Resolution No. 139

WHEREAS, Conditions III.H.2 & III.H.3.(c) of the Skagit Nuclear Power Project Site Certification Agreement require the Puget Sound Power and Light Company (Puget) to submit for approval the plans and specifications for the construction of the temporary barge off-loading facility and the procedures for underwater excavation attendant thereto, and

WHEREAS, On January 20, 1978 Puget did submit to the Council such plans, specifications and procedures as proposed, and

WHEREAS, On March 14, 1978 representatives of the Council and Puget did consult and perfect said proposal, and

WHEREAS, On March 27, 1978 Puget did submit a revised proposal properly incorporating the modifications developed in consultation with the Council,

NOW, THEREFORE, BE IT RESOLVED That Puget's proposal entitled "Delivery of Skagit Reactor Pressure Vessel Equipment (Revision 1)" incorporating the required plans, specifications and procedures and appended hereto is herewith approved in satisfaction of Conditions III.H.2 & III.H.3.(c) of the Skagit Nuclear Power Project Site Certification Agreement.

Dated this 27th day of March 1978.

WASHINGTON STATE ENERGY FACILITY
SITE EVALUATION COUNCIL

BY _____
Nicholas D. Lewis
Chairman

ATTEST:

BY _____
William L. Fitch
Executive Secretary

APPROVED AS TO FORM:

BY _____
Thomas F. Carr
Assistant Attorney General

DELIVERY OF THE SKAGIT

REACTOR PRESSURE VESSEL EQUIPMENT

FOR

PUGET SOUND POWER & LIGHT COMPANY

MARCH 1978
(REVISION 1)

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DELIVERY OF THE SKAGIT
REACTOR PRESSURE VESSEL EQUIPMENT
FOR
PUGET SOUND POWER & LIGHT COMPANY

1. INTRODUCTION

The General Electric Company, Nuclear Energy Division, acting under contract with Puget Sound Power & Light Company, will deliver the Skagit reactor pressure vessel equipment to the plant site.

Upon completion at the place of fabrication, the equipment will be loaded on a barge for transport by water to an off-loading facility which is to be constructed on the Skagit River near the plant site. The equipment will then be transferred from the barge onto an overland hauling vehicle which will transport it overland onto the plant site for subsequent installation in the power plant. The equipment for Unit 1 is scheduled to arrive on site during the first half of the year, 1980.

2. EQUIPMENT DESCRIPTION

The largest equipment to be delivered consists of a reactor vessel and shop installed components, the vessel closure head, and the shipping rigs for both the vessel and closure head. The entire assembly, as loaded on the barge, weighs approximately 1400 tons. The heaviest load for overland transport will be approximately 1230 tons. Refer to Figure E, "Reactor Vessel and Components Shipping Data."

3. TRANSPORTATION ROUTES

3.1 General

Delivery of this equipment will be made by a combination of ocean, river, and overland movements.

3.2 Ocean Route

The Unit 1 reactor pressure vessel assembly will be moved by barge using ocean-going tugs from Memphis, Tennessee to a deep-water port within Puget Sound, Washington. Movement will be down the Mississippi River into the Gulf of Mexico, Carribean Sea and through the Panama Canal into the Pacific Ocean. Movement in the Pacific Ocean will be northerly along the West Coast of Central America, Mexico and the United States, finally entering Puget Sound via the Straight of Juan de Fuca. Approximately 45 days are required for movement from Memphis to Puget Sound.

3.3 River Route

Upon arrival at the deep-water port in Puget Sound, a transfer will be made from the sea-going tugs to shallow draft river tugs. The barge which will be used for ocean transport is specifically selected for its suitability for movement up the Skagit River, thus eliminating a need to transfer the load onto a second barge. After the tugs and barge have been arranged for river movement, the equipment will be moved from the deep-water port facility and will enter the north fork of the Skagit River via Skagit Bay. Movement will then be up river, past the towns of Mt. Vernon, Burlington and Sedro Woolley to a point approximately one mile east of Sedro Woolley. A temporary barge off-loading facility is to be constructed on the north bank of the Skagit River at the base of Fruitdale Road. Approximately 3 days are required for movement from the deep-water port facility to the off-loading site. Refer to Figure A, "General Area Map".

3.4 Overland Route

After the barge has been secured at the off-loading facility, the equipment will be transferred onto an overland hauling vehicle. The equipment will then be moved overland via Fruitdale Road and State Route 20 and then on-site via the private access road to its final destination. Approximately 5 days are required for movement from the off-loading facility to the plant site. Refer to Figure B, "Vicinity Map".

4. SUITABILITY OF THE SKAGIT RIVER

4.1 Surveys and Studies

Extensive and detail surveys and studies have been made of the Skagit River route from its mouth in Puget Sound up to and beyond the off-loading facility site. It has been concluded from these surveys and studies that the river is navigable without dredging and is suitable for accomplishing the delivery of the Skagit reactor vessel assembly. During the month of June 1976, a trial run was conducted using a barge that was ballasted to a depth simulating the actual transport barge with the reactor pressure vessel assembly aboard, at minimum river flow. This trial run provided further verification that the safe delivery of the Skagit equipment can be made by barge up the Skagit River as planned. Movement up river will require specific coordination with both tidal and river flow conditions.

4.2 Channel Clearance

It is known that the Skagit River can only be entered during a high tide, and then only via its north fork. The minimum tide elevation that will assure a sufficient depth of water in

Skagit Bay to allow movement across the mud flats and into the north fork corresponds to an elevation of 10.7 feet at Seattle. A survey of tidal data/ history shows that sufficient high tides occur at a frequency of about 7 per week during the period between January 1 and June 30.

It is also known that a minimum river flow (measured at the Riverside Bridge Gage) of 12,000 cubic feet per second is needed to assure a sufficient depth of water over the entire river route. A survey of river flow data/history shows that flows in excess of the minimum occur 5 out of 7 days during the period between January 1 and June 30.

It should also be noted that additional flexibility for controlling river flow can be obtained from the operation of the upstream dams owned by Seattle City Light and Puget Sound Power & Light Company.

A suitable channel width for movement up river exists along the entire route at flows equal to or above the minimum required for draft.

4.3 Overhead Clearance

There are several highway and railroad bridges which cross over the Skagit River along the movement route. All of the bridges which are designated "fixed span" will provide sufficient vertical clearance for safe passage. Those bridges which were originally designated as "draw" or "swing" but which are now locked closed must be open to allow passage. Federal law provides that these bridges must be opened by the owner when given at least one year's notice by the U.S. Coast Guard. General Electric has obtained agreements from the bridge owners to open the bridges as necessary to provide suitable vertical clearance.

In addition, the barge will have the capability to adjust its draft by taking on and discharging ballast during river transit. This will provide additional flexibility for controlling vertical clearance at specific locations. The barge tanks are painted with a primer and finish coats totaling 6 mils thickness. The surface is a smooth, dry, glossy finish. Any water taken on or discharged as ballast will be Skagit River water, thus there will be no contamination of the river during these operations.

4.4 Removal of Debris

Prior to movement up river, the channel will be cleared of all floating and underwater debris which could pose a threat to safe navigation.

4.5 Concurrence

Concurrence that the Skagit River is suitable for movement of the reactor pressure vessel has been received from barge operators, tug boat operators and the insurance carrier.

5. BARGE OFF-LOADING FACILITY

5.1 Description

The barge off-loading facility is a temporary facility which will provide a safe place to dock and off-load the equipment. The facility will consist of a barge slip, off-loading pad, equipment laydown area, operating area, storage areas and access road. The facility is to be constructed prior to equipment arrival and will be removed and the land area restored after equipment delivery is completed.

5.2 Site

The facility is located on the north bank of the Skagit River at the intersection of Fruitdale and River Roads. A temporary bypass of River Road will be constructed around the facility. Several alternate sites were considered with this site being chosen on the basis of prudent technical, economical and environmental considerations. The site provides excellent accessibility to the river and suitable public roads, it is in close proximity to the plant site and other off-site construction activities, and it results in disruption to a minimum of neighboring land owners and will have a minimum effect on traffic. Refer to Figure C, "Facility Plot Plan", which provides the legal description of the land area. Figure D, "Facility Arrangement Plan" shows the arrangement of the facility and slip.

5.3 Construction Procedure

The construction of the off-loading facility is scheduled to begin in the second quarter of 1979. Work will first begin on the construction of the temporary bypass of River Road. The design of this temporary bypass has already been tentatively approved by the Skagit County Engineer and will meet or exceed minimum county standards as well as the condition of the existing River Road. Traffic control devices for the bypass will be installed as the County Engineer deems appropriate.

Construction of the slip will involve the excavation and dredging of approximately 26,000 cubic yards of material consisting of fine to coarse sand (slightly silty) fine to coarse gravel and some silty sand. The bulk (approximately 21,000 cubic yards) of this excavation will take place in the "dry" behind the existing river bank which will be left temporarily as a construction dike. A backhoe, clamshell, dragline and

suction dredge will be used at the contractor's option for this phase of the excavation. All work on the bank or in the river will be confined to the period beginning on May 31 and ending on September 15, 1979.

Prior to the removal of the construction dike, a silt barrier will be installed across the mouth of the slip. The barrier will consist of a flexible curtain made of strengthened polyvinyldene chloride (PVC). The top of the barrier will be suspended above the surface of the water by a float system and will extend down to and against the river bottom and against the bank on either side of the slip. It will be held in place against the river bottom with a gravel anchor and will also be sealed against the bank so as to form a continuous silt barrier between the construction area and the river. The float system will be anchored by wire rope tie-backs to deadmen on the bank. After installation of the silt barrier, the construction dike (approximately 3,500 cubic yards) will be removed using a clamshell and possibly a suction dredge.

A minor amount of dredging (approximately 1,500 cubic yards) will also be required on the river side of the silt barrier and construction dike to connect the barge slip with the river channel. This will be accomplished using a clamshell and/or suction dredge working continuously to minimize the duration of high turbidity levels in the river. Additionally, multiple underwater passes to obtain full buckets will be prohibited. All other construction activities, with the exception of the installation of a small amount of riprap at the mouth of the slip and possibly the timber pile dolphin, will take place behind either the silt barrier or the construction dike.

All excavated material will be stored at the facility site adjacent to the barge slip. Dry material excavated from above the water table will be used to form the walls of sediment ponds which will be used for storage of all saturated materials,

1

and excess water removed from the slip area during the construction process (or restoration process) will not be allowed to run off into the river outside the confines of either the silt curtain or the construction dike. The sediment ponds incorporating an appropriate weir structure will be used to achieve this purpose.

The installation of sheet piling for the off-loading dock and the optional side access dock (including the sheet piling for each of the respective anchor walls) will commence once the excavation of the slip has reached elevation + 37'-10". In order to reduce construction noises, the sheet piling will be installed using a vibratory hammer whenever subsurface conditions permit. However, if stiff soils or cobbles are encountered, a mechanical driver will be used. A subsurface soils investigation of the off-loading facility site indicates that it should be possible to drive most of the sheet piling with the vibratory type hammer. After the sheet pilings have been driven, local excavation will be necessary for the installation of the wales and tie-backs. Depending on the location of the water table at the time of construction, this installation may or may not require some localized dewatering. If localized dewatering is needed, the water so removed will be pumped into sediment ponds and none will be allowed to run off directly into the river outside the confine of either the construction dike or silt curtain.

Approximately 2,000 cubic yards of riprap aggregate will be placed to line both sides and the bottom of the slip. Riprap for the sides will consist of stones approximately 12 to 15 inches in diameter with smaller stones being used to fill spaces between the large stones. Either a polypropylene filter sheet designed for erosion control or a 6-inch filter blanket consisting of well graded gravel will be placed beneath all side riprap. Aggregate for the slip bottom will be 12 inches of pea gravel ranging in size from 1/8 inch to 3/4 inch in diameter.

A mechanical driver will be used for driving timber piles used for the turning dolphin (optional), mooring bollards, and deadmen for anchoring the silt barrier. The bollards and deadmen will be installed on the upland portion of the silt barrier and construction dike.

The off-loading pad will be approximately 40 feet square. It will be a reinforced concrete slab on grade and will range from 2½ feet to 4 feet in thickness. This pad is designed to carry all loads imposed by the reactor assembly and hauling equipment.

The work area adjacent to the slip will have a 12-inch compacted gravel surface and will drain toward the barge slip.

The access road will be designed to carry the load of the reactor and hauling equipment. It will have a surface of crushed gravel with a Light Bituminous Surface Treatment and will join the off-loading pad with Fruitdale Road.

Appropriate traffic control, security and industrial safety provisions will be in effect throughout the construction period.

5.4 Fish Traps

The barge slip is designed to preclude any built-in fish traps. It is not anticipated that river conditions would occur which would result in the forming of fish traps within the slip excavation area. However, during periods of low river flow, or other conditions which could potentially result in fish traps, the mouth of the slip will be periodically inspected for possible fish traps. Any such condition would be reported to the Energy Facility Site Evaluation Council.

5.5 Oil Spills

During the construction and operation of the facility, all contractors working on the site will be required to take precautionary measures to prevent any spilling of oil or other petroleum distillates. Appropriate materials for cleaning up spills will be required to be stored on the facility for immediate use should a spill occur. General compliance with the intent of the provisions of Document No. NPDES-G15, "Oil & Hazardous Substance Spill Prevention, Control & Countermeasures Plan" will be required as applicable and appropriate to the construction and operation of the facility. 1

5.6 Restoration

Restoration of the facility will be performed after the equipment delivery is completed. All work on the bank or in the river will be confined to the period beginning on May 31 and ending on September 15 during the year the restoration work is performed.

The facility will be removed (including riprap aggregate to elevation +29 feet) and the original bank restored by first reinstalling the silt barrier and then constructing a dike across the mouth of the slip using approximately 3,500 cubic yards of stored excavation material. Subsequently, the riprap, sheet piling, concrete, etc., will be removed and the slip filled in with the remaining stored excavation material. Any water removed by dewatering or trapped behind the dike will not be allowed to run off into the river outside the confines of the silt barrier or construction dike.

If it is necessary for the stabilization of the restored river bank, a minor amount of material will be used to restore the original river bed and will be placed with a clamshell outside the confines of the silt barrier. Removal of the turning

dolphin (if used) and a minor amount of riprap removal at the mouth of the slip will also be accomplished outside the confines of the silt curtain. The land area behind the bank will be compacted and graded to pre-existing contours to the extent practicable and necessary. The River Road bypass will also be removed and both Fruitdale and River Roads will be refurbished to their pre-existing condition to the extent practicable.

Further consideration for devoting the facility to public water-oriented recreational use, after it has served its intended prupose, will be given subject to appropriate arrangements being placed into effect as determined in consultation with the Council and the County. 1

6. EQUIPMENT OFF-LOADING FROM BARGE

6.1 Barge Preparation

Once the barge has been properly docked and secured in the slip, the river tugs will be released. Ballast will then be added to the barge tanks allowing the barge to sink until it rests on the bottom of the slip. In order to provide the support and stability required during the off-loading procedure, additional ballast will be added until the barge tanks have been filled. The tanks have a total capacity in excess of 1,600 tons of fresh water which is more than sufficient to provide the necessary stability. Shipping braces, deck weldments, etc. will be removed to free the reactor vessel and rig from the barge.

6.2 Off-Loading Methods

A lowboy trailer will be used to transport the reactor vessel closure head and rig from the barge overland to the plant site. Two methods are being considered for off-loading the head onto the lowboy. The first involves raising the head

with hydraulic jacks and then lowering it onto the lowboy after the lowboy has been positioned under the head. The second entails using a large mobil crane to lift the head from the barge and lower it onto the lowboy. Off-loading time and equipment availability will be the major considerations in selecting the method to be used.

The reactor vessel and rig will be moved from the barge to the plant site on two multi-tired pneumatic trailers, one located under each end of the vessel. It is planned that the vessel and rig will be raised above the barge deck to a sufficient height to allow the trailers to be driven under the load. The load will then be lowered onto the trailers which will subsequently be driven off the barge and overland to the site. In all probability the method used for raising the Skagit vessel will involve the use of a large hydraulic jacking system. The particular system will be selected later.

All work will be performed in compliance with the requirements of ANSI N45.2.15 (proposed) and the Industrial Safety Requirements of the State of Washington.

Approximately 10 working days will be required to off-load the vessel from the barge and an additional 3 working days will be required for dismantling the rigging equipment and cleanup.

7. OVERLAND HAUL

7.1 Route

After the load is placed and secured on the overland hauling vehicle, the system will be moved onto Fruitdale Road via the off-loading facility access road. Movement will then be north on Fruitdale Road for approximately 1.6 miles to its intersection with State Route 20. Here the loaded trailers will turn onto

State Route 20 and travel east for approximately 3.5 miles to the intersection of State Route 20 and the private access road for the plant site. At this juncture the overland hauling vehicle will proceed north over the site access road for approximately 1.1 miles to the final destination. Preliminary verbal approval has been obtained from the County Engineer's office for upgrading and traversing Fruitdale Road, and discussions are under way with the Washington State ~~Highway~~ transportation Department, concerning their issuance of a permit for traveling on State Route 20 with the equipment.

Several alternate routes were considered with the above route being chosen on the basis of prudent technical, economical, and environmental considerations. This route is directly accessible from the off-loading facility and is the most direct route to the plant site. All movement and turns along this route can be made within existing right-of-ways of both State and County roadways, thus minimizing any disturbance to property owners along the route. There are sufficient existing county roads which can be used for bypassing of traffic around the load during its movement to the plant site. Adequate traffic control and safety measures will be in effect during the period that the load is on public roadways.

7.2 Roadway Suitability

A preliminary subsurface investigation has been conducted along the proposed overland route from the barge slip to the plant access road. Numerous soil borings have been made along Fruitdale Road (other county roads) and State Route 20, including borings at each major creek crossing. The soils investigation is being conducted by a soils firm having previous experience in design and analysis of roadways for vehicles and loadings similar to those involved in this movement.

Results of the preliminary investigation indicates that although a certain amount of widening and upgrading will be required for portions of the roadway, the roads along the proposed route should sustain the loads imposed by the overland hauler while undergoing little or no damage.

Prior to the final assessment of road upgrading requirements, a more thorough subsurface investigation of the route will be conducted. This will include a soil boring being taken at least every 1,000 feet along the route and will also include a simulated axle load test which will be conducted at various route locations.

The off-loading facility access road and the site access road will be designed and constructed to carry the loads involved in the vessel movement.

7.3 Roadway Preparation

It will be necessary to widen and upgrade the entire stretch of Fruitdale Road involved in the vessel movement. Both shoulders of the road will be excavated to a depth of 2'-6" to remove unsuitable load-bearing material. This material will be replaced with compacted sand and gravel. Additional fill material will also be placed at several roadway locations along Fruitdale Road to reduce the excessive longitudinal roadway slopes which now exist. Approximately 9 inches of compacted gravel will then be placed over the existing pavement and upgraded shoulders to form a road surface 28 feet wide. Similar widening and upgrading techniques will be used to construct the additional road surface which will be needed for turning the transporter from Fruitdale Road onto State Route 20.

No roadway upgrading will be required along State Route 20 except at the two creek crossings and as required for protection of pipes and structures beneath the road surface.

There are several small subgrade structures along the route which must be crossed. These include box culvert type structures as well as sewer, drainage, and water pipes. Crossing some of these will be accomplished by placing timber or steel matts and beams over the structure thereby constructing a bridge over the structure. Some have sufficient cover to protect them and can be crossed as they now exist. Still other small structures may be temporarily shored to sustain the loads imposed by the vessel movement. In all cases, the structures will be protected to the satisfaction of their owners and any structures or pipe which may be inadvertently damaged by the vessel movement will be repaired or replaced.

An agreement will be reached with the County and the State as to the manner in which the roadways will be restored after the vessel movement. Roadway upgrading will either be removed or left in place as specified by these agreements, and any roadway damaged by either the upgrading process or the vessel movement will be repaired so as to meet or exceed its pre-haul condition.

7.4 Creek Crossings

The two state bridges over Hansen and Coal Creeks along State Route 20 represent the only major creek crossings along the entire route. Each will involve the construction of a short, temporary bypass road around the existing bridge as well as a temporary culvert type creek crossing. The bypass road will be constructed by removing undesirable load-bearing materials and backfilling with compacted sand and gravel. Additional compacted fill will be placed as required for proper vertical alignment of the bypass road with the existing roadway.

Each culvert creek crossing will be constructed by placing a 15'-4" wide by 10'-4" high multi-plate pipe-arch in the creek bed and placing compacted gravel fill over it and around it.

Some excavation of the creek bed may be required for the proper installation of the multi-plate, but to prevent the formation of any fish traps, gravel will be placed inside the multi-plate to restore the creek bed to its original elevation. After the vessel movement has taken place, the gravel and multi-plates will be removed and the creeks restored as nearly as is practicable to their original condition. All construction and restoration activities in the creeks will be confined to the period beginning on May 31 and ending on September 15 during the years that construction and restoration work is performed.

7.5 Overhead Obstructions

Electrical power and telephone lines along the route which hang too low to allow passage of the vessel will be either permanently raised, temporarily raised, temporarily disconnected, or temporarily bypassed with a shunt line which can be raised to clear the vessel. Agreements will be reached with affected utility owners to have these overhead obstacles cleared for the vessel movement.

7.6 Hauling Equipment

The vessel transporter will consist of two multi-tired pneumatic trailers arranged in series and two prime movers, one pushing and the other pulling the two trailers. Each trailer will have approximately 200 to 250 tires. The number of tires per trailer will be set to maintain a tire loading of between 6,000 and 7,000 pounds per tire. (Presently trucks with 5,000 pound wheel loads are allowed to travel State Route 20 without a special permit.) The trailers will also be equipped with a hydraulic suspension system to compensate for road curves and roughness. The particular trailers to be used for transport of the Skagit vessel have not yet been selected, however there are several manufacturers who build trailers capable of hauling

this load. Trailer characteristics and configurations vary depending on the manufacturer. Widths range from 19 to 21 feet and lengths vary from approximately 50 to 90 feet. Depending on the type of trailers and support structure used, clearance height for the vessel and transporter may range from 30 to 35 feet, and trailer centerlines may be as close a 80 feet or as far away as 110 feet.

The two prime movers will consist of tractors on which weights have been placed for increased traction. Each prime mover will have approximately 500 H.P. engine capacity.

7.7 Detail Planning

Detail planning of the overland transport will be fully coordinated with all of the appropriate State and County agencies prior to overland movement.

FIGURES

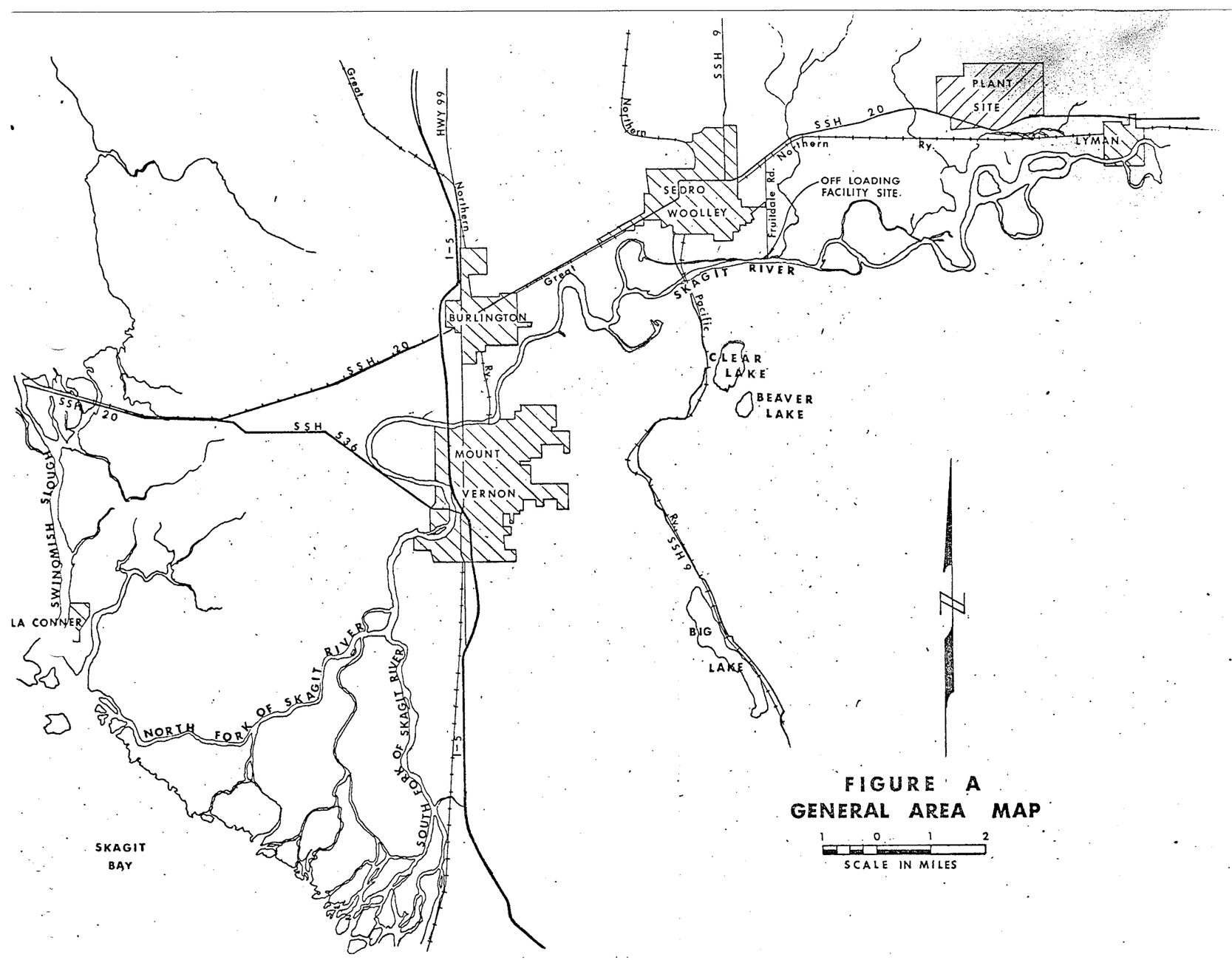
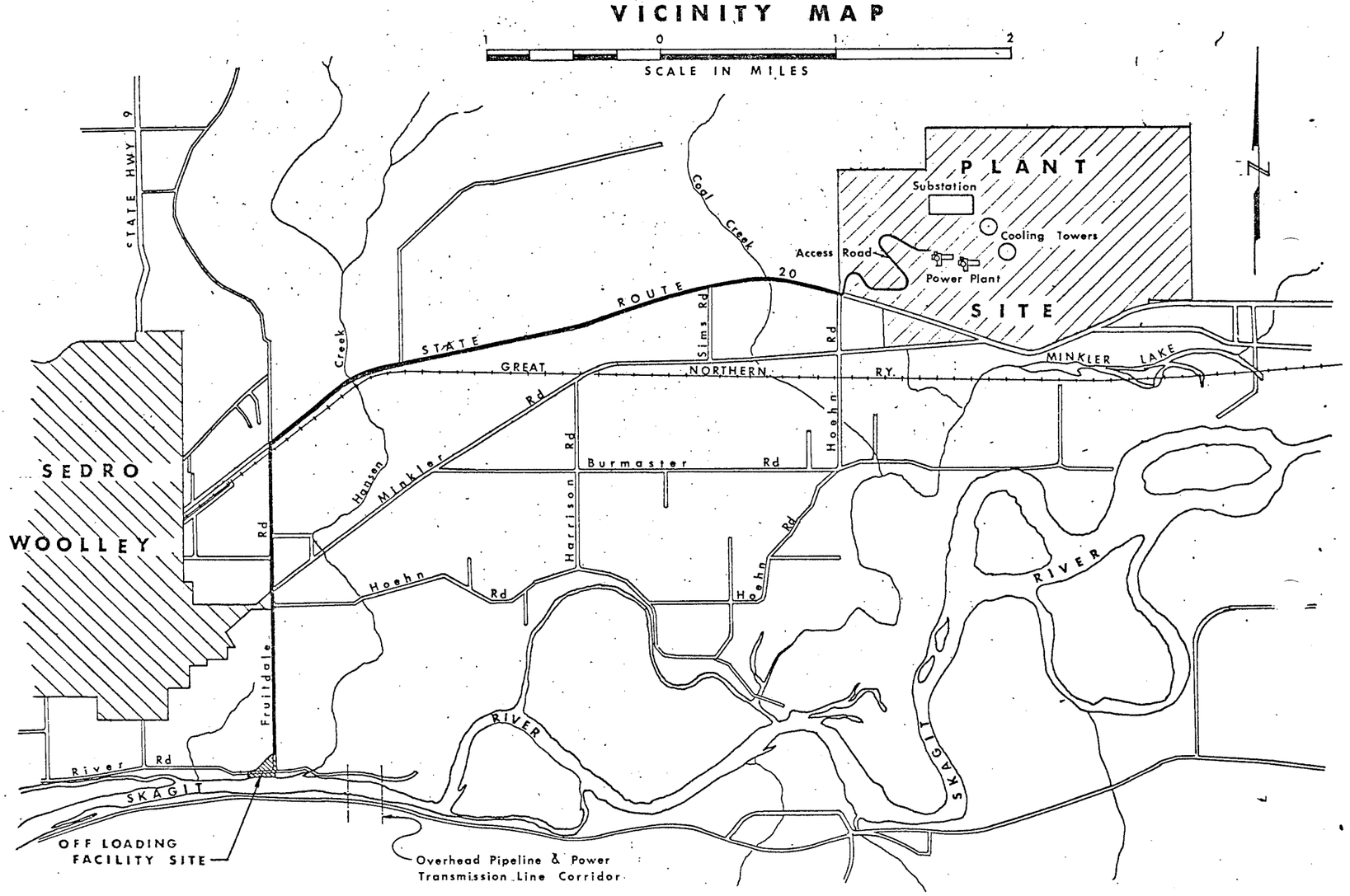


FIGURE A
GENERAL AREA MAP

1 0 1 2
SCALE IN MILES

FIGURE B
VICINITY MAP



LEGAL DESCRIPTION OF SLIP SITE

That portion of Government Lot 10 together with that portion of Government Lot 9 in Section 30, Township 35 North, Range 5 East, W.M., described as follows: Commencing at the east Y4 corner of said section 30; thence north 88°33'12" west along the north line of said Government Lot 9 a distance of 1277.86 ft to the centerline of the Fruitdale Rd as constructed, thence south 1°38'59" east parallel to the centerline of said Fruitdale Rd as presently constructed a distance of 279.46 ft to the intersection with a curve having a radius point bearing south 1°38'59" east of distance of 365.00 ft from said intersection, being also the true point of beginning; thence along the arc of said curve to the left in a southwesterly direction through a central angle of 45°00'00" a distance of 286.67 ft; thence south 43°21'0" west a distance of 372.98 ft to the beginning of a curve to the right having a radius of 375.00 ft; thence along the arc of the curve through a central angle of 47°28'59" a distance of 310.78 ft; thence south 0°50' west a distance of 60 ft more or less to the line of ordinary high water of the Skagit River; thence easterly along said line of high water a distance of 800 ft more or less to the intersection of a line bearing south 1°38'59" east from the true point of beginning; thence north 1°38'59" west a distance of 530 ft more or less to the true point of beginning. Except the Fruitdale Rd as deeded to Skagit County by deed recorded under auditor's file number 75371. Also except the River Rd, and the Fruitdale Rd, as they presently exist.

Area = 4.1 Acres (Approx.)

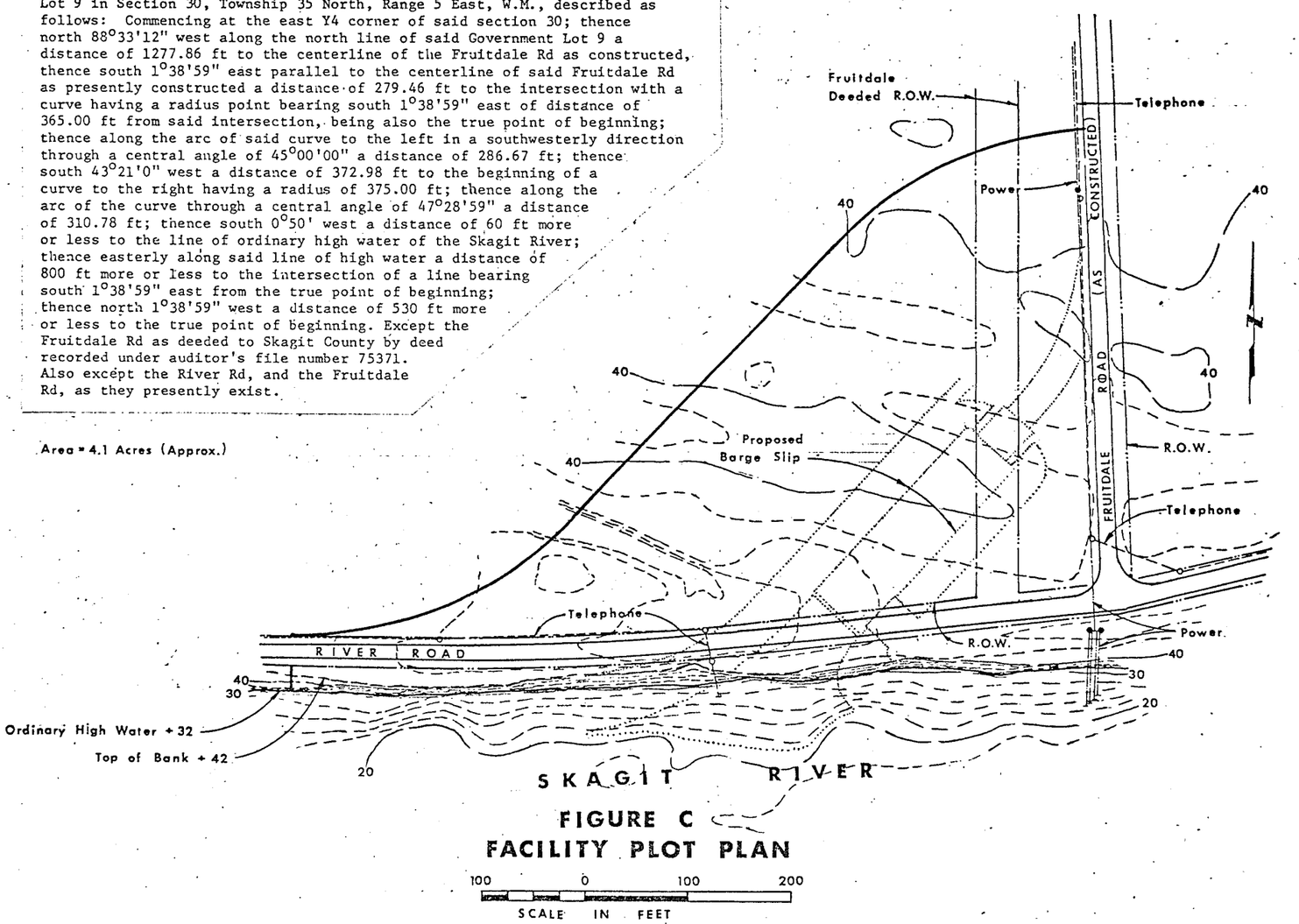


FIGURE C
FACILITY PLOT PLAN

100 0 100 200
SCALE IN FEET

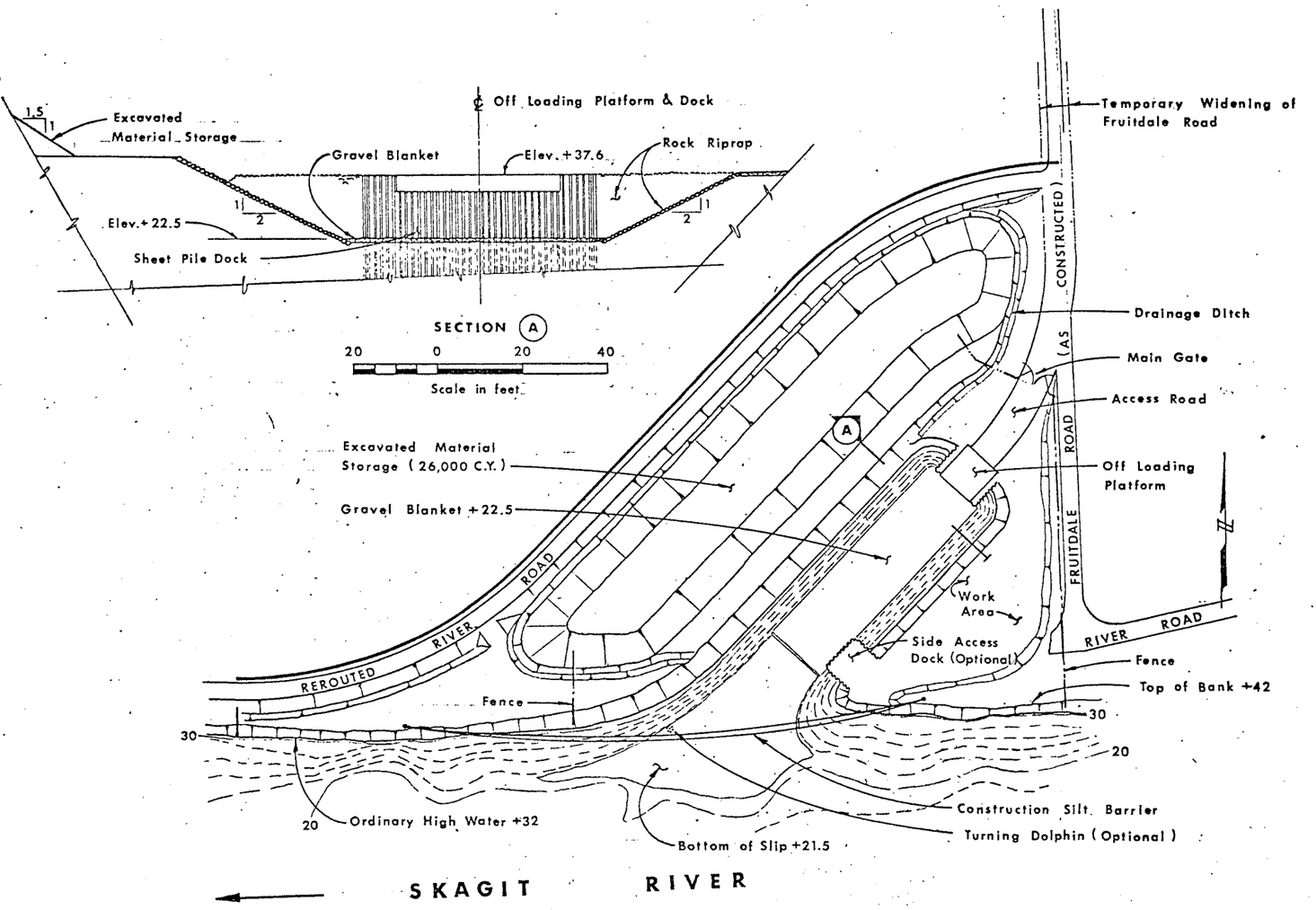


FIGURE D
FACILITY ARRANGEMENT PLAN

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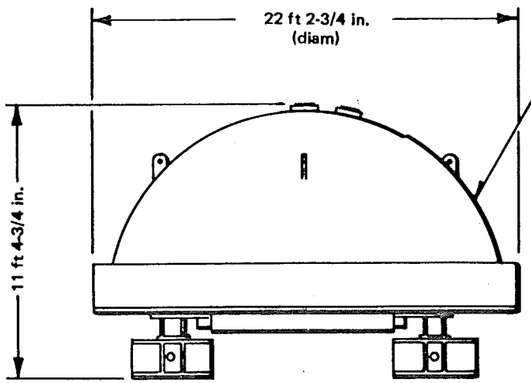
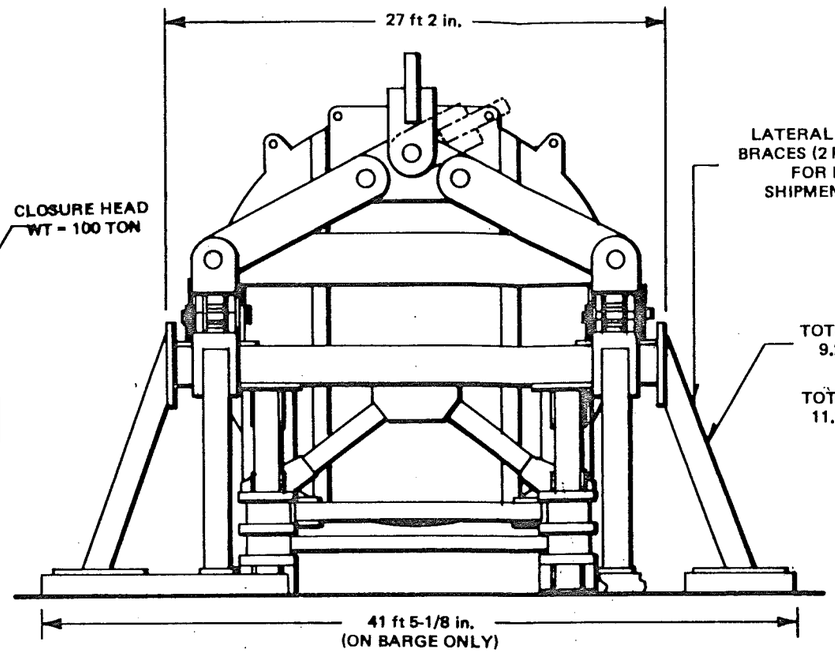
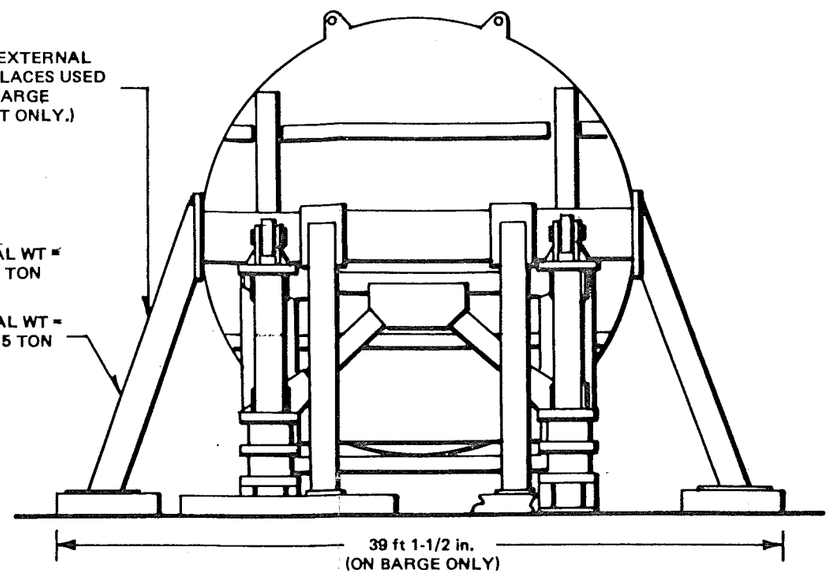
SCALE IN FEET



CLOSURE HEAD RIG
WT = 15 TON



VIEW AA



VIEW BB

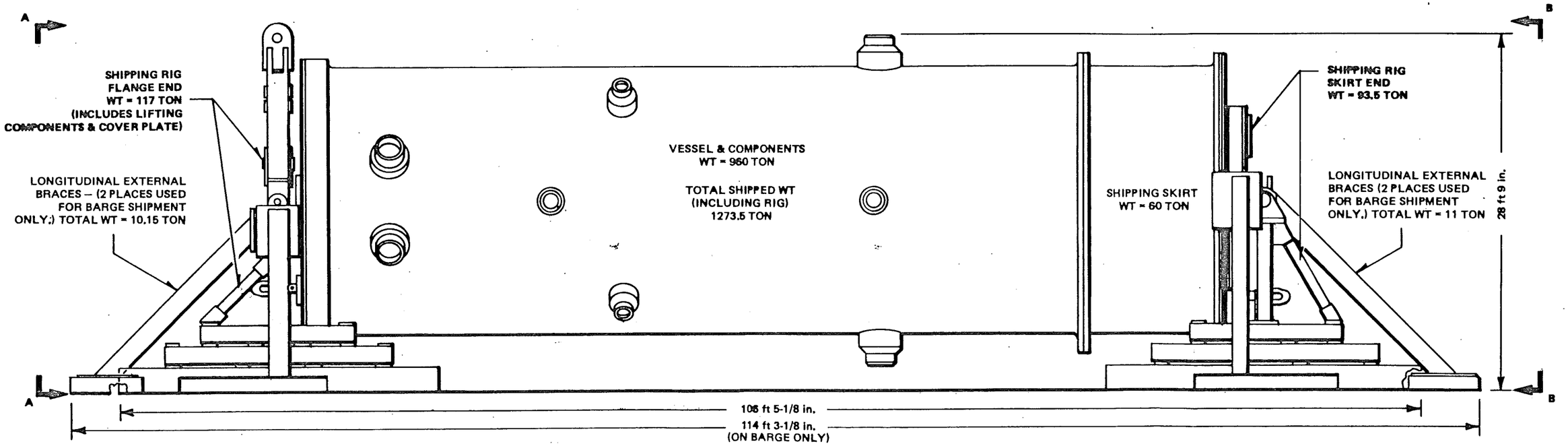


FIGURE E
REACTOR VESSEL & COMPONENTS
SHIPPING DATA