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ENGINEERING DATA TRANSMITTAL

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Acceptance Test Procedure for K Basins Dose Reduction Project Clean and Coat Equipment

R. F. Creed
Westinghouse Hanford Company, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

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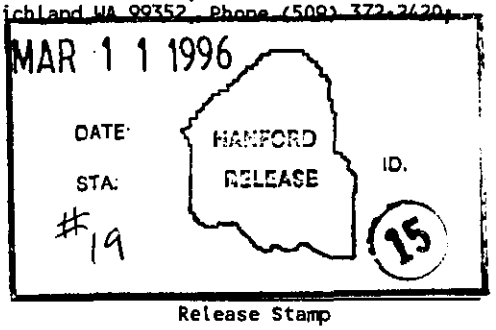
Abstract: This document is the Acceptance Test Procedure (ATP) for the clean and coat equipment designed by Oceaneering Hanford, Inc. under purchase order MDK-XVC-406988 for use in the 105 K East Basin. The ATP provides the guidelines and criteria to test the equipment's ability to clean and coat the concrete perimeter, divider walls, and dummy elevator pit above the existing water level. This equipment was designed and built in support of the Spent Nuclear Fuel, Dose Reduction Project. The ATP will be performed at the 305 test facility in the 300 Area at Hanford. The test results will be documented in WHC-SD-SNF-ATR-020.



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Vendor Acceptance Test Procedure for the 105 KE Basin Clean and Coat Equipment Loadout Dose Reduction Project

Contract Number
MDK-XVC-406988

Vendor Information File Number
18534

March 6, 1996

Richard F. Creed
Project Engineer

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1.0 INSTRUCTIONS

1.1 PURPOSE AND SCOPE

The purpose of this test procedure is to verify that the system(s) procured to clean and coat the concrete perimeter and the sides of the divider walls in the 105 K East Basin fulfills its functional requirements. This procedure focuses on the ability of the Clean and Coat equipment to be deployed into the basin and clean and coat an 18 inch band around the basin. The acceptable completion of this test is the basis for final acceptance of equipment by Westinghouse Hanford Company.

This test attempts to simulate the actual event of deploying the Clean and Coat equipment and performing the cleaning and coating operations in the basin. This test will be performed in the 305 Test Facility in the 300 area of the Hanford Site. Acceptance testing will include operations of the trolley carriage delivery system, cleaning and coating of concrete test samples supplied by Westinghouse Hanford Company (WHC).

1.2 REFERENCES

Clean & Coat operations manual (See Appendix A)

1.3 RESPONSIBILITIES

Oceaneering Hanford Inc. - will provide technical oversight for the conduction of the ATP. Oceaneering will perform any equipment modifications required to ensure a satisfactory approval of the "Acceptance Criteria".

WHC - will provide test facility and personnel to operate the equipment to ensure that the operation of the equipment is acceptable and test sample coupons with material applied that is capable of being brushed off for testing the effectiveness of the cleaning brush. The Dose Reduction Project (DRP) will provide a representative to direct the activities in the 305 building facility for conducting the ATP. WHC will publish the results of the ATP in a Acceptance Test Report (ATR) Document (WHC-SD-SNF-ATR-002).

1.4 SYSTEM DESCRIPTION

Oceaneering has developed and fabricated a custom trolley carriage system. The trolley carriage system was designed to address all positions of the constraining geometry in the basin.

The vertical members of the delivery system are constructed of seamless tubing of varying diameter to allow the system to be telescoped up and down above and below the grates in the basin. The support channel and lower parts of the vertical tubes are lifted and slide into the upper tubes. The system is lifted by a brake winch and cable

pulley system. The winch system allows the support channel to be lifted high enough to be above the grating, so that the heads can be replaced at floor level in the staging area. The top of the vertical tubes have shackles that hang on the monorail hoist system, and the bottom of the vertical tubes attach to the support channel.

The support channel consists of a sliding carriage with an extendable swing arm. A standard pressure roller and a motorized cleaning head can be attached to the swing arm. The swing arm is held perpendicular to the support channel by opposing torsion springs that are installed at the pivot point of the swing arm. The swing arm always returns perpendicular to the support channel, similar to a bar door. A hand controlled locking mechanism allows the swing arm to be controlled from above the grating. The locking mechanism allows the operator to swing the arm in parallel to the support channel and lock it into place for maneuvering around the obstructions in the basin. The slider carriage is driven by a ball nut. The ball nut rides along a 3/4 inch lead screw. The lead screw is mounted to the support channel with bearings and is turned by helical gears mounted on the lead screw and the drive shaft. The drive shaft is driven from above the grating by a manual operated hand wheel.

Attached to the frame work of the delivery system above the grates, is a commercially off the shelf, 17 gallon HEPA vacuum system and a 9" color monitor connected to a fixed camera. The camera is attached to the swing arm to allow the operators to view the cleaning and painting from above the grating.

1.5 TEST CONDITIONS AND EQUIPMENT REQUIRED

All the inventory listed in Operations Manual (See Operations Manual, Equipment Inventory in Appendix A).

Concrete test blocks (minimum dimensions 18 inches high x 4 feet long) positioned in test facility.

4- 110 VAC, 20 AMP receptacles capable of being relocated throughout the basin.

1- Batch of BIO-DUR 560 (20 gallons) (BIO-DUR is a trademark of Thin Film Technology, Inc., Houston TX).

1.6 ACCEPTANCE TEST

1.6.1 EQUIPMENT INVENTORY

(See Operations Manual, Equipment Inventory in Appendix A)

1.6.2 FUNCTIONAL TEST REQUIREMENTS

This section provides a functional test of each component on the Clean & Coat system,

to ensure each component is operational and will perform its required function. The operational details are provided in the operations manual. This test will refer to the operations manual for performance of the steps. The ATP will provide for procedure validation. Installation and removal of equipment as described in the operations manual will not be conducted as part of the ATP except where specifically called out by this ATP.

1.6.3 VISION SYSTEM

Operate vision system per instructions of operations manual section VIII.

1.6.3.1 Acceptance Criteria: Vision system is capable of viewing work area with enough clarity to perform cleaning and coating operations.

/	/
DRP Engineering / ICF-KH	Date

Comments: _____

_____

_____

1.6.4 HEPA VACUUM AND CLEANING BRUSH HEAD

Operate HEPA Vacuum/Cleaning brush head per instructions of operations manual section VI.

1.6.4.1 Acceptance Criteria: HEPA Vacuum/Cleaning brush head is able to brush loose surface material off of concrete test sample coupons to allow adequate bonding of coating material.

/	/
DRP Engineering / Oceaneering	Date

Comments: _____

_____

_____

1.6.4.2. Acceptance Criteria: HEPA Vacuum/Cleaning brush head provides adequate capture velocity to pass smoke test while operating brush shroud against the test sample coupon.

Rad-Con Engineering	Date

Comments: _____

1.6.4.3 Acceptance Criteria: HEPA Vacuum/Cleaning brush head provides adequate capture velocity to entrain smoke with the brush shroud moved away from the test sample coupon.

Rad-Con Engineering	Date

Comments: _____

1.6.4.4 Acceptance Criteria: Cleaning brush head is capable of being removed inside a glove bag and the brush changed out in simulated operating conditions.

/	/
DRP Engineering / QA Engineer	Date

Comments: _____

1.6.4.5 Acceptance Criteria: Vacuum canister is capable of being removed from the equipment support frame and relocated further from operating personnel.

/	/
DRP Engineering / QA Engineer	Date

Comments: _____

_____

_____

1.6.5 TEST OF COATING APPLICATION EQUIPMENT

Operate the coating application equipment per section VII of the operations manual.

1.6.5.1 Acceptance Criteria: Coating application equipment supplies the BIO DUR 560 to the test samples and coats with 95% coverage by visual contrast between the concrete and the coating.

/	/
DRP Engineering / QA Engineer	Date

Comments: _____

_____

_____

1.6.5.2 Acceptance Criteria: Coating application equipment provides a minimum of an 18" band width to the test coupons.

/	/
DRP Engineering / QA Engineer	Date

Comments: _____

_____

_____

1.6.6 TELESCOPING TUBES AND BRAKE WINCH MECHANISM

Operate the lifting mechanism in accordance with sections III and IV of the operations manual.

1.6.6.1 Acceptance Criteria: The brake winch, boom and telescoping tubes operate according to section III and IV of the operations manual and allow the delivery system to be deployed and retracted from the basin.

/	/
DRP Engineering / QA Engineer	Date

Comments: _____

_____

_____

1.6.7 SWING ARM

Operate the swing arm mechanism in accordance with section V of the operations manual.

1.6.7.1 Acceptance Criteria: The swing arm mechanism operates according to section V of the operations manual and allows the arm to be retracted and locked into place for maneuvering around the basin.

/	/
Engineering / QA Engineer	Date

Comments: _____

_____

_____

1.7 Accident Scenarios

1.7.1 Accident Scenario: Record operator response time for a simulated vacuum hose breach.

Response Time: _____

/	/
DRP Engineering / QA Engineer	Date

Comments: _____

1.7.2 Accident Scenario: Record operator response time for a simulated mixed epoxy hose breach.

Response Time: _____

/	/
Engineering / QA Engineer	Date

Comments: _____

1.7.3 Accident Scenario: Record the time and amount of epoxy collected when the mixing valve switch is held open without roller action/operation.

Time :_____ Amount: _____

/	/
DRP Engineering / QA Engineer	Date

Comments: _____

1.7.4 Accident Scenario: Record the response time for the inside basin equipment operator to communicate an outside equipment emergency shutdown to the outside equipment operator.

Time :_____

/	/
DRP Engineering / QA Engineer	Date

Comments: _____

_____

_____

1.7.5 Equipment Weight

1.7.6 Record maximum equipment weight, scale number, calibration number, and calibration expiration date.

Maximum weight: _____
Scale number: _____
Calibration number: _____
Calibration expiration date: _____

QA Engineer	Date

Comments: _____

_____

_____

Appendix A

Clean and Coat Equipment Operations Manual

Contract Number
MDK-XVC-406988

Vendor Information File Number
18534

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System Description

Oceaneering has developed and fabricated a custom trolley carriage system as shown in the drawings provided. The trolley carriage system was designed to address all positions of the constraining geometry in the basin.

The vertical members of the delivery system are constructed of seamless tubing of varying diameter to allow the system to be telescoped up and down for deployment above and below the grates in the basin. The support channel and lower parts of the vertical tubes are lifted and slide into the upper tubes. The system is lifted by a brake winch and cable pulley system. The winch system allows the support channel to be lifted high enough to be above the grating, so that the heads can be replaced at floor level in the staging area. The top of the vertical tubes have shackles that hang on the monorail hoist system, and the bottom of the vertical tubes attach to the support channel.

The support channel consists of a sliding carriage with an extendable swing arm. A standard pressure roller and a motorized cleaning head can be attached to the swing arm. The swing arm is held perpendicular to the support channel by opposing torsion springs that are installed at the pivot point of the swing arm. The swing arm always returns perpendicular to the support channel, similar to a bar door. A hand controlled locking mechanism allows the swing arm to be controlled from above the grating. The locking mechanism allows the operator to swing the arm in parallel to the support channel and lock it into place for maneuvering around the obstructions in the basin. The slider carriage is driven by a ball nut. The ball nut rides along a 3/4 inch lead screw. The lead screw is mounted to the support channel with bearings and is turned by helical gears mounted on the lead screw and the drive shaft. The drive shaft is driven from above the grating by a manual operated hand wheel. For details on these mechanisms see the drawings provided.

Attached to the frame work of the delivery system above the grates, is a commercially off the shelf, 17 gallon HEPA vacuum system and a 9" color monitor connected to a fixed camera. The camera is attached to the swing arm to allow the operators to view the cleaning and painting from above the grating.

I. Equipment Inventory

A. Required Tools

1. Standard set of sockets and end wrenches
2. Standard Allen wrenches
3. Tie wraps
4. Pipe fitters standard tools

B. Personal Protective Equipment

1. See the RWP for work inside the basin.
2. Eye protection, long sleeves and gloves are required for workers outside the basin that are handling BIO DUR and Spray Quip equipment (Spray Quip is a trademark of Spray Quip Inc, Houston, TX).

C. Inventory of Clean and Coat equipment

(See Vendor Information File 18534 for complete parts list description)
2-Telescoping tubes
1-Support channel assembly with short swing arm attached
1-Cleaning head support assembly
1-Vacuum shroud
1-Swing arm extension
2-Shackles
1-Brake winch and mount
1-HEPA Vacuum
1-25' vacuum hose with neck down piece attached
1-9" CCTV color monitor
1-CCTV camera and lens
1-COAX cable
1-Air compressor (supplied by Oceaneering for ATP and operations)
1-Paint application unit
1-200 feet of 2 part epoxy hose
1-Boom with pulley attached
1-6' length of flexible epoxy hose
1-15' length of flexible epoxy hose
1-Mini-mixing manifold
1-Trigger mechanism
1-Pressure feed roller

II. Installation and Removal

A. Installation of Common Equipment

1. Initial Conditions: Equipment is at the staging area in the storage box.
2. Remove all equipment from storage box if not already removed

during inventory.

3. Attach the telescoping vertical tubes to the top of the support channel.
4. Lift each of the telescoping vertical tubes and attach the shackles to the trolley carriages as shown on Figure 1.
5. Mount the camera on the swing arm and the light on the support channel as shown on Figure 1 , route the cord to the receptacle on the support channel.
6. Attach the mounting bracket video monitor to the telescoping vertical tube (See Figure 1). Place the color monitor on the bracket and secure. Route the cord to the receptacle located on the telescoping vertical tubes. Route the coaxial cable to the video monitor.
7. Attach the brake winch and cable extension as shown on Figure 1.
8. Mount the short swing arm as shown on Figure 2. If the swing arm extension is needed mount it on the swing arm at this time. The swing arm is a two piece mechanism connected with sleeved tubes that are pinned together. The extension fits within the same sleeves.
9. Connect the power cord to the upper and lower power receptacle.

B. **Removal of Common Equipment**

1. Initial Conditions: The system has been retracted from the basin and is in the staging area. Decontamination is in progress or completed.
2. Disconnect all cables and power cords from the system and place in the storage box.
3. Remove the camera, video monitor and its mounting bracket from the telescoping tube and place in the storage box.
4. Remove the cleaning head and cords or the pressure roller and hoses if installed. If the cleaning system is connected the vacuum and other components will need to be removed before disconnecting the vertical tubes from the trolley.
5. Using the brake winch lower the support channel assembly onto the floor of the staging area until the line goes slack. With the support channel resting on the floor, remove the telescoping vertical tubes from the monorail hoist system and lay the whole system down.
6. Disconnect the brake winch cable from the support channel assembly. Disconnect the telescoping vertical tubes from the support channel and place in the storage box.
7. Remove the light from its mount on the support channel and store. Check to ensure that all power cords are disconnected.
8. Place the lower support channel assembly in the storage box with the swing arm attached. The swing arm extension is stored

separate from the support channel assembly.

C. **Installation of Cleaning Application Equipment.**

1. Install the HEPA Vacuum and support bracket as shown on drawing, route the hose to cleaning head shroud. Plug the power cord to the vacuum into the receptacle located on the telescoping vertical tubes.
2. Install cleaning head assembly to the end of swing arm as shown on Figure 3. Route and plug in cord to the receptacle located on the support channel assembly.
3. To install a new brush in the cleaning head conduct the following steps:
   a. Remove the gear guard on the brush assembly.
   b. Remove worm gear and bushing attached to the top of the brush with a allen wrench.
   c. Remove the two wing screws that attach the top plate to the brush support. Lift off the top plate.
   d. Remove the top plate to the vacuum shroud.
   e. Pull the brush out into the glove bag and dispose of properly.
   f. Install the new brush in the assembly.
   g. Replace the shroud top and secure.
   h. Replace the top plate to the brush support and tighten the wing screws.
   i. Replace the bushing, worm gear and gear guard. Check the alignment of the gears before replacing the guard.

D. **Removal of Cleaning Application Equipment**

1. Remove the cleaning brush assembly by unbolting in from the end plate to the swing arm. Disconnect the vacuum hose from the shroud to the cleaning head. Disconnect power cord to the drive motor. If the brush is contaminated removal of the cleaning head will be performed inside a glove bag.
2. Remove the brush from the cleaning head assembly and dispose of as Low Level Waste. (See section C.3) Decontaminate the rest of the assembly as necessary.
3. Bag the end of the vacuum hose and leave the other end connected to the vacuum. Remove the vacuum and its bracket from the telescoping vertical tubes. Disconnect the power cord for the vacuum from the receptacle located on the telescoping vertical tubes.

E. **Installation of Coating Application Equipment.**

1. Remove the cleaning head equipment (if installed). Removal completed by conducting steps of section D.

2. Install the pressure head roller to the plate on the end of the swing arm that is attached to the support channel.
3. Route the epoxy hose through the swing arm and up the telescoping vertical tube. Ensure flexible hose has enough slack to allow the slider carriage to freely move through its range of motion.
4. Connect the trigger mechanism, mini mixing manifold and the static mixer to the flexible hose and then tie them off to the telescoping vertical tube using quick ties.

WARNING

Check all hose connections to ensure that they are tight before starting the SPRAY QUIP equipment. The hoses are subject to high pressures.

5. Connect the 2 part heated epoxy hoses to the mini mixing manifold and connect the other end to the Spray Quip epoxy supply module.
6. Startup and operation of the Spray Quip epoxy supply module shall be done according to the vendor supplied instructions included as section IX of this procedure.

F. **Removal of Coating Application Equipment**

1. Shutdown the Spray Quip epoxy supply module per the vendors instructions. (See section IX)
2. Disconnect the two part epoxy hose, with the mini mixing manifold attached, from the static mixer and from the Spray Quip epoxy supply module. Take the hose to the decontamination area.
3. Deploy the delivery system to the staging area.
4. Remove the pressure roller head, flexible hose, trigger mechanism and static mixer. Dispose of appropriately.

III. Deploying System into Basin

A. **Initial Conditions**

1. Clean and Coat (C & C) equipment rigged onto Basin monorail hoist system.
2. Cleaning or Coating equipment installed on the unit (which ever is applicable).
3. C & C equipment located over deployment area (i.e.: opening in grating at center of basin).

B. **Operations**

1. Check to ensure all cords and hoses are free from binding.
2. Using the lifting winch slowly lower the support channel assembly to the desired level.

3. As the system is lowered, observe all cords, hoses, shafts, and telescoping equipment to ensure no binding occurs.
4. When desired level is reached, lock the brake winch in place.

IV. Retracting System from Basin

A. Initial Conditions

1. Operations completed
2. Two part epoxy hoses disconnected (if applicable)
3. C & C equipment deployed to location for removal from below the grating (IE: Dummy Elevator Pit).
4. Swing arm is retracted into support channel

B. Operations

1. Check to ensure all cords hoses, shafts, and telescoping vertical tubes's are free from binding.
2. Using the brake winch, turn the winch to raise the support channel assembly.

> NOTE: while raising the assembly, watch to ensure equipment is not binding.

V. Swing Arm Operations

A. Initial Conditions

1. Swing arm is attached to slider carriage
2. Swing arm is locked in retracted position
3. Delivery system is deployed to desired location

> Note: The swing arm is spring loaded and will always return perpendicular to the support channel.

B. Operations

1. While holding the swing arm crank, unlock the swing arm.
2. Slowly release the swing arm and let it rest upon the wall of the basin.

> Note: The swing arm is to be left unlocked when the system is in operation. The springs in the arm, control the force applied to the wall. When larger forces are needed, the crank mechanism may be used.

3. Use the swing arm crank to retract the arm as necessary to allow

for maneuvering the system around the obstructions in the basin.

> Note: This will allow for maximum clearance around obstructions, the swing arm should be retracted and locked in position when maneuvering around obstructions.

4. To extend the swing arm in the opposite direction, one end of the C & C equipment should be moved into a slot that crosses the basin. This will allow enough room for the swing arm to clear the wall and be held in position until the C & C equipment is returned next to the wall.

> Note: This step will need to be accomplished only when an obstruction does *not* allow cleaning or coating in the other direction.

5. For swing arm operations with the cleaning head on, the slider carriage will have to be moved to the far end, so that the motor will clear the support channel when the arm is retracted. This will typically only need to be done when trying to clear obstructions in the basin.

VI. Cleaning Basin Wall Operations

A. Initial Conditions

1. Cleaning head installed/ plugged in
2. HEPA vacuum installed/plugged in
3. C & C equipment deployed to desired location
4. Vision system operating

B. Operations

1. Release the swing arm according to instructions in Section III.
2. Ensure that vacuum shroud is flush against the wall by viewing it with the vision system.
3. Turn on the switch to provide power to the motor for the cleaning brush and vacuum.
4. Check vacuum gage to ensure vacuum is operating.
5. Rotate the hand crank to move the slider carriage across the support channel.
6. Repeat step five as necessary to ensure adequate cleaning of the wall.
7. Secure power to the drive motor and vacuum when cleaning of area is complete.
8. Retract swing arm according to Section III.

9. Relocate C & C equipment to next location.
10. Repeat steps 1-9 of this section until cleaning of basin is completed.

Note: To complete cleaning of the basin, the extension arm will have to be installed. The C & C equipment will have to be taken out of the basin per Section III, the extension attached, and redeployed per Section IV. The steps to this section also apply to the extended arm.

VII. Coating Basin Wall Operations

A. Initial Conditions

1. Pressure roller head, flexible hose, mix manifold, and trigger mechanism installed.
2. HEPA vacuum removed.
3. Vision system operating.
4. Two-part heated epoxy hoses connected to mixing manifold.
5. C & C Equipment deployed to desired location.
6. Spray Quip Applicator operational with epoxy in lines and heated.

B. Coating Operations

Note: For operation of Spray Quip Applicator Model #397-346, use vendor supplied operating instructions in section IX of this procedure.

1. Release the swing arm according to section III.
2. Ensure the pressure roller is flush against the wall by viewing it with the vision system.
3. While rotating the hand crank to move the slider carriage across the support channel, engage the trigger mechanism to allow the flow of the epoxy. Control the rate of motion of the slider carriage based on the paint flow viewed in the vision system.
4. Release the trigger mechanism when the slider carriage reaches the end of its travel.
5. Retract the swing arm according to Section III.
6. Relocate the C & C equipment to the next location.
7. Repeat steps 1-7 of this section until coating of the basin is completed, or until operations cease for the day. If operations are complete go to step 9.

Note: To complete coating of the basin, the extension arm will have to be installed. The C & C equipment will have to be taken out of the basin per Section II, the extension attached, and redeployed per Section I. The steps to this section also apply to the extended arm.

8. Secure the Spray Quip Painting Applicator in accordance with

section VIII of this procedure.

9. Disconnect two-part epoxy hoses from mixing manifold.
10. Move C & C equipment to retracting area.
11. Retract system from the basin according to section II of this procedure.
12. Move the system to the staging area.
13. Disconnect the pressure roller head, the trigger mechanism, static mixer, and flexible tube. If operations are complete, store the C & C equipment for future use.
14. If continued operation during the next shift is necessary, then replace the pressure roller head, trigger mechanism, static mixer and flexible tubing.

VIII. Vision System

A. Initial Conditions

1. Monitor connected to the vertical tubes as shown in drawing.
2. Camera attached to swing arm.
3. Camera plugged into outlet on support channel.
4. Monitor plugged into outlet on vertical tube.
5. Coax cable connected between monitor and camera.
6. Ensure that all power cords and cables are connected
7. Lens installed on camera.

B. Vision System Operation

1. Turn power switch to vision system on.
2. View monitor to verify that pressure roller head or cleaning head can be seen.
3. Adjust camera as necessary to obtain correct view of equipment. (This should be accomplished before deploying system.)
4. Check the clarity and focus of the picture.
5. When cleaning or coating operations are completed secure the power to the vision system.

IX. Epoxy Material Applicator Operation

397-346 OPERATION INSTRUCTIONS FOR ROLLER APPLICATION OF OCEANEERING TWO COMPONENT EPOXY WITH HEAVY DUTY FIXED PROPORTIONER

FOLLOW ALL SAFETY PRECAUTIONS AND REQUIREMENTS LISTED HEREIN.

POWER REQUIREMENTS

Compressed Air: 30-40 CFM @ 100 psi minimum capacity.

NOTE: The proportioning pump operates at pressures below 100 psi and should NEVER exceed 100 psi.

Electrical: (4) 120 V, 1 ph, 20 AMP circuits

(2) Tank Heaters: 120 VAC, 1 ph, 20 AMP each.
(2) A & B Line Heaters: 120 VAC, 1 ph, 20 AMP each.

NOTE: Unit should be grounded at all times.

NOTE: All electrical components should be protected from weather as they are not water tight or explosion proof.

The application contractor must be prepared to have a supervisor, foreman or technician on site at all times during coating applications operations. He must thoroughly understand the basics of the unit, the material and the application techniques. He should supervise the application crew regarding daily use including, proper temperature/mix ratio, cleanup, and maintenance of the unit. He should also assure that the EPOXY is properly stored, heated and applied. THIS PERSON IS KEY TO THE SUCCESSFUL AND PROFITABLE APPLICATION OF EPOXY. The application crew should consist of a coating applications man, a pump man, and a helper.

The pump man needs to do the following:

- ✓ Anticipate material needs to keep hoppers full, so that material will be preheated at all times.
- ✓ Immediately cleanup any spills or leaks.
- ✓ Monitor all pressure and heat gauges. Large differences between the pressure gauges indicate an off ratio condition. The unit should be shut down immediately and the problem corrected before continuing.
- ✓ Anticipate job progress and position unit and hose for continuous coating application.

Arrange equipment and work to allow the applicator to roll continuously.

Before start-up the applicator should have on site, wrenches (WRENCHES HAVE TO BE ONES THAT PROPERLY FIT THE COMPONENTS OF THE ROLLER AND PUMP), 10 gallons of recommended clean up solvent.
Make sure compressed air is clean and dry and at least 30 CFM @ 100 psi. The air hose to the pump should be 3/4" ID or larger and unrestricted. A filter and lubricator comes on the unit, the lubricator should be filled with non-detergent oil. In cold damp climates where air motor icing can be a problem, use a 50/50 mix of water and Ethylene Glycol.

Follow start up and operations instructions in equipment manual.

SOLVENT CHECK OUT ---- PROPORTIONING UNIT

Fill A and B hoppers with 5-6 gallons of recommended flush solvent. Turn proportioning pump air valve on, open mixer manifold handle (Back Position). Hold roller control valve over one of supply pump flush buckets. Slowly turn proportioning pump regulator to 30-40 psi. Allow pump to cycle until unit and hose assembly are fully charged with solvent and you have a steady flow of solvent from the hose outlet. Observe A & B fluid pressure gauges, they should be balanced. If not balanced , actuate the trigger mechanism until gauges do balance. Once system is balanced, and with trigger mechanism closed, slowly increase air pressure to 50 psi. Make sure gauges stay balanced, if unbalanced slowly open high side fluid bleed valve, balance with air pressure off, then close valve tight. Pressure check system for leaks. Eliminate any leaks by tightening. Reduce air pressure to zero by actuating the trigger mechanism and draining the solvent into waste container. After solvent check out of the complete pump, drain and blow all solvent from unit.

NOTE: Pressure gauges have an accuracy of about ± 10 % when compared to one another.

DO THE "PUMP CHECK-OUT" EVERY DAY BEFORE STARTING UP (WITH COATING IN UNIT)

Starting with a clean unit:

1. Load material

Load material into hoppers:

The resin or base material (1 part) goes into the hopper tank on the left side as you face the pump. The activator material (1 part) goes into the hopper tank on the right side as you face the pump.

2. Start Heaters:

Turn power on to the (2) 120V circuits to the unit. The two tank heaters will begin to heat material in tanks to the pre-set temperatures.

Use (2) separate 20 amps circuit breakers and (2) separate extension cords, of proper size. (3-12 gage minimum)

Ideally material should be stored at 77 °F (25 °C). Heat material at least 1 hour in tank hoppers before start-up. For proper metering, mix, and rolling results to be achieved, "A": base must be pre-heated to a minimum of 120-125 °F and the "B" activator must be pre-heated to a minimum of 110-115 °F in the heated hoppers, to reduce viscosity before use in unit.
NOTE: A & B tank heaters are adjustable. The A & B tank heaters should each be set at proper temperature for epoxy system being used.

3. With control valve, whips and static mixer removed, set air pressure to Bulldog pump at 30-40 psi, open.

Close ball valves on MIXER manifold BY PUSHING HANDLE TOWARD THE ROLLER. Closing the mixer manifold by pulling the handle toward the dispense valve is intentional. For instance, if you pickup the mixer manifold and move it to another location, you will automatically close the ball valves when you begin pulling it forward.

Open circulating valves on material lines leading back to hopper tanks. Turn on pump slowly. Run at slow speed. Circulating material through line heater and back into tanks heats the pumps and removes air from inside the pumps. Close circulating valves.

4. Set heated hose thermostat to 120-125 °F. Allow 30 minutes to warm up.

Make sure material maintains proper A & B temperature for the epoxy system being used and no bubble popping is evident.

5. **RATIO CHECK**

With unit fully charged, with material mixer manifold valves closed and mixer whip and dispense valve thoroughly flushed, set Bulldog air motor regulator at 40-45 psi. Turn on Bulldog air valve slowly, when unit is up to pressure slowly open both re-circ valves at same time and allow pump to slowly re-circulate. Adjust re-circ valves until both (2) gauges read 600-700 psi. Take ratio samples from return parts in A and B hopper tanks. Use straight sided identical (1) gallon

sized cans and simultaneously fill (1) can with (A) and the other with (B). When "A" base becomes full the "B" activator can should be full. Measure with ruler, repeat sampling as needed to assure ratio is (1) part base to (1) part activator.

6. Turn off air to motor of Bulldog pump.

7. Test Roll: (2 people required)

- ✓ Connect mixer manifold, 6' whip hose and dispense valve to mixer manifold. Connect 15' whip hose and roller assembly to dispense valve.
- ✓ Make sure recirculation valves are closed..
- ✓ Open mixer manifold material valve handle.
- ✓ Trigger dispense valve.
- ✓ Open Bulldog pump air valve slowly (run pump slowly) to start pumping material.

Pump enough material through dispense valve and roller, to wet out roller. Make several test passes on scrap cardboard to establish best roller performance. Trigger dispense valve as needed to supply epoxy to roller cover at proper rate. Adjust pump fluid pressure as needed.

8. Proceed with roller production.

9. CAUTION: Mixed material is in the static mixer, whip hoses, valve and roller (will harden if not flushed out).

10. **DAILY OR WORK STOPPAGE CLEANUP:**

- ✓ Turn off tank and line heaters.
- ✓ Turn off air supply to Bulldog pump and bleed system of air. Make sure pump is stopped with the pump rods in the down position (shiny part of pump rod hidden from view).
- ✓ Slowly trigger dispense valve into waste container or open re-circ valves on outlet manifold to relieve pressure in system.
- ✓ Remove static mixer, whips, valve and roller from mixer manifold and dispose of.
- ✓ Remove air supply from unit.
- ✓ Clean all the equipment so that it is spotless.

NOTE: ALLOW ENOUGH TIME AT THE END OF THE SHIFT TO COMPLETELY CLEAN THE UNIT. THE SUPERVISOR OR FOREMAN NEEDS TO INSPECT THE CLEANING JOB. FIELD EXPERIENCE HAS PROVEN THAT A CLEAN MACHINE WILL START UP AND WORK THE NEXT DAY.

Material does not need to be removed from hoppers, hose or mixer manifold, if the unit will be used within 2 or 3 days. Make sure to do the circulating at pump manifold each day at start up, so that any material separation problems will be avoided.

Follow the daily cleanup schedule above. A & B material plus the following:

Drain and remove material from tanks.

Wash tanks with proper thinner or solvent (MEK TYPE). Circulate 3 or 4 gallons of solvent per hopper tank as in the circulating mode (pump to tank).

Purge paint from heated hose and circulate solvent through hoses and mixer manifold until clean.

Drain complete system and circulate clean solvent through system again for several minutes.

Open the in line filters at the paint outlet manifold and inspect the screens for trash. Clean as needed.

11. STORAGE AND LONG TERM SHUT DOWN:

Leave mineral spirits, solvent or oil in system during long term shutdown. All pump rods should be in down position with TSL in wet cups.

NOTICE:
All statements, information and data contained herein are based upon tests and field experience believed to be accurate and reliable. However, since field conditions vary widely, the user must determine the suitability of the equipment for his particular use.

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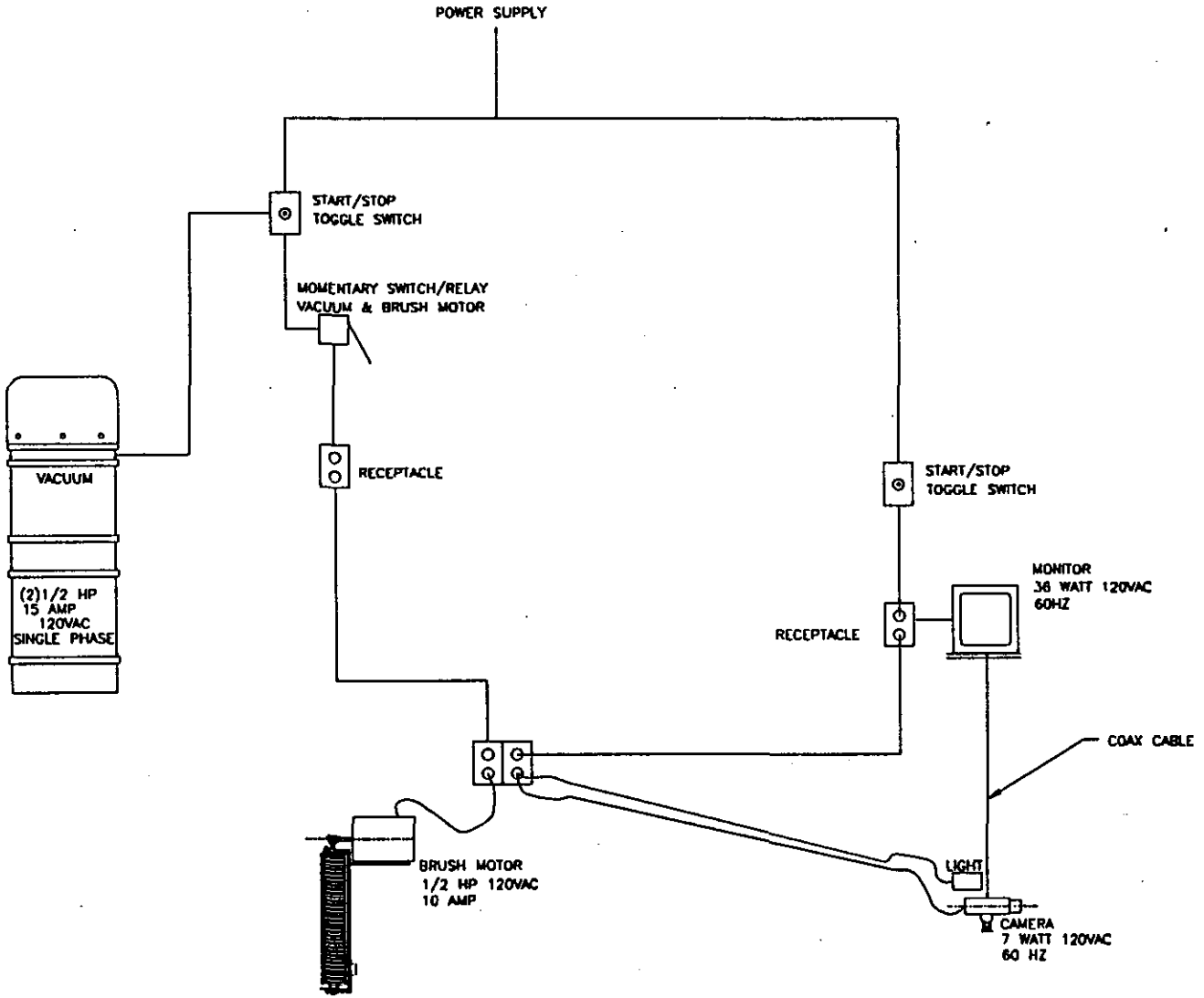
X. Equipment Drawings

A. Electrical Layout

B. Brush Assembly

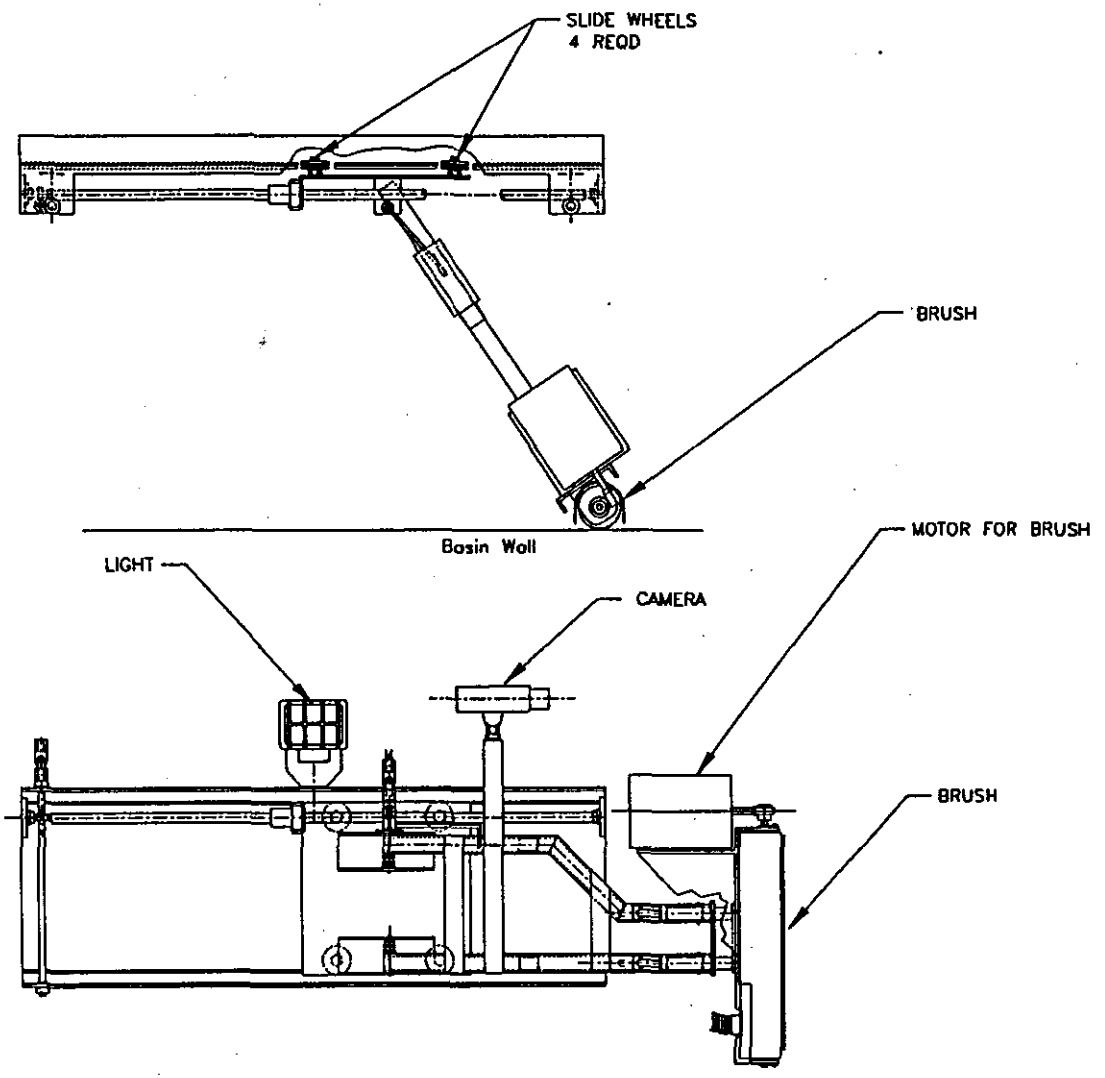
C. Roller Assembly with Swing Arm Extension



OCEANEERING HANFORD
K-BASIN
CLEAN & COAT
ELECTRICAL LAYOUT
ELECT-VR/JR-1-96

A-18

WHC-SD-SNF-ATP-~~002~~ 020
Rev 0



BRUSH ASSEMBLY

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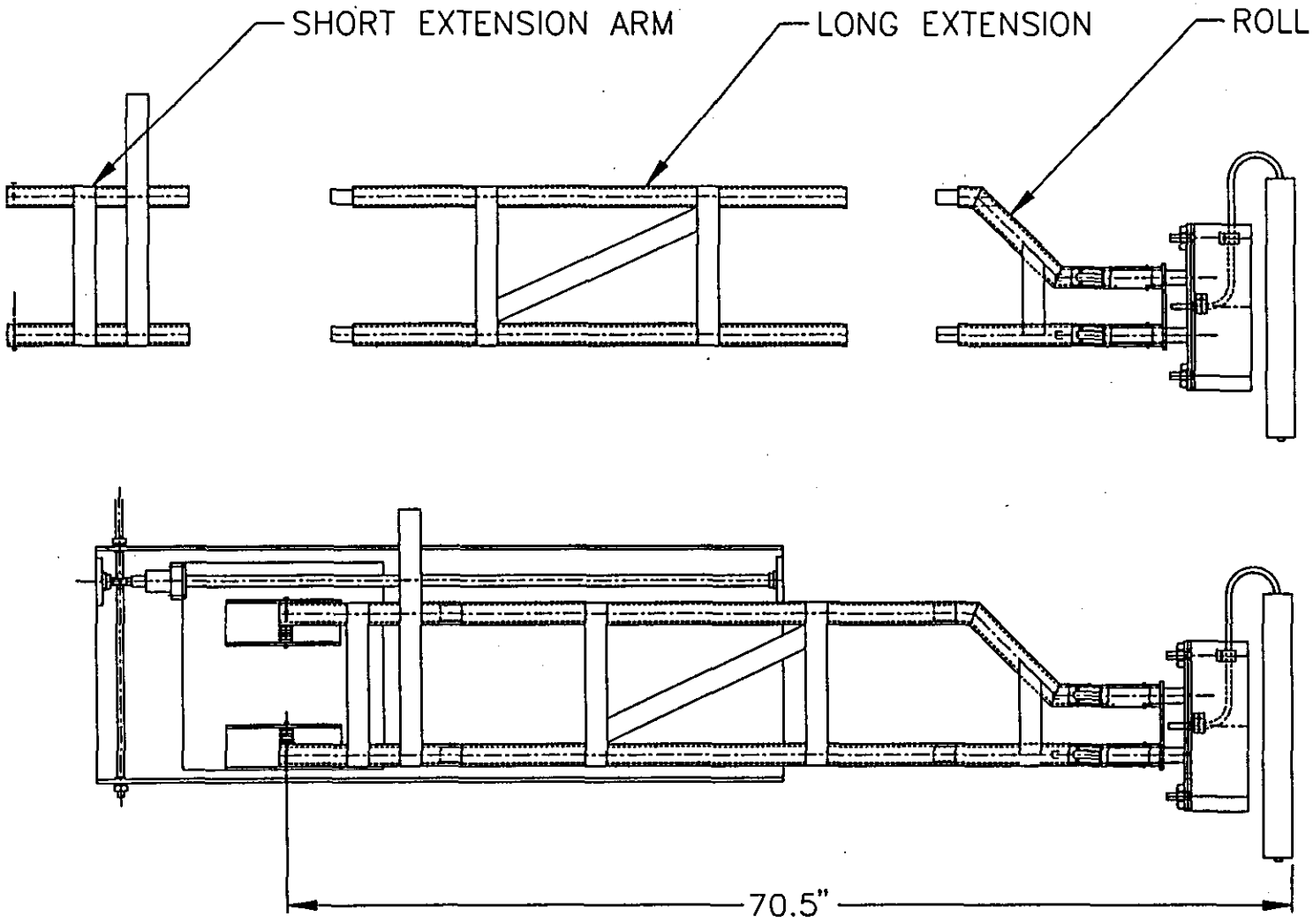
SK-VR/JR-1-96E	0



SWING ARM EXTENSION

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