APPENDIX C

AUTOTURN TRUCK TURNING SIMULATION — STUDY FOR SEMITRUCK TURNING ON 88-FOOT PIER

One of the conclusions from the Phase 1 concept study was that the MHP should be as narrow as functionally possible in order to be cost competitive with fixed pier. Every additional foot of width on a 1,300-foot (396-meter) long floating MHP costs approximately an additional $200,000. According to MIL-HDBK 1025/1, all Navy vessels, except aircraft carriers, can be berthed on piers 80 feet (24.4 meters) wide [carriers require a minimum width of 100 feet (30.5 meters)].

Section VI.E., Operations Deck Functional Design Criteria, outlines the vehicle access requirements for the operations deck and concludes that the 88-foot (26.8-meter) deck width is functionally viable and allows turning of all vehicles that must access the operations deck.

In order to confirm the functionality of the pier, the capability to turn a semitractor trailer rig was checked using the computer program AUTOTURN. To assure a realistic result, the following information for a tractor and trailer combination was used.

Tractor

Information was obtained from International Harvester Corp., Seattle, 206/433-3466

- Model Code: SF25740 (2574 6x4)
- Wheelbase: 204 inches (17 feet) (5.18 meters)
- Overall Length: 291 inches (24.25 feet) (7.39 meters)
- Turning Radius (to Bumper): 34 feet 5 inches (10.49 meters)

Trailer

Information was obtained from Fruehauf Trailer, Seattle, 206/762-5800

- 45-foot (13.7-meter) box (wheelbase is 37 feet) (11.28 meters)
- Truck-to-trailer angle is 90 degrees ok

Using the above information, the result from the program illustrates that this truck can turn around within 79 feet (88 feet – 1 foot curb x 2 – 3.5 feet bollard x 2 = 79 feet), as shown in Figure Appendix C-1.

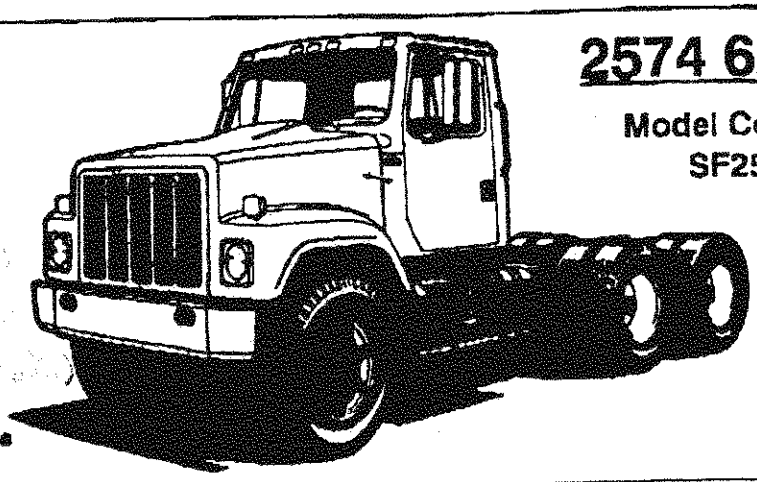
As shown in Figure Appendix C-1, depending on the tractor/trailer combination actually used on the pier, a portion of the traffic lane approaching the turning area may need to be wider than the typical 12-foot (3.7-meter) lane. The traffic lane should be striped for the actual tractor and trailers used to supply Navy piers.

Even though the result of the computer analysis shows that an 88-foot (16.8-meter) wide pier is sufficient for turning the selected truck and trailer, a field-turning test should be undertaken to confirm the truck turning ability. This would use a typical truck trailer combination in current use at a Navy facility and a marked-out simulated deck turning area in a parking lot. If the result of the testing is not satisfactory, the possibility of widening the pier, as shown in Drawing S-07, will be investigated. However, as noted, this would result in a cost increase of the pier.

2000 SERIES HEAVY DUTY
STANDARD CHASSIS SPECIFICATIONS

GAW Rating (lbs.)	STD.	MAX.
Front	12,000	20,000
Rear	40,000	52,000
GVW Rating (lbs.)		
Total	52,000	72,000
GCW Rating (lbs.)	STD.	MAX.
Total	60,000	110,000

NOTE: Model Code and Wheelbase Must Be Specified on Order.



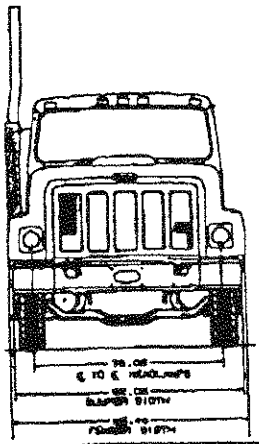
2574 6x4

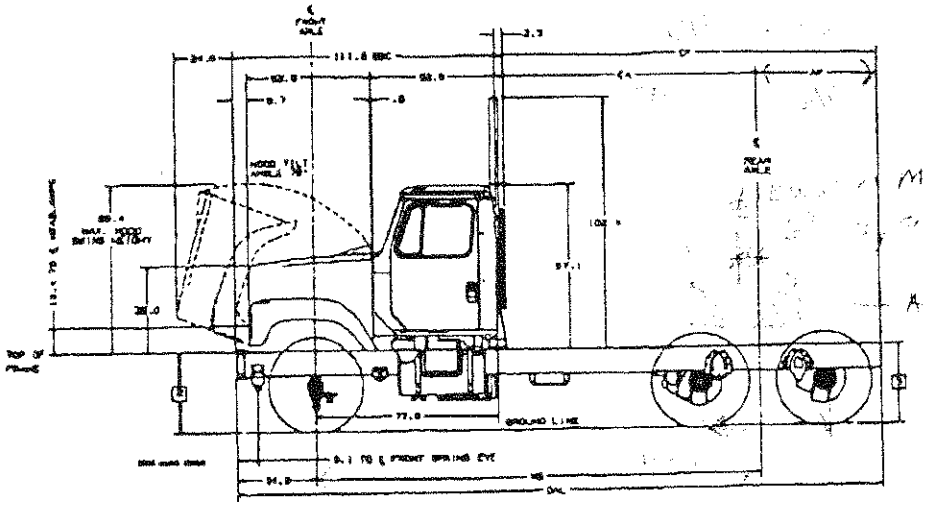
Model Code: SF25740

2574 | 4 6 X X 2 4

Wheelbase (In.)	Chassis Weights (lbs.) ** Front	Rear	Total	Dimensions (In.) CA	CF	AF	OAL	Turning Radius To Curb	W/Bumper Clearance
*180	6,837	8,354	15,191	102	155	53	267	29 ft. 7 in.	30 ft. 10 in.
186	6,867	8,342	15,209	108	161	53	273	30 ft. 6 in.	31 ft. 9 in.
196	6,917	8,321	15,238	118	171	53	283	31 ft. 11 in.	33 ft. 11 in.
198	6,927	8,317	15,244	120	173	53	285	32 ft. 3 in.	33 ft. 6 in.
204	7,288	8,821	16,107	126	179	53	291	33 ft. 1 in.	34 ft. 5 in.
216	7,367	8,813	16,180	138	191	53	303	34 ft. 10 in.	36 ft. 2 in.
228	7,464	8,827	16,291	150	203	53	315	36 ft. 7 in.	37 ft. 11 in.
246	7,556	8,784	16,340	168	221	53	333	39 ft. 0 in.	40 ft. 6 in.
252	7,596	8,780	16,376	174	227	53	339	40 ft. 1 in.	41 ft. 5 in.

NOTES: *Chart data based on vehicle with standard equipment. Artwork may show some optional equipment.*
* Optional add-on weights for this model are based on the 150" wheelbase.
** Weight includes standard chassis, standard tires, oil and water, but less fuel.
[2] = Frame Height at centerline of front axle: unloaded - 39.0", loaded - 36.2"
[5] = Frame Height at centerline of rear axle: unloaded - 39.8", loaded - 37.9"

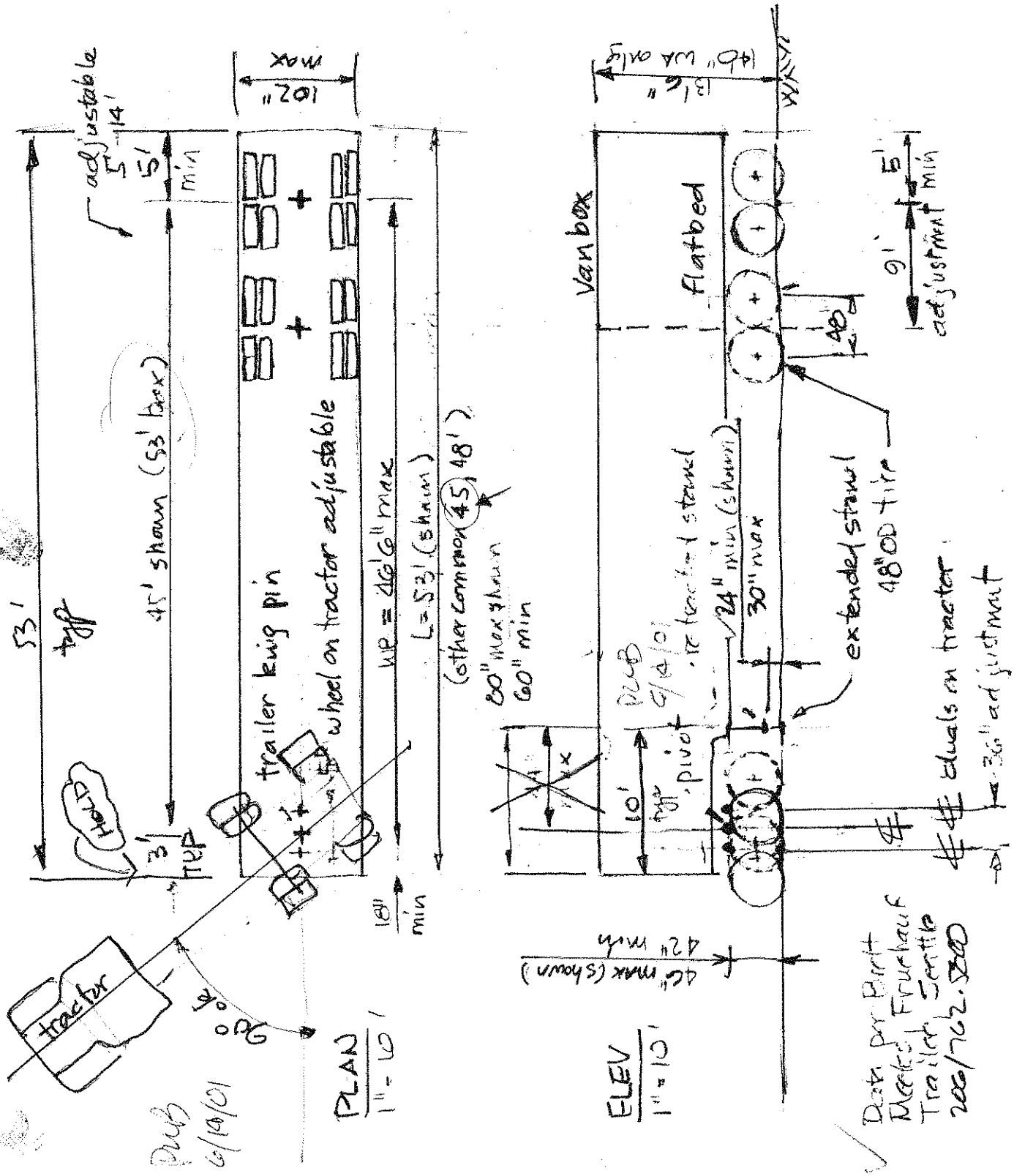


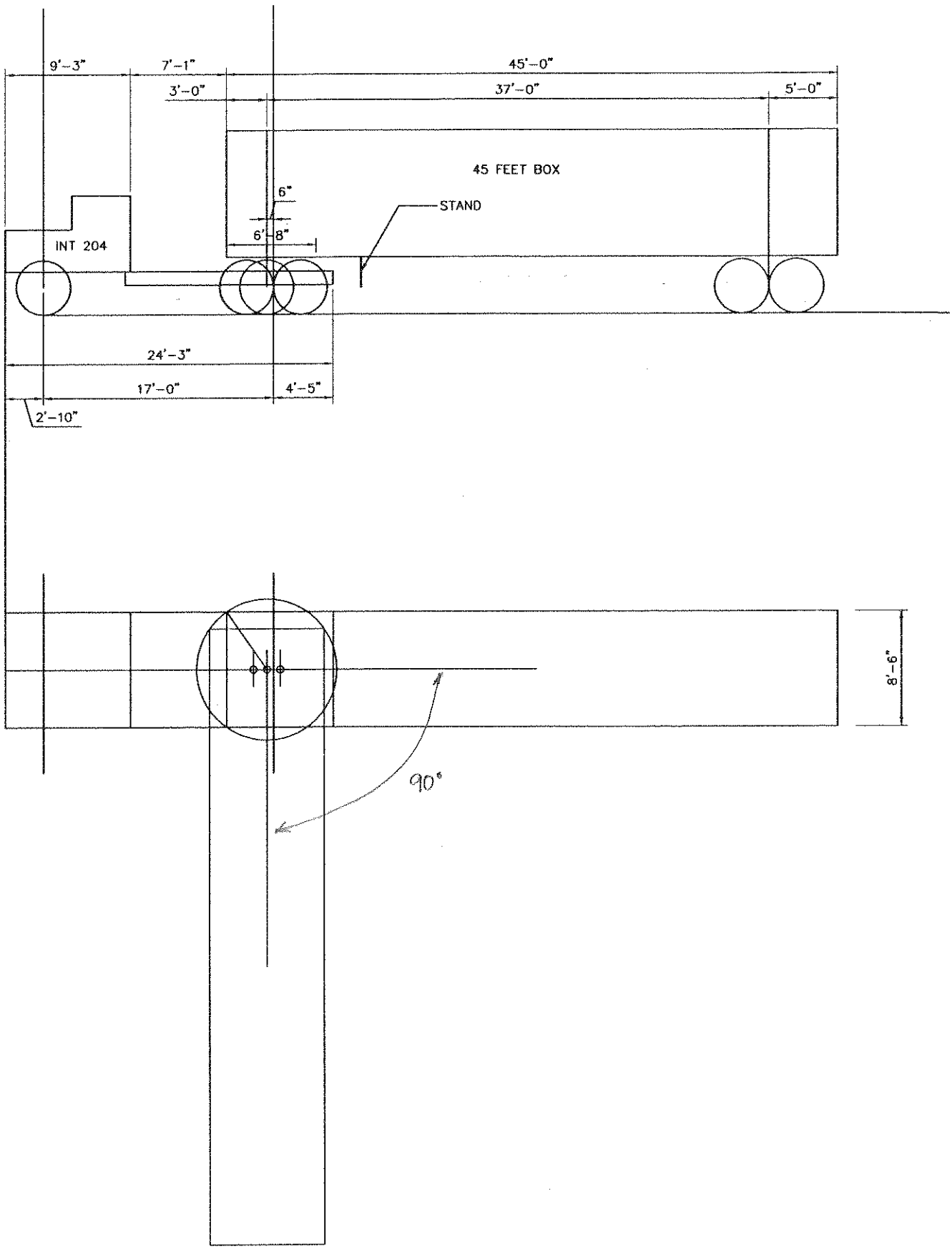


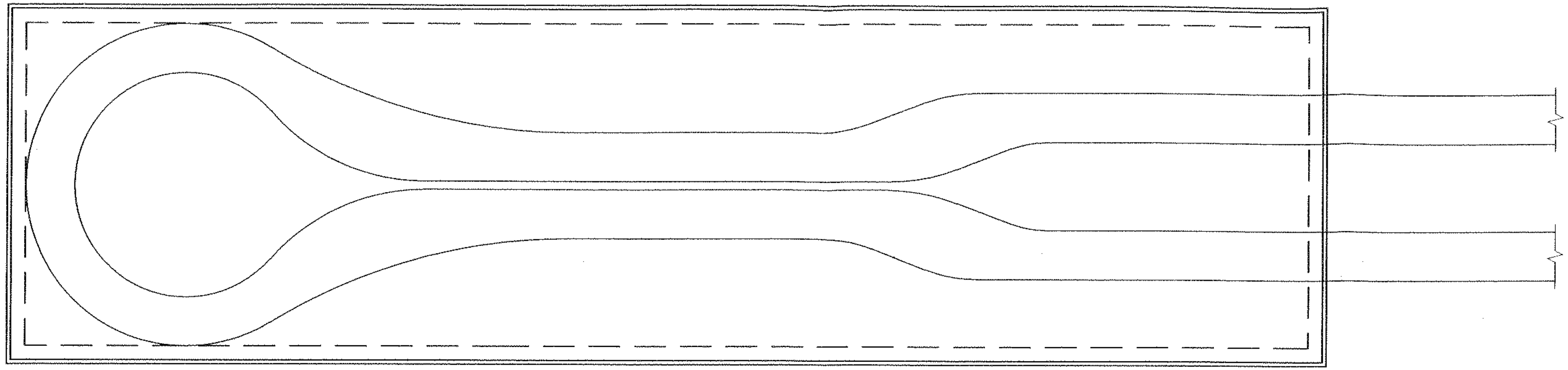
BERGER/ABAM ENGINEERS INC.

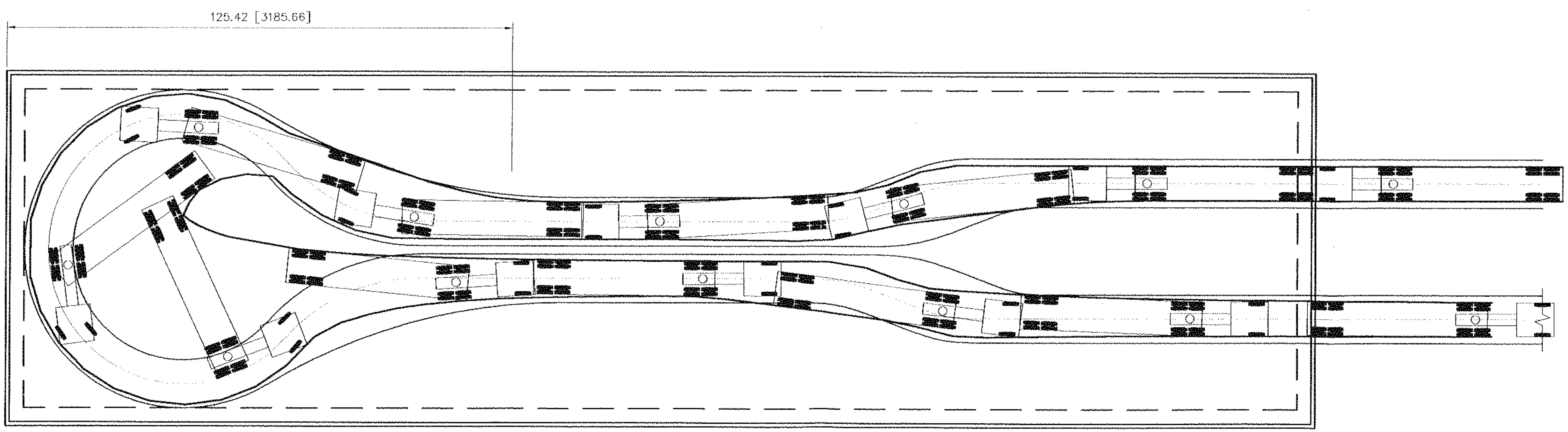
Project Floating MHP
Ramp & Roadways
Subject Trailer Dimensions

Sheet 1 of
Job Number AC1647
Designer PLB
Date 11/17/00

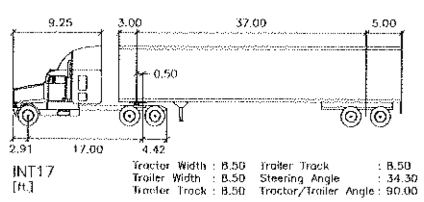



9'-3"
7'-1"
45'-0"
3'-0"
37'-0"
5'-0"
45 FEET BOX
6"
STAND
6'-8"
INT 204
24'-3"
17'-0"
4'-5"
2'-10"
8'-6"
90°





TRUCK TURNING - INTERNATIONAL WITH 45 FOOT TRAILER (WB=17')



RESULTS OF AUTOTURN COMPUTER SIMULATION

BERGER/ABAM

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING SERVICES CENTER

NFESC

MODULAR HYBRID PIER
FLOATING PIER

Plan - Truck Turn

CODE ID. NO. 80091 | SIZE D
SCALE: AS NOTED

SHEET APP C-1