

**WASTE PIT 5 LINER REPAIR WORK PLAN
FERNALD SITE OFFICE**

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WASTE PIT 5 LINER REPAIR

1901

WORK PLAN

FERNALD SITE OFFICE

Prepared by:

Westinghouse Materials Company of Ohio
P. O. Box 398704
Cincinnati, Ohio 45239-8704

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I. INTRODUCTION

This document provides a work plan describing the proposed repairs to the Waste Pit 5 liner with the objective of maintaining the integrity of the liner and mitigating release to the environment.

II. BACKGROUND

Waste Pit 5 was constructed in 1968 and received wastes from 1968 to 1983. The Pit was lined with clay and a 60 mil thick Elastomeric membrane. This pit received liquid waste slurries from the refinery and the recovery plant, including neutralized raffinate settled solids, slag leach slurry, sump slurries, and lime sludge. The waste volume consists of approximately 98,840 cu. yd., which contains an estimated 50,729 kg of uranium and 17,000 kg of thorium.

From 1983 to February, 1987, when it was taken out of service, Pit 5 received only clear decant from the general sump, filtrate from the recovery plant, or nonradioactive slurries, such as filtrate (clear liquor) from the boiler plant and water treatment plant. The surface of Waste Pit 5 is open and has not been covered with any type of fill material. Over the years, routine maintenance repairs to the Pit 5 liner have been made by the maintenance department.

All repairs outlined in this work plan are to be made by WMCO hourly personnel under the direction of WMCO supervisory personnel.

III. SUPPORT ACTIVITIES

1. The Operable Unit 1 Manager has the responsibility for all activities concerning this repair through the management organizational structure. These activities will include, but will not be limited to, tasks described on the attached schedule. This repair will be completed prior to initiating the final remedial action for Operable Unit 1. The repair will complement the efficient performance of the final remediation to the extent practicable. All design and construction activities associated with the repair will be reviewed and approved by the Operable Unit 1 Manager to assure consistency with the final remedial program.
2. All involved personnel are responsible and accountable for compliance with this repair work plan, any applicable procedures and all Fernald Site (FS) safety policies.
3. Workers are responsible for the following:
 - 3.1 Maintaining line of sight contact with at least one other person while in the exclusion zone.
 - 3.2 Promptly informing supervision of any abnormality or unforeseen situations that may occur during the repair.

4. Industrial Hygiene Technicians (IHTs) and Radiological Safety Technicians (RSTs) are responsible for the following:
 - 4.1 Performing and documenting the required surveys and air monitoring.
 - 4.2 Promptly notifying the health and safety officer and supervision of monitoring results.
5. The Field Supervisor is responsible for the following:
 - 5.1 Overseeing the proper implementation of the work plan.
 - 5.2 Promptly notifying the Assistant Emergency Duty Officer (AEDO) of abnormal or unforeseen situations.
 - 5.3 Maintaining a daily log of operations.
 - 5.4 Generating and maintaining an approved access list for the exclusion area.
 - 5.5 Conducting daily pre-shift briefings for planned activities.
 - 5.6 Maintaining a copy of all checklists required by the work plan or the task specific health and safety plan.
 - 5.7 Reporting progress of repairs to the OUI manager.
6. The Health & Safety Officer, as identified in the task specific health and safety plan, is responsible for verifying compliance with the task specific health and safety plan.

IV. LINER REPAIR WORK IMPLEMENTATION

GENERAL

1. A daily log of operations shall be maintained and must include the following:
 - 1.1 Date and time of operations.
 - 1.2 Initial conditions at start-up, including meteorological data (i.e., wind speed and direction).
 - 1.3 Names of all personnel accessing the area and duration of the access.
 - 1.4 Operations performed.
 - 1.5 Any abnormal or unforeseen conditions.
 - 1.6 Verification that all required checklists are complete, and no

defective equipment is in service.

2. A daily pre-shift briefing shall be conducted as required by the task specific health and safety plan.

PROCEDURES

NOTE: Issue or verify an active work permit and perform any required initial monitoring.

1. Verify that the exclusion area and decontamination zone barriers and postings meet the requirements of the task specific health and safety plan.
2. Don all protective clothing.
3. Start all monitoring equipment, including air sampling equipment.
4. The actual repairs planned for the liner will consist of the following steps:
 - 4.1 Drain water from Pit 5 (water level reduced to the point of contact with waste solids) and send to clearwell.
 - 4.2 Liner inspection by the project engineer.
 - a. determine the extent of repairs needed and the appropriate method (patch hole, match seam, splice, etc.).
 - b. report on the significance and extent of any problems and document alternatives.
 - c. document that conditions are sufficient for liner repair to commence (weather conditions are dry and wind speeds are low (<20 mph)).
 - 4.3 Installation of air monitor stations.
 - 4.4 Installation of a water fog system.
 - 4.5 Visually monitor waste pit contents to ensure surface is wet/damp, and that water is not ponded before beginning each day's repair activity. At the end of the day's repair activity, the waste pit contents will be wetted down.
 - 4.6 Remove grass, weeds, and soil (using the appropriate equipment such as shovel or weed cutters) from seams (containerize). Exercise care in removing material to avoid additional impact on the liner. Containerized material should be placed in a satellite accumulation area to await sampling and analysis and final disposition.

- 4.7 To complete visual inspection of the liner seam remove sludges and waste pit material from around seam area using the appropriate equipment.
 - 4.8 Wash off liner with clean water from hose and then thoroughly dry (using clean rags) in preparation for repairs.
 - 4.9 Project Engineer shall perform liner inspection.
 - 4.10 Repairs to liner are to be made per the approved procedure (See Attachment F).
5. At the completion of all liner repairs, the following shall be completed:
- 5.1 Test of repairs made (where required). This will be a visual inspection by the Project Engineer.
 - 5.2 A visual inspection of the liner for any defects created during the liner repair activity. If any defects or problems are identified, the OUI Manager should be contacted for guidance and disposition of the problem.
 - 5.3 Removal of the water fogging system.
 - 5.4 Clean up and dispose of PPE and liner repair wastes according to established site procedures.
 - 5.5 Remove air monitor stations.
 - 5.6 Adjust and maintain the desired water cover (refill Pit 5 with water) in the pit and institute inspections in accordance with the existing procedure for waste pit area surveillance.
 - 5.7 The supervisor and Health and Safety Officer shall together with IRS&T personnel, verify that: a. all planned work has been successfully completed; b. required surveys are complete; c. all equipment meets contamination limits and; d. all waste (PPE, soil, grass, and liner repair wastes) are containerized correctly.

V. SAMPLING AND ANALYSIS

A sampling and monitoring program is part of the repair activity. Monitoring and sampling will be completed to meet the following objectives:

1. Provide quantified results of particulate radionuclide emissions during the repair activity.
2. Provide real time monitoring to immediately assess the adequacy of the worker protective methods employed during the repair activity.
3. Evaluate the soils, grass, and weeds for contaminants of concern.

The primary control method to reduce airborne emissions will be to apply a water spray during movement of pit solids to keep the excavation area thoroughly wetted. During liner repairs, the exposed Pit 5 contents will be kept thoroughly wetted to minimize airborne emissions. Secondary measures for reducing airborne contamination include personnel training and administrative controls.

The water supply spray system (fog system) will be regulated by the manual control of the flow of water through a water line. The accumulation of excess water will be controlled by manual drainage to the clearwell.

Table I, attached, represents the contaminants that are contained in the Waste Pit 5 material and are available for wind erosion and fugitive airborne emissions.

Estimated radioactive particulate emissions attributable to Pit 5 as reported in 1989 resulted in 0.16 mrem equivalent dose to the nearest neighbor for the entire year of 1989. Given the short duration of this repair action, negligible impact is expected from fugitive emissions.

To accomplish objective 1, two high volume air samplers will be installed at the specified locations (Attachment B). The locations are based on the predominant wind direction. The filters will be analyzed at the WMCO analytical laboratory for gross beta, total uranium and for any other radionuclides that may be present. Eight hour samples will be taken prior to the start of repairs and continuously during repairs. Sampling procedures, chain of custody, and sample handling protocol are contained in Attachment C.

To accomplish objective 2, Table II presents the hazards to be monitored, sampling method and type, sample location and frequency of monitoring.

To accomplish objective 3, samples from the containerized soils, grass, and weeds will be analyzed for full RAD, HSL, and TCLP. Determination of the disposition of the containerized material will be made after review of the analysis.

Meteorological data (temperature, wind speed, and direction) shall be recorded on all air sample data sheets.

The results of all analyses and effectiveness of the repair activity will be summarized and consolidated with other information generated from the Waste Pit berm study currently underway.

VI. QUALITY ASSURANCE

The overall quality assurance program at the FMPC is described in the site Quality Assurance Plan, FMPC 2139. The Quality Assurance Plan is based on the criteria specified in ASME NQA-1, Federal EPA Guideline QAMS-005/80 and DOE Orders 5700.6 and 5400.1. This repair and associated activities will also be consistent with the RI/FS Quality Assurance Project Plan (QAPP).

VII. HEALTH AND SAFETY PLAN

The work to be performed will be consistent with the RI/FS Health and Safety Plan and a site specific safety plan to be prepared for this repair activity. The plan identifies, evaluates and controls all identified safety and health hazards. In addition, it provides for emergency response for hazardous operations. The plan is consistent with 29 CFR 1910.120 and the FSO Site Health and Safety Plan.

Safety documentation will be prepared according to FMPC-2116 Topical Manual "Implementing FMPC Policies and Procedures for System Safety Analysis." FMPC-2116 has been prepared to implement DOE Order 5481.1B, "Safety Analysis and Review System" and DOE/OR-901, "Guidance for Preparation of Safety Analysis Reports."

ATTACHMENT D

**SAMPLING PROCEDURE SUPPLEMENT
TO THE WASTE PIT 5
LINER REPAIR WORK PLAN**

Detailed project sampling plans have been prepared to document the scope and methodology of airborne particulate radioactivity measurements for the Waste Pit 5 Liner Repair Work Plan.

The following considerations form the basis for the project specific sampling program:

- Frequency of samples
- Location and number of monitoring stations to be used
- Methods of sampling and media to be sampled
- Type and kind of analysis to be performed at the laboratory
- Procedures and precautions to be followed during sampling

FREQUENCY OF SAMPLES

Eight hour samples will be taken prior to the start of repairs. Samples will be taken continuously during all Waste Pit 5 material movements.

LOCATION AND NUMBER OF SAMPLES

Two samplers will be used downwind at the perimeter of the waste pit.

METHODS OF SAMPLING AND MEDIA TO BE SAMPLED

High volume air samples will be collected to measure airborne particulate radioactivity.

TYPE AND KIND OF ANALYSIS TO BE PERFORMED AT THE LABORATORY

Each sample will be tested for:

- Kinetic phosphorescence (total uranium)
- Gross beta and alpha
- Gamma spectroscopy

ATTACHMENT D (continued)

PROCEDURES AND PRECAUTIONS TO BE FOLLOWED DURING SAMPLING

- Samples will be collected on 8 x 10 inch glass-backed filter.
- Sample flow rate is to be set at about one cubic meter per minute.
- Care shall be used to avoid contaminating the filter while it is being handled.
- Record date and time of sample.
- With the air pump, off-load a new filter in the housing.
- Close the housing.
- Start the pump.
- Record time and differential pressure (dp). Convert dp to flow rate in cubic meters per minute.
- At completion of sampling, record time and flow rate.
- Stop pump.
- Unload filter holder and place in a clean plastic bag.
- Calculate and record total flow.
- Record air temperature, wind speed and direction.
- Complete and attach chain-of-custody record sheet.
- Transfer filter and chain-of-custody record sheet to safety chemistry lab for shipment to the WMCO analytical laboratory.

OPERABLE UNIT I - WASTE PIT 5 CHARACTERISTICS
TABLE I

Item No.	Description	Quantities and Units
1.	Area	161,103 ft ² (3.70 acres)
2.	Contents: Solids from neutralized raffinate, slag leach slurry, sump slurry, and lime sludge	98,840 yd ³
3.	Surface Water	750,000 gallons
4.	Geotechnical data: Dry density Specific gravity Moisture content	62.5 lb/ft ³ 2.43 59.8%
5.	Material consistency: This pit is still open with up to 3 feet of standing surface water over a portion of the pit. The upper 4 feet of the pit consists of watery material with some sand-sized grains. The remaining 25 feet consists of wet, semisolid material with very little cohesion.	
6.	Radioactive material concentrations: Radium-226 Uranium-235 Uranium-238 Thorium-230 Thorium-232 Technetium-99	235 to 999 pCi/g 14 to 79 pCi/g 387 to 1,230 pCi/g 3,080 to 20,200 pCi/g 21 to 90 pCi/g 423 to 2,990 pCi/g
7.	Radioactive material quantities Uranium-235 Uranium-238 Thorium-230 Total curies	420 kg 50,309 kg 17,000 kg 327 Ci
8.	Volatile inorganics Arsenic Mercury	139 to 2,800 mg/kg 1.9 to 6.2 mg/kg
9.	Organics PCBs (Aroclor 1254)	750 ppb
10.	HSL semivolatile	Note 1
11.	HSL inorganics Aluminum Calcium Iron Magnesium Arsenic Mercury Vanadium	6.373 to 15,400 mg/kg 116,000 to 206,144 mg/kg 10,979 to 17,900 mg/kg 807 to 63,200 mg/kg 139 to 2,800 mg/kg 0.4 to 1.8 mg/kg 792 to 5,380 mg/kg
12.	Hazardous materials/wastes	Note 2
13.	Listed hazardous materials	Note 3
14.	Grass and soils	Note 4

Weston, Inc., Roy F., 1987b, Characterization Investigation Study, Vol. 2: Chemical and Radiological Analysis of Waste Pits.

Note 1:

The concentration level for HSL semivolatiles analyzed was below quantification level.

Note 2:

All samples tested were within the established limits for corrosivity, reactivity, ignitability and EP toxicity.

Note 3:

The concentration level for all listed hazardous materials analyzed was below quantification level.

Note 4:

Representative samples of each container will be taken in order to make a waste disposal determination. Each sample will be tested for total U, total thorium and full TCLP.

WASTE PIT 5 LINER REPAIR SAMPLING AND ANALYSIS REQUIREMENTS

TABLE II

Hazard Monitored	Sampling Method	Analysis	Frequency	Location
Uranium	Filter Sampling ³	Counts on filter and activity	Continuous	Breathing zone Various ²
Arsenic, lead silver & magnesium fluoride	Filter Sampling ⁴	Atomic absorption analysis per NIOSH 7300 method	Continuous	Breathing zone Boundary ²
1,1,2,2-Tetrachlorethane	Photo ionization ⁵	HNu-101 photo ionization instrument calibrated with 100 ppm. isobutylene prior to use	Prior to movement, hourly, and upon completion	Boundary ²
External Radiation	TLD	Direct	Continuous	Personal
Internal Contamination	Urinalysis	Florescence	Annual	NA
External Contamination	NA	Direct scintillation	Exiting	Decon Zone
Total Particulates	Photometer	MIE-RAM-1	Continuous	Various as per evolution near work stations

1 = Direct reading dosimeter not required at the dose rates around the waste pit

2 = Refer to Attachment "B"

3 = 8" x 10" backed glass fiber Whatman EPM 1000 filter

4 = 0.8 micron mixed cellulose ester filter

5 = Portable IR (MIRAN 1B) or GC equipment may be used to augment the broad spectrum analysis

DAILY CHECKLIST FOR
PIT 5 LINER REPAIR PROJECT

ATTACHMENT E

The following is a daily checklist which is to be completed by the maintenance supervisor in charge of the Pit 5 liner repairs. This completed checklist is to be sent to the OUI manager who will add it to the project file.

- 1. Assigned personnel (name & badge/check when completed, add additional page). _____
- 2. Supervisor in charge. _____
- 3. Work zones established
 - Exclusion zone _____
 - Decontamination zone _____
 - Worker rest facilities available _____
- 4. Permits _____
 - RAD tech available _____
 - RAD permit current _____
 - Work permit current _____
 - Confined space entry permit current _____
- 5. Safety equipment
 - All monitors in operation _____
 - Respiratory protection _____
 - Life vests and safety harness and tie-off lines on hand _____
 - PPE on hand _____
 - Weather report current _____
 - Review of health and safety plan completed _____
- 6. Tools and liner repair components
 - All tools on hand _____
 - All repair components on hand _____
- 7. Record of liner repairs
 - Number _____
 - Size _____
 - Location of repair area in Pit 5 _____
 - Photograph of repair (if required) _____
- 8. Waste containers
 - Container for soil and grass on hand _____
 - Container for excess repair material on hand _____
 - Storage area for solvents, adhesive, rags, etc. _____
 - Container for used PPE _____

Date: _____

Supervisor: _____

MATERIALS, TOOLS & EQUIPMENT**1. Materials**

- a. GenFlex Membrane .045 or .060 (black or white)
- b. GenFlex Flashing - EPDM or Neoprene
- c. GenFlex Seam Tape 3" or 5-1/2" wide (mandatory with certain systems)
- d. GenFlex G-400 Seam Adhesive
- e. GenFlex Bar Anchor Cover Tape - 5" wide
- f. GenFlex Primer (mandatory with tapes)
- g. GenFlex Bonding Adhesive
- h. GenFlex Edge Caulk
- i. GenFlex Pipe Boots
- j. GenFlex Premolded Inside/Outside Corners
- k. GenFlex Walkway Pads
- l. Gravel stops, drains, pitch pans, etc.
- m. Ballasted systems only (3/4" - 1-1/2" washed, rounded river rock)
- n. GenFlex Waterstop
- o. GenFlex Pitch Pan Sealer
- p. Vapor Barrier (when required)
- q. GenFlex Fasteners and plates
- r. Termination bars and fasteners
- s. Anchor bars and fasteners
- t. Approved cleaners-premium unleaded gas, white gas, heptane, hexane and cotton cloth rags for cleaning splice areas.

TOOLS AND EQUIPMENT

- a. Material handling equipment for membrane, insulation board, ballast and other materials.
- b. Power sweeper, broom.
- c. 2" to 3" steel roller.
- d. Caulking gun.
- e. Hot air gun for forming flashing.
- f. Brushes - 3" to 4" wide.
- g. Hand tools (rake, shovel, hammer, shears, metal snips, spudder, etc.)
- h. Spray equipment for fully adhered systems.
- i. Chalk box, wax crayon and measuring tape for layout.
- j. Roller applicator for bonding adhesive - 9" plastic core with 1/2" nap.
- k. Stiff bristle broom with long handle (fully adhered system).
- l. 3" wide paint roller for application and GenFlex Primer.

LINER REPAIR INSTRUCTIONS ATTACHMENT F
(Per manufacturer's instruction manual)

The attached instructions were taken in part from the GenFlex (Gen Corp), Polymer Products foreman's manual. These instructions have been modified to pertain to use of the system with the manufacturer's .060 inch thick, type EPDM material. This is the same material that was installed for the Pit 5 liner in 1968. All applicable instructions in regard to general workmanship, cautions and storage, cold weather application, materials, tools, & equipment, lap splicing instructions (.060 inch thick material), and troubleshooting EPDM systems, are to be followed by all WMCO personnel making the repairs to the Pit 5 liner.

Additional considerations include the use of solvents (white gas, etc.) on rags only. No free pouring of solvents will be permitted. The rags used to clean and dry the liner are to be treated with the solvent using pans and/or cans with lids. This is to prevent any solvent from entering the waste pit. The rags containing solvent will be containerized and disposed of properly.

GENERAL WORKMANSHIP

Key points:

1. Seams are the critical point of the liner.
 - a. When using G-400 Splice Adhesive, ensure the seam areas are cleaned thoroughly with an approved cleaner (such as unleaded gas or white gas), changing rags frequently.
 - b. When using G-400 Splice Adhesive, apply adhesive properly and allow solvents to flash off! (Dry knuckle test).
 - c. When using G-400 Splice Adhesive, clean surface and apply edge caulk correctly using "High Profile" method. DO NOT SCREED.
 - d. When using seam tape, prime both halves with GenFlex Primer, allow solvents residue to flash off (make sure no streaming of free solvents occurs).
 - e. When using seam tape or bar anchor cover tape (BAT), clean areas at over-laps and T-joints and caulk 12" on all sides using "High Profile" method. DO NOT SCREED.
 - f. Roll the seam completely and LEAN on the roller.
2. Don't get caught in the rain!
 - a. Seams must be completed and caulked, as described above, before being exposed to water.
3. REMEMBER!
 - a. Components of any GenFlex EPDM system are to be products supplied by GenFlex Roofing Systems (or approved by GenFlex Roofing Systems) as

compatible and acceptable.

- b. The contractor is responsible for providing and determining that the substrate and liner is suitable to receive the GenFlex EPDM system.
- c. If possible, install repair system starting at the high point of the pit liner and work to the lowest point.
- d. Do not work on rainy days, or when the humidity is high and the temperature is falling. Moisture can condense on the adhesives under these conditions and ruin the seam.
- e. Splicing and bonding surfaces MUST be clean and dry.
- f. Liner surface must be free of ponded water, ice or snow prior to and during the repair process.
- g. Don't get ahead of yourself, don't uncover more area than can be repaired by day's end or before an expected change in the weather.
- h. Do not install GenFlex EPDM membrane directly onto low melting point asphalt (ASTM D-312, Type I or II).

CAUTIONS AND STORAGE

To ensure your GenFlex material is of the highest quality and that it is applied safely, follow these easy tips:

Storage

1. Store all adhesives, primers, and sealants between 60°F and 80°F. Don't expose to lower/higher temperatures 24 hours prior to their application. Note: Application temperatures of these products are different, contact GenFlex Technical Department for these temperatures.
2. Store all uncured flashing materials at temperatures below 75°F. This will reduce flexibility.
3. Mechanically mix all stored adhesives and primers before using. Don't thin or cut with other solvents, stored adhesives and primers during mixing.
4. Don't store in direct sunlight or expose to weather conditions.

Cautions

1. Apply adhesives, primers, sealants and approved cleaners only as directed and always use rubber gloves. Read and follow all precautions and warnings on the material labels and MSDS sheets. Don't apply in confined areas; avoid breathing vapors and direct contact with the skin.
2. Adhesives, primers, sealants and approved cleaners are extremely flammable. Don't apply when smoking or near open flames or sparks.

3. Follow site procedures for compliance with EPA codes when disposing of unused adhesives, primer, sealants and all approved cleaners. Don't pour unused adhesives, primer, sealants, and approved cleaners in drains, downspouts, and rain runoff ditches.

PERIMETER ATTACHMENT AND LAYOUT

1. Unroll several rolls of GenFlex membrane at the start of each workday. Avoid stretching membrane, position membrane for installation and allow to relax for 30 minutes minimum.
2. Layout sheets per shop drawings (if available) or in a manner to minimize the number of seams required. Do not run field seams into other penetrations. Allow for the minimum lap width per specification requirements at each seam.

COLD WEATHER APPLICATION

GenFlex Roofing Systems may be installed in cold temperatures provided all primers, tapes, adhesives and sealants are returned to a working temperature between 60°F and 80°F. Only expose as much of these materials to cold temperatures that can be used in four hours.

1. Allow extra time for membrane to relax after it has been unrolled. The colder it is, the longer you should wait.
2. Keep all components warm (except membrane). An easy way to keep adhesives, primer and sealants warm consists of a foam plastic ice chest with a light bulb for a heat source. Use a protected bulb socket (lead light) to prevent breakage.
3. Do not allow moisture to condense on the adhesives. This will happen on foggy days and towards the end of the day. Restrict seaming and bonding to low humidity conditions.

MATERIALS, TOOLS & EQUIPMENT

1. Materials

- a. GenFlex Membrane .045 or .060 (black or white)
- b. GenFlex Flashing - EPDM or Neoprene
- c. GenFlex Seam Tape 3" or 5-1/2" wide (mandatory with certain systems)
- d. GenFlex G-400 Seam Adhesive
- e. GenFlex Bar Anchor Cover Tape - 5" wide
- f. GenFlex Primer (mandatory with tapes)
- g. GenFlex Bonding Adhesive
- h. GenFlex Edge Caulk
- i. GenFlex Pipe Boots
- j. GenFlex Premolded Inside/Outside Corners
- k. GenFlex Walkway Pads
- l. Gravel stops, drains, pitch pans, etc.
- m. Ballasted systems only (3/4" - 1-1/2" washed, rounded river rock)
- n. GenFlex Waterstop
- o. GenFlex Pitch Pan Sealer

- p. Vapor Barrier (when required)
- q. GenFlex Fasteners and plates
- r. Termination bars and fasteners
- s. Anchor bars and fasteners
- t. Approved cleaners-premium unleaded gas, white gas, heptane, hexane and cotton cloth rags for cleaning splice areas.

TOOLS AND EQUIPMENT

- a. Material handling equipment for membrane, insulation board, ballast and other materials.
- b. Power sweeper, broom.
- c. 2" to 3" steel roller.
- d. Caulking gun.
- e. Hot air gun for forming flashing.
- f. Brushes - 3" to 4" wide.
- g. Hand tools (rake, shovel, hammer, shears, metal snips, spudder, etc.)
- h. Spray equipment for fully adhered systems.
- i. Chalk box, wax crayon and measuring tape for layout.
- j. Roller applicator for bonding adhesive - 9" plastic core with 1/2" nap.
- k. Stiff bristle broom with long handle (fully adhered system).
- l. 3" wide paint roller for application and GenFlex Primer.

TROUBLESHOOTING

A. Patching the membrane.

- 1. Clean the area around where you have found the hole with an approved cleaner, such as unleaded gas, hexane, or heptane.
- 2. Cut a patch at least 3" larger on each side of the hole, from roll of uncured EPDM or Bar Anchor Cover Tape.
- 3. When using GenFlex Anchor Cover Tape, clean, apply primer to area around hole, and allow solvents to flash off. Lay patch directly over the hole and smooth in place. Roll patch with 2" roller. Apply a "high profile" bead of Edge Caulk to the edges of the patch. DO NOT SCREED.

B. Fishmouth repair

- 1. Use a steel roller and roll the area adjacent to the fishmouth. Get as much adhered as possible.
- 2. With a pair of scissors laid flat, cut this unadhered membrane away from the fishmouth.
- 3. Ensure the area is cleaned using an approved cleaner.
- 4. Patch as previously stated in Section XI-A.

C. Corners pulling away

- 1. Ensure you use fresh uncured EPDM or uncured neoprene.

2. Cut area of membrane that is pulling away and allow it to return to its normal relaxed position.
 3. Form new piece of uncured EPDM or uncured neoprene into place. Do not stretch excessively. When using G-400 Splice Adhesive and uncured EPDM or uncured neoprene, apply adhesive to both mating surfaces and allow to cure to a tacky state. Check for proper amount of adhesive as too much or too little can cause problems. Apply new piece of uncured EPDM or uncured neoprene and smooth in place. Roll with 2" roller and apply a "High Profile" bead of edge caulk to all edges. DO NOT SCREED. (Be careful not to cut uncured flashings when rolling.)
- D. To test for cured EPDM or neoprene:
1. Cut a piece of material 1" wide and 6" long.
 2. Warm strip to working temperature with a heat gun.
 3. Stretch material to 12" long.
 4. If it pulls back 6" to 8" in length, it is cured and should NOT be used.
 5. If it remains approximately 12" long, it is ACCEPTABLE for use.
- E. When trimming field anchor bars, round ends of cut bar, deburr and re-drill hole (1" from end of bar) and fasten to deck.