KLICKITAT PORT DISTRICT No. 1

KLICKITAT COUNTY, WASHINGTON

COMPREHENSIVE SCHEME

OF

DEVELOPMENT

May 4th, 1955

N. W. HANER & ASSOCIATES
ENGINEERS • CONSULTANTS

220 S. W. ALDER ST.
PORTLAND 4, OREGON

13

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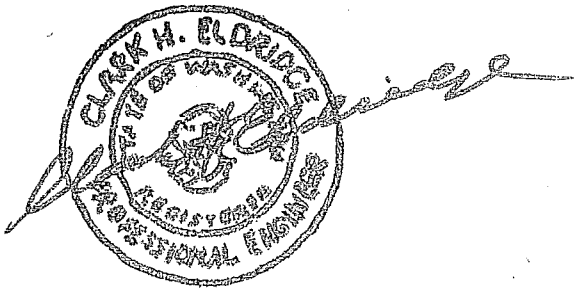


TABLE OF CONTENTS

	Page
FOREWORD	
PART A - GENERAL	1
1. Purpose of the Report	1
2. Existing Facilities	1
3. Potential of the Area	2
PART B - JUSTIFICATION OF PORT DEVELOPMENT	2
PART C - COMPREHENSIVE PLANS OF DEVELOPMENT	2
1. General	3
2. Bingen West Site	4
3. Bingen East Site	7
4. Lyle Site	8
5. Dallesport North Site	9
6. Site Analysis	9
7. Suggested Developments	10
8. Financing	12
9. Engineer's Recommendations	12
10. Conclusions	13

EXHIBITS	Sheet
General Plan of County	1
General Plan of Bingen-White Salmon Sites	2
General Plan of Lyle Site	3
General Plan of Dallesport North Site	4
Bingen West Site - Phases A and B	5
" " " " C	6
" " " " D	7
" " " " E	8
Bingen East Site - Phase A	9
" " " " B	10
" " " " C	11
" " " " D and E	12
" " " " A (Modified)	13

ESTIMATES	
Bingen West Site	Table #1
Bingen East Site	" #2

FOREWORD

This report has been prepared by the undersigned at the request of the Commissioners of the Klickitat Port District No. 1 who are

Homer James	- President
Donald A. Reed, Jr.	- Secretary
A. C. McCormick	- Member

Acknowledgment is made to the Klickitat County Public Utility District, the Corps of Engineers and the U. S. Department of Agriculture for their cooperation in making available data for this report.

N. W. HANER & ASSOCIATES

Engineers -- Consultants

May, 1955

KLICKITAT PORT DISTRICT NO. 1

PORT DEVELOPMENT STUDIES

and

COMPREHENSIVE SCHEME OF DEVELOPMENT

PART A - GENERAL

1. PURPOSE OF THE REPORT

It is the intent of this report to present and analyze the various factors pertinent to the development of port facilities on available sites within Klickitat Port District No. 1 and set forth a Comprehensive Scheme of Development.

The following considerations are considered relevant thereto:

(1) Review of present plans and status of development.
(2) Analyses of the several areas suitable for development.
(3) Preliminary layouts and cost estimates for stage development of the desirable areas.

2. EXISTING FACILITIES

Klickitat Port District No. 1 consists of the westerly portion of Klickitat County as shown on Sheet #1 of the attached plans. It extends from the westerly boundary of the County at the mouth of the White Salmon River and easterly along the pool in the Columbia River formed by the Bonneville Dam to a North-South line several miles upstream of the site of The Dalles Dam now under construction.

The Port has acquired, or has under its control for initial development, an area between the Spokane, Portland and Seattle Railroad and the Columbia River lying westerly from the town of Bingen. Portions of the area are submerged at normal water elevations. Its use or development for industrial purposes would necessitate filling. Facilities for water transport would require channel and mooring basin dredging.

Initial plans of development of the area have been made. An entrance channel and mooring basin have been dredged, and certain areas filled. These areas are currently being used for

the dumping, sorting and storing of logs. The extent of present development is indicated on Sheet #5, Phase "B", Bingen West of the appended exhibits.

Experience in the use of the area indicates that its full utilitization will be dependent on adequate protection from the strong westerly winds to which the area is exposed.

3. POTENTIAL OF THE AREA

The towns of White Salmon and Bingen are the trading points for an area lying east of the White Salmon River and extending northerly to Trout Lake and Mount Adams. The economy of the area is based principally on logging, lumbering, agriculture, the tourist business and sportsmen. Recent analysis of the trends in the area made by Ivan Bloch and Associates indicates:

a. The logging industry is about at its maximum development, timber growth and cuttings being about in balance.

b. The manufacture of wood products from timber is not considered likely.

c. There is reasonable probability of the establishment of a hardboard plant and perhaps other industries utilizing wood wastes.

d. Irrigation in the White Salmon area will have a stimulating effect on the growth of the area.

e. Increases in the population over the next 30 year period for the area will be about 21%, the population now being about 4600 persons.

f. The tourist industry, coupled with that occasioned by sportsmen being attracted to the area will be a factor in the growth of the area.

PART B - JUSTIFICATION OF PORT DEVELOPMENT IN KLICKITAT COUNTY

The creation of slack water by the Bonneville Dam and the resulting increase in river transportation have made port facilities attractive to those communities which could benefit therefrom. To the present, the use of water transportation has

been more extensive to upriver ports. Petroleum products and wheat have been the chief water-borne commodities. The area tributary to Bingen is not a wheat producing area nor have any oil facilities been established there. Until the development of general cargo handling by water carriers, or the establishment of industry requiring such facilities, the principal use that may be expected from a port is that of serving the logging and lumbering industry. In addition, there is an increasing use of the river by small pleasure craft and in connection with sport fishing activities. The justification of a port development at this time must therefore be based on these activities.

The use now being made of the port area for log dumping, sorting and storage indicates that this activity can support a considerable investment. There is also the possibility of movement by barge of lumber produced in the area to downriver ports for overseas export.

These conditions justify the construction of log dumping facilities, small boat marina and such facilities as are discussed hereafter.

PART C - COMPREHENSIVE PLAN OF DEVELOPMENT

1. GENERAL

The possible sites for port development within the limits of Klickitat Port District No. 1 as now established and shown on Sheet #1 of the attached plans, have been investigated. Feasible locations have been visited and studied and general topographic maps prepared. These areas are:

a. The area adjacent to the town of Bingen now under control of the Port District and on which certain dredging has recently been done. This is termed "Bingen West Site".

b. An area easterly from that under "a" in the NW¼ of Section 32, T. 3 N., R. 11 E., not now under the control of the Port but which would be acquired by purchase or condemnation, and will be termed "Bingen East Site".

c. Areas at the mouth of the Klickitat River adjacent to the town of Lyle and termed "Lyle Site".

d. Areas east of The Dalles Dam near the Indian village of Spearfish hereafter termed "Dallesport North Site".

Preliminary plans and estimates of cost for the development of the Bingen West and Bingen East Sites have been prepared and are presented hereinafter.

2. BINGEN WEST SITE

This site is that on which current development work has been undertaken by the Port District. A channel and basin have recently been dredged by the Port to elevation 61. This channel provides a 200 foot wide approach from deep water to a basin approximately 425 feet wide by 1200 feet in length. A log dumping facility has been constructed by others and the basin is being used to raft and store logs.

Use of the area to date has been limited by the fact that it is exposed to westerly winds which hamper sorting and rafting of logs during periods of rough weather.

The full development of this site would provide a usable area of about 90 acres and would involve the construction of a breakwater for protection from westerly winds, dredging and filling. Its development would include:

A. Enlargement of the log dumping and sorting facility.

B. A small boat marina providing moorage facilities, a marine service station, a boat repair facility, a bathing beach, etc.

C. The construction of a dock and warehouse with rail connections.

D. Partial filling of the area for industrial use.

E. Maximum filling of the area for industrial use.

This work could be accomplished in stages as circumstances warrant.

In order to evaluate the site, estimates have been prepared for its development in stages, and are presented hereunder:

Phase A. This phase consists of the acquisition of the present log dumping facility, its expansion and operation by the Port on a revenue producing basis. The facility improvement would involve:

1) Additional excavation work adjacent to the log dump.

2) Increasing the sorting and storage areas by the addition of dolphins and booming facilities.

3) Improvement of the hoist building to allow efficient operation and record keeping.

The estimate for this phase is $12,535.

Phase B. This phase would provide for moorage for small craft, marine service station, small boat building area, repair facility and a protected public bathing beach. It includes the following items:

1) Construction of a breakwater.

2) A limited amount of dredging and filling.

3) Protecting the filled slopes with rock riprap.

4) The construction of an access road with parking areas.

Construction of mooring floats, marine service station, boat repair facility, etc., has been excluded, it being felt that the cost should be borne by those who may desire to operate these facilities under ground lease from the Port.

The estimate for this phase is $156,400 with a rock breakwater. If a pile breakwater is considered sufficient, the cost would be $99,225.

Phase C. This phase consists of a docking area 600 feet long and of railway trackage. It includes the following construction:

1) A steel sheet pile wall 600 feet long.

2) Approximately 2000 feet of railway trackage.

3) Extending the existing culvert approximately 300 feet to allow construction of the railroad spur.

4) Protection of the filled area with rock riprap.

A warehouse is not included. The cost is estimated to be $249,808.

Phase D. This phase would fill an additional area of about 24 acres for industrial use and extension of the breakwater to the west side of the present dredged entrance. It would involve:

1) Filling by dredging.

2) Protection of the slopes by rock riprap.

3) Extension of the breakwater.

The cost is estimated to be $313,662 and $272,912 for rock breakwater or pile bulkhead respectively.

Phase E. This phase would enlarge the area for industrial purposes to its maximum for industrial use. It would include:

1) Dredging a channel inside the breakwater from the existing entrance to the area under Phase A.

2) The extension of the breakwater to provide maximum production for the area.

3) Protecting the filled slopes with rock riprap.

The cost is estimated to be $344,137 if a rock fill breakwater is used and $229,312 for a pile breakwater. The total cost for the development of Bingen West Site will then be:

For rock breakwater - $1,076,542
For pile breakwater - $ 863,792

The per acre cost for usable land area will be $11,900 or $9,600 depending on the type of breakwater used.

3. BINGEN EAST SITE

This area is attractive by reason of the fact that it offers a development well protected from the winds both easterly and westerly with the construction of a minimum length of breakwater. Along its river side the existing ground is at elevations up to 85 which offers protection from rough water during all periods except extreme high water. Much of the area is now at elevation below 70 and a minimum of dredging will be required.

Its full development can provide for a log dumping and sorting facility "A", a small boat marina as outlined for Bingen West Site "B", a docking and warehouse area and area for industrial development "C", a breakwater along the entrance channel "D", maximum filling of the area for industrial use "E". It will provide a minimum area as outlined hereafter of 77 acres with the possibility of enlargement eastward. Its development can be in stages which for estimating purposes have been taken as follows:

Phase A. This phase will provide a log dumping, sorting and storage area. The construction would involve:

1) Dredging a 200 foot channel from deep water and a basin 300 feet in width by approximately 1000 feet in length for log storage.
2) Construction of a log dump facility.
3) Pile bounded sorting and storage areas.

The cost is estimated to be $69,943.

Phase B. This phase will provide a small boat marina, moorage, marine service station, boat repair facility, etc. The construction would involve:

1) Increasing the width of the basin to 800 feet.
2) Protection of filled slopes with rock riprap.

The cost is estimated to be $50,715.

Phase C. This phase will provide a docking area with rail and highway connections. It will involve the construction of:

1) A rail spur from the main line of the S.P. & S. Railway.

2) A road connection to the log dump constructed under Phase A.
3) A steel sheet pile bulkhead 600 feet in length with a filled area behind suitable for the construction of warehousing facilities.

The cost is estimated to be $207,920.

Phase D. This phase would provide a breakwater along the westerly side of the approach channel for a distance of approximately 1000 feet. Its cost is estimated to be $46,000.

Phase E. This phase will complete the development of the area for industrial development. It will involve the following construction:

1) Filling by dredging.
2) Protection of slopes by rock riprap.

The cost is estimated to be $495,995.

The total cost of the Bingen East development will then be $870,573, or $11,306 per acre of usable area.

4. LYLE SITE

At the mouth of the Klickitat River there is a large area of shoal water which, if there were a demand for industrial property, could be utilized by filling. Along the easterly bank of the Klickitat River at its junction with the Columbia, there is a natural rock shelf which would lend itself to dock construction. However, the whole area is so exposed to westerly winds that it is not believed practical for development. The Klickitat River itself being in a narrow gorge and of good depth for a considerable distance up the river, offers an excellent shelter for small craft. However, the rock banks are so precipitous that access from the land is nearly impossible.

On the easterly side of the town there is a well sheltered area with deep water up to nearly vertical banks. The area is now used for a log dump and a ferry landing. It would be a suitable location for a small docking facility were there a demand for such. A topographic map of the area is attached as Drawing #3.

5. DALLESPORT NORTH SITE

The general features of this site immediately north of the Dalles Dam now under construction are as shown on Drawing #4. While the formation of the pool above the Dam will create sheltered inlets which could provide desirable harbors, they will be shut off from access to the river by the relocated line of the Spokane, Portland and Seattle Railroad which will traverse the inlet entries on heavy fills. The elevation of the track grade will be about 10 feet above normal water level. Hence it would not be feasible to provide entry clearance by bridge construction.

The only possibility of development here is for some facility such as for grain or oil, that could be established on the high ground on the area landward from the railroad. Access to river carriers could be provided by bridge or conveyor over the railroad. The topography is such that river carriers could approach very closely to the tracks.

Development of this site would be contingent upon the economic trend of the tributary area.

The Army Engineers are constructing a road into the area from U.S. Highway 830.

6. SITE ANALYSIS

There is no present justification for development of "Klickitat" or "Dallesport North" sites. Their future development will, of necessity, be governed by the economic and industrial expansion of the community.

The Bingen West and Bingen East are alternate sites, the development of either one being sufficient to meet all presently anticipated demands in the forseeable future barring again the attraction of industry. The selection of which of these areas to develop should be made only after a careful analysis of all the factors involved. Parallel development may be had in each, however, at somewhat different costs.

x The Bingen West Site has these advantages:

1. It is now under control of the Port.
2. A substantial sum has been spent in dredging and a log dump and sorting facility established.
3. It is cheaper to expand log dump facility here than at Bingen East Site.

The disadvantages are:

1. Exposure to westerly winds.
2. More expensive construction for like facilities.

To give comparative protection with Bingen East Site, a rock fill breakwater will be required. The total costs of development at the two sites may be compared as follows:

Phase	Bingen West Rock Breakwater	Bingen West Pile Breakwater	Bingen East
Log Dump - A	$ 12,535	$ 12,535	$ 69,943
Marina - B	156,400	99,225	50,715
Docking - C	249,808	249,808	207,920
Filling - D	313,662	272,912	46,000
Max. Filling - E	344,137	229,312	495,995
Fully Develop	$ 1,076,542	$ 863,792	$ 870,573

The Bingen East Site has the advantages of:

1. Cheaper construction for all facilities except log dump.
2. A more protected harbor area.
3. Possibility of economical expansion eastward.

The only apparent disadvantage is that the Port does not now own the property. Original planning of the Port included the possibility of using the area "Bingen East" for an airport. However, there appears to be no forseeable need for such facility and further, the power line crossing of the Columbia at the west boundary makes it inadvisable without the removal of this hazard. The cost of acquiring the property should be small in comparison to the advantages gained and money saved, in development.

7. SUGGESTED DEVELOPMENTS

An analysis of the area and its economic potential suggests several possible developments for the Port.

(a) A log dumping, sorting and storing facility operated by the Port and for the use of all. It is believed that such an operation would yield a very substantial income to the Port. Exact

data is not available, however, the following rough analysis indicates the possibilities here.

The annual expense in operating such a facility should be approximately as follows. It is assumed the yearly operation would consist of eight months.

Scaler and hoist operator @ $100 week each for 35 weeks	$ 7,000
Boom men - 2 @ $80 week each - 35 weeks ...	7,000
Charge for yarding tug: Purchase price $5,000 $150 a month - 8 months	1,200
Fuel - 175 days @ $2.50	440
Tug Operator - 35 weeks @ $100	3,500
Bookkeeper for billing - half time 35 weeks @ $40	1,400
Repairs to facility	2,000
Annual Expense	$ 22,560

If 100,000 F.B.M. a day passes over the dump, we get in 35 weeks or 175 days 17,500,000 F.B.M. for the year and at a charge of $1.50 per 1000 F.B.M., this would yield $26,250, giving a profit to the Port of $3,690.

(a) Such a facility might be leased to operators either on a straight ground lease or on a percentage lease based on the logs handled.

(b) Establish a small boat marina including moorage, boat rentals, marine service station, boat construction and repair facilities.

The Port should develop the area exclusive of these features and turn the construction and operation of them over on lease arrangements to those who desire to conduct such businesses. Statistics taken the past few years indicate that the number of pleasure boats on the river is increasing at the rate of about 50% per year. It is felt that such a facility would be attractive to the entire Bingen, White Salmon area as well as to the sportsmen and tourists from outside. The development could logically wait upon arrangements with operators and then might be financed by bond issue.

(c) The establishment of dock and rail facilities as outlined under Phase C, Bingen West, and Phase C, Bingen East, should await a demand for such a facility and then only on a favorable financial showing. One possibility which can now be seen is the shipment of lumber by barge to lower Columbia River ports for export. The Port might construct and operate such a facility provided such need developed and agreements were worked out with the mills in the area.

(d) The expansion of the areas as outlined under Phase D and E of Bingen West or Bingen East should wait upon the requirements of any industry which might be attracted to the area.

8. FINANCING

Any development undertaken by the Port requires financing. The Port has several alternatives.

The Port District can raise money by general taxation to the extent of 2 mills on the assessed valuation of the district. Based on current valuation of $8,001,284, this would amount to $16,000 per year.

The District is authorized by law to issue general obligation bonds to the extent of 1% of the assessed valuation on approval of the Commissioners, or 3% by a vote of the people in the area. The amounts thus available would be $80,012 and $240,036 respectively.

The Port Commissioners may authorize issuance of revenue bonds based on agreements with industry or operators of certain facilities.

The present bonded debt of the District is $75,000. Should work be undertaken requiring funds in excess of this amount, an additional 2% of the assessed valuation could be raised by an electorate-approved general obligation bond issue. Or, as above stated, financing could be effected by authorization by the Commissioners of a revenue bond issue.

9. ENGINEER'S RECOMMENDATIONS

It is recommended that the Port Commission:

1. Adopt the Comprehensive Scheme here set forth including

both the Bingen West and Bingen East Sites.

2. Acquire the land necessary for the Bingen East development.

3. Acquire control of the present log dump at Bingen West and operate as a public facility either directly or under lease to the operators. It is not felt that any large sum of money should be spent here to enlarge the facility, such amounts to be reserved for the Bingen East development.

4. Develop Bingen East as needs develop and finances permit.

5. Plan to develop a small boat facility at Bingen East and explore means of financing.

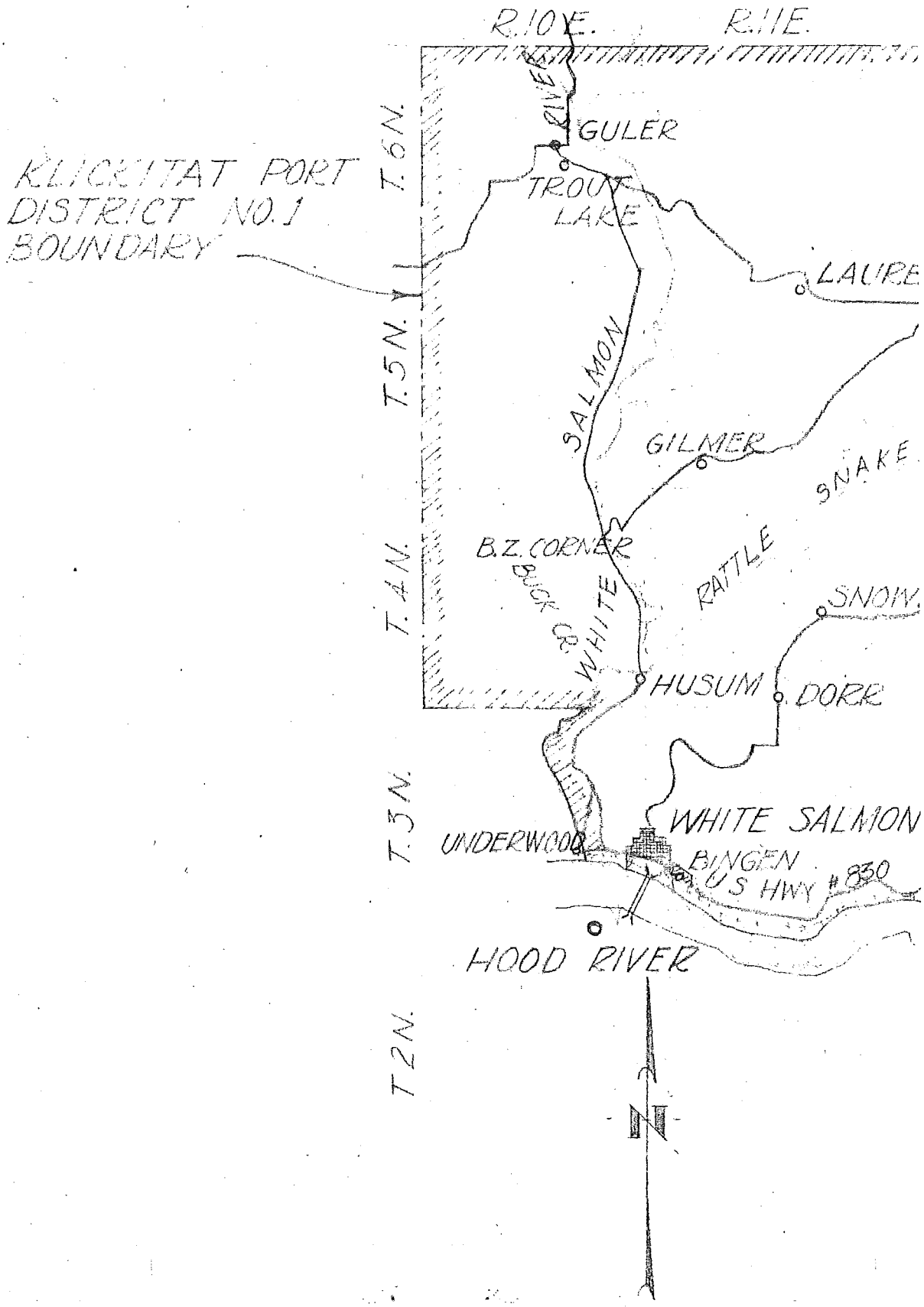
6. Do only such development work as will fit into the adopted Scheme without prejudice to future development only upon definite detail engineering plans and specifications and by contract arrived at by open competitive bidding.

10. CONCLUSIONS

The plans of development here set forth have been arbitrarily chosen in order to present the full possibilities of Port development. They may all be modified to suit needs and finances.

For example, the Bingen East development may be further broken down to reduce its initial cost as follows. Instead of the 200 foot wide, 10 foot deep channel indicated from deep water, an 80 foot channel 5 feet deep may be opened from deep water to the existing lagoon as shown on the drawing, Sheet #13. This would allow the use of the area by small craft and floating moorages provided in the lagoon. These can later be moved to the areas indicated under Phase B, Drawing Sheet #10. This channel would also give access to the mill east of this location. The opening of such a channel is estimated to cost $14,000 to $18,000 depending on its width.

This same channel could be extended at a relatively small cost to permit construction of a dock along its westerly side also, as indicated.


R.10E.
R.11E.
T.6N.
T.5N.
T.4N.
T.3N.
T2N.
KLICKITAT PORT DISTRICT NO.1 BOUNDARY
RIVER
GULER
TROUT LAKE
LAURE
SALMON
GILMER
SNAKE
B.Z. CORNER
BUCK CR.
WHITE
RATTLE
SNOW
HUSUM
DORR
UNDERWOOD
WHITE SALMON
BINGEN
U.S HWY #830
HOOD RIVER
N


R.12E.
R.13E.
R.14E
R.15E.
R.16E.
GLENWOOD
LUCAS
YAKIMA
INDIAN
CREEK
RIVER
U.S. HWY #97
KLICKITAT
WAHKIAKUS
GOLDENDALE
APPLETON
PITT
WRIGHTS
HARTLAND
CENTERVILLE
WARWICK
MARYHILL
LYLE
ROWENA
ROCK ISLAND
AVERY
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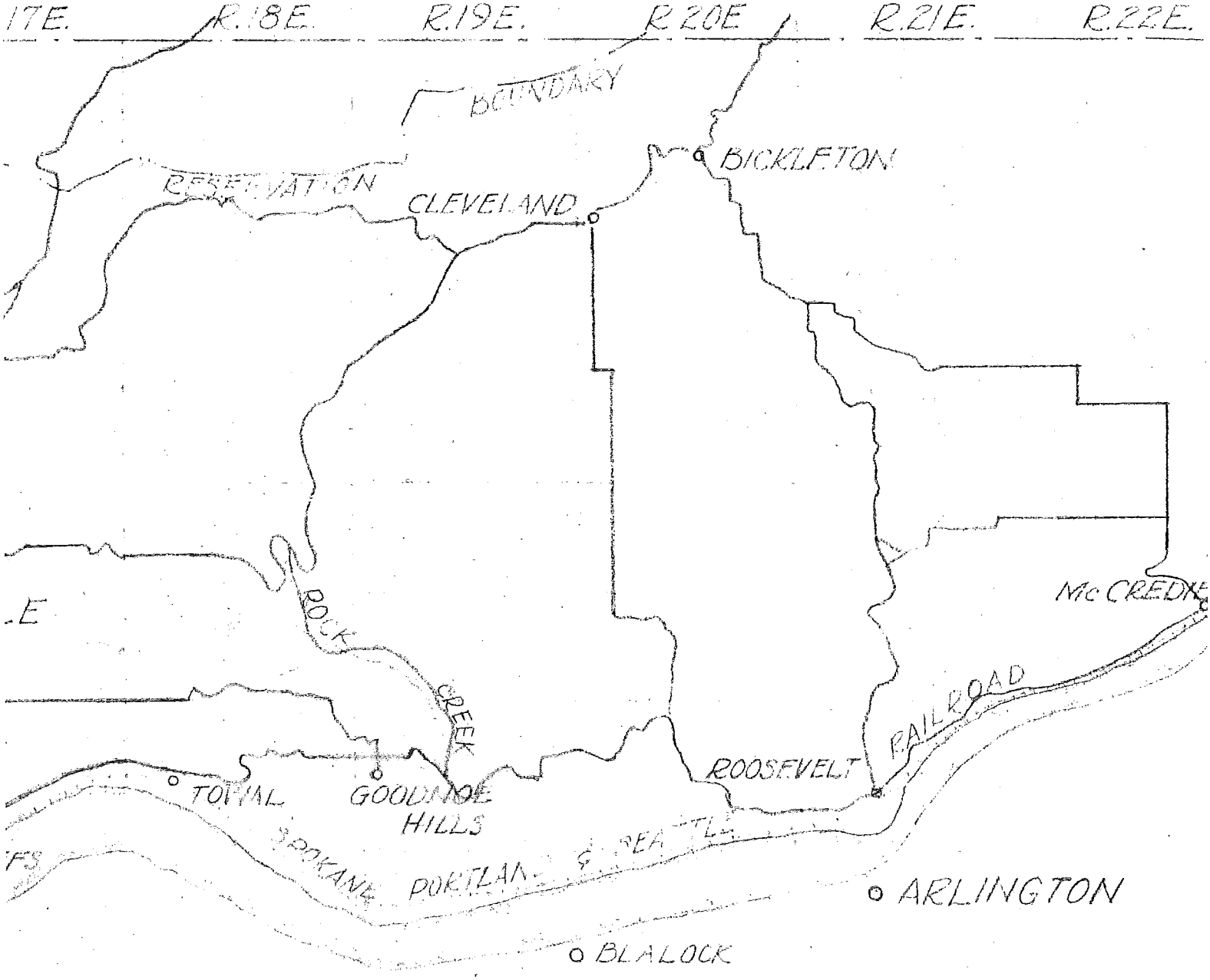
WISHRAM
BIGGS
THE DALLES



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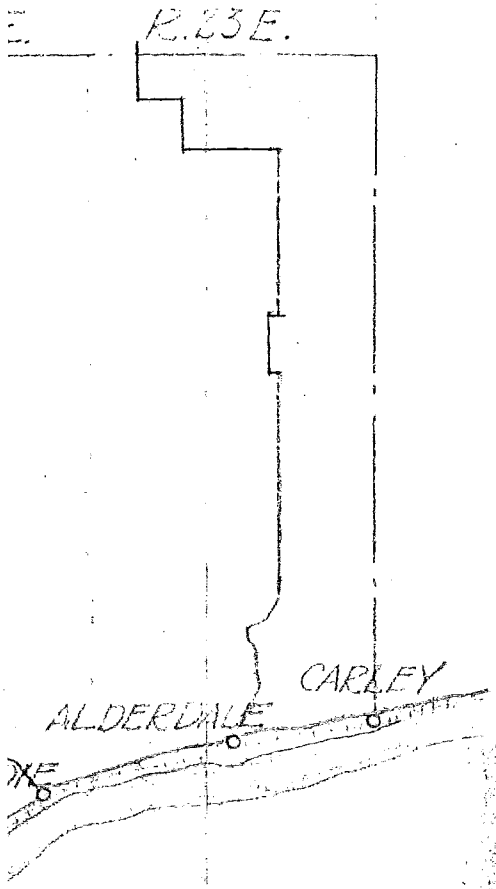


REV.	DATE	DESCRIPTION	BY

KLICKITAT PORT DISTRICT NO. 1
BINGEN, WASHINGTON

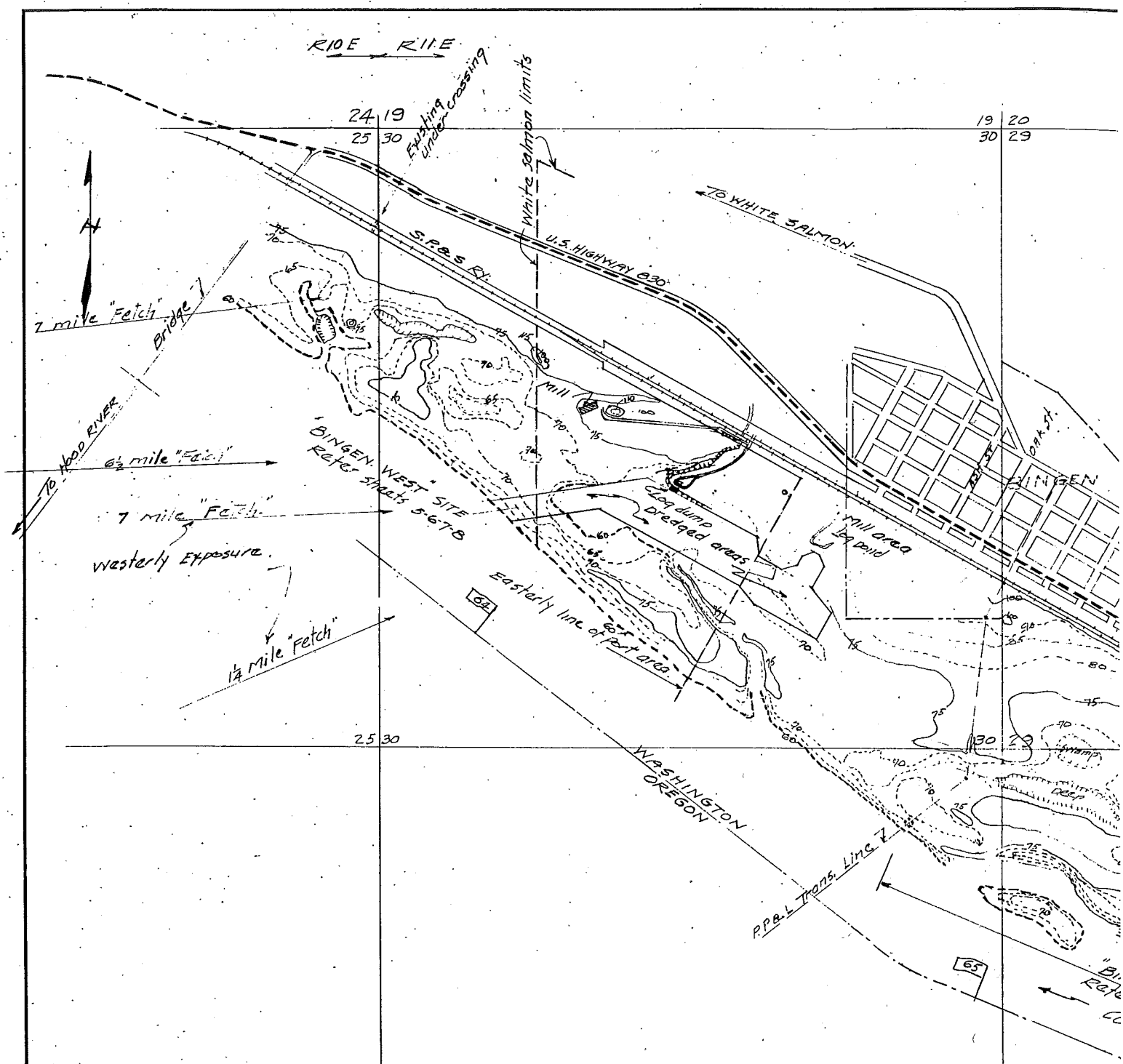
PORT DEVELOMENT STUDIES

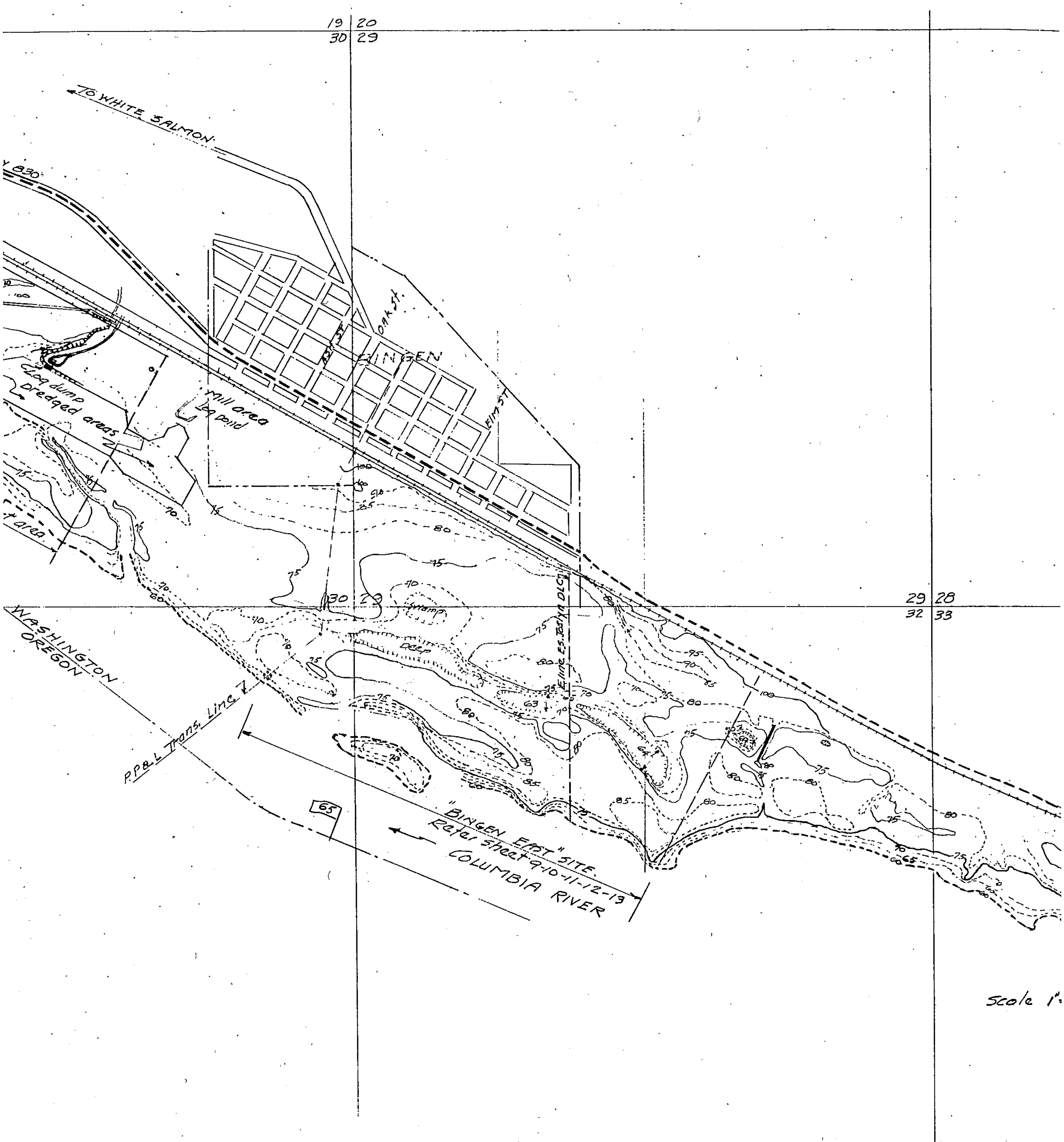
KLICKITAT COUNTY

DESIGN CHE
DRAWN MKH
CHECK NWH
SUBMITTED Chas H Elmendorf

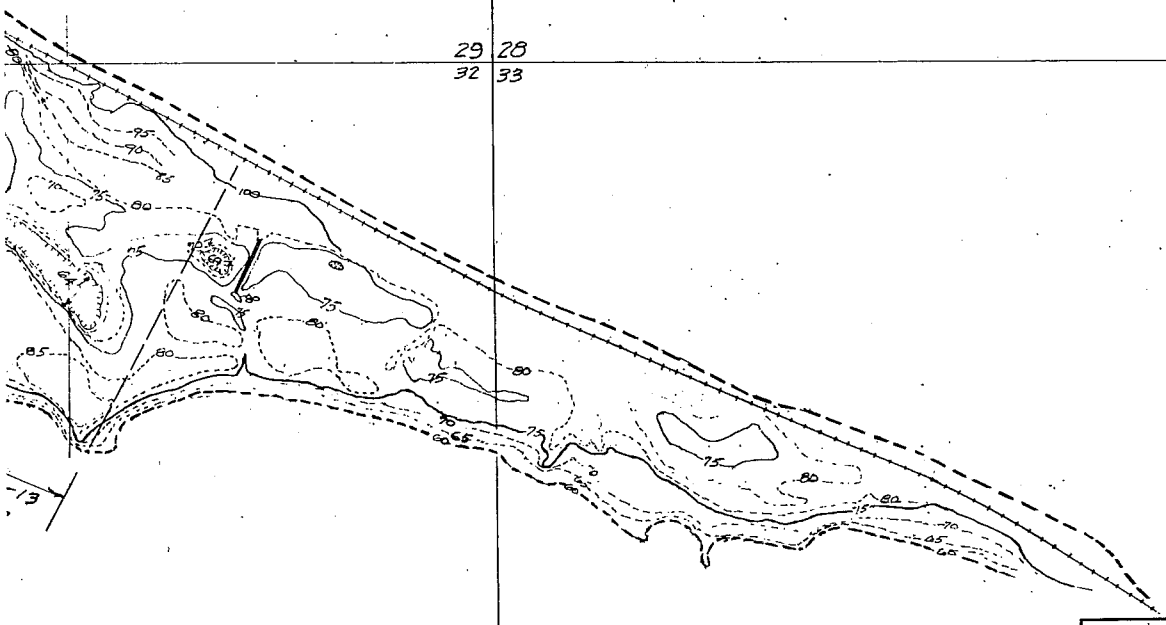
N.W. HANER & ASSOCIATES
ENGINEERS - CONSULTANTS
220 S. W. ALDER
PORTLAND 4, OREGON

JOB 192 SHEET 1 OF 13


R10E R11E
24 19
25 30
19 20
30 29
Existing under crossing
White Salmon limits
To White Salmon
S.P.&S. Ry.
U.S. Highway 830
N
2 mile "Fetch"
Bridge
To Hood River
6½ mile "Fetch"
7 mile "Fetch"
Westerly Exposure.
1¼ Mile "Fetch"
Bingen West Site
Refer sheets 5-6-7-8
Mill
Log dump
Dredged areas
Mill area
Log pond
East Bingen
Oak St.
Easterly line of Port area
64
65
25 30
30 29
Washington
Oregon
Swamp
Deep
P.P.&L. Trans. Line 2



19 20
30 29
TO WHITE SALMON
BINGEN
OAK ST.
ELM ST.
Log dump
Dredged areas
Mill area
Log pond
30 29
Swamp
Deep
29 28
32 33
WASHINGTON
OREGON
P.P.&L. Trans. Line
65
"BINGEN EAST" SITE
Refer sheet 9-10-11-12-13
COLUMBIA RIVER
Scale 1"



REV.	DATE	DESCRIPTION	BY

KLICKITAT PORT DISTRICT NO 1
BINGEN, WASH

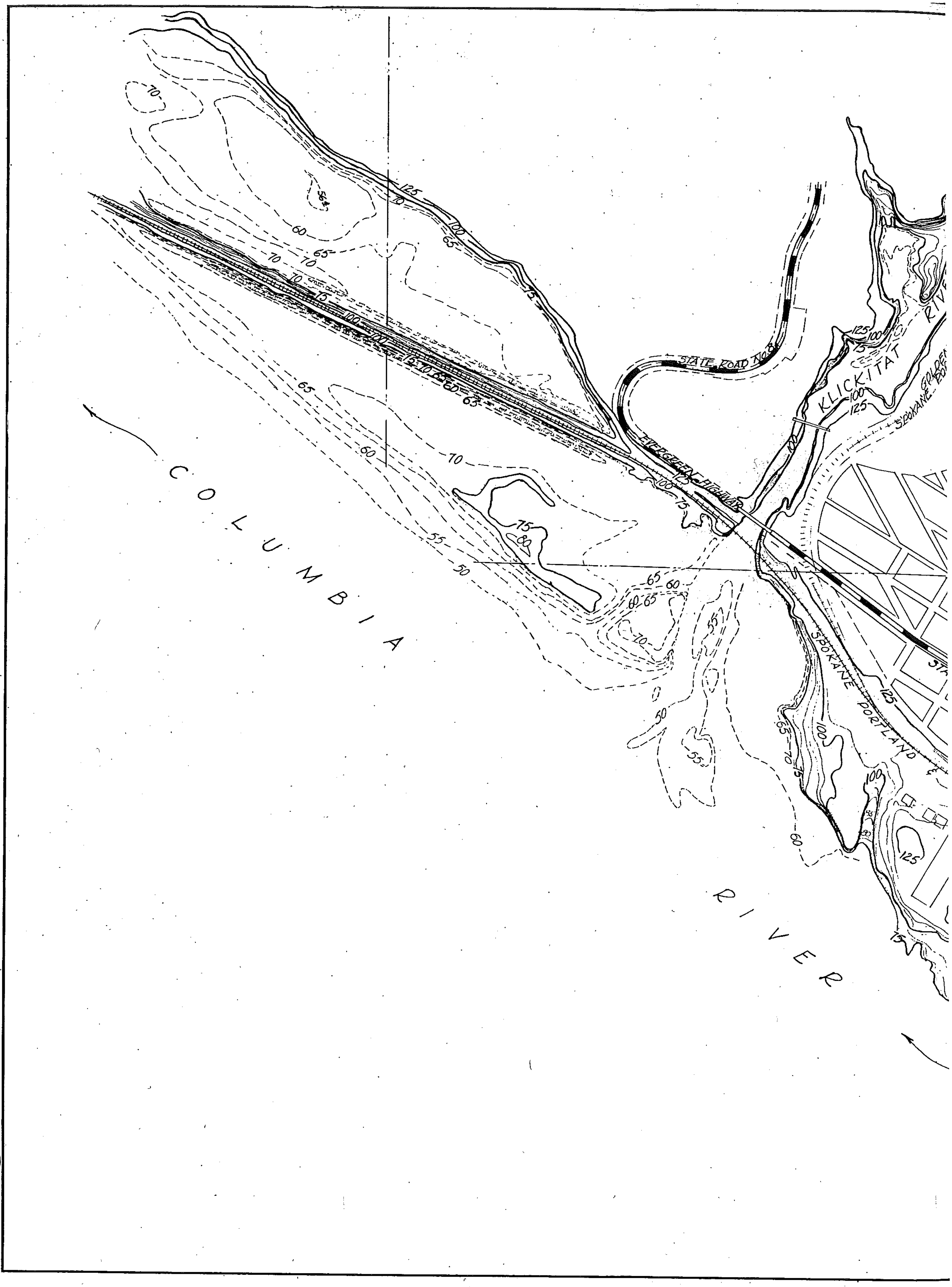
PORT DEVELOPMENT STUDIES
BINGEN - WHITE SALMON AREA

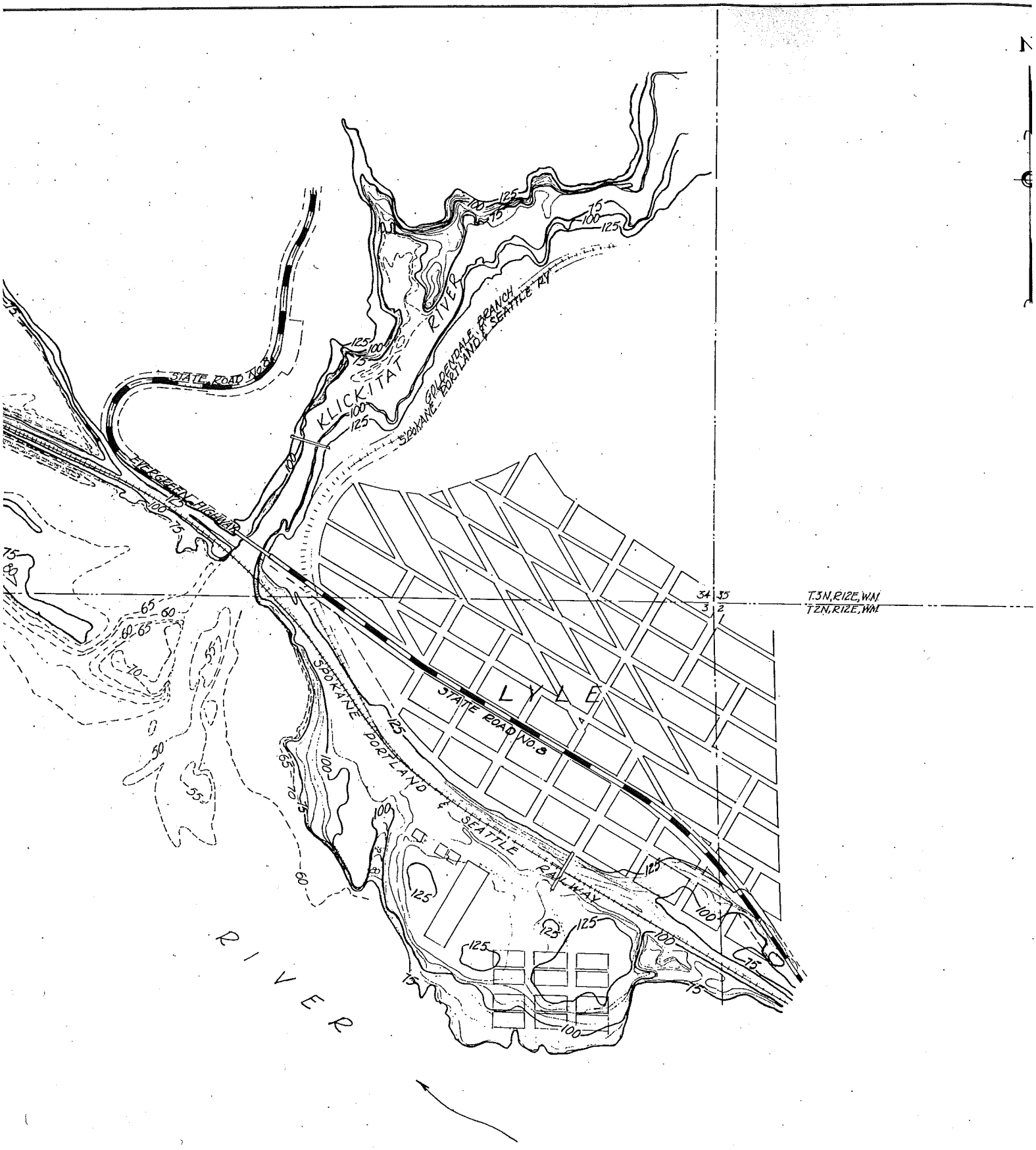
CLARK H. ELDRIDGE
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

DESIGN CHE
DRAWN CHE 2,55
CHECK NWH
SUBMITTED Clark H Eldridge

N.W. HANER & ASSOCIATES
ENGINEERS - CONSULTANTS
220 S.W. ALDER
PORTLAND 4, OREGON

JOB 192 SHEET 2 OF 13


COLUMBIA
RIVER
KLICKITAT
STATE ROAD NO 8
EVERGREEN HIGHWAY
SPOKANE PORTLAND


STATE ROAD No. 3
KLICKITAT RIVER
SPOKANE, PORTLAND & SEATTLE RY
SPOKANE, PORTLAND & SEATTLE RAILWAY
STATE ROAD No. 8
LYLE
RIVER
T.3N, R12E, W.M.
T.2N, R12E, W.M.
34
35
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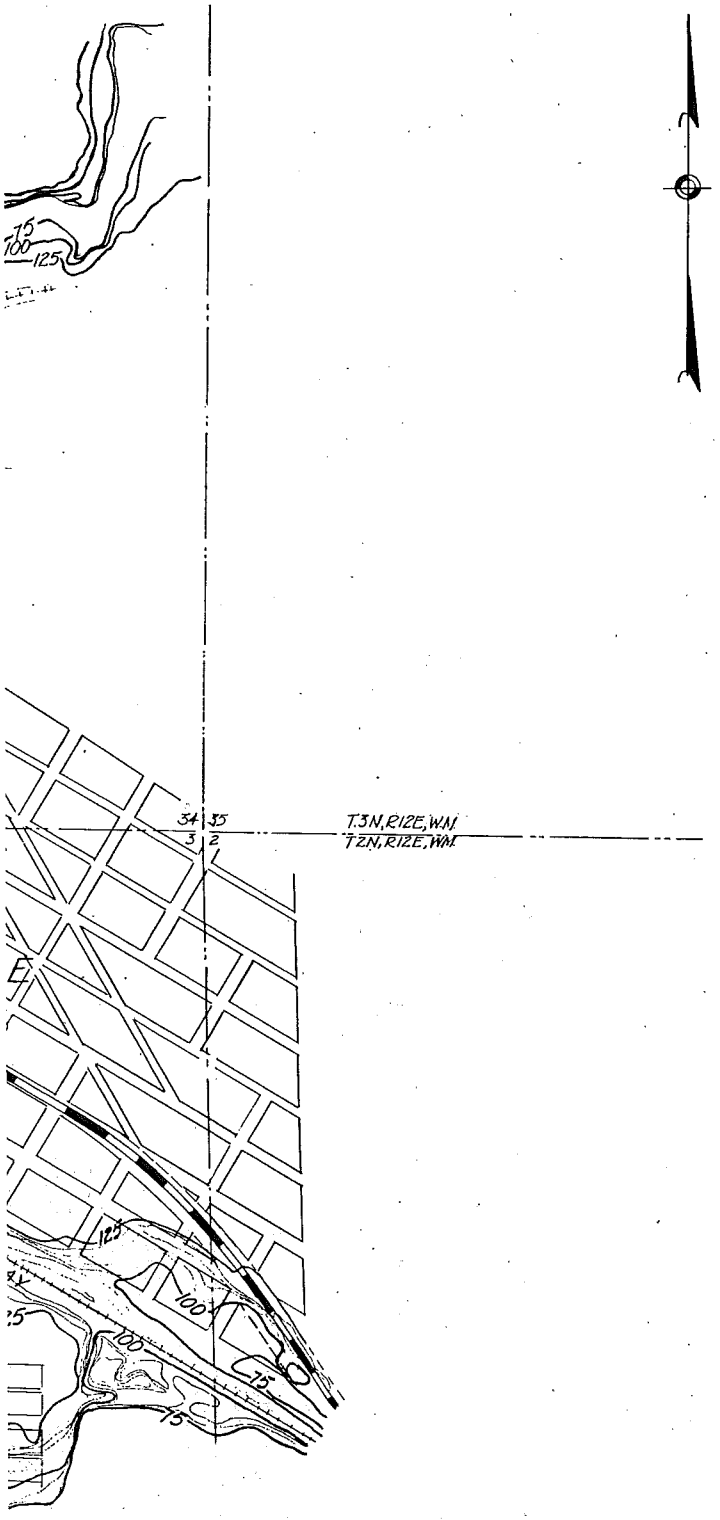
2
1
N



SCALE 1"=400'

400 0 400 800 1200 1600

Feet

REV.	DATE	DESCRIPTION	BY

KLICKITAT PORT DISTRICT NO. 1
BINGEN, WASHINGTON

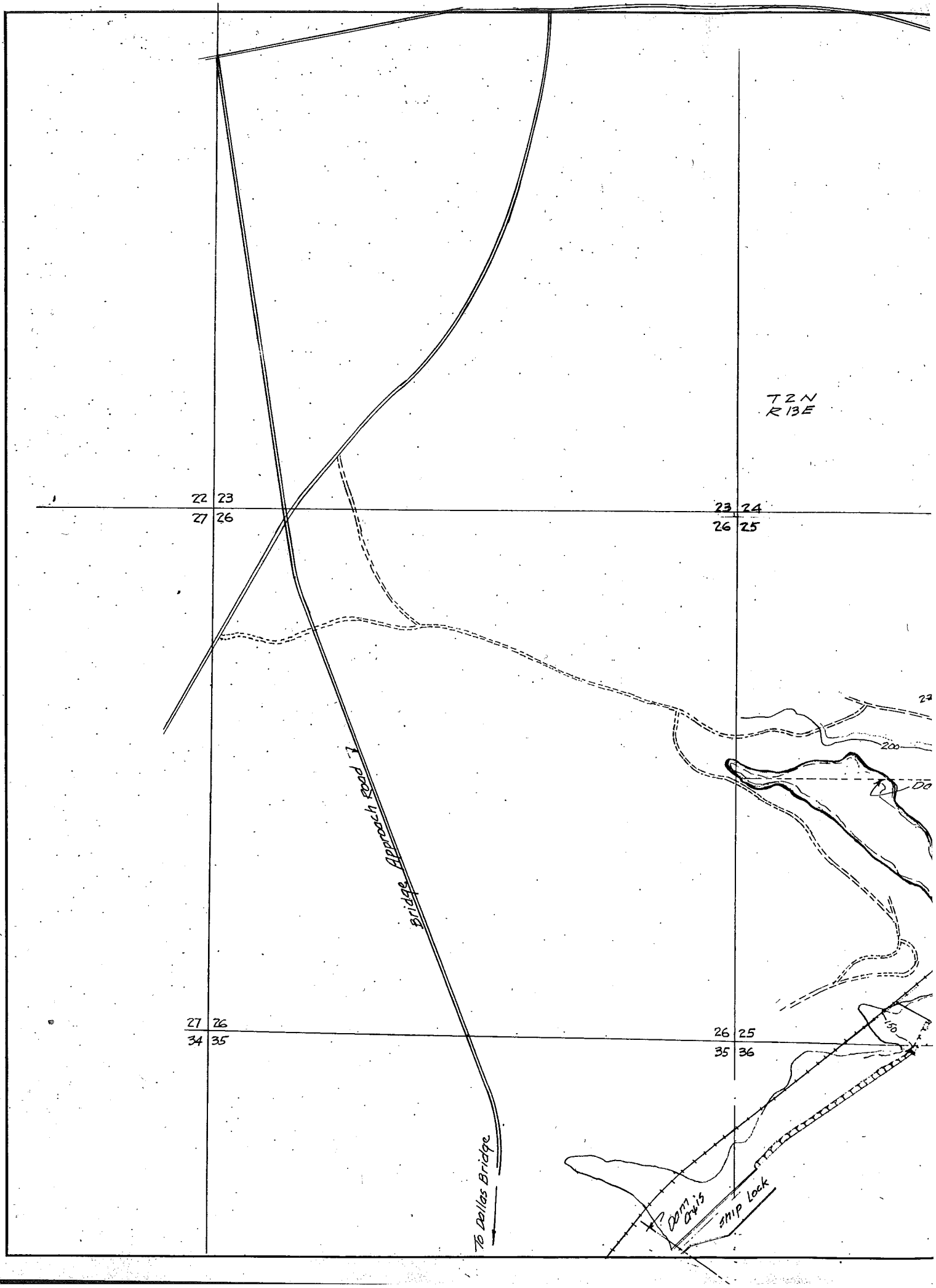
PORT DEVELOPMENT STUDIES
LYLE SITE

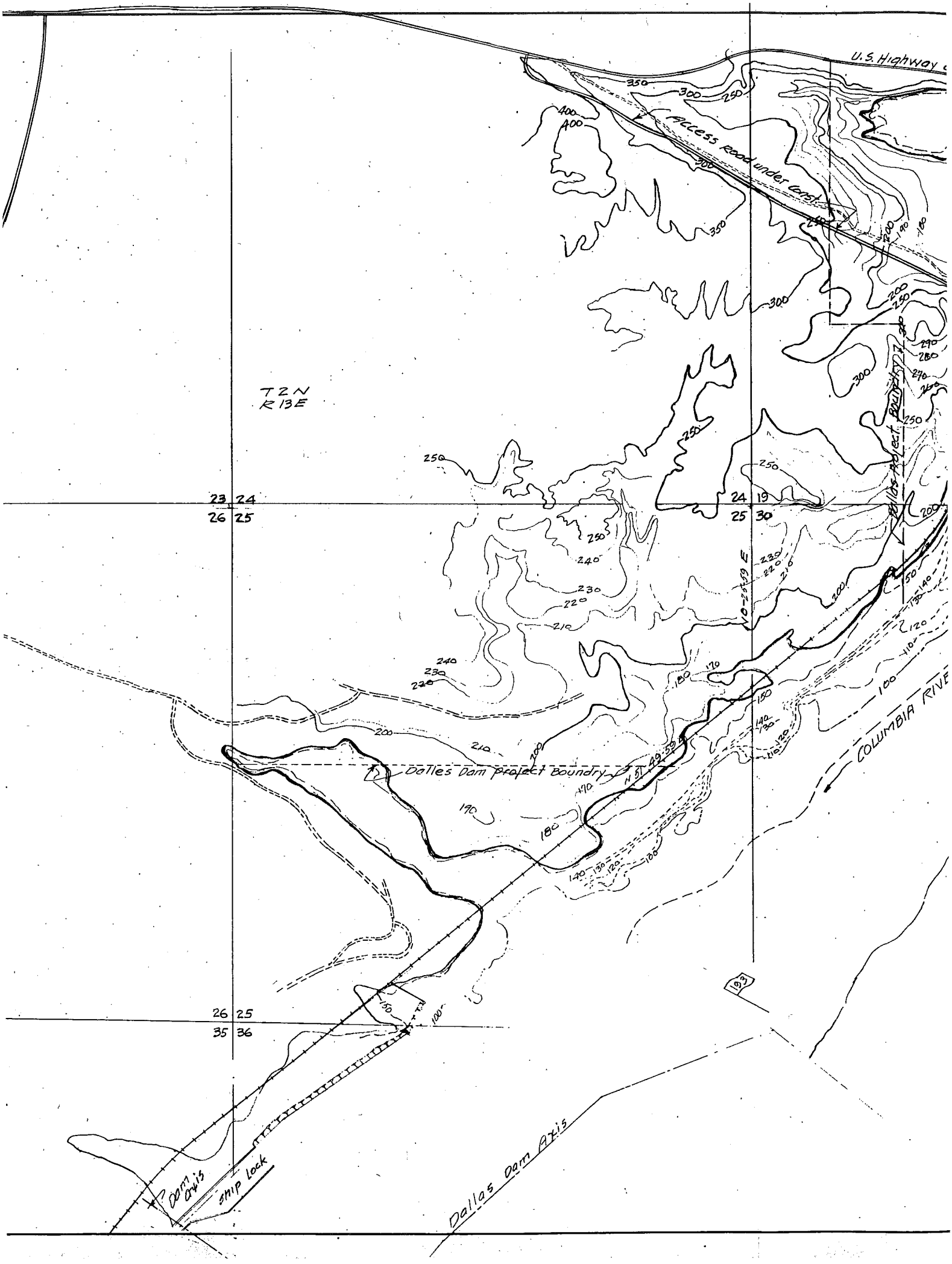
CLARK H. ELDRIDGE — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER

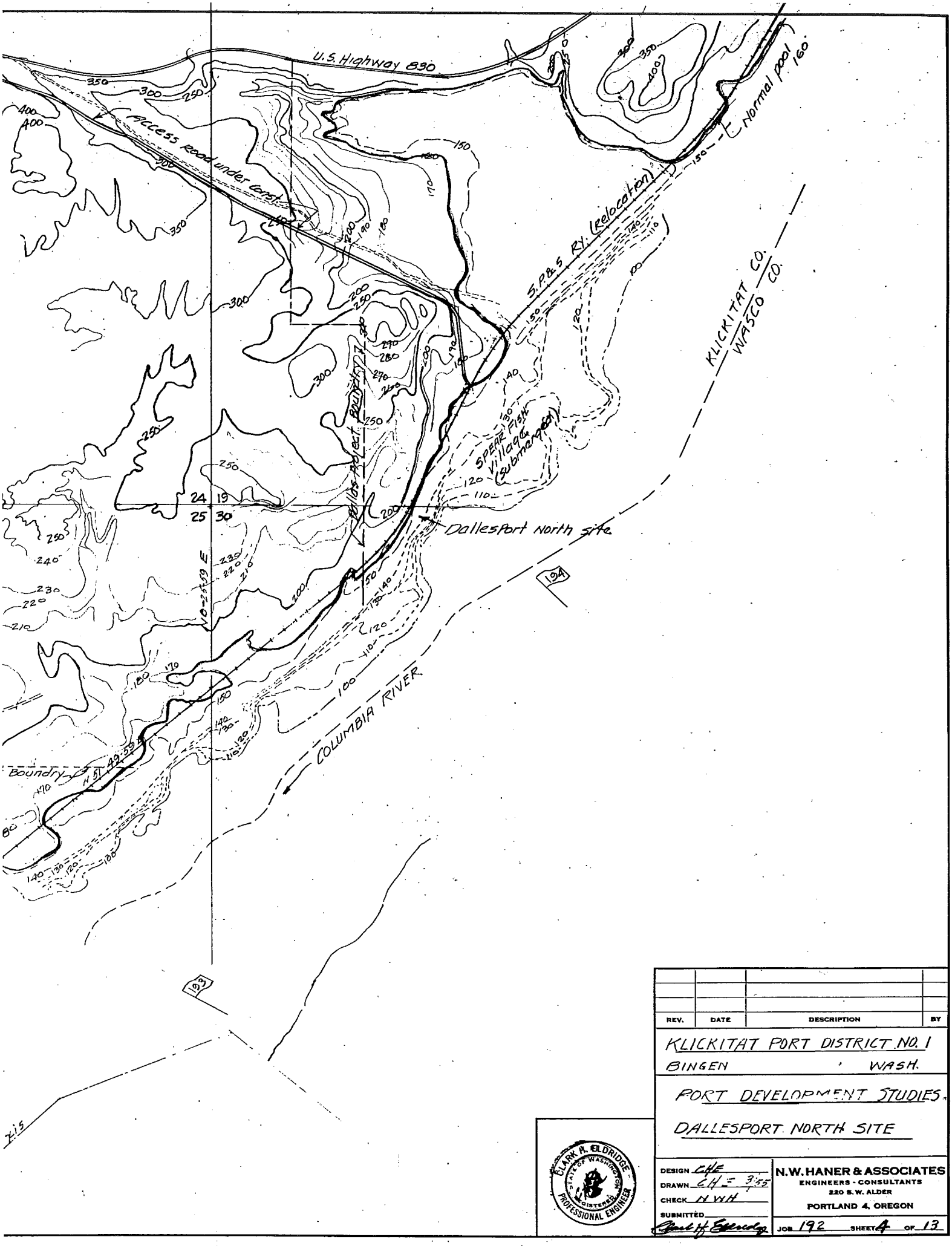
DESIGN CHE
DRAWN MKH 3/4/55
CHECK
SUBMITTED

N.W. HANER & ASSOCIATES
ENGINEERS - CONSULTANTS
220 S.W. ALDER
PORTLAND 4, OREGON

JOB 192 SHEET 3 OF 13


T2N
R13E
22 23
27 26
23 24
26 25
27 26
34 35
26 25
35 36
Bridge Approach Road
To Dallas Bridge
Dam's Axis
Ship Lock
200
100


U.S. Highway
Access Road under const.
T2N
R13E
23 24
26 25
24 19
25 30
26 25
35 36
Dalles Project Boundry
N 51° 49' 59" E
Dalles Dam project boundry
COLUMBIA RIVE
193
Dam Axis
Ship Lock
Dallas Dam Axis



REV.	DATE	DESCRIPTION	BY

KLICKITAT PORT DISTRICT NO. 1

BINGEN , WASH.

PORT DEVELOPMENT STUDIES

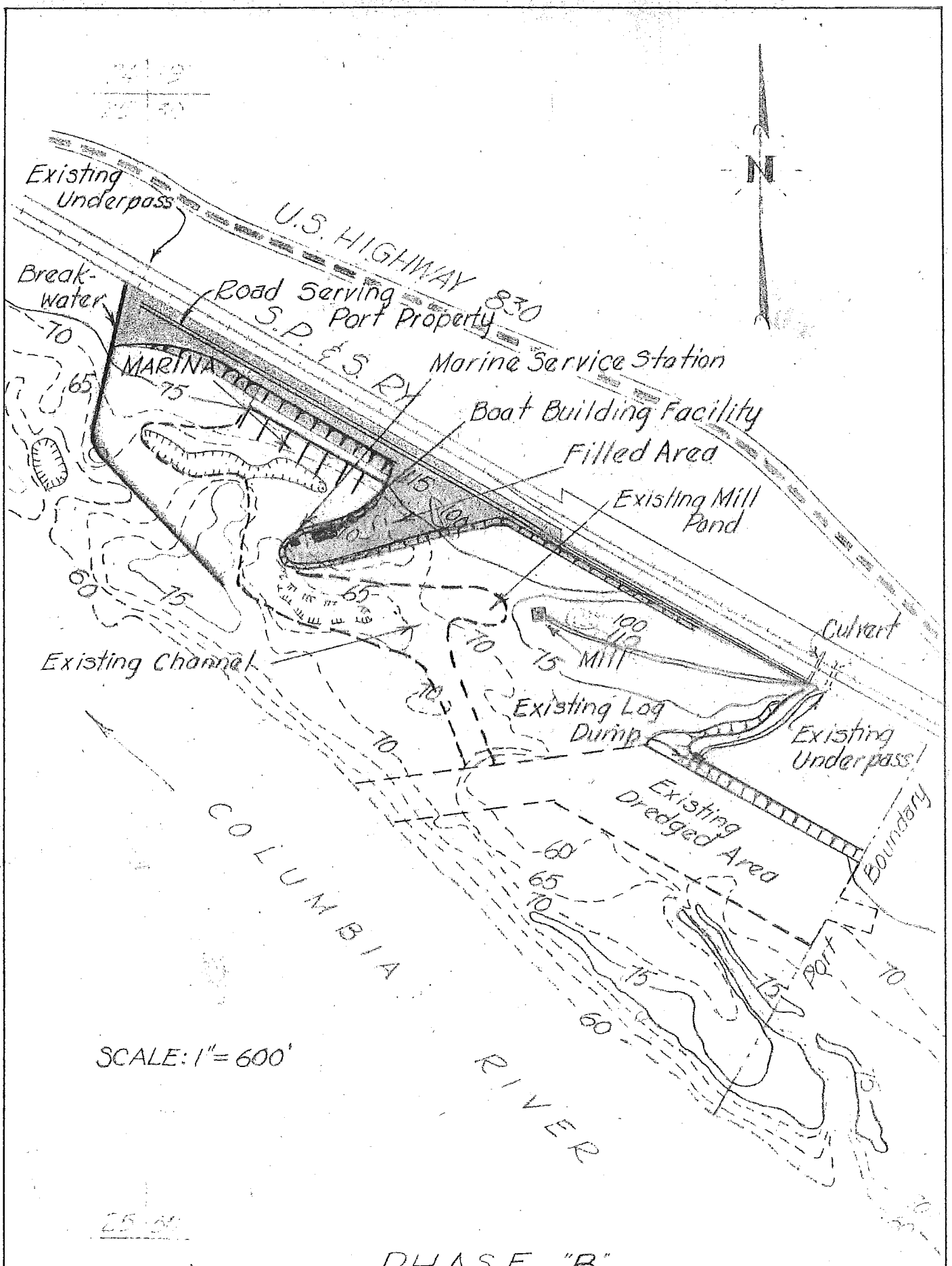
DALLESPORT NORTH SITE

CLARK H. ELDRIDGE — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER

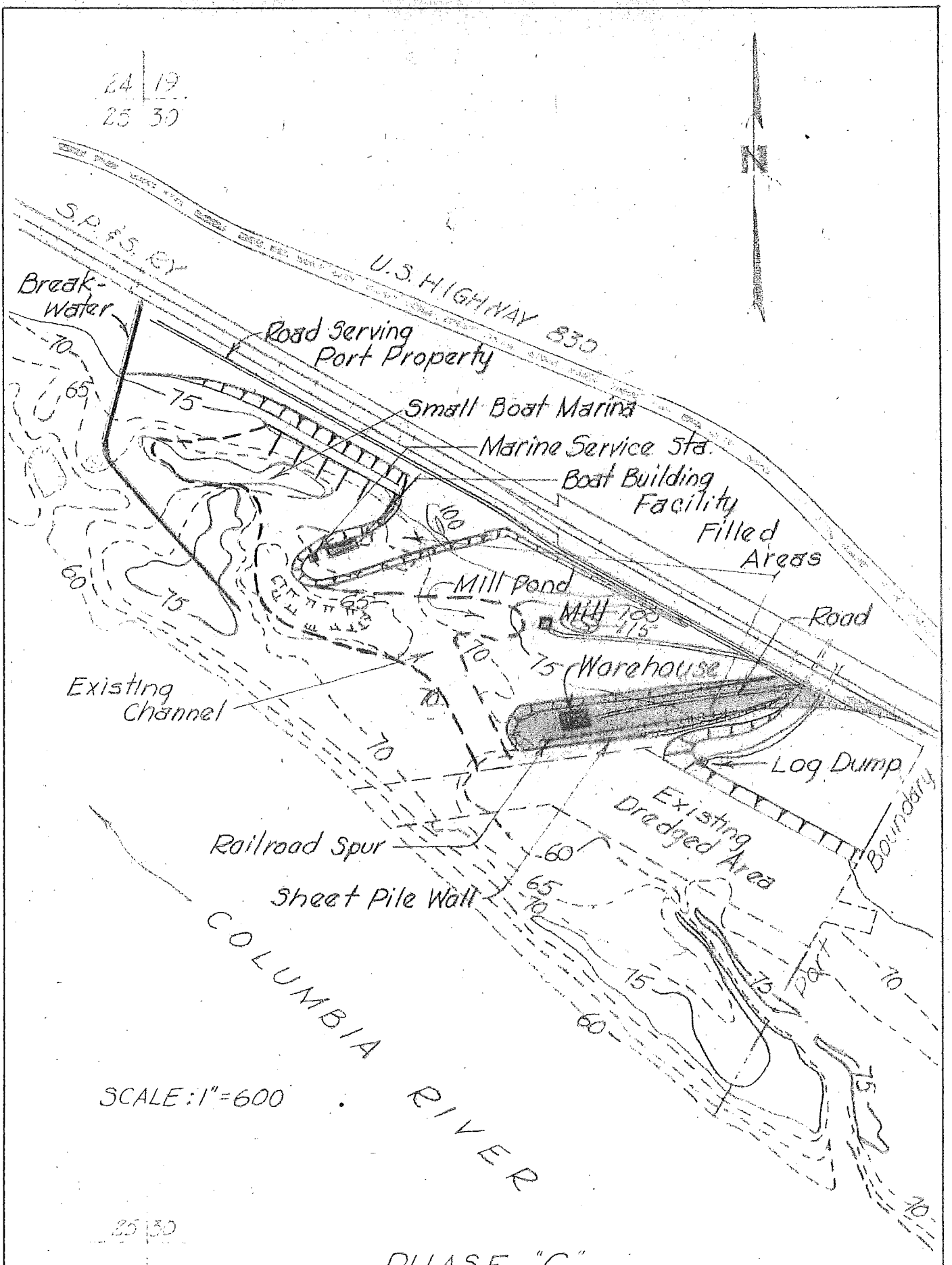
DESIGN CHE
DRAWN CH 3-55
CHECK NWH
SUBMITTED

N.W. HANER & ASSOCIATES
ENGINEERS - CONSULTANTS
220 S.W. ALDER
PORTLAND 4, OREGON

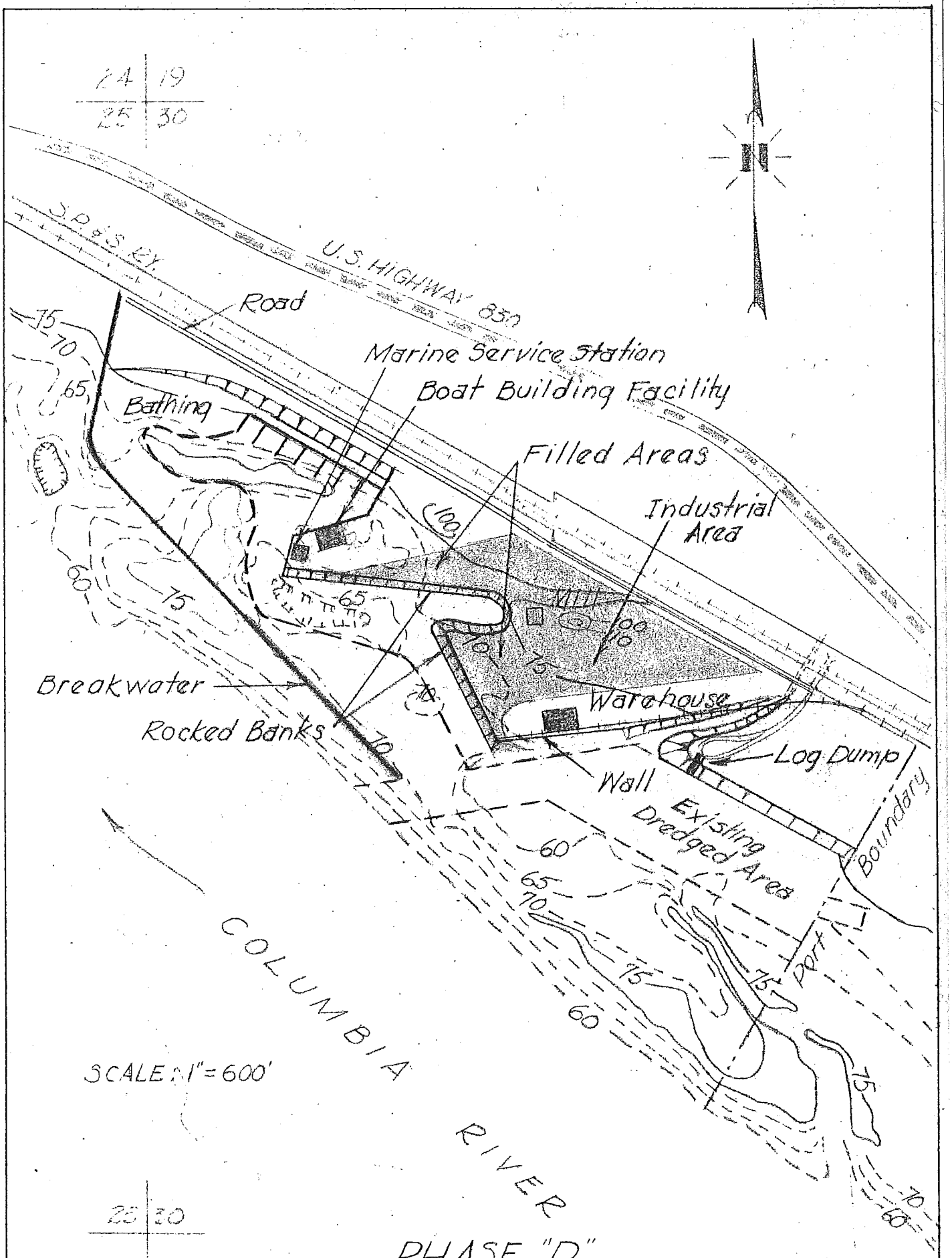
JOB 192 SHEET 4 OF 13



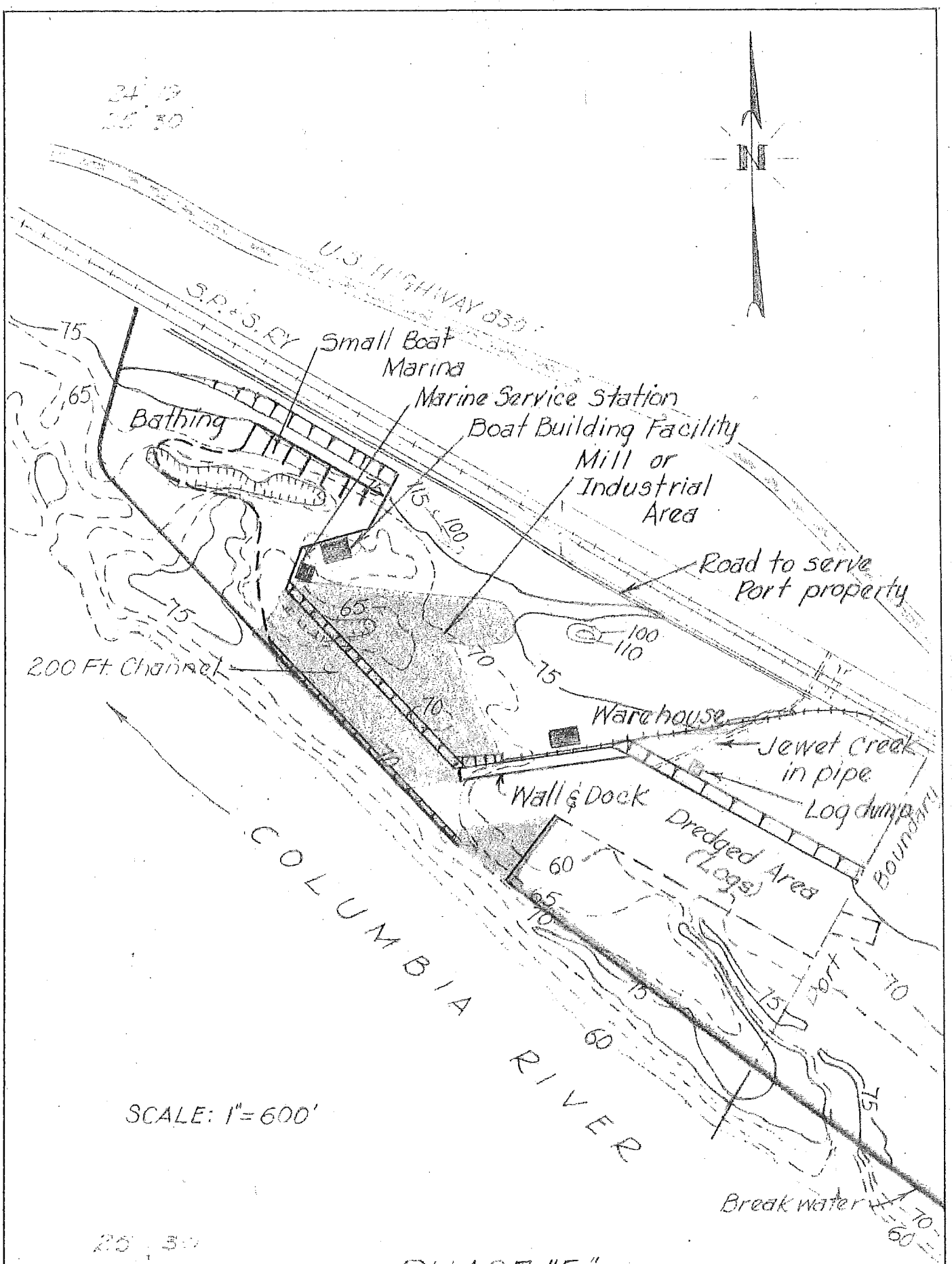
PHASE "B"
BINGEN WEST



PHASE "C"
BINGEN WEST

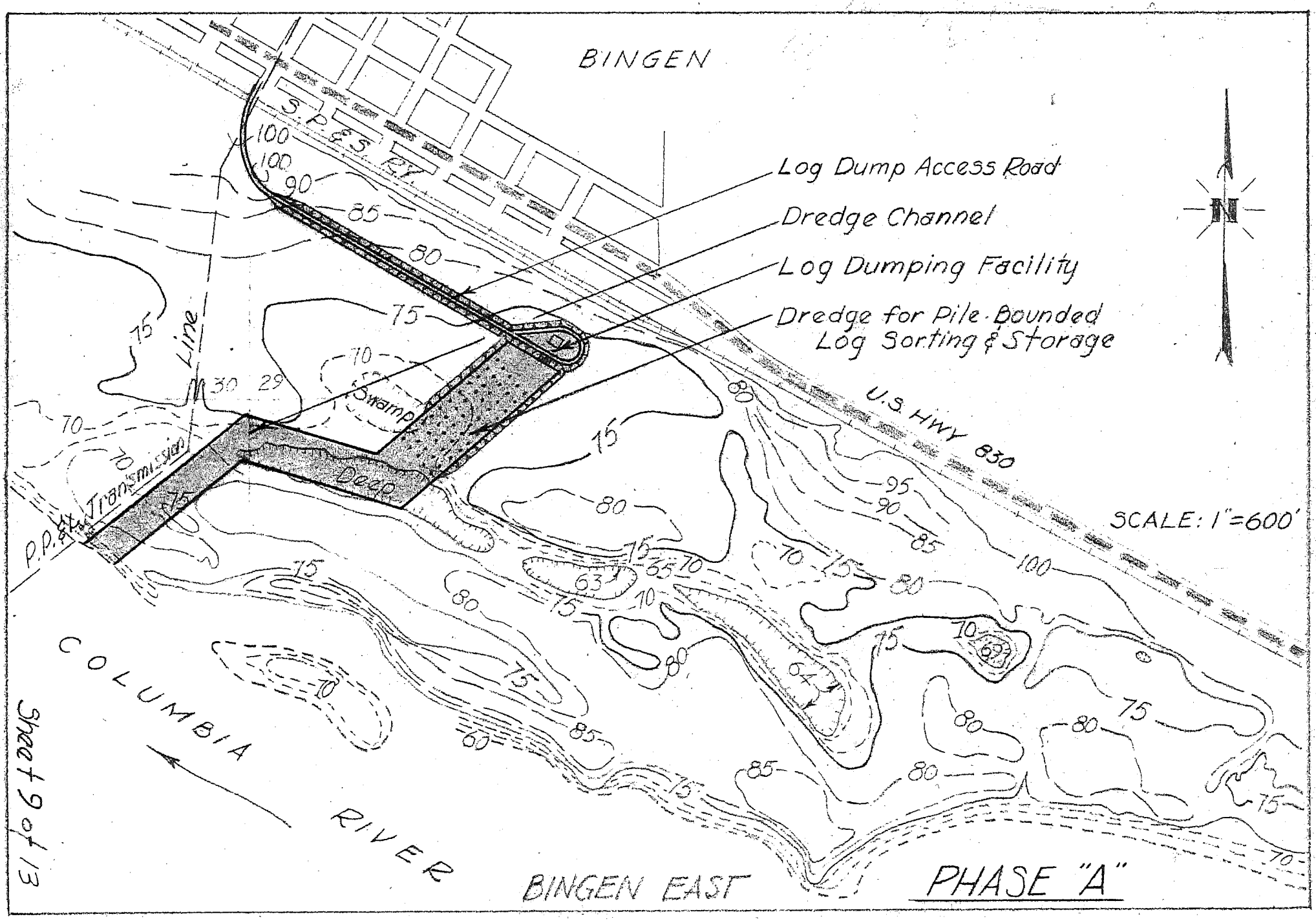


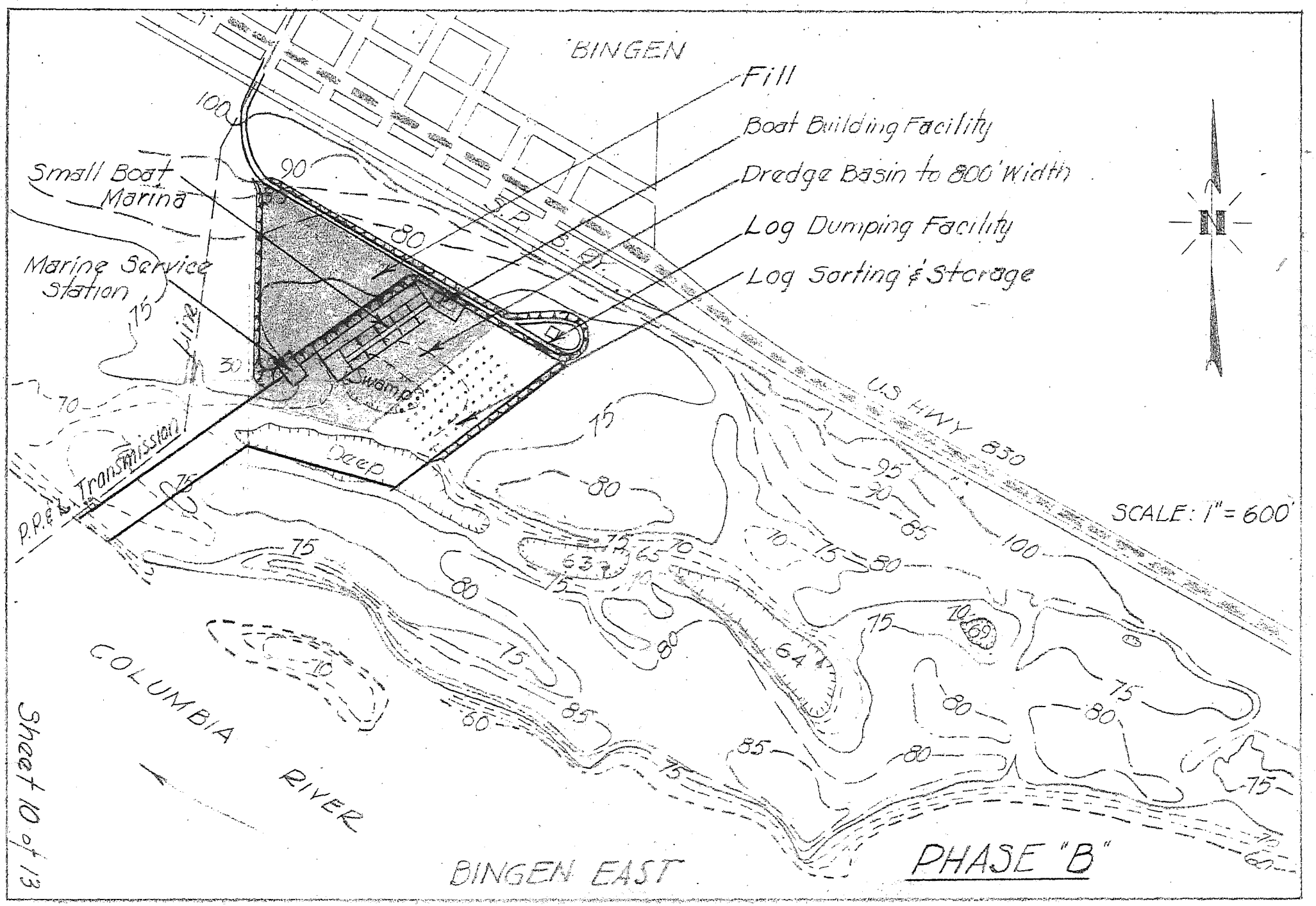
PHASE "D"
BINGEN WEST

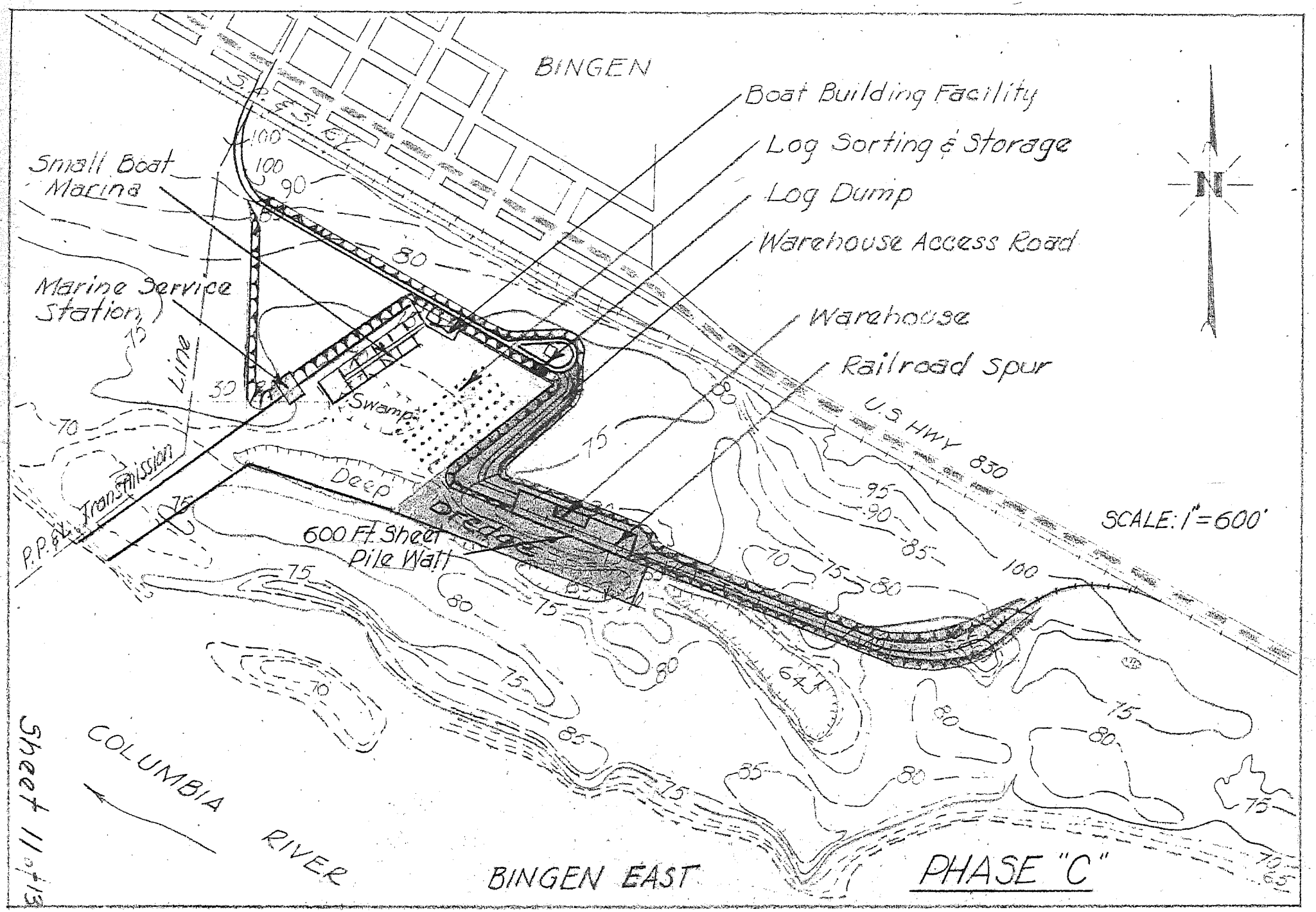


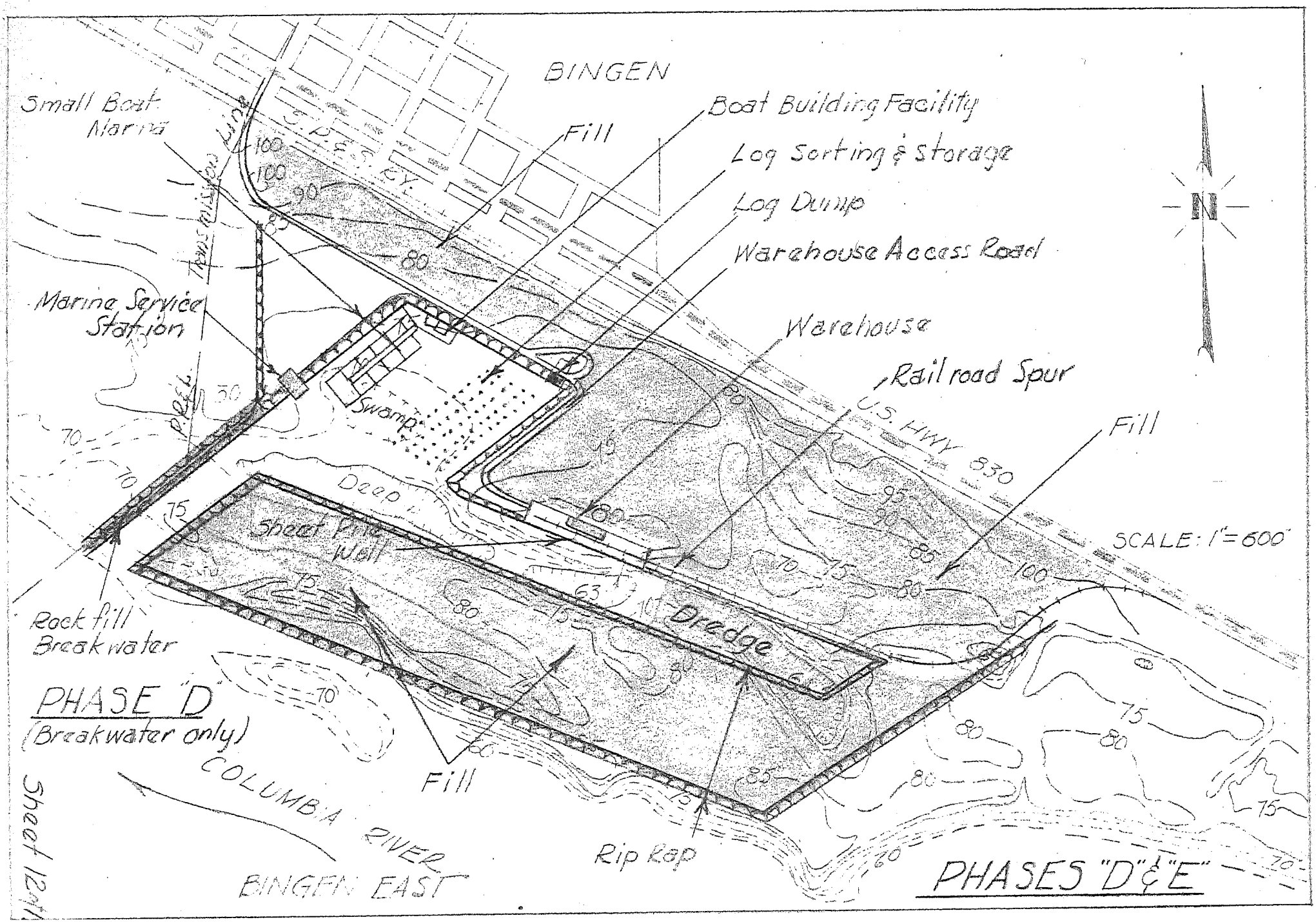
PHASE "E"

BINGEN WEST


BINGEN
S. P. & S. R.R.
Log Dump Access Road
Dredge Channel
Log Dumping Facility
Dredge for Pile-Bounded Log Sorting & Storage
N
U.S. HWY 830
Swamp
Deep
P.P. & L. Transmission Line
SCALE: 1"=600'
COLUMBIA RIVER
BINGEN EAST
PHASE "A"
Sheet 9 of 13


BINGEN
Fill
Boat Building Facility
Dredge Basin to 800' Width
Log Dumping Facility
Log Sorting & Storage
Small Boat Marina
Marine Service Station
Swamp
Deep
P.P.&L. Transmission Line
U.S. HWY 830
SCALE: 1" = 600'
COLUMBIA RIVER
BINGEN EAST
PHASE "B"
Sheet 10 of 13


BINGEN
Boat Building Facility
Log Sorting & Storage
Log Dump
Warehouse Access Road
Warehouse
Railroad Spur
Small Boat Marina
Marine Service Station
P.P. & L. Transmission Line
Swamp
Deep
Dredge
600 Ft. Sheet Pile Wall
U.S. HWY 830
SCALE: 1" = 600'
COLUMBIA RIVER
BINGEN EAST
PHASE "C"
Sheet 11 of 13


BINGEN
Small Boat Marina
Boat Building Facility
Fill
Log Sorting & Storage
Log Dump
Warehouse Access Road
Warehouse
Railroad Spur
U.S. HWY 830
Marina Service Station
Swamp
Deep
Sheet Pile Wall
Dredge
Fill
Rock fill Breakwater
PHASE "D"
(Breakwater only)
COLUMBIA RIVER
BINGEN EAST
Rip Rap
PHASES "D" & "E"
SCALE: 1" = 600'
N

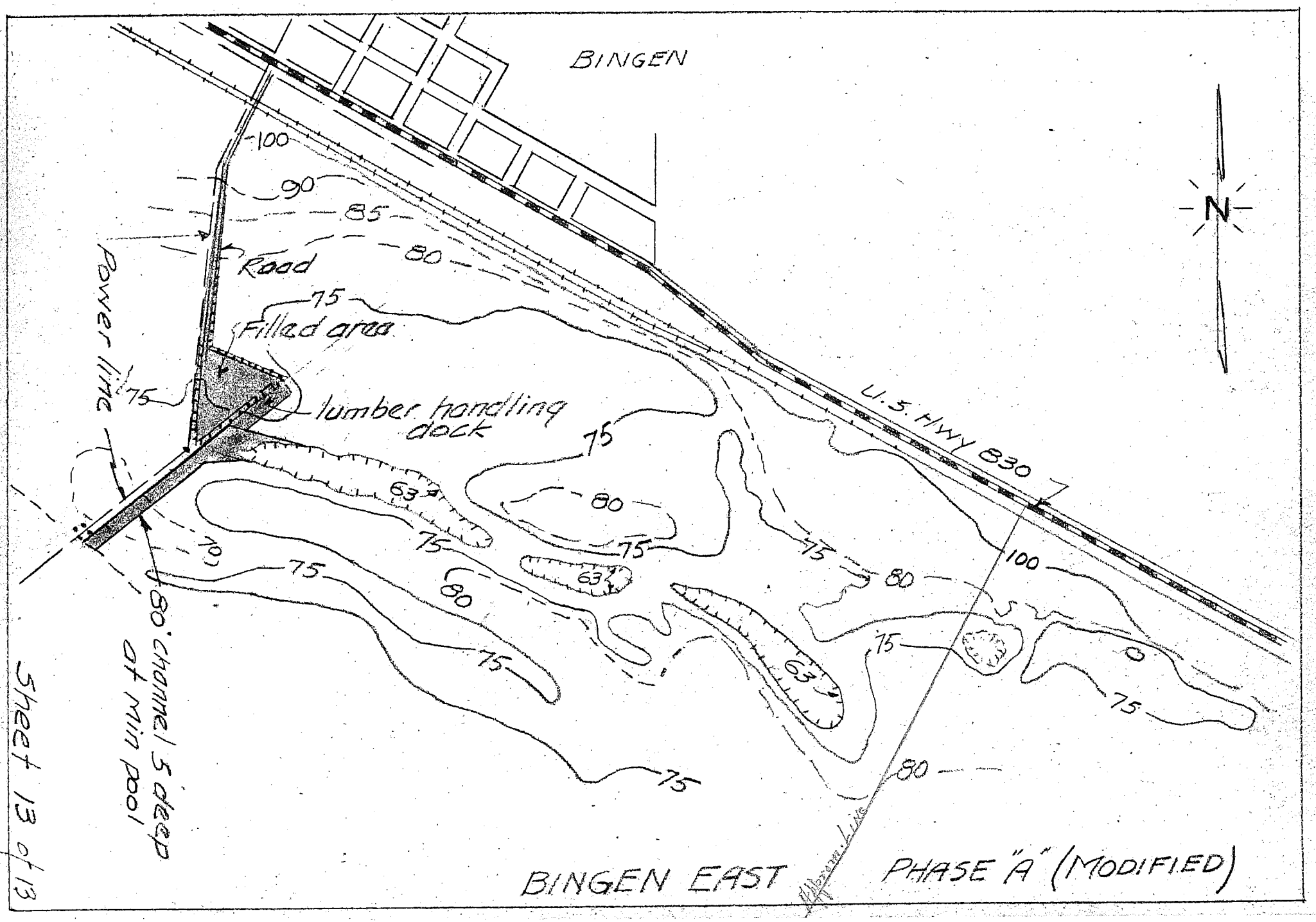

BINGEN
N
U.S. Hwy 830
Power line
Road
Filled area
lumber handling dock
100
90
85
80
75
63
0
80' channel 5' deep at min pool
Sheet 13 of 13
BINGEN EAST
PHASE "A" (MODIFIED)

TABLE #1

Bingen West Site

Phase A

Purchase log dump		$ 5,000
Pile - 4,000' @ 50¢		2,000
Drive piles - 80 @ $30		2,400
Enlarge hoist, etc.		1,500
		10,900
Admin., Engr. & Contingencies - 15%		1,635
	Cost	$ 12,535

Phase B

Embankment - 127,000 C.Y. @ 50¢		$ 63,500
Rock riprap - 5,200 C.Y. @ 1.25		6,500
Gravel roadway & parking areas - 875 C.Y. @ $4		3,500
Rock fill breakwater - 50,000 C.Y. @ 1.25		62,500
		136,000
Admin., Engr. & Contingencies - 15%		20,400
Total Phase B		156,400
If a pile breakwater, deduct		57,175
	Cost	$ 99,225

Phase C

Embankment - 184,950 C.Y. @ 50¢		$ 92,475
Rock riprap - 5,000 " @ 1.25		6,250
Rail spur - 2000' @ $15		30,000
Switch		2,500
Steel sheetpile wall - 600' @ $125		75,000
Culvert extension - 250' @ $40		10,000
Gravel road - 1000' @ $1.00		1,000
		217,225
Admin., Engr. & Contingencies - 15%		32,563
	Cost	249,808

Phase D

Embankment - 560,000 C.Y. @ 40¢		$ 224,000
Rock riprap - 3,000 " @ 1.25		3,750
Breakwater - 36,000 " @ 1.25		45,000
		272,750
Admin., Engr. & Contingencies - 15%		40,912
		313,662
If a pile breakwater, deduct		40,750
	Cost	$ 272,912

Phase E

Embankment - 400,000 C.Y. @ 40¢		$ 160,000
Rock riprap - 3,000 " @ 1.25		3,750
Breakwater - 108,400 " @ 1.25		135,500
		299,250
Admin., Engr. & Contingencies - 15%		44,887
		-344,137
If pile breakwater, deduct		114,825
	Cost	$ 229,312

TABLE #2

Bingen East Site

Phase A

Dredging - 104,000 C.Y. @ 30¢		$ 31,200
Road construction - 2200 L.F. @ $5.00		11,000
Build log dump		7,120
Sorting yard		11,500
		60,820
Admin., Engr. & Contingencies - 15%		9,123
	Cost	$ 69,943

Phase B

Dredge and fill 137,000 C.Y. @ 30¢		$ 41,100
Rock riprap - 2,400 C.Y. @ 1.25		3,000
		44,100
Admin., Engr. & Contingencies - 15%		6,615
	Cost	$ 50,715

Phase C

Embankment - 112,000 C.Y. @ 50¢		$ 56,000
Rock riprap - 7,000 " @ 1.25		8,800
Steel sheetpile wall - 600 L.F. @ $125		75,000
Rail spur - 2500 L.F. @ $15		37,500
Switch		2,500
Gravel roadway		1,000
		180,800
Admin., Engr. & Contingencies - 15%		27,120
	Cost	$ 207,920

Phase D

Breakwater - 32,000 C.Y. @ 1.25		$ 40,000
Admin., Engr. & Contingencies - 15%		6,000
	Cost	$ 46,000

Phase E

Embankment - 1,188,000 C.Y. @ 35¢		$ 415,800
Rock riprap - 12,400 C.Y. @ 1.25		15,500
		431,300
Admin., Engr. & Contingencies - 15%		64,695
	Cost	$ 495,995