-2A / C-3-1A
B	C-2-1 / C-2	C-2A	C-2	C-2A	C-2	C-2A / C-2-1A
A	C-1-1 / C-1	C-1-2A / C-1A	C-1	C-1A	C-1 / C-1-2	C-1A / C-1-1A
COL. LINE	7 13 19 25	8 14 20 26	9 15 21 27	10 16 22 28	11 17 23 29	12 18 24 30
F	C-1A	C-1	C-1A	C-1	C-1A	C-1
E	C-2A	C-2	C-2A	C-2	C-2A	C-2
D	C-3A	C-3	C-3A	C-3	C-3A	C-3
C	C-3	C-3A	C-3	C-3A	C-3	C-3A
B	C-2	C-2A	C-2	C-2A	C-2	C-2A
A	C-1	C-1A	C-1	C-1A	C-1	C-1A

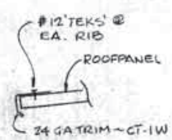


DOCK 'E' KEY PLAN

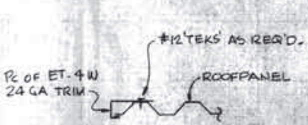
JOB NO 47418 DATE 10/17/97
PERATROVICH, NOTTINGHAM & DRAGE, INC.
☐ APPROVED
☒ APPROVED AS NOTED
☐ REVISE AND RESUBMIT
☐ REJECTED
CHECKED: TN



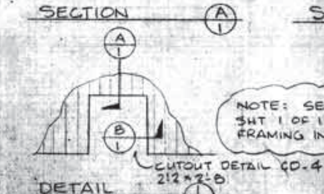
ROOF PANEL APPLICATION
@ 28' SLIPS



SECTION A/1



SECTION B/1



DETAIL 1

NOTE: SEE CUTOUT DETAILS, SHT 1 OF 1 FOR ADDITIONAL FRAMING INFORMATION.

OCT 10 1997

Bellingham Marine Industries
Builders of UNIFLOTE

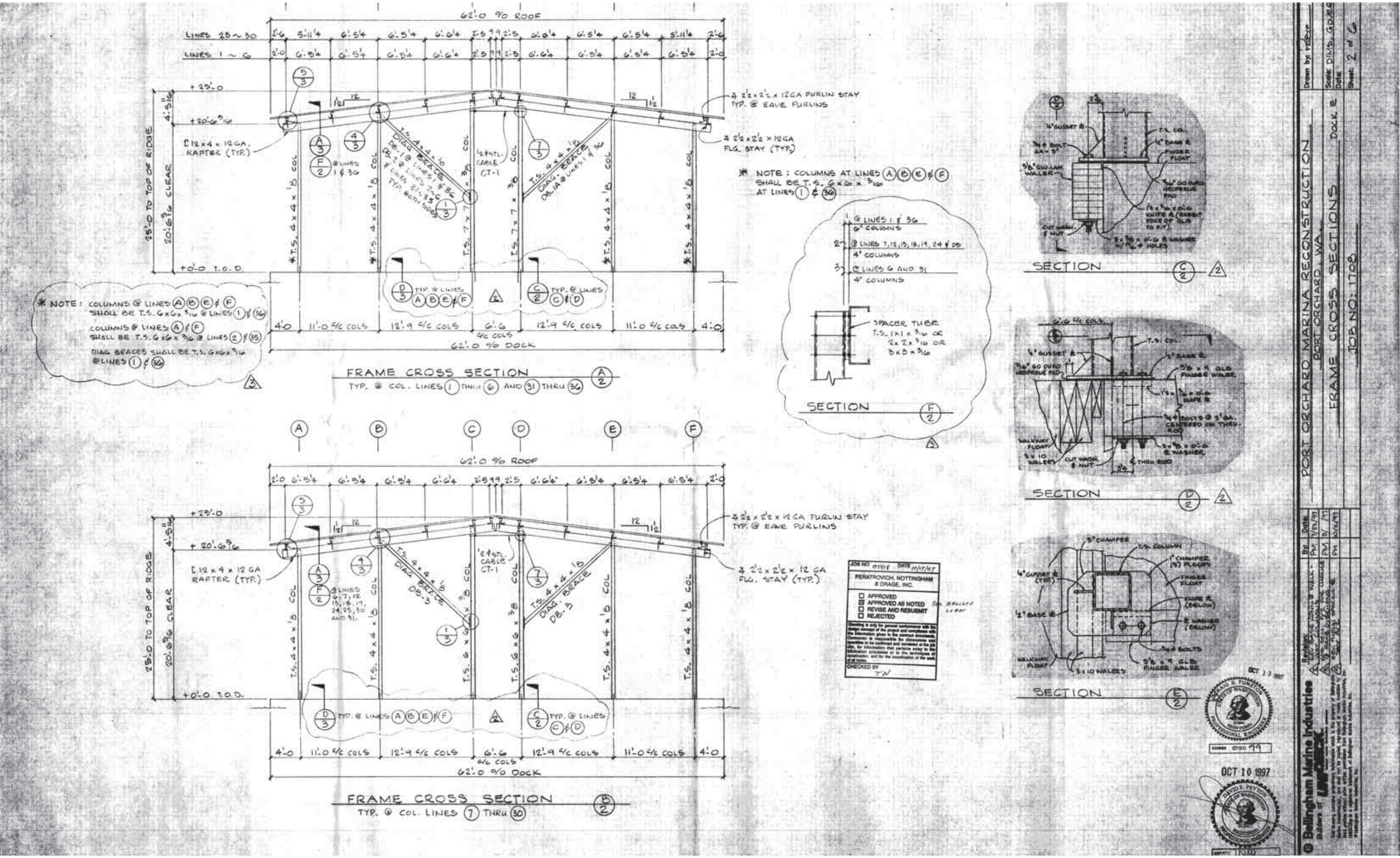
By:	Date:
PM	8/ /97
PM	10/7/97

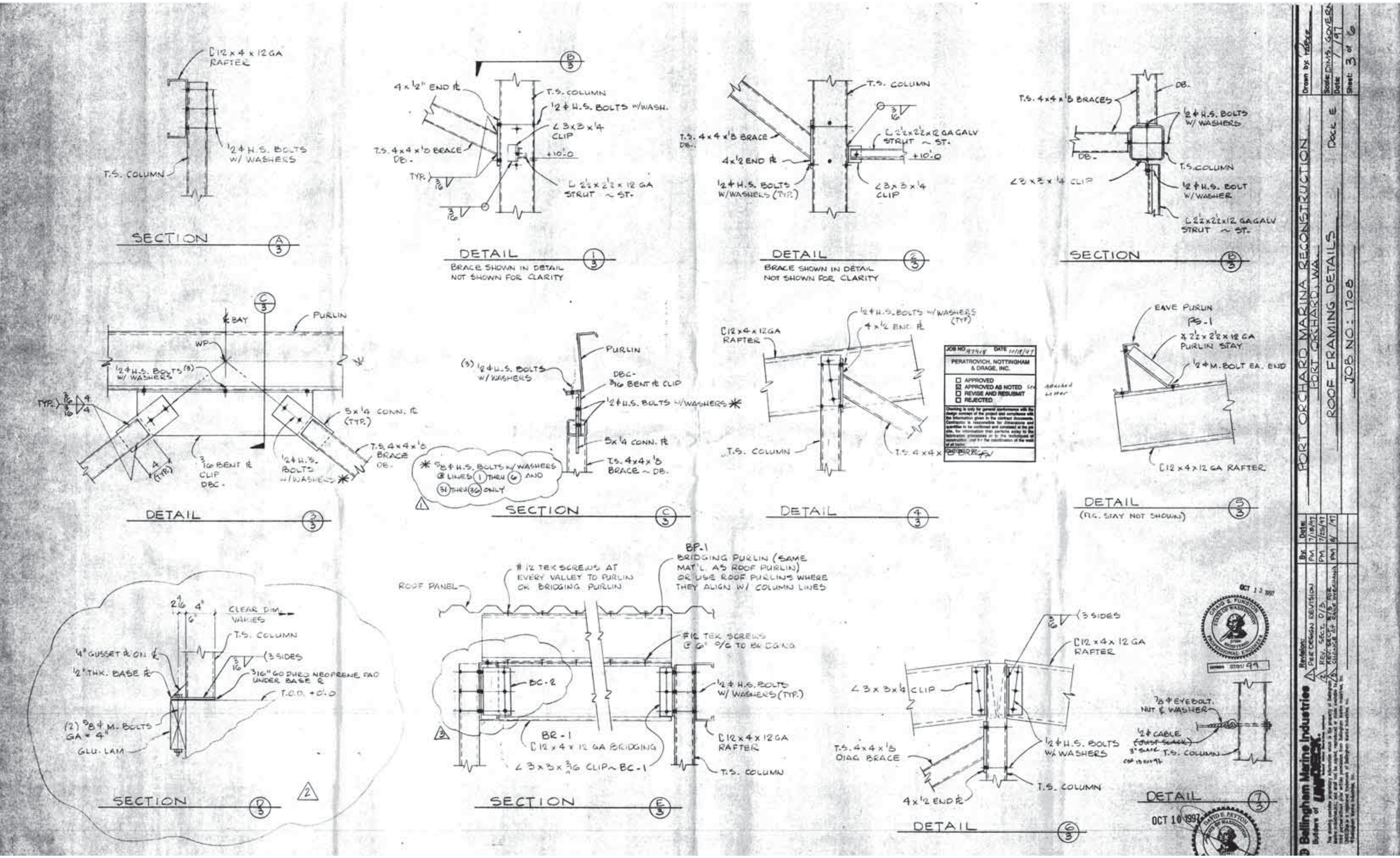
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.

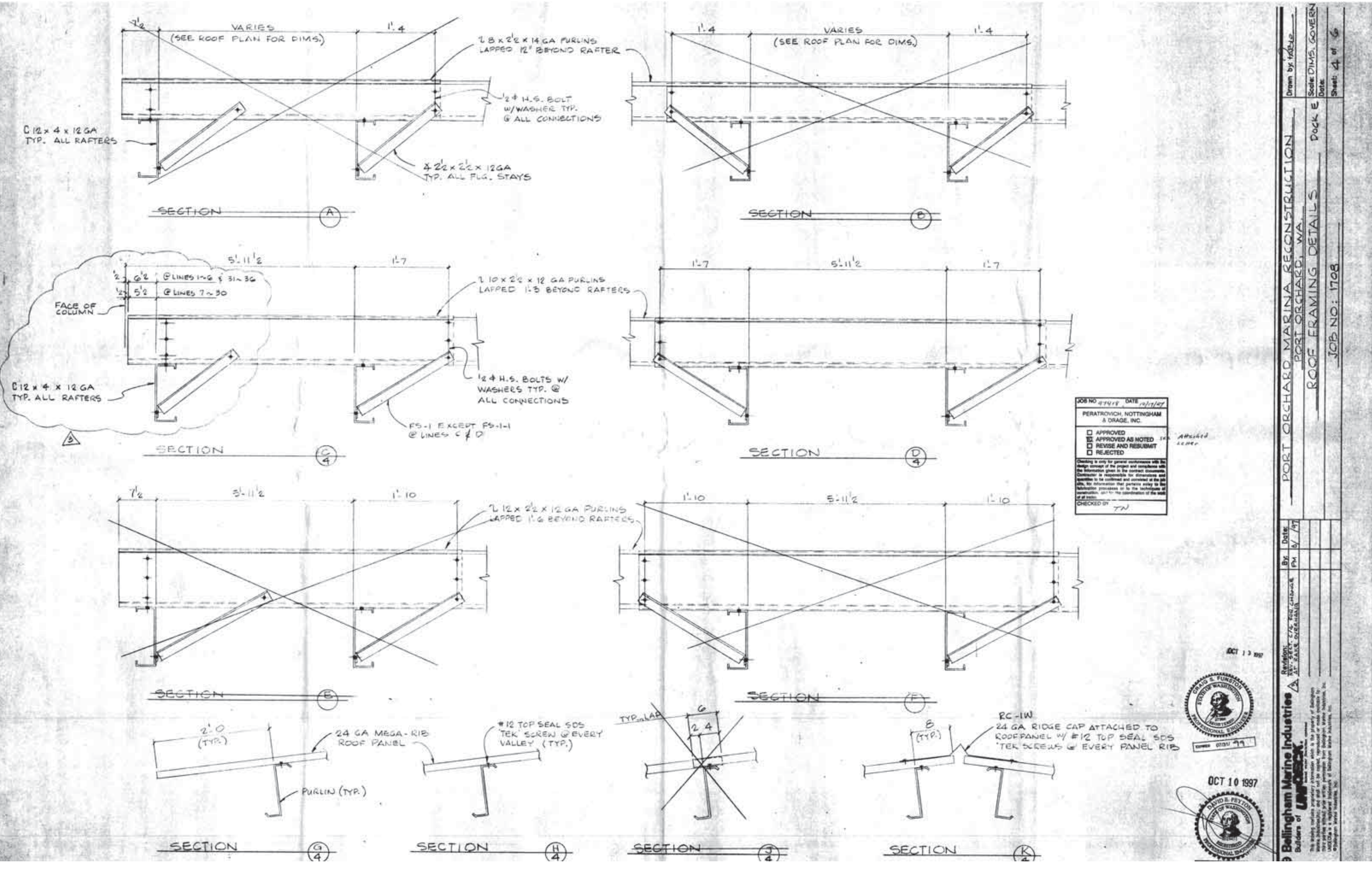
DOCK 'E' ROOF FRAMING PLAN - 28' SLIPS

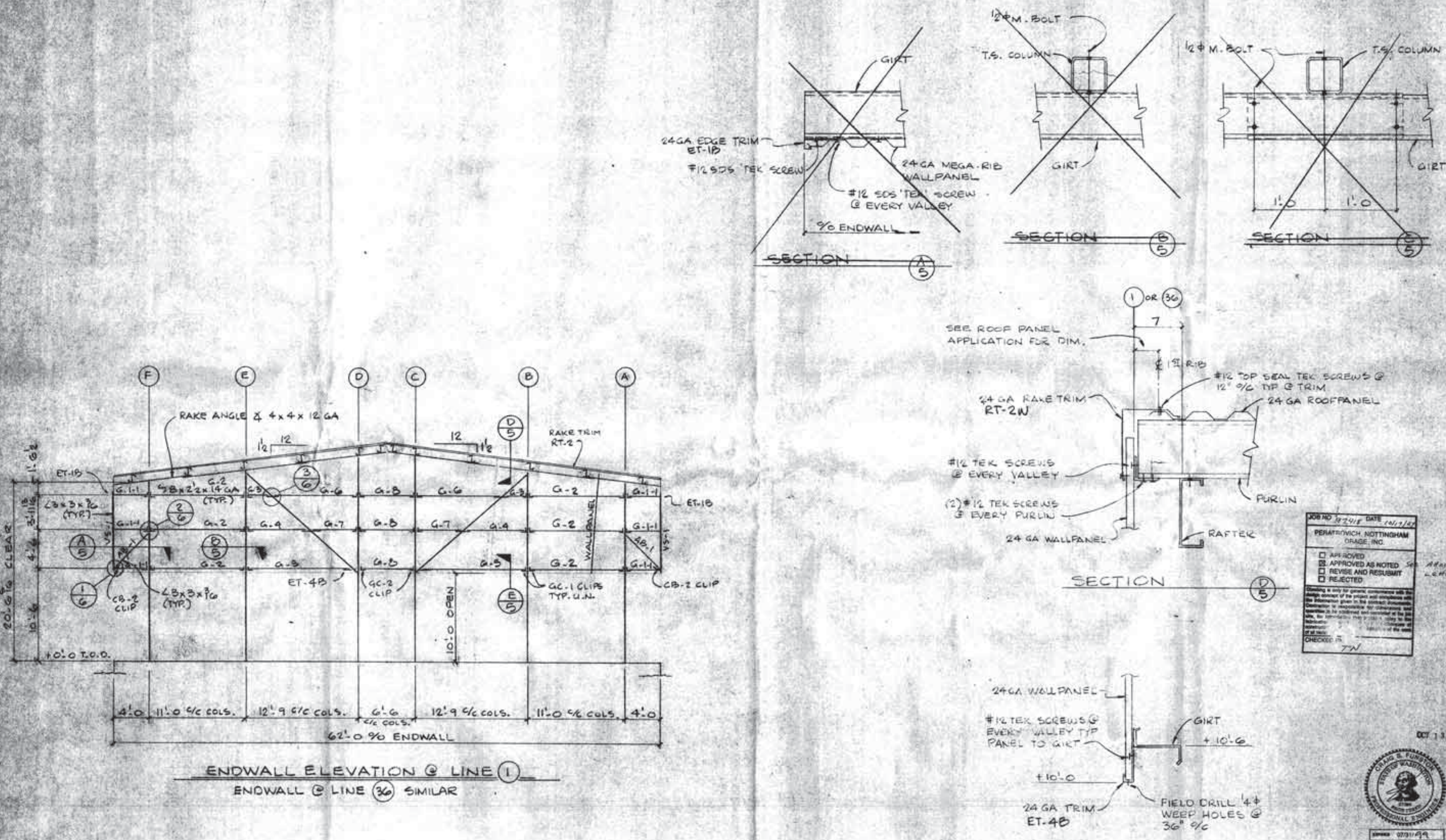
JOB NO. 1708

Drawn by:
Scale: DIMS. GOVERN
Date:
Sheet: 1 of 6


FRAME CROSS SECTION
TYP. @ COL. LINES (1) THRU (6) AND (31) THRU (36)
A/2
FRAME CROSS SECTION
TYP. @ COL. LINES (7) THRU (30)
B/2
62'-0 o/o ROOF
62'-0 o/o DOCK
+23'-0
+20'-6 5/16
+0-0 T.O.D.
25'-0 TO TOP OF RIDGE
20'-6 5/16 CLEAR
C 12 x 4 x 12 GA RAFTER (TYP.)
2 1/2 x 2 1/2 x 12 GA PURLIN STAY TYP. @ EAVE PURLINS
2 1/2 x 2 1/2 x 12 GA FLG. STAY (TYP.)
T.S. 4 x 4 x 1/8 COL
T.S. 6 x 6 x 3/8 COL
T.S. 7 x 7 x 3/8 COL
1/2" Ø STL. CABLE CT-1
T.S. 4 x 4 x 1/8 DIAG. BRACE DB-3
* NOTE: COLUMNS AT LINES (A) (B) (E) & (F) SHALL BE T.S. 6 x 6 x 3/16 AT LINES (1) & (36)
* NOTE: COLUMNS @ LINES (A) (B) (E) & (F) SHALL BE T.S. 6x6x 3/16 @ LINES (1) & (36)
COLUMNS @ LINES (A) & (F) SHALL BE T.S. 6x6x 3/16 @ LINES (2) & (35)
DIAG BRACES SHALL BE T.S. 6x6x 3/16 @ LINES (1) & (36)
SECTION F/2
SPACER TUBE T.S. 1x1 x 3/16 OR 2x2x 3/16 OR 3x3 x 3/16
SECTION C/2
SECTION D/2
SECTION E/2
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
FRAME CROSS SECTIONS
DOCK E
JOB NO: 1708
Sheet: 2 of 6
Bellingham Marine Industries
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
OCT 10 1997


C12 x 4 x 12 GA RAFTER
1/2 ϕ H.S. BOLTS W/ WASHERS
T.S. COLUMN
SECTION A/3
4 x 1/2" END PL
T.S. COLUMN
1/2 ϕ H.S. BOLTS W/WASH.
∠ 3x3x1/4 CLIP
T.S. 4x4x1/8 BRACE DB.
+10'-0
∠ 2 1/2 x 2 1/2 x 12 GA STRUT ~ ST.
DETAIL 1/3
BRACE SHOWN IN DETAIL NOT SHOWN FOR CLARITY
T.S. COLUMN
T.S. 4x4x1/8 BRACE DB.
∠ 2 1/2 x 2 1/2 x 12 GA GALV STRUT ~ ST.
4x1/2 END PL
1/2 ϕ H.S. BOLTS W/WASHERS (TYP.)
∠ 3 x 3 x 1/4 CLIP
DETAIL 2/3
BRACE SHOWN IN DETAIL NOT SHOWN FOR CLARITY
T.S. 4x4x1/8 BRACES
DB.
1/2 ϕ H.S. BOLTS W/ WASHERS
T.S. COLUMN
∠ 3 x 3 x 1/4 CLIP
1/2 ϕ H.S. BOLT W/ WASHER
∠ 2 1/2 x 2 1/2 x 12 GA GALV STRUT ~ ST.
SECTION B/3
PURLIN
℄ BAY
WP
1/2 ϕ H.S. BOLTS (3) W/ WASHERS
5 x 1/4 CONN. PL (TYP.)
T.S. 4x4x1/8 BRACE DB.
3/16 BENT PL CLIP DBC.
1/2 ϕ H.S. BOLTS W/ WASHERS
DETAIL 3/3
PURLIN
(3) 1/2 ϕ H.S. BOLTS W/ WASHERS
DBC- 3/16 BENT PL CLIP
1/2 ϕ H.S. BOLTS W/WASHERS
5x1/4 CONN. PL
T.S. 4x4x1/8 BRACE ~ DB.
5/8 ϕ H.S. BOLTS W/ WASHERS @ LINES 1 THRU 6 AND 31 THRU 36 ONLY
SECTION C/3
C12 x 4 x 12 GA RAFTER
1/2 ϕ H.S. BOLTS W/ WASHERS (TYP)
4 x 1/2 END PL
T.S. COLUMN
T.S. 4 x 4 x 1/8 BRACE
DETAIL 4/3
JOB NO 97418 DATE 10/8/97
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
EAVE PURLIN
PS-1
∠ 2 1/2 x 2 1/2 x 12 GA PURLIN STAY
1/2 ϕ M. BOLT EA. END
C12 x 4 x 12 GA RAFTER
DETAIL 5/3
(P.G. STAY NOT SHOWN)
CLEAR DIM. VARIES
T.S. COLUMN
1/4" GUSSET PL ON
1/2" THK. BASE PL
(3 SIDES)
3/16" 60 DURO NEOPRENE PAD UNDER BASE PL
T.O.C. +0'-0
(2) 5/8 ϕ M. BOLTS GA = 4"
GLU. LAM
SECTION D/3
BP-1
BRIDGING PURLIN (SAME MAT'L AS ROOF PURLIN) OR USE ROOF PURLINS WHERE THEY ALIGN W/ COLUMN LINES
12 TEK SCREWS AT EVERY VALLEY TO PURLIN OR BRIDGING PURLIN
ROOF PANEL
#12 TEK SCREWS @ 6" O/C TO BRIDGING
BC-2
1/2 ϕ H.S. BOLTS W/ WASHERS (TYP.)
BR-1
C12 x 4 x 12 GA BRIDGING
∠ 3x3x3/16 CLIP ~ BC-1
C12 x 4 x 12 GA RAFTER
T.S. COLUMN
SECTION E/3
(3 SIDES)
C12 x 4 x 12 GA RAFTER
∠ 3 x 3 x 1/4 CLIP
T.S. 4 x 4 x 1/8 DIAG BRACE
1/2 ϕ H.S. BOLTS W/ WASHERS
T.S. COLUMN
4 x 1/2 END PL
DETAIL 6/3
7/8 ϕ EYEBOLT, NUT & WASHER
1/2 ϕ CABLE
T.S. COLUMN
DETAIL 7/3
OCT 10 1997
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ROOF FRAMING DETAILS
JOB NO: 1708
Sheet: 3 of 6
Bellingham Marine Industries


VARIES
(SEE ROOF PLAN FOR DIMS.)
1'-4
2 8 x 2½ x 14 GA PURLINS LAPPED 12" BEYOND RAFTER
½ϕ H.S. BOLT W/WASHER TYP. @ ALL CONNECTIONS
C 12 x 4 x 12 GA TYP. ALL RAFTERS
∠ 2½ x 2½ x 12GA TYP. ALL FLG. STAYS
SECTION A
SECTION B
5'-11½
1'-7
6½ @ LINES 1~6 & 31~36
5½ @ LINES 7~30
FACE OF COLUMN
2 10 x 2½ x 12 GA PURLINS LAPPED 1'-3 BEYOND RAFTERS
½ϕ H.S. BOLTS W/ WASHERS TYP. @ ALL CONNECTIONS
C 12 x 4 x 12 GA TYP. ALL RAFTERS
FS-1 EXCEPT FS-1-1 @ LINES C & D
SECTION C/4
SECTION D/4
JOB NO 97418 DATE 10/17/97
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
CHECKED BY TN
1'-10
2 12 x 2½ x 12 GA PURLINS LAPPED 1'-6 BEYOND RAFTERS
SECTION E
SECTION F
2'-0 (TYP.)
24 GA MEGA-RIB ROOF PANEL
PURLIN (TYP.)
#12 TOP SEAL SDS 'TEK' SCREW @ EVERY VALLEY (TYP.)
TYP. LAP
RC-1W
24 GA RIDGE CAP ATTACHED TO ROOF PANEL W/ #12 TOP SEAL SDS 'TEK' SCREWS @ EVERY PANEL RIB
SECTION G/4
SECTION H/4
SECTION J/4
SECTION K/4
OCT 10 1997
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ROOF FRAMING DETAILS
DOCK E
JOB NO: 1708
Scale: DIMS. GOVERN
Sheet: 4 of 6
Bellingham Marine Industries
Builders of UNIFLOTE

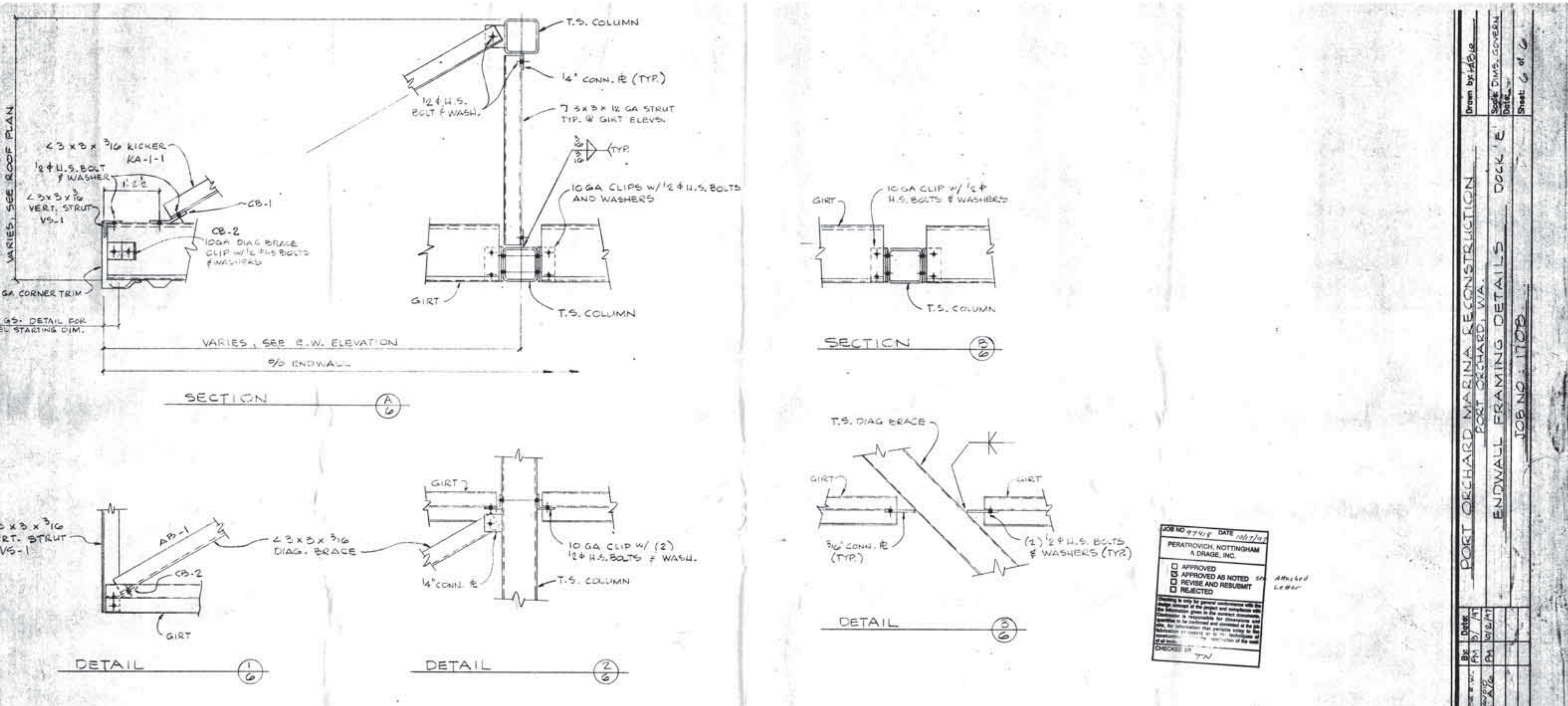

1/2"Ø M. BOLT
T.S. COLUMN
GIRT
24GA EDGE TRIM ET-1B
#12 SDS 'TEK' SCREW
24 GA MEGA-RIB WALLPANEL
#12 SDS 'TEK' SCREW @ EVERY VALLEY
O/O ENDWALL
SECTION A/5
SECTION B/5
SECTION C/5
1'-0
1'-0
SEE ROOF PANEL APPLICATION FOR DIM.
7
1 OR 36
#12 TOP SEAL TEK SCREWS @ 12" O/C TYP @ TRIM
24 GA RAKE TRIM RT-2W
24 GA ROOFPANEL
#12 TEK SCREWS @ EVERY VALLEY
(2) #12 TEK SCREWS @ EVERY PURLIN
24 GA WALLPANEL
PURLIN
RAFTER
SECTION D/5
RAKE ANGLE 4x4x12 GA
RAKE TRIM RT-2
ET-1B
G-2
G-3
G-4
G-6
G-7
G-8
G-1-1
GC-2 CLIP
GC-1 CLIPS TYP. U.N.
CB-2 CLIP
ET-4B
10'-0 OPEN
+0'-0 T.O.D.
20'-6 1/8 CLEAR
4'-0
11'-0 C/C COLS.
12'-9 C/C COLS.
6'-6 C/C COLS.
62'-0 O/O ENDWALL
ENDWALL ELEVATION @ LINE 1
ENDWALL @ LINE 36 SIMILAR
24GA WALLPANEL
#12 TEK SCREWS @ EVERY VALLEY TYP PANEL TO GIRT
GIRT
+10'-6
+10'-0
24 GA TRIM ET-4B
FIELD DRILL 1/4"Ø WEEP HOLES @ 36" O/C
SECTION E/5

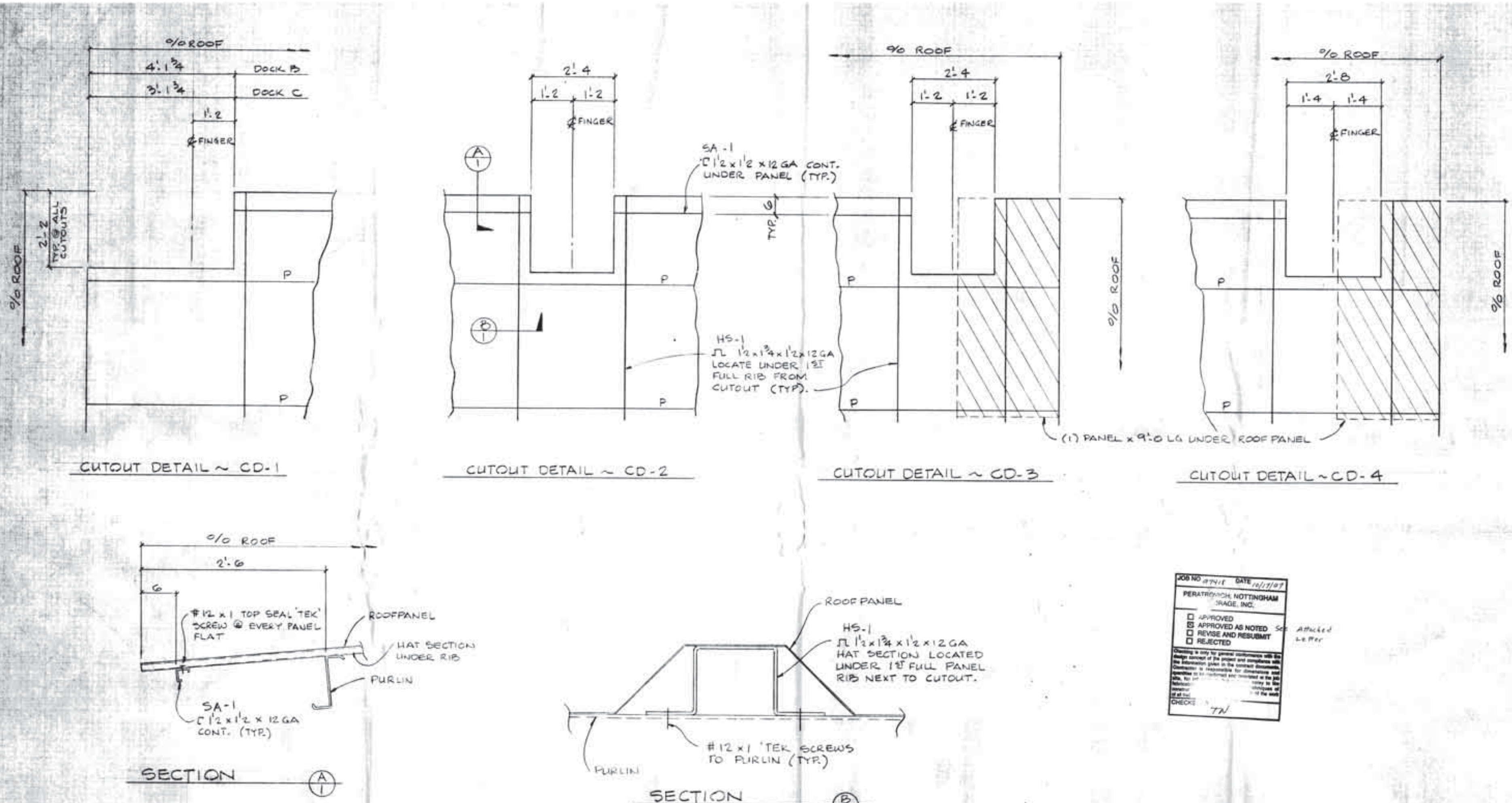
JOB NO. 10-2418
PERATROVICH, NOTTINGHAM & DRAGE, INC.
☐ APPROVED
☒ APPROVED AS NOTED
☐ REVISE AND RESUBMIT
☐ REJECTED
CHECKED BY TN

OCT 10 1997

Bellingham Marine Industries
Builders of UNIFLOAT

PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
DOCK E
ENDWALL ELEVATIONS
JOB NO: 1706
Scale: DIMS. GOVERN
Sheet: 5 of 6


T.S. COLUMN
1/4" CONN. PL (TYP.)
1/2 Ø H.S. BOLT & WASH.
7 3x3x12 GA STRUT TYP. @ GIRT ELEVS.
TYP.
10 GA CLIPS W/ 1/2 Ø H.S. BOLTS AND WASHERS
∠3x3x3/16 KICKER KA-1-1
1/2 Ø H.S. BOLT & WASHER
∠3x3x3/16 VERT. STRUT VS-1
CB-1
CB-2
10GA DIAG BRACE CLIP W/ 1/2 Ø HS BOLTS & WASHERS
VARIES, SEE ROOF PLAN
24 GA CORNER TRIM
SEE GS- DETAIL FOR PANEL STARTING DIM.
GIRT
T.S. COLUMN
VARIES, SEE E.W. ELEVATION
O/O ENDWALL
SECTION A/6
GIRT
10 GA CLIP W/ 1/2 Ø H.S. BOLTS & WASHERS
T.S. COLUMN
SECTION B/6
∠3x3x3/16 VERT. STRUT VS-1
AB-1
CB-2
GIRT
∠3x3x3/16 DIAG. BRACE
DETAIL 1/6
GIRT
1/4" CONN. PL
10 GA CLIP W/ (2) 1/2 Ø H.S. BOLTS & WASH.
T.S. COLUMN
DETAIL 2/6
T.S. DIAG BRACE
GIRT
3/16" CONN. PL (TYP.)
(2) 1/2 Ø H.S. BOLTS & WASHERS (TYP.)
DETAIL 3/6
JOB NO 97418 DATE 10/17/97
PERATROVICH, NOTTINGHAM & DRAGE, INC.
APPROVED
APPROVED AS NOTED
REVISE AND RESUBMIT
REJECTED
CHECKED BY TN
Attached Letter
OCT 13 1997
CRAIG S. FUNSTON STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER
EXPIRES 07/01/99
OCT 10 1997
DAVID E. PEYTON STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER
PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
ENDWALL FRAMING DETAILS
DOCK 'E'
JOB NO. 1708
Drawn by: HBie
Scale: DIMS. GOVERN
Sheet: 6 of 6
Bellingham Marine Industries
Builders of UNIFLOTE
Revision:
By:
Date:


O/O ROOF
4'-1 3/4 DOCK B
3'-1 3/4 DOCK C
1'-2
℄ FINGER
2'-2 TYP. @ ALL CUTOUTS
O/O ROOF
P
P
CUTOUT DETAIL ~ CD-1
2'-4
1'-2 1'-2
℄ FINGER
SA-1
⊏ 1 1/2 x 1 1/2 x 12 GA CONT. UNDER PANEL (TYP.)
6 TYP.
HS-1
⊓ 1 1/2 x 1 3/4 x 1 1/2 x 12 GA LOCATE UNDER 1ST FULL RIB FROM CUTOUT (TYP.)
P
P
CUTOUT DETAIL ~ CD-2
O/O ROOF
2'-4
1'-2 1'-2
℄ FINGER
O/O ROOF
P
P
CUTOUT DETAIL ~ CD-3
(1) PANEL x 9'-0 LG UNDER ROOF PANEL
O/O ROOF
2'-8
1'-4 1'-4
℄ FINGER
O/O ROOF
P
CUTOUT DETAIL ~ CD-4
O/O ROOF
2'-6
6
#12 x 1 TOP SEAL 'TEK' SCREW @ EVERY PANEL FLAT
ROOFPANEL
HAT SECTION UNDER RIB
PURLIN
SA-1
⊏ 1 1/2 x 1 1/2 x 12 GA CONT. (TYP.)
SECTION A/1
ROOF PANEL
HS-1
⊓ 1 1/2 x 1 3/4 x 1 1/2 x 12 GA HAT SECTION LOCATED UNDER 1ST FULL PANEL RIB NEXT TO CUTOUT.
#12 x 1 'TEK SCREWS TO PURLIN (TYP.)
PURLIN
SECTION B/1

JOB NO 97415 DATE 10/17/97
PERATROVICH, NOTTINGHAM & DRAGE, INC.
☐ APPROVED
☒ APPROVED AS NOTED See Attached Letter
☐ REVISE AND RESUBMIT
☐ REJECTED
CHECKED TN

OCT 13 1997
EXPIRES 07/31/99
OCT 10 1997

PORT ORCHARD MARINA RECONSTRUCTION
PORT ORCHARD, WA.
PILE CLEARANCE CUTOUT DETAILS FOR ALL DOCKS
JOB NO: 1708

Drawn by:	Scale: D.M.'s GOVERN	Date:	Sheet: 1 of 1

Revision	By	Date
A NEW DRAWING	PM	10/1/97

Bellingham Marine Industries
Builders of UNIDECK