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K-65 SILOS INTERIM STABILIZATION - SAND FILL (K-65 SILO PROJECT OUTLINE LAYER INSTALLATION) (WORK PLAN FOR THE K-65 STORAGE SILOS INTERIM STABILIZATION PROJECT - INSTALLATION OF SAND LAYER)

03/10/89

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U-006-303.26

March 10, 1989
DOE-712-89

Mr. Basil G. Constantelos, Director
Waste Management Division
U. S. Environmental Protection Agency
Region V - 5H-12
230 S. Dearborn Street
Chicago, Illinois 60604

Dear Mr. Constantelos:

K-65 SILOS INTERIM STABILIZATION - SAND FILL

Reference: Letter, DOE-400-89, J. A. Reafsnyder to B. G. Constantelos, U.S. EPA, "K-65 Silos Near-Term Activities and Final Remediation Plan", dated January 10, 1989.

A detailed outline of the DOE's plan to address near-term activities and final remediation of the K-65 Silos and the adjacent silo area, was submitted to the U.S. EPA Region V in the above reference. This plan specified actions completed in response to the Federal Facilities Compliance Agreement (FFCA), all of which have either been satisfied or exceeded the FFCA requirements. The plan also included a justification/description of the K-65 Interim Stabilization Sand Fill Project, and outlined the advantages gained by installing the 4' layer of sand inside the silos.

Attachment I, "K-65 Silo Project Outline - Sand Layer Installation", is a description of the sand layer installation project. This outline provides information on: 1) the K-65 silos physical characteristics, 2) the various methods investigated to place the sand into the silos, 3) a description of the method chosen to place the sand into the silos, including drawings, and 4) the methods taken to assure radiation exposure to personnel working on and around the silos is reduced as much as possible.

Attachment II, "Work Plan for the K-65 Storage Silos Interim Stabilization Project - Installation of Sand Layer", details site preparation for the project, operation of the radon treatment system, equipment staging, sand installation operations, and radon monitoring before, during, and after sand fill operations.

The K-65 Interim Stabilization/Sand Fill Project will be completed after the K-65 Sampling Project of the RI/FS, which is scheduled

for completion in May 1989. The Interim Stabilization/Sand Fill Project will be completed in calendar year 1989.

In addition to the actions taken to date, DOE is committed to seeing the K-65 Interim Stabilization Project through to completion. This will be accomplished by completing the K-65 Interim Stabilization Sand Fill Project. An expeditious review and approval of the information attached by U.S. EPA will ensure that this project is completed in a timely manner.

If you have any questions, please contact Jack Craig of my staff at (513) 738-6159 or FTS 774-6159.

Sincerely,

James A. Reafsnyder
Site Manager

DP-84:Craig

Attachments: As stated

cc w/att.:
L. Jensen, USEPA-5
C. A. McCord, USEPA-5
L. C. Bogar, WMCO
R. C. Kispert, WMCO

cc w/o att.:
G. Mitchell, OEPA-Dayton

ATTACHMENT I

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K-65 SILO PROJECT OUTLINE
SAND LAYER INSTALLATION

GENERAL PROJECT DESCRIPTION

Interim stabilization of the K-65 Silos will be accomplished by applying a four-foot layer of sand over the top of the residue. A subcontract company who can provide the equipment, manpower, and materials to accomplish this task is being solicited.

Each storage silo has an inside diameter of 80 feet, the side wall is 26 feet in height and the domed roof arches to a maximum height 10 feet above the side wall. The circumference of the silos is surrounded by an earthen berm that extends eight feet horizontally from the top of the wall and then tapers at a slope of approximately 3:1 to the grade. Silo 1 is filled to within six feet of the top of the sidewall and Silo 2 is filled to within four feet of the top of the sidewall (see Drawing 34X-5500-X-00102).

Each silo dome has five manways that provide a 20 inch diameter opening. Four of the manways are equally spaced 25 feet from the center of the dome. The fifth manway is located about four feet from the center of the dome apex, underneath the 30 foot diameter dome cap. Prior to gaining access to the fifth manway a panel from the dome cap will have to be removed. To remove this panel the protective liner and a section of polyurethane foam must be removed. This manway and the other four equally-spaced manways are the only openings in the dome that can be used for placing the sand into the silos. Also, each silo dome has 20 closed sounding pipes (four additional sounding pipes are located underneath the dome cap) that are two inches in diameter. The sounding pipes are equally spaced throughout the dome surface and can be used to check the depth of the sand layer (see Drawing 34X-5500-X-00103).

Various methods of placing the sand into the silos at the required depth have been considered. Methods that require large volumes of air to propel the sand into the silos (pneumatic systems) and methods that would use water to slurry the sand into the silos were eliminated due to the environmental risks associated with each of these methods. Pneumatic spreading systems require large volumes of air which would be exhausted from the silos. The air discharges could carry radioactive particulates thus possibly necessitating the installation of a HEPA filter. Slurry systems utilizing water for the installation of the sand layer would require significant amounts of water to be added to the silos. The mechanical spreader/broadcaster type system is the preferred method for safely placing the sand over the surface of residues.

The preferred mechanical method includes conveying the specified fine (masonry) sand from the base of the earthen berm using a mechanical conveyor with a sand feed hopper. The mechanical conveyor will reach the designated manway using a cantilever design to minimize loading on the silo dome. The conveyor will unload the sand in the feed hopper to the mechanical spreader/broadcaster supported from the conveyor to again minimize loading on the silo dome. The spreader/broadcaster will distribute the sand to the desired area until the specified thickness of sand layer has been achieved. Measuring rods inserted in the sounding pipes will be used to check the depth of the sand layer to assure the layer is within specifications. A minimal amount of weight will be allowed on the silo surface. The majority of the weight from the conveyor and spreader/broadcaster will be supported on the earthen berm and the spreader/broadcaster will be supported by the conveyor. Drawing 34X-5500-X-00102 shows a typical layout of the equipment.

To reduce radiation exposure to personnel working on the silo domes and the concentration of radon being released from the silos during the interim stabilization project, the radon treatment system has been constructed. The radon treatment system is operated on a batch process. The system is used to filter radon and radon daughters from the air located in the silos which will reduce the radiation levels on the silo domes. The radon filters are located in the Radon Treatment Building. A 32 inch thick concrete wall was constructed around the building to shield radiation from the radon filters from effecting personnel working on the silo domes. As outlined in the Work Plan, the radon treatment system will be operated prior to starting the sand installation.

Four radon monitoring techniques will be used during the installation of the sand layer in each silo while the manway covers are removed. The four independent techniques are: 1) Working Level grab samples, 2) Radon Gas Monitors, 3) Radon Gas Analyzers, and 4) Working Level Monitors.

1) Grab samples will be collected next to the manways using portable, battery powered air pumps with small filters. These grab samples will be collected immediately after the manway covers are removed and during the sand installation. The grab samples will be used to determine if the proper respiratory protection against Working Level (WL) dose rates is being used for that area. The criteria for respiratory protection is outlined in Section 7.0 of Attachment II. If the measurement of radioactivity in the grab sample is 4 Curies or above, then the manway and sounding pipe covers will be reinstalled and secured and the Radon Treatment System will be operated before the silos will be allowed to be opened to the environment.

2) Four Radon Gas Monitors will be used to conduct continuous radon monitoring at the K-65 fenceline using alpha scintillation devices known as RGM-2. Every hour during the sand installation while the manways are open to the environment, the RGM-2 unit readings will be checked. If the RGM-2 unit readings exceed 1500 pCi/liter, then all manway covers will be reinstalled and secured and the Radon Treatment System will be operated before the silos will be allowed to be opened to the environment.

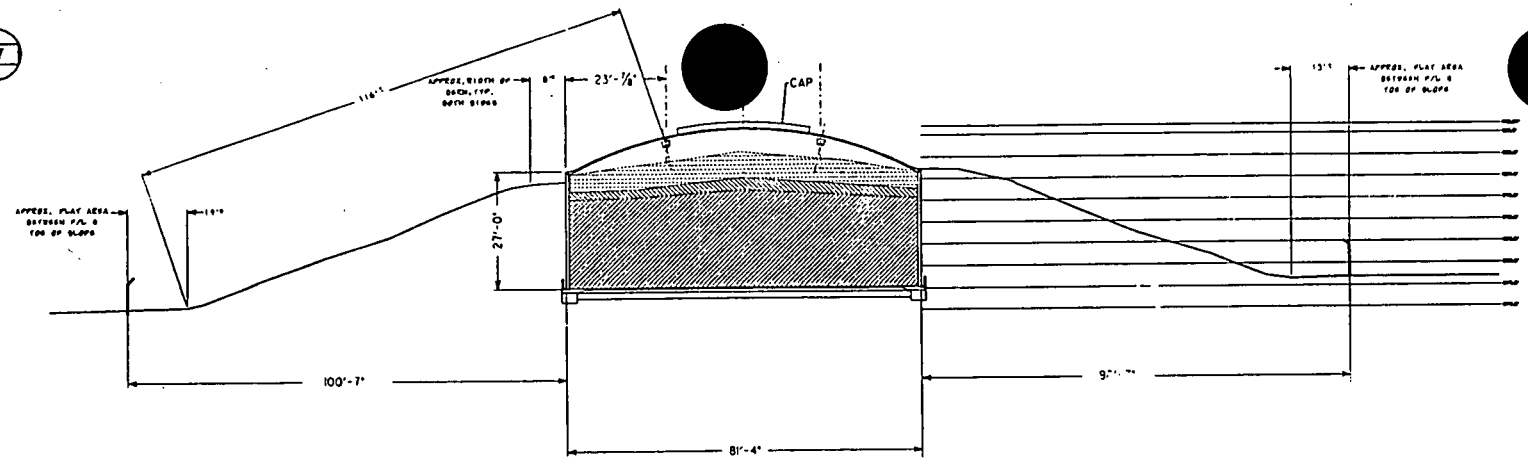
3) Two Radon Gas Analyzers will continuously monitor the area during the sand installation. One unit will be located at the top of the earthen berm and the other will be located at the base of the berm in the personnel Work Area. All unit locations will be maintained in the downwind direction.

4) Three Working Level Monitors will continuously monitor the area during the sand installation. One monitor will be located on the dome surface close to the open manway, the second monitor will be located at the top of the earthen berm, and the third monitor will be located at the base of the berm in the personnel Work Area. All monitor locations will be maintained in the downwind direction.

Radon will be sampled after the Radon Treatment System is operated and prior to opening the manways or sounding pipes each day to verify whether a correlation can be made between radiation dose rates on the surface of the domes and the radon concentrations inside the silos. A sample can be drawn from the silos using the tap installed on the northeast manway on each silo. The sample will be drawn into a sample bag and the sample bag will be transported to the OS&H Laboratory to be measured. If this correlation cannot be established, radon samples will be taken each day prior to opening the silos to the environment.

Radon is generated inside the silos at a rate of 0.24 Curies/hour. A total of five hours is needed from the time the silos are sampled until the concentration of radon contained in the sample can be analyzed. This time period is needed for the radon daughters to reach equilibrium with the radon gas and equilibrium must be reached before the sample can be analyzed. Presently, the concentration of radon in the head space of the silos has been estimated to be 3×10^7 pCi/l. The Radon Treatment System will be operated to remove greater than 90% of radon in the head space. This can be determined when the dose rate on the silo dome surface is below 100 mrem/hr. The concentration of radon inside the silo must be below 3×10^6 pCi/l before any manway or the sounding pipe covers will be removed. After the result of the sample is determined, the manway or sounding pipe cover will be opened within an hour so the concentration of radon inside the silo does not build-up to beyond the limit. Therefore, the manways and sounding pipes will have to be opened prior to six hours after the Radon Treatment System has been shutdown to avoid excessive radon build-up inside the silos. When the Radon Treatment System has not been operated for more than two days, the concentration of radon within the silo shall be determined prior to opening the manways or the sounding pipes.

Under no circumstances will the silos be opened to the environment when the radiation dose rates on the silo surface is above 100 mrem/hr or the expected release of radioactivity is more than 4 Curies or the radon concentration inside the silos is greater than 3×10^6 pCi/l.



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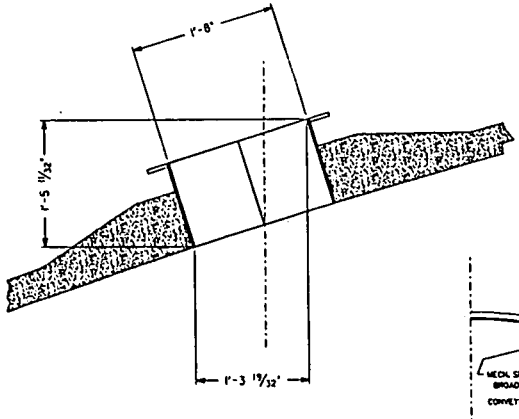

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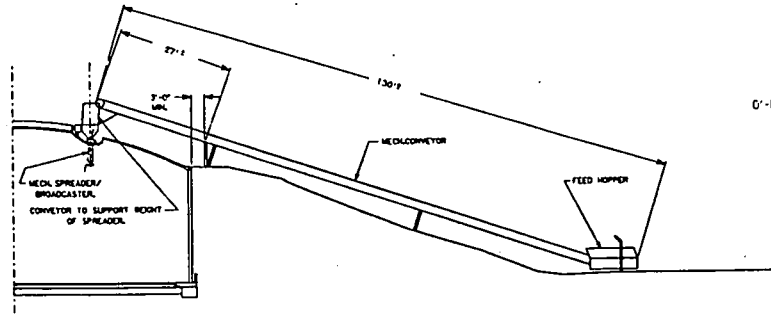
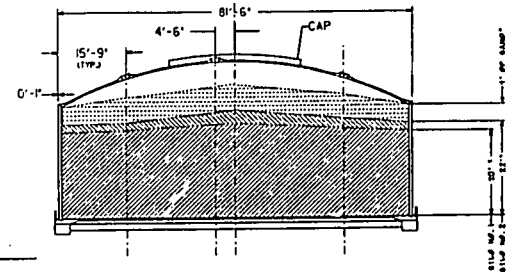


DETAIL 1

TYPICAL CONVEYOR PLACEMENT
(FOR REF. ONLY)

PRELIMINARY



SECTION
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NO.	REVISIONS	DATE	DWN. BY	APPD.
E	ADDED NOTES TO DET.1	9/98	JAS	
D	ADDED NOZ. OR TYP. DETAIL "B"	9/98	JAS	
C	ADDED DETAIL LCONV. PLACEMENT	9/98	JAS	
B	ADDED "SECTION "B-B "C"	9/98	JAS	
A	TWR	9/98	JAS	

34X-5500-E-00002 REF. DWG. NO.

NOTE: PUCO CAD DRAWING, NOT TO BE REVISED MANUALLY.

WESTINGHOUSE MATLS CO. OF OHIO
FERNALD, OHIO
FEED MATERIALS PRODUCTION CENTER
U.S. DEPARTMENT OF ENERGY

WEST END OF SITE — K-65 SILO
K-65 INTERIM STABILIZATION
CROSS SECTION
SCALE 1"=10'-0"

34X-5500-X-00102 | E

FILE NAME: 34X5500X00102.SDG

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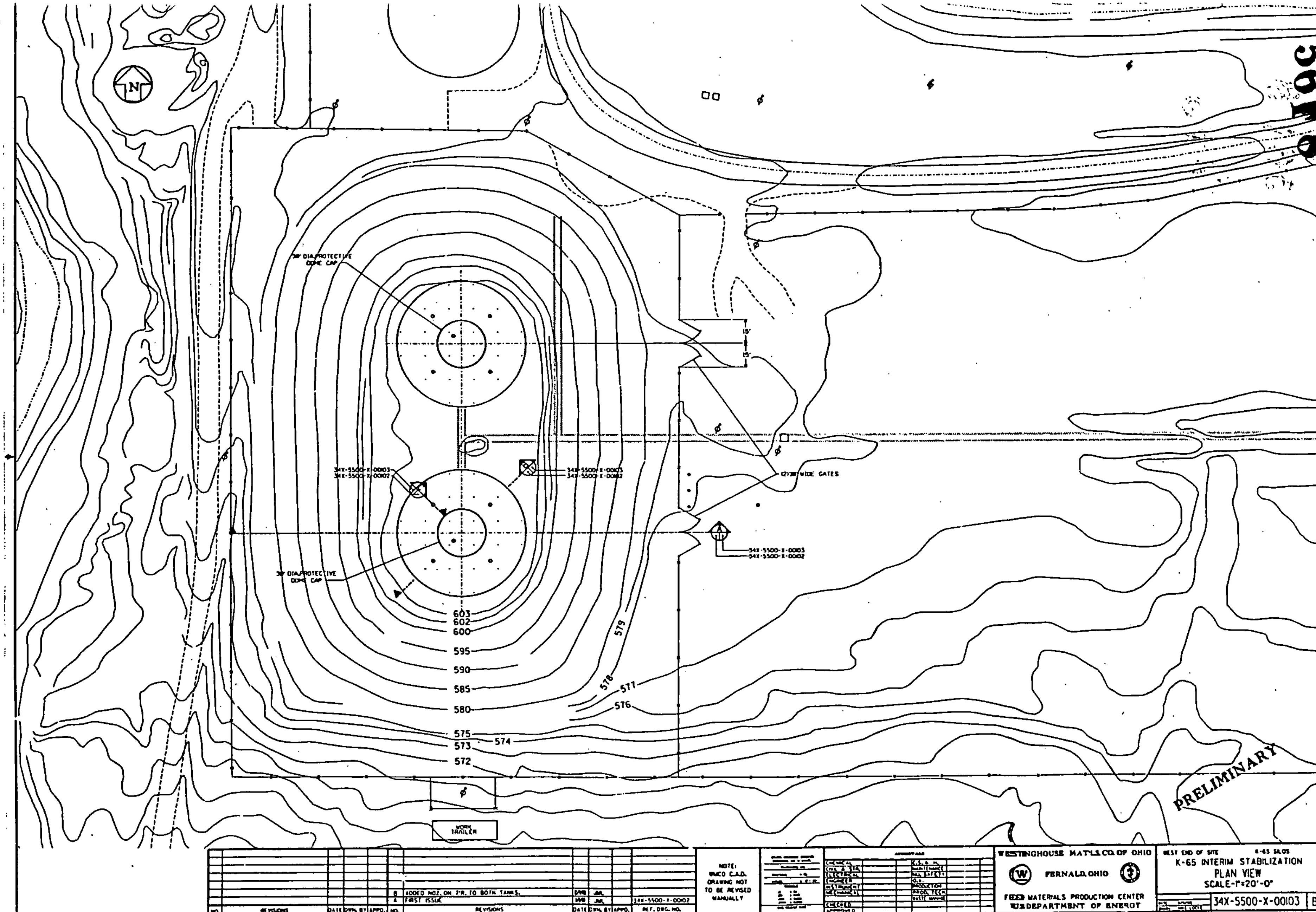
PRELIMINARY
30' DIA. PROTECTIVE DOME CAP
34X-5500-X-00103
34X-5500-X-00102
(2) 30' WIDE GATES
15'
603
602
600
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580
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WORK TRAILER
NOTE: WMCO C.A.D. DRAWING NOT TO BE REVISED MANUALLY
B ADDED NOZ. ON 7'R. TO BOTH TANKS.
A FIRST ISSUE
REVISIONS
WESTINGHOUSE MAT'LS. CO. OF OHIO
FERNALD, OHIO
FEED MATERIALS PRODUCTION CENTER
U.S. DEPARTMENT OF ENERGY
WEST END OF SITE K-65 SILOS
K-65 INTERIM STABILIZATION
PLAN VIEW
SCALE-1"=20'-0"
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ATTACHMENT II

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WORK PLAN

FOR THE

K-65 STORAGE SILOS INTERIM STABILIZATION PROJECT

INSTALLATION OF SAND LAYER

Prepared By:

P. A. SHANKS

February 16, 1989

APPROVALS

WREE: (R. C. Kispert) DATE: 2/16/89

SITE REMEDIATION: (L. C. Bogar) DATE: 2/21/89

OS&H: (H. D. Christiansen) DATE: 2/17/89

QUALITY ASSURANCE: (J. L. Trujillo) DATE: 2/16/89

WASTE OPERATIONS: (J. T. Grumski) DATE: 2/16/89

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FIGURES

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(continued)

FIGURES (continued)

TABLES

1.0 PROJECT OVERVIEW

Westinghouse Materials Company of Ohio (WMCO) operating under prime contract with the Department of Energy (DOE), has the responsibility of maintaining the K-65 Waste Storage Silos in the most environmentally safe containment mode possible until final remedial alternative is selected by the United States Environmental Protection Agency (USEPA) for implementation. As part of this responsibility, WMCO has developed the Interim Stabilization Project for the K-65 Silos in response to Item B of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section of the Federal Facilities Compliance Agreement between the DOE and USEPA.

The main focus of the Interim Stabilization Project for the K-65 Silos involves the construction and operation of a radon treatment system, the application of a weatherproof polyurethane foam layer on the exterior silo dome and dome cap surfaces, and the installation of a uniform four-foot layer of sand on top of the silo residues. To support the Interim Stabilization Project, a remote-controlled camera was installed inside the K-65 Silos to monitor and record the internal structural condition. The construction of the radon treatment system and the application of the exterior polyurethane foam layer was completed in December, 1987. The internal camera monitoring of the K-65 Silos was completed in June, 1988.

The purpose of the construction and operation of the radon treatment system was to temporarily reduce the concentration of radon contained within the K-65 Silos. Radon is a radioactive gas that is formed inside the silos from the radioactive decay of radium contain in the waste residues. The reduction of radon concentration within the silos serves the following two purposes: 1) the radiation levels on the silo domes will be reduced for a several day period which will consequently reduce the radiation exposure to personnel working on the dome surfaces; and 2) the release of radon during any operation of the Interim Stabilization Project that requires opening the silo manways will be minimized.

The purpose of the application of the weatherproof polyurethane foam layer on the exterior of the silo dome and dome cap surfaces was to provide weather protection, insulation, improvement to the structural integrity, and reduction of radon emissions for the K-65 Silos.

The remaining facet of the K-65 Silos Interim Stabilization Project that has not been completed is the installation of the uniform four-foot layer of sand on top of the silo residues. The purpose of installing the four-foot sand layer is to provide a protective barrier between the silo residues and the environment in case of a partial dome collapse, reduce radon emanations, reduce the gamma radiation emitting from the silos, and provide a protective barrier during future remedial work with the silos.

The following Work Plan consists of a functional plan that will be followed to operate the radon treatment system and to install the sand layer inside the K-65 Silos. The Work Plan also includes sections that describes the radiation surveys that will be taken, the radon monitoring that will take place, and the method by which worker radiation exposure will be measured during the course of the project. P. A. Shanks or a designated alternate is the Project Leader for the Interim Stabilization Project and is referred to as the K-65 Task Leader throughout this Work Plan.

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2.0 SITE PREPARATION PRIOR TO RADON TREATMENT SYSTEM OPERATION

Section 2.0 is intended as a checklist for items that must be completed prior to the operation of the radon treatment system. Any problems and/or concerns will be noted by the signee in the margin next to each item.

2.1 PRIOR TO RADON TREATMENT SYSTEM OPERATION

Prior to operating the radon treatment system, the following items must be completed prior to operating the radon treatment system:

2.1.1 Operations Safety and Health (OS&H) personnel will check the four (4) active Radon Gas Monitors that are located around the perimeter of the K-65 fenced-in area, Radon Gas Analyzers (RGA), and the Working Level Monitors (WLM) that will be used during the operation of the radon treatment system to see if the monitors are operating properly. These monitors will be calibrated and any calibration data should be provided to the K-65 Task Leader.

Radon Gas Monitors:

CALIBRATED BY: _____ DATE: _____

CHECKED BY: _____ DATE: _____

Radon Gas Analyzers:

CALIBRATED BY: _____ DATE: _____

CHECKED BY: _____ DATE: _____

Working Level Monitors:

CALIBRATED BY: _____ DATE: _____

CHECKED BY: _____ DATE: _____

2.1.2 Fire and Safety Inspector (6235) will check the Emergency Pull Box located next to the Radon Treatment Facility, Portable Eyewash and Safety Shower, and 2 X ABC Fire Extinguishers (at least 10 lbs.).

FIRE & SAFETY: _____ DATE: _____

2.1.3 Fire and Safety Inspector (6235) will check the two Emergency Phones (one located next to the Main Waste Storage Entry Gate, and the other located next to the Radon Treatment System).

FIRE & SAFETY: _____ DATE: _____

2.1.4 All personnel involved in operating the radon treatment system will have completed the following training courses. Personnel names, badge numbers, and dates for each training session will be recorded in the Project Log Book by the K-65 Task Leader.

1) Radiation Worker Training
2) Respirator Fit Training and Testing
3) Self Contained Breathing Apparatus (SCBA) Training
4) Criticality Training
5) Operation Procedures for the Radon Treatment System

2.1.5 D. J. Carr (6930), Security (6295), and Fire and Safety (6235) will be notified by the K-65 Task Leader of the perimeter road closure.

K-65 Task Leader: _____ DATE: _____

2.1.6 The RST will check to make sure that proper anticontamination clothing, protective gloves, full-face air purifying, and SCBA equipment are available at the construction site in quantities sufficient to operate the radon treatment system. RST will oversee the dressing, undressing, and disposal of the anticontamination clothing. The WMCO RST will check each person prior to entering the K-65 exclusion area to see if the Self-Reading Pencil Dosimeters (SRPD) and Thermo Luminescent Dosimeter (TLD) are being properly worn, if the anticontamination clothing is being properly worn, and if the correct respirator is being properly worn by each person. The requirements for entering the K-65 exclusion area are described in Section 3.2.

RST: _____ DATE: _____

3.0 RADON TREATMENT SYSTEM OPERATION

Section 3.0 is intended as a functional plan that covers the operation of the Radon Treatment System to lower the radiation levels on the dome surfaces of the K-65 Silos. Included in this plan are the radiation monitoring requirements that shall be performed before, during, and after operation of the Radon Treatment System. Items in Section 2.0 must be completed before proceeding with the operation of Radon Treatment System.

3.1 BASE LINE RADIATION SURVEYS

Either G. L. Gels (x6801) or C. D. Dodd (x6909) must be notified before moving or disconnecting any RGM-2 unit. Three Working Level Monitors (WLM) and two Radon Gas Analyzers (RGA) will be used during the operation of the Radon Treatment System. These units will be tested and calibrated by OS&H personnel at the OS&H Laboratory prior to using the units in the field. Radiation survey data will be written in the WMCO Radiation Safety Technician (RST) Log Book. The following base line radiation surveys must be performed prior to operation of the Radon Treatment System:

3.1.1 Measure and record general area radiation levels prior to starting the Radon Treatment System in locations marked 1 through 32 and 33, 34 if the panels are removed from the dome cap in Figure 3.1.1.

3.1.2 Ensure the four RGM-2, three WLM, and the two RGA-40 units are operating in the locations identified in Figure 3.1.1.

3.1.3 Perform Working Level grab samples in close proximity to and downwind of the Radon Treatment System.

3.2 OPERATION OF RADON TREATMENT SYSTEM

The operation of the Radon Treatment System will be conducted under the direct cognizance of the K-65 Task Leader. The Radon Treatment System will be operated initially for an approximate 2-4 hour period until the dose rates on the silo dome surface is below 75 mrem/hr prior to starting the sand installation. Additional operation of the Radon Treatment System after the initial 2-4 hour period will be determined by the K-65 Task Leader.

3.2.1 Prior to operation of the Radon Treatment System, ensure that the baseline radiation surveys have been completed as detailed in Section 3.1.

K-65 TASK LEADER:_____ DATE:_____

3.2.2 Prior to operation of the Radon Treatment System, ensure that the rope barriers are in place on the road leading to K-65 silos. The rope barriers shall be initially posted as radiation areas and airborne activity areas. The Radon Treatment System fence area shall be posted as a high radiation area and the key

controlled by Health Physics personnel. The entrance to the Radon Treatment System building shall be posted as an exclusion area and entry in the building is prohibited without RST approval. Traffic on the west side of the K-65 Silos will be restricted. The gates south of the silos will be locked and the road north of the silos will be blocked off with a rope barrier and posted as a radiation and airborne activity area. Additional rope barriers will be installed in areas where the radiation level is above 2 mrem/hr. Rope barriers are not to impede emergency response vehicles from being able to use roadways. Refer to Figure 3.2.2 for details.

3.2.3 Before entering the K-65 exclusion area, each person must be wearing the proper anticontamination clothing. Each person will be wearing disposable anticontamination suit and hood. The hands will be covered by rubber gloves with cloth liners that are approved by the RST. Work gloves will be placed over the rubber gloves when handling equipment and tools. Each worker will be wearing the proper safety boots. Each worker shall have the anticontamination suit properly taped at the wrist and ankle so no flesh is exposed. All openings or tears in the anticontamination clothing will be taped closed with duct tape and approved by the RST.

3.2.4 Each person entering the K-65 exclusion area must be wearing a TLD and SRPD badges properly. The RST will read the SRPD each time a person exits the exclusion area or every two hours to assure each individual is within the allowable whole body exposure limits. The allowable whole body exposure limits for personnel involved with the equipment staging will be 300 mrem/week, 2.4 rem/quarter, and 5 rem/year per person for the Subcontract personnel and and RUST personnel not working full time at the FMPC. The whole body exposure limits for RUST personnel working full time at the FMPC and WMCO personnel will be 150 mrem/week, 1 rem/quarter, and 5 rem/year for each person.

3.2.5 While the manway and sounding pipe covers are secured, each person will properly wear a full-face air purifying respirator when inside the exclusion area.

3.2.6 Personnel shall minimize congregating together in groups larger than three persons on the dome surface and the dome cap. No more than five people total are allow on the dome surface and dome cap at any one time. A minimal amount of workers should be on the dome surface and dome cap at all times.

3.2.7 Prior to operation of the Radon Treatment System FOR EACH SILO, all manways and sounding pipes must be covered and secured and all 28 valves as shown in Figure 3.2.7 must be closed. To operate the Radon

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Treatment System for K-65 Silo 1, open valve numbers 1, 2, 3, 4, 13, 14, 15, 16, 25, 27 and one of the following set of two valves either 17,18 or 19,20 or 21,22 or 23,24. To operate the Radon Treatment System for K-65 Silo 2, open valve numbers 5, 6, 7, 8, 9, 10, 11, 12, 15, 16, 25, 27 and one of the following set of two valves either 17,18 or 19,20 or 21,22 or 23,24.

3.2.8 After all the valves specified in step 3.2.3 are opened for the respective silo, turn on the blower unit isolated by valve numbers 25 and 27. Immediately check the manometer reading and verify that the pressure drop reading on the manometer is between 10 and 20 inches of water pressure. Log pressure reading in Table 3.2.8.

3.2.9 If the manometer reading is not between 10 and 20 inches of water pressure, immediately close the valve numbers 1, 2, 3, and 4 if treating Silo 1 and 5, 6, 7, and 8 if treating Silo 2 (see Figure 3.2.7). Personnel entering the K-65 exclusion area to close the above valves must be wearing SCBA equipment. Personnel outside the exclusion area up to 50 meters or 164 feet from the exclusion area must wear a full-face air purifying respirator. Once the valves are closed, immediately turn off the blower unit. RST should immediately take downwind Working Level grab samples to verify and/or measure whether any radon release had occurred. Once the valves are closed, personnel inside the exclusion area can wear a full-face air purifying respirator and do not need a respirator outside the exclusion area as long as the criteria for wearing respiratory protection is met outlined in step 3.2.10.

3.2.10 The following criteria for respiratory protection will be followed for Working Level (WL) grab sampling during the operation of the radon treatment system:

0 to 0.03 WL: No respirator is required

0.03 to 16.5 WL: full-face air purifying respirator

16.5 to 660 WL: full-face forced air respirator

greater than 660 WL: SCBA equipment

3.2.11 If no radon release is detected, reopen the valves specified in step 3.2.7 and turn on blower again. If pressure drop as measured on the manometer is between 10 and 20 inches of water pressure, allow the system to continue operating. Log pressure reading in Table 3.2.8. If the pressure drop is not between 10 and 20 inches of water drop, follow step 3.2.9 and await resolution from K-65 Task Leader.

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3.2.12 If the pressure drop is between the limits stated in step 3.2.8, allow the Radon Treatment System to operate for approximately 2-4 hours until the dose rate on the silo dome surface is less than 75 mrem/hr. After approximately 3 hours of operation on a single set of carbon units, another set of carbon units can be brought on line by opening the valves on a fresh set of carbon canister then closing the valves on the existing canisters. The pressure drop reading should be checked immediately after a change in carbon canister operation. Log pressure reading in Table 3.2.8. Any set of carbon canisters can be used by isolating the valve pairs numbered (17,18), (19,20), (21,22) and (23,24). Only two sets of carbon canisters should be utilized per K-65 Silo. Carbon canister usage will be controlled and checked by the K-65 Task Leader.

3.3 RADIATION SURVEYS DURING OPERATION

Radiation survey results will be logged in the RST Log Book. The following radiation surveys must be performed during operation of the Radon Treatment System:

3.3.1 Immediately after the Radon Treatment System is turned on, Working Level grab samples must be taken in close proximity to and downwind of the Radon Treatment System and locations on the edge of silo indicated in Figure 3.1.1 during operation. All Working Level grab samples will be repeated every hour.

3.3.2 Every hour during the Radon Treatment System operation, the RGM-2 unit readings should be checked. If the radon measurements from the Working Level grab samples or the RGM-2 units exceeds 4 Working Levels or 1500 pCi/liter respectively for 2 consecutive measurements, immediately close the valve numbers 1, 2, 3, and 4 if treating Silo 1 and 5, 6, 7, and 8 if treating Silo 2 (see Figure 3.2.7). Personnel entering the K-65 exclusion area to close the above valves must be wearing SCBA equipment. Personnel outside the exclusion area up to 50 meters or 164 feet from the exclusion area must wear a full-face air purifying respirator. Once the valves are closed, immediately turn off the blower unit. RST should immediately take downwind Working Level grab samples to verify and/or measure whether any radon release had occurred. Once the valves are closed, personnel inside the exclusion area can wear a full-face air purifying respirator and do not need a respirator outside the exclusion area as long as the criteria for wearing respiratory protection is met outlined in step 3.2.10. Monitoring should continue after system shutdown to verify that radon levels are decreasing outside the silos. Do not restart the system without approval from Health Physics Representative and Radiological Engineering Supervision.

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3.3.3 Every hour during the Radon Treatment System operation, gamma radiation measurements shall be taken by the RST and written in the RST Log Book at the locations 1 through 32 and 33,34 if panels are removed from the dome caps as shown in Figure 3.1.1. Note that locations 11, 12, and 13 will be monitored using the extended teletector probe from outside the Radon Treatment System fence. Location 32 will be measured with the extended teletector probe. Caution should be exercised during the measurement at location 32 due to the high potential radiation reading.

3.3.4 If the gamma radiation levels at locations marked 1, 2, 3, 4, 5, 16, and 17 on Figure 3.1.1 exceed 30 mrem/hr, immediately close the valve numbers 1, 2, 3, and 4 if treating Silo 1 and 5, 6, 7, and 8 if treating Silo 2 (see Figure 3.2.7). Personnel entering the K-65 exclusion area to close the above valves must be wearing SCBA equipment. Personnel outside the exclusion area up to 50 meters or 164 feet from the exclusion area must wear a full-face air purifying respirator. Once the valves are closed, immediately turn off the blower unit. RST should immediately take downwind Working Level grab samples to verify and/or measure whether radon release had occurred. Once the valves are closed, personnel inside the exclusion area can wear a full-face air purifying respirator and do not need a respirator outside the exclusion area as long as the criteria for wearing respiratory protection is met outlined in step 3.2.10. Monitoring should continue after system shutdown to verify that radon levels are decreasing outside the silos. Do not restart the system without approval from Health Physics Representative and Radiological Engineering Supervision.

3.3.5 If the radiation levels at locations 6, 7, 8, 9, 10, 14, and 15 exceed 100 mrem/hr for two consecutive readings or if radiation levels at locations 11, 12, and 13 exceed 40,000 mrem/hr, immediately close the valve numbers 1, 2, 3, and 4 if treating Silo 1 and 5, 6, 7, and 8 if treating Silo 2 (see Figure 3.2.7). Personnel entering the K-65 exclusion area to close the above valves must carry the teletector to measure the radiation levels in the area, must climb the earthen berm on the east side between the two silos or the south side near Silo 1 to stay away from the Radon Treatment Building, and must be wearing SCBA equipment. Personnel should avoid being near the Radon Treatment Building until the levels have decrease to 50 mrem/hr at locations 6, 7, 8, 9, 10, 14, and 15 and 10,000 mrem/hr at locations 11, 12, and 13 for two consecutive readings. Personnel outside the exclusion area upto 50 meters or 164 feet from the exclusion area must wear a full-face air purifying respirator. Once the valves are closed, immediately turn off the blower unit. RST should immediately take

downwind Working Level grab samples to verify and/or measure whether radon release had occurred. Once the valves are closed, personnel inside the exclusion area can wear a full-face air purifying respirator and do not need a respirator outside the exclusion area as long as the criteria for wearing respiratory protection is met outlined in step 3.2.10. Monitoring should continue after system shutdown to verify that radon levels are decreasing outside the silos. Do not restart the system without approval from Health Physics Representative and Radiological Engineering Supervision.

3.3.5 The Radon Treatment System can be shutdown after the radiation levels at locations 24, 25, 26, 27, and 33 (if the panel is removed from the dome cap) are below 75 mrem/hr when Silo 1 is being treated or after the radiation levels at locations 28, 29, 30, 31, and 34 (if the panel is removed from the dome cap) are below 75 mrem/hr when Silo 2 is being treated (see Figure 3.1.1).

3.4 RADIATION SURVEYS PRIOR TO K-65 AREA ENTRY

The following radiation surveys shall be performed after the Radon Treatment System is shutdown and prior to any personnel entering the K-65 area. Caution should be exercised during these measurements due to the high potential radiation readings. Radiation survey results will be logged in the RST Log Book.

3.4.1 The gamma radiation readings at locations 1, 2, 3, 4, 5, 16, and 17 as shown in Figure 3.1.1 must be measured.

3.4.2 The gamma radiation readings at locations 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, and 33 (if the panel is removed from the dome cap) must be measured if Silo 1 was treated or locations 18, 19, 20, 21, 22, 23, 28, 29, 30, 31, and 34 (if the panel is removed from the dome cap) must be measured if Silo 2 was treated.

3.4.3 After the gamma radiation levels have been recorded, close all valves on the radon treatment system.

3.5 ADDITIONAL RADON TREATMENT SYSTEM OPERATION

If the sand installation is delayed due to poor weather conditions and the radiation levels on the treated silo exceed 100 mrem/hr, additional radon treatment may be necessary. The steps in Sections 3.1 through 3.4 should be followed again to decrease the radon/gamma radiation levels on either K-65 Silo 1 or Silo 2.

3.6 RADON SAMPLING OF THE K-65 SILOS

Radon will be sampled after the Radon Treatment System is operated and prior to opening the manways or sounding pipes each day to verify whether a correlation can be made between radiation dose

rates on the surface of the domes and the radon concentrations inside the silos. A sample can be drawn from the silos using the tap installed on the northeast manway on each silo. The sample will be drawn into a sample bag and the sample bag will be transported to the OS&H Laboratory to be measured. If this correlation cannot be established, radon samples will be taken each day prior to opening the silos to the environment.

Radon is generated inside the silos at a rate of 0.24 Curies/hour. A total of five hours are needed between the time the silos are sampled and the concentration of radon contained in the sample is measured. Therefore, the manways and sounding pipes must be opened no longer than six hours after the Radon Treatment System has been shutdown to avoid excessive radon build-up inside the silos. When the Radon Treatment System has not been operated for more than two days, the concentration of radon within the silo shall be determined prior to opening the manways or the sounding pipes.

Under no circumstances will the silos be opened to the environment when the radiation dose rates on the silo surface is above 100 mrem/hr or the expected release of radioactivity is more than 4 Curies or the radon concentration inside the silos is greater than 3×10^6 pCi/l.

FIGURE 3.1.1
RADIATION SURVEY AND TYPICAL AIR MONITORING LOCATIONS

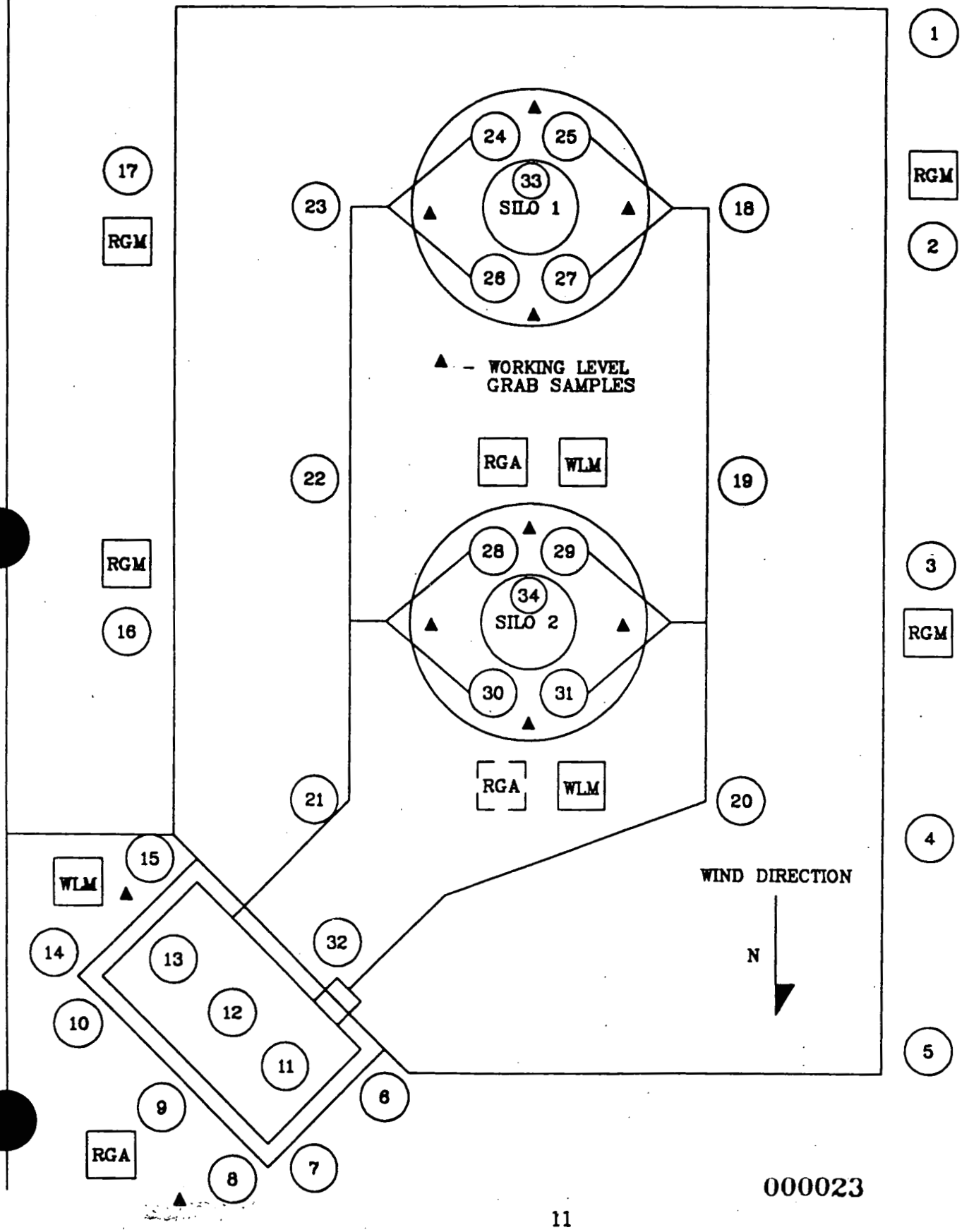

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FIGURE 3.2.2

RADIATION CONTROL AREAS

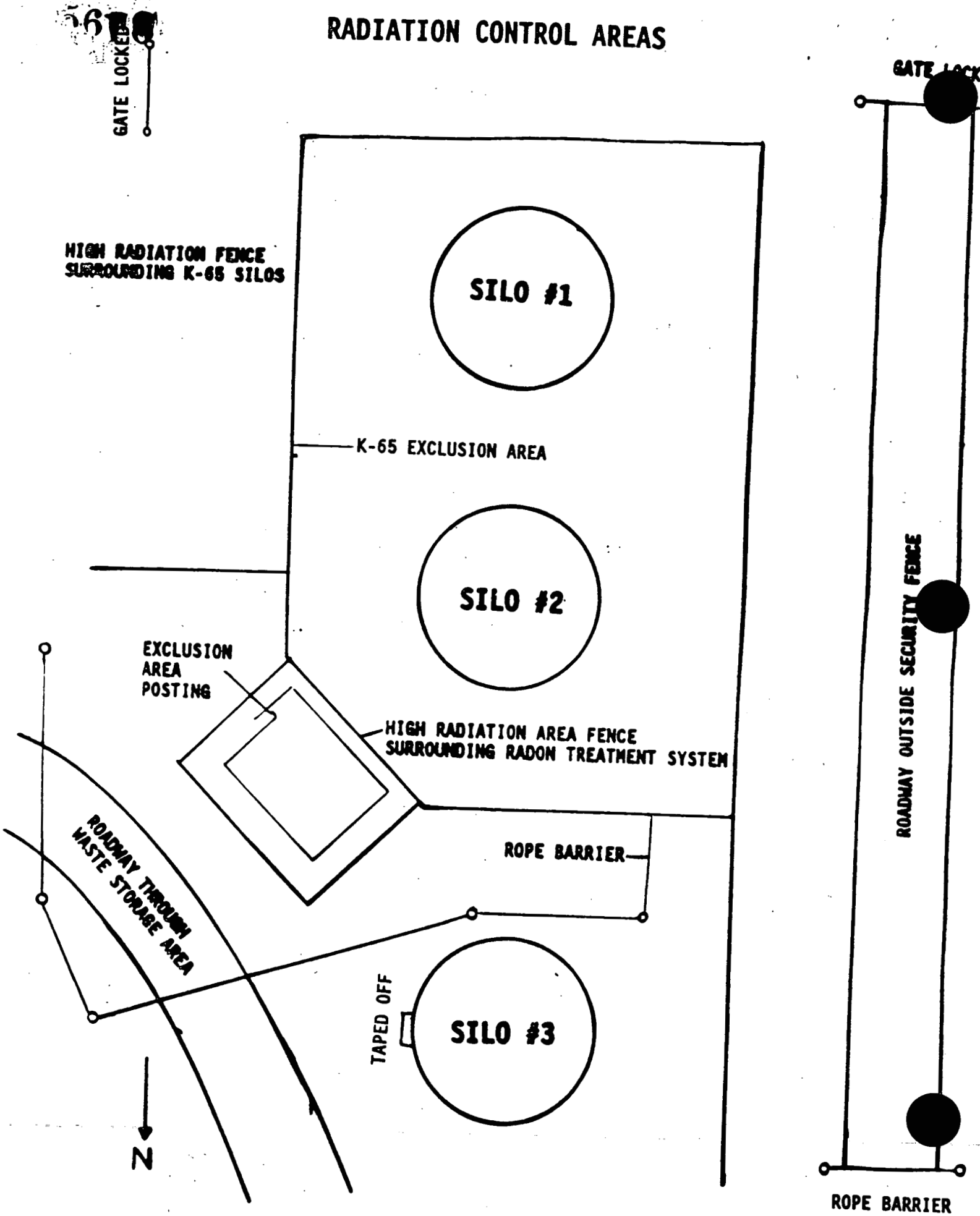

FIGURE 3.2.7

RADON TREATMENT SYSTEM VALVE LOCATIONS

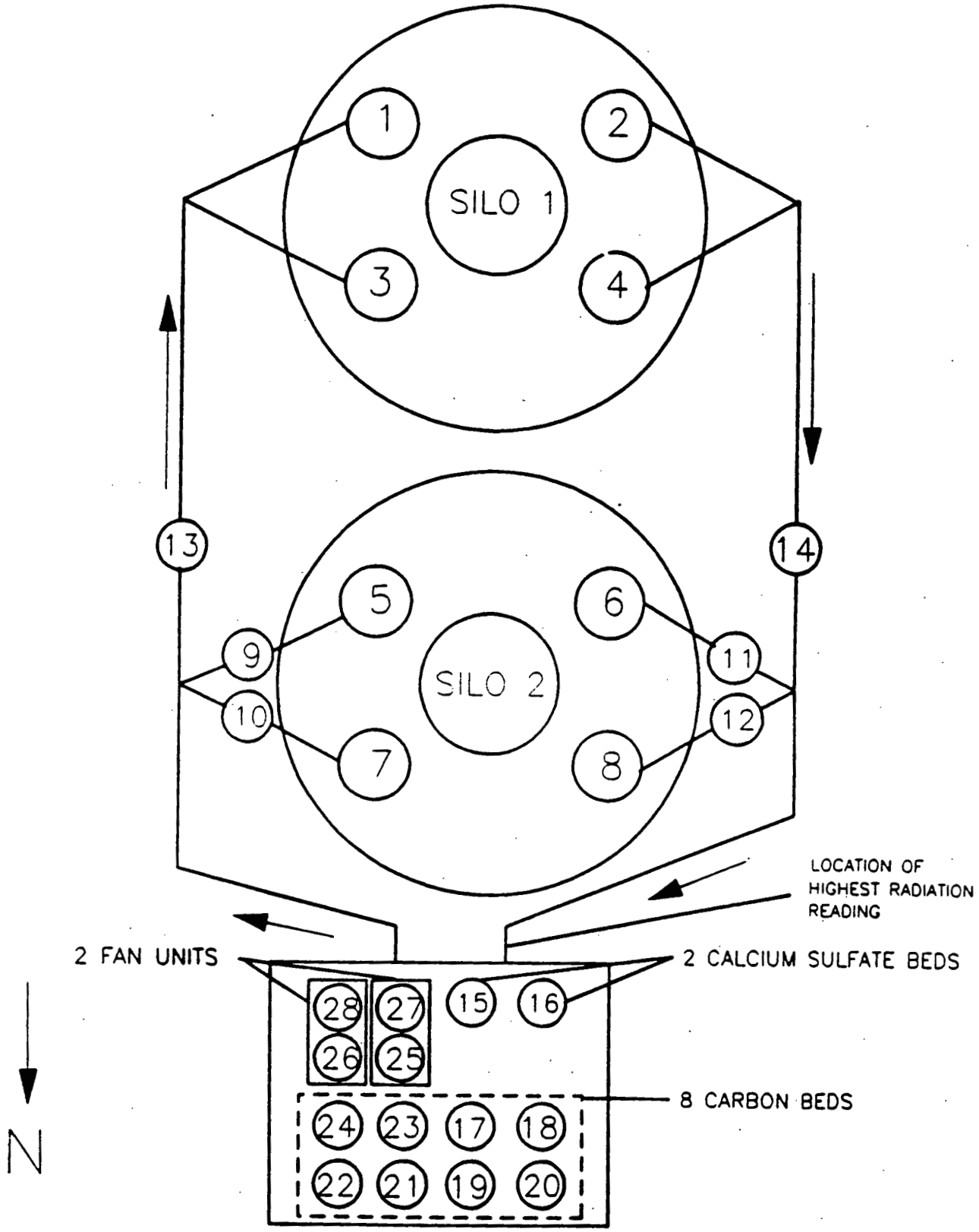

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TABLE 3.2.8

START-UP MANOMETER READINGS FOR THE OPERATION OF RADON TREATMENT SYSTEM AND INSTALLATION OF SAND LAYER

SILO #1:

DATE	TIME	PRESSURE DROP (INCHES)	COMMENTS

SILO #2:

DATE	TIME	PRESSURE DROP (INCHES)	COMMENTS

NOTE: Pressure readings on top of each silo has to be zero or indicate the silo is under a vacuum before work can begin on the sand installations. Make pressure readings at the radon treatment system during start-up and whenever a valve position is changed.

If the pressure readings at the radon treatment system is outside the limits of 10 to 20 inches of water once the system has stabilized, the blower is to be turned off and valves are to be closed.

4.0 SITE PREPARATION PRIOR TO STARTING THE SAND INSTALLATION

Section 4.0 is intended as a checklist for items that must be completed each work day prior to starting the sand installation inside the K-65 Silos. The appropriate person must sign the Checklist Signature Sheet (see Table 4.0) for each step in Section 4.0 at the beginning of each work day. The K-65 Task Leader is responsible for obtaining all signatures. All work performed inside the K-65 exclusion area during the site preparation must be done under the cognizance of an WMCO RST and the K-65 Task Leader. All Health and Safety requirements will be documented on the WMCO Radiation Work Permit (RWP). Environmental Safety and Health requirements will be specified on the Construction Environmental Safety and Health Work Survey (CESHWS).

4.1 PRIOR TO STARTING THE SAND INSTALLATION

4.1.1 Prior to starting the initial equipment staging, the Radon Treatment System must be operated (see Section 3.0) with sufficient cool down period, usually two hours, so the radon daughters that have plated out on the inside of the piping have decayed to safe levels approved by the RST.

4.1.2 Each day, prior to any workers entering onto the silo dome, the RST is to take radiation dose readings on the surface of the dome. See Figure 3.1.1 for Location Numbers 24-34. Each reading should be documented with the date, time, silo number, location, dose rate and RST signature. If the dose rates are above 100 mrem/hr, the Radon Treatment System must be operated (see Section 3.0) prior to starting the staging of equipment or sand installation.

4.1.3 Prior to starting the initial equipment staging, the bolts and nuts securing the covers on all sounding pipes not underneath the dome cap will have to be conditioned with penetrating oil. If the center manway is going to be used, the foam layer, protective liner, and panel must be removed by The Rust Engineering Company (RUST) prior to starting the initial equipment staging. Also, the bolts and nuts securing the center manway cover will have to be conditioned with penetrating oil at this time. A water shedding material with weighted anchors must be provided by RUST at the construction site to cover the unprotected section of the dome cap during nonworking hours.

4.1.4 Prior to starting the initial equipment staging, a list of Subcontract personnel and other personnel that will be involved in the sand installation must be provided to the K-65 Task Leader by RUST. Each day the K-65 Task Leader will check the list to assure that an adequate number of crew members are available during the sand installation. The list will include names, training courses completed by each person, and the date the training course was completed. Each person must have gone through a training program which

FIGURE 6.5.12

FLANGE ASSEMBLY WITH C-CLAMPS SECURED

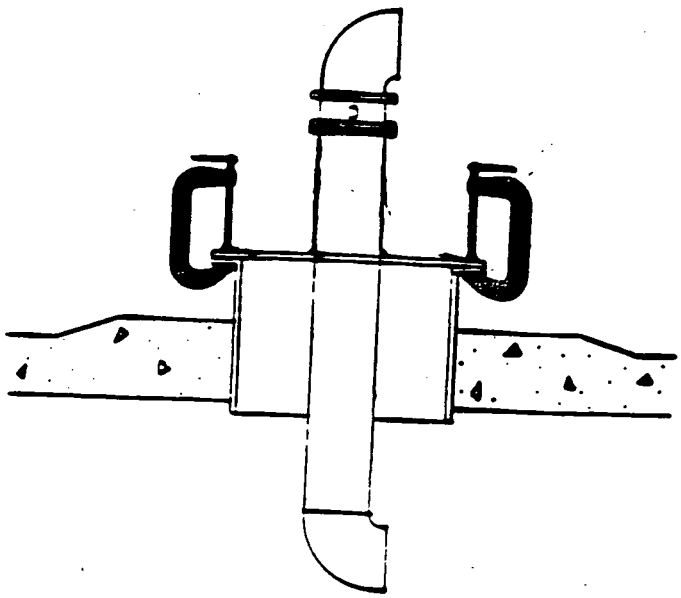


FIGURE 6.5.13
FLANGE ASSEMBLY INSTALLED

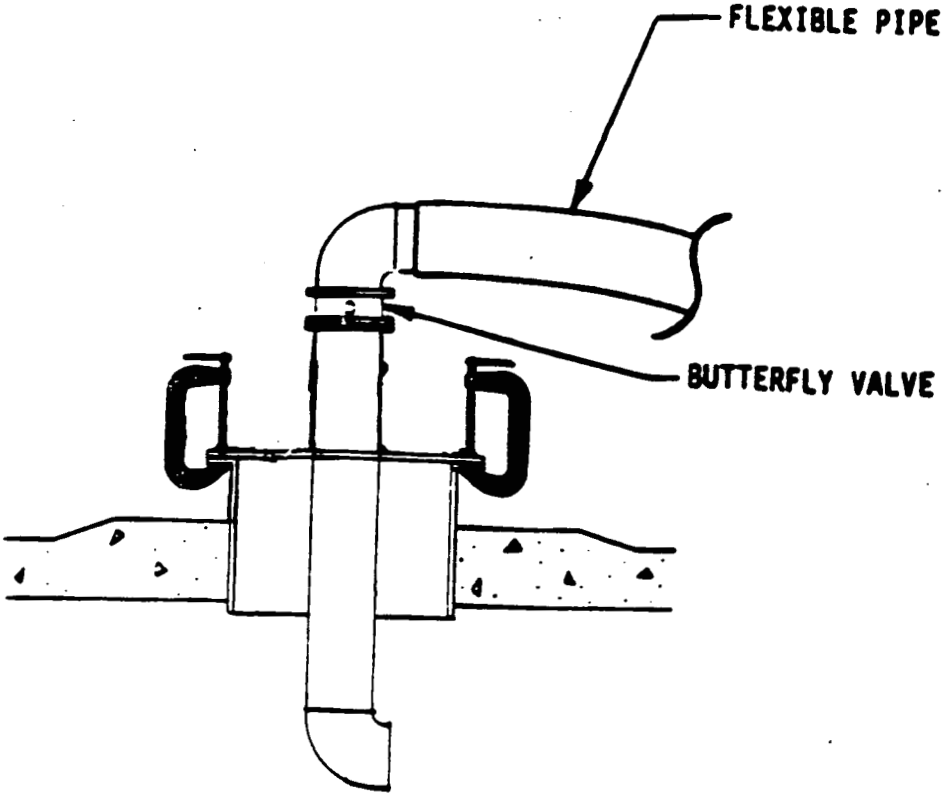
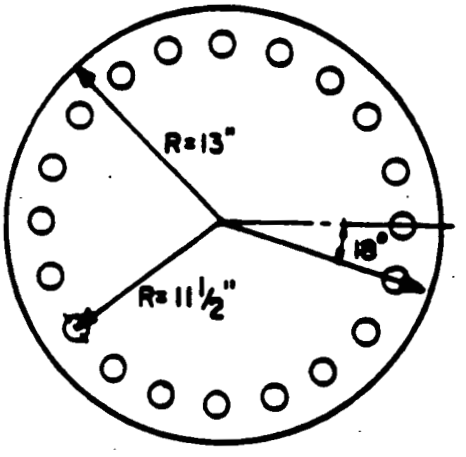
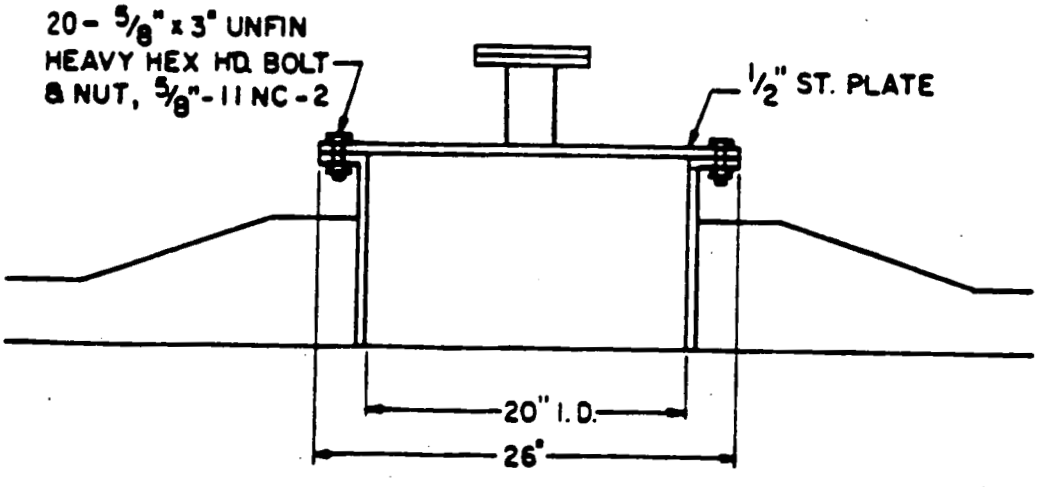


FIGURE 6.5.21

EXISTING CENTER MANWAY COVER



USE 20 BOLTS FOR MANWAY CLOSURE WITH RED RUBBER GASKET



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Three short-term interpretation monitoring techniques will be employed during the installation of the sand layer in each silo while the manway covers are removed. Each of the three techniques are discussed in Sections 7.1 - 7.4. The monitoring locations are shown in Figure 7.0.

7.1 WORKING LEVEL GRAB SAMPLING

Working Level grab samples will be collected using a portable, battery powered air pumps with a small filter located next to the open manways. Working Level grab samples will be collected immediately after the manway covers are removed and during the sand installation. The Working Level grab samples will be used to determine if the proper respiratory protection is being used for that area. The following criteria for respiratory protection will be followed for Working Level (WL) grab sampling during the sand installation:

0 to 0.03 WL: No respirator is required

0.03 to 16.5 WL: full-face air purifying respirator

16.5 to 660 WL: full-face forced air respirator

greater than 660 WL: SCBA equipment

When the dose rates on the dome surface are below 100 mrem/hr, the amount of radioactivity that should escape from the manways should be less than 4 Curies. If the radioactivity is higher than 4 Curies, all manway and sounding pipe covers must be reinstalled and secured following the procedures in Section 6.5 and the Radon Treatment System must be operated following the procedures in Section 3.0. The Working Level grab samples will be collected in the immediate vicinity of the opened manways, at the base of the berm downwind, and at the Work Area (see Figure 7.0) during the sand installation. All Working Level grab samples will be taken downwind at the designated spots. The Working Level grab samples will also be taken 24 hours prior to the sand installation begins, at defined intervals during sand installation, and at 2, 24, and 36 hours respectively after the sand installation has been completed and the manways have been covered and secured for a silo.

7.2 RADON GAS MONITORS (RGM-2)

Continuous radon gas monitoring is conducted at the K-65 fenceline using alpha scintillation devices known as RGM-2. The location of the RGMs are approximately east and west of each of the K-65 Silos' fenceline as shown in Figure 7.0. Every hour during the sand installation while the manways are open to the environment, the RGM-2 unit readings will be checked. If the RGM-2 unit readings exceed 1500 pCi/liter, then all manway covers will be reinstalled and secured following the procedure in Section 6.5. The Radon Treatment System will be operated following the procedures in Section 3.0 before the silos will be allowed to be opened to the environment.

7.3 RADON GAS ANALYZERS

Three Working Level Monitors (WLM) and two continuous radon gas analyzers (RGA-40) will be used during the sand installation for the K-65 Silos. The location of these units are shown in Figure 7.0. For the three WLM units, one will be placed on the silo dome, one will be placed on top of the earthen berm, and one will be placed at the Working Area during the sand installation. For the two RGA-40 units, one will be placed at the top of the earthen berm and one will be placed in the Work Area during sand installation. All units will be located downwind in their respective positions. The units will be moved if the wind direction changes to keep the units in the downwind position.

7.4 RADON SAMPLING FROM THE K-65 SILOS

Radon will be sampled after the Radon Treatment System is operated and prior to opening the manways or sounding pipes each day to verify whether a correlation can be made between radiation dose rates on the surface of the domes and the radon concentrations inside the silos. A sample can be drawn from the silos using the tap installed on the northeast manway on each silo. The sample will be drawn into a sample bag and the sample bag will be transported to the OS&H Laboratory to be measured. If this correlation cannot be established, radon samples will be taken each day prior to opening the silos to the environment.

Radon is generated inside the silos at a rate of 0.24 Curies/hour. A total of five hours are needed between the time the silos are sampled and the concentration of radon contained in the sample is measured. Therefore, the manways and sounding pipes must be opened no longer than six hours after the Radon Treatment System has been shutdown to avoid excessive radon build-up inside the silos. When the Radon Treatment System has not been operated for more than two days, the concentration of radon within the silo shall be determined prior to opening the manways or the sounding pipes.

Under no circumstances will the silos be opened to the environment when the radiation dose rates on the silo surface is above 100 mrem/hr or the expected release of radioactivity is more than 4 Curies or the radon concentration inside the silos is greater than 3×10^6 pCi/l.

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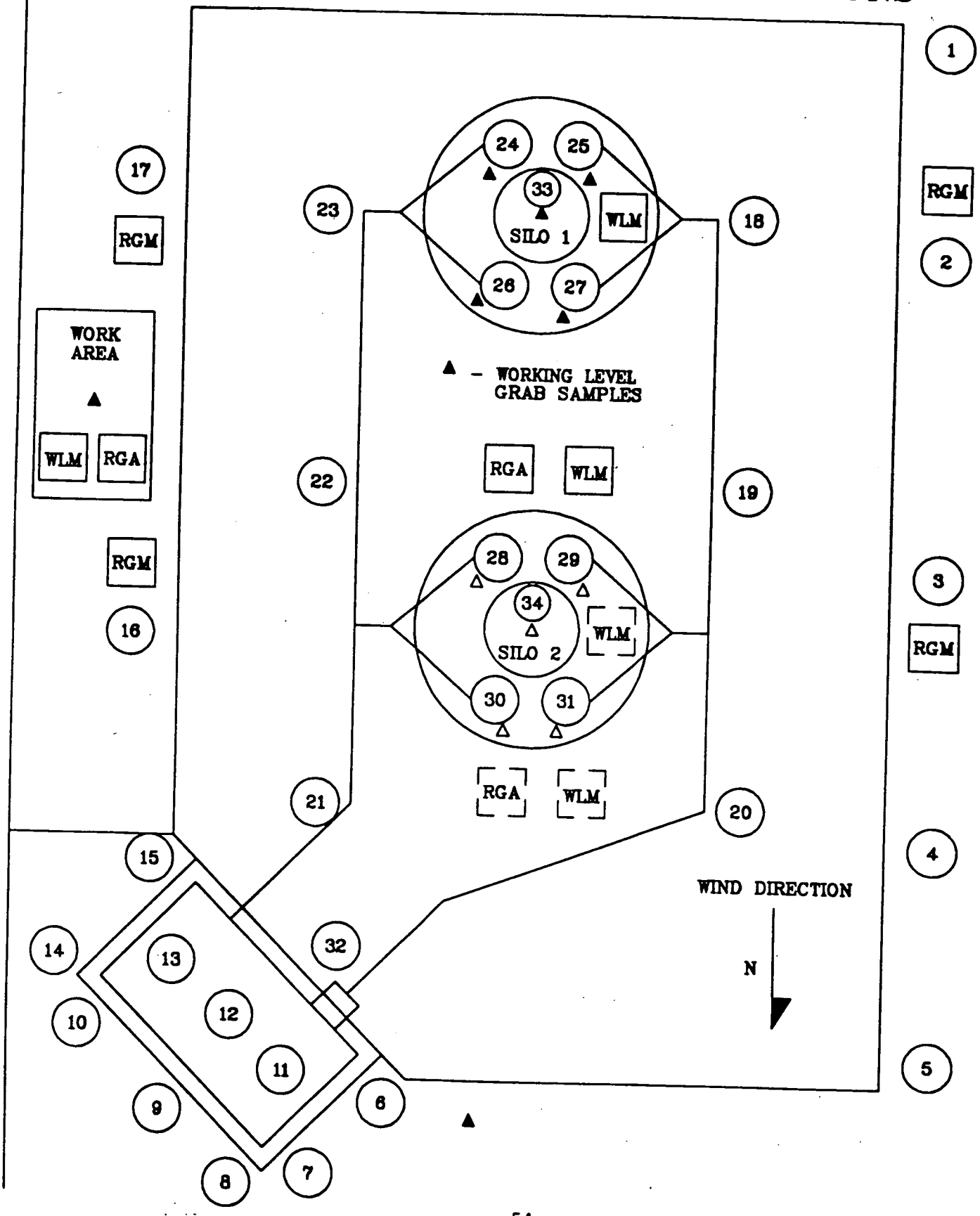
FIGURE 7.0
RADIATION SURVEY AND TYPICAL AIR MONITORING LOCATIONS



2.0 THE CONSTRUCTION SITE

The Subcontractor is responsible for cleaning up the construction site once the installation of the sand layer in the K-65 Silos is completed. RUST will be responsible for providing waste containers according to the approved CWID Form to dispose of all waste generated during the project. All construction rubble and general trash will be removed from the immediate work area at a minimum of one time per day. RUST will be responsible for the waste containers and will follow the WMCO Site Policy and Procedure FMPC-720 for the disposal of the construction waste.

Any alterations to the project site involving such efforts as construction of access roads, excavation, borings, ramps, and similar work will be subjected to prior WMCO approval and shall be returned to essentially its original state by the Subcontractor following the completion of the project.

All manway and sounding pipe covers shall be reinstalled and secured and the rubber hoses shall be reattached to the flange assembly by the Subcontractor and subjected to WMCO approvals at the end of the project. The center manway will be secured by 20 bolts and nuts and the flange assemblies will be secured by eight C-clamps equally spaced. If the center manway is used, RUST will be responsible for securing the removed panels to the dome cap and reinstalling the protective liner over the panels and sealing the seams on the protective liner which will be subjected to WMCO approvals. RUST will also be responsible for reinstalling the polyurethane foam layer using the same specifications used during the original installation.

8.1 SITE SAFETY

All work shall be performed in accordance with the safety and health requirements and programs of the U. S. Department of Labor (OSHA), U. S. Department of Energy (DOE), the National Fire Protection (NFPA), and WMCO.

includes orientation in safety including Criticality Training, environmental issues, health including a medical exam, radiation workers training, specific project orientation, and respirator including Self Contained Breathing Apparatus (SCBA) fit testing and training. Each person that will be involved in the sand installation must be trained in this Work Plan and Operating Procedures for the conveyor and spreader/broadcaster equipment.

4.1.5 Each work day, the RST must make sure that proper anticontamination clothing, protective gloves, full-face air purifying, and full-face forced air respirators and SCBA equipment are available at the construction site in quantities sufficient for the job. RUST is responsible for supplying the anticontamination clothing, protective gloves, full-face air purifying respirators, and safety gear for the project. WMCO will approve the clothing, respirator, and safety gear and oversee the dressing, undressing, and disposal of the anticontamination clothing. WMCO will supply full-face forced air respirators and SCBA equipment including the breathing air equipment.

4.1.6 Prior to the initial equipment staging and before each work day, the RUST Construction Manager is to make sure that the following items are located at the construction site and functioning properly:

1) Portable Eyewash and Safety Shower
2) Temporary Trailer and Toilet
3) K-65 Emergency Phone
4) Emergency Pull Box
5) 2 X ABC Fire Extinguishers (at least 10 lbs.)

4.1.7 Each work day, RUST must check the two-way communication systems to make sure the systems are operating properly.

4.1.8 Each work day, RUST is responsible for hooking up the internal camera system including the VCR and monitor. WMCO will provide the VCR and recording tapes. The K-65 Task Leader is to make sure that the internal camera system is functioning properly and that the storage location is known for camera spare parts.

4.1.9 Prior to starting the initial equipment staging, WMCO and RUST must approve all electrical connections and distribution systems.

4.1.10 Each work day, RUST must supply waste disposal containers according to the approved Construction Waste Identification and Disposition (CWID) Form for the anticontamination clothing and other waste generated during the sand installation.

4.1.11 Each work day, WMCO RST must check to make sure that the four RGM-2 units around the silos are operating properly and that all air samplers and radon analyzers including the WLM and RGA units that will be used by the RST during the sand installation are operating properly and are located in the proper locations (see Section 7.0).

4.1.12 Each work day, prior to removing any manway cover or flange assembly, RUST must have the breathing air equipment and air lines located in the proper place as directed by WMCO Health Physics Representative and functioning properly. The K-65 Task Leader will determine the wind speed and direction from Security (6295).

4.1.13 Each work day, RUST will check to assure an adequate amount of sand meeting the required specifications (see Section 6.0 for sand specifications) is available at the construction site and next to the conveyor so the installation of sand can process throughout the work day without delay.

4.1.14 The WMCO RST will check each person prior to entering the K-65 exclusion area during site preparation to see if the Self-Reading Pencil Dosimeters (SRPD) and Thermo Luminescent Dosimeter (TLD) are being properly worn, if the anticontamination clothing is being properly worn, and if the correct respirator is being properly worn by each person. The requirements for entering the exclusion area for each person during site preparation will be the same as the requirements set for each person during the staging of equipment (see Section 5.1).

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TABLE 4.0

CHECKLIST SIGNATURE SHEET

K-65 TASK LEADER _____ DATE _____ TIME _____

STEP		SIGNATURE
4.1.1	RST _____	
4.1.2	LOCATION	DOSE RATES
	24	_____
	25	_____
	26	_____
	27	_____
(if panel is removed)	33	_____
	28	_____
	29	_____
	30	_____
	31	_____
(if panel is removed)	34	_____
	RST _____	
4.1.3	K-65 TASK LEADER _____	
4.1.4	K-65 TASK LEADER _____	
4.1.5	RST _____	
4.1.6	_____ PORTABLE EYEWASH AND SAFETY SHOWER _____ TEMPORARY TRAILER AND TOILET _____ K-65 EMERGENCY PHONE _____ EMERGENCY PULL BOX _____ 2 X ABC FIRE EXTINGUISHERS (AT LEAST 10 LBS.)	
	RUST CONSTRUCTION MANAGER _____	
4.1.7	RUST CONSTRUCTION MANAGER _____	
4.1.8	K-65 TASK LEADER _____	
4.1.9	WMCO INSPECTOR _____	
	RUST INSPECTOR _____	
4.1.10	RST _____	
4.1.11	RST _____	
4.1.12	WIND DIRECTION _____ WIND SPEED _____	
	WMCO HEALTH PHYSICS REP. _____	
4.1.13	RUST CONSTRUCTION MANAGER _____	
4.1.14	RST _____	

Section 5.0 is intended as a functional plan that will be followed during the staging of the conveyor and spreader/broadcaster equipment. The plan includes requirements that must be met by all personnel during the staging of the equipment. All items listed in Section 4.0 must be completed with the Checklist Signature Sheet filled out before starting the equipment staging. All work performed inside the K-65 exclusion area during the equipment staging must be done under the cognizance of an RST and the K-65 Task Leader. All Health and Safety requirements will be documented on the WMCO Radiation Work Permit (RWP). Environmental Safety and Health requirements will be specified on the Construction Environmental Safety and Health Work Survey (CESHWS).

The procedures to stage and operate the conveyor and spreader/broadcaster equipment is not included in this Work Plan but will be included in the Operating Procedures provided by the Subcontractor who will be providing the equipment and installing the sand layer inside the silos.

5.1 PROTECTION REQUIREMENTS FOR PERSONNEL

Section 5.1 explains the requirements in protective clothing, radiation monitoring devices, and respiratory protection that will be met by each person entering the K-65 exclusion area during the staging of equipment. The WMCO RST will check each person prior to gaining access in the exclusion area to assure all the following requirements have been met.

5.1.1 Before entering the K-65 exclusion area, each person must be wearing the proper anticontamination clothing. Each person will be wearing disposable anticontamination suit and hood. The hands will be covered by rubber gloves with cloth liners that are approved by the RST. Work gloves will be placed over the rubber gloves when handling equipment and tools. Each worker will be wearing the proper safety boots. Each worker shall have the anticontamination suit properly taped at the wrist and ankle so no flesh is exposed. All openings or tears in the anticontamination clothing will be taped closed with duct tape and approved by the RST.

5.1.2 Each person entering the K-65 exclusion area must be wearing a TLD and SRPD badges properly. The RST will read the SRPD each time a person exits the exclusion area or every two hours to assure each individual is within the allowable whole body exposure limits. The allowable whole body exposure limits for personnel involved with the equipment staging will be 300 mrem/week, 2.4 rem/quarter, and 5 rem/year per person for the Subcontract personnel and and RUST personnel not working full time at the FMPC. The whole body exposure limits for RUST personnel working full time at the FMPC and WMCO personnel will be 150 mrem/week, 1 rem/quarter, and 5 rem/year for each person.

5.1.3 While the manway and sounding pipe covers are secured, each person will properly wear a full-face air purifying respirator when inside the exclusion area.

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5.1.4 When the manway and sounding pipe covers are ready to be removed, each person in the K-65 exclusion area must be wearing a full-face forced air respirator and will continue to wear this respirator until all manway covers are secured again.

5.1.5 When the manway and sounding pipe covers are ready to be removed, each person outside the K-65 exclusion area up to 50 meters or 164 feet from the exclusion area must wear a full-face air purifying respirator. Each person while in this area will continue to wear this respirator until all manway covers are secured again. Personnel beyond 50 meters from the K-65 exclusion area are not required to wear any respiratory protection.

5.1.6 If the breathing air equipment malfunctions while the manway and/or sounding pipe covers are removed, all personnel will immediately leave the K-65 exclusion area and replace the full-face forced air respirator with a full-face air purifying respirator up to 50 meters or 164 feet from the exclusion area. RUST and the K-65 Task Leader will inspect the breathing air equipment to see if the equipment can be repaired quickly. If not, Subcontract personnel must reinstall and secure the covers on the manway and sounding pipes using SCBA equipment following the procedures in Section 6.5.

5.1.7 The following criteria for respiratory protection will be followed for Working Level (WL) grab sampling during the sand installation:

0 to 0.03 WL: No respirator is required

0.03 to 16.5 WL: full-face air purifying respirator

16.5 to 660 WL: full-face forced air respirator

greater than 660 WL: SCBA equipment

5.2 K-65 SILOS DOME LOAD LIMITATIONS

Section 5.2 explains the load limitations for each silo dome surface and dome cap. Each person must be familiar with these limitations and must follow these limitations throughout the project.

5.2.1 All equipment and material supplies must be staged in such a way that no forces act on the berm within three feet of the silo walls. Staging of equipment and material supplies must be accomplished in such a way that no weight is placed on the 12 inch PVC piping for the radon treatment system (see Figure 5.2.1 for piping location).

5.2.2 The maximum amount of total distributed load that can ever be placed on the silo surface (excluding the dome cap) during the equipment staging cannot exceed 1000 pounds and all weight applied by the equipment will be distributed to 20 pounds/square foot. A total of 7000 pounds can be placed on the dome caps since this load is distributed to the outer edge of the dome cap and all weight applied by the equipment on the dome cap will be distributed in some fashion so a point load is not applied on the dome cap.

5.2.3 No vibrational forces will be permitted to act on the silo domes, dome caps, or walls without adequate dampening and cushioning. Written approval by WMCO is required on this matter.

5.2.4 Personnel shall minimize congregating together in groups larger than three persons on the dome surface and the dome cap. No more than five people total are allowed on the silo dome and dome cap surfaces at any one time. A minimal amount of workers should be on the dome surface and dome cap at all times.

5.3 MANWAY AND SOUNDING PIPE COVER REMOVALS

Section 5.3 is intended as a functional plan for the removal of the manway cover on each of the five manways per silo and the sounding pipe cover on each of the 20 sounding pipes per silo not underneath the dome cap. The locations of the sounding pipes and manways are shown in Figure 5.3. The manway and sounding pipe covers need to be removed after the conveyor is in place, the feed hopper to the conveyor is filled with sand that has already met the required specifications and both are ready to operate. Only the two manways that will be used for the sand installation and camera viewing will need to be uncovered. The removal of the manway and sounding pipe covers should begin only when the spreader/broadcaster is ready to be placed in the manway and sand installation is ready to immediately follow.

NOTE: Prior to the manway and sounding pipe covers being removed, all personnel must be in the proper respirator, anticontamination clothing, and TLD and SRPD badges as described in Section 5.1.

EQUIPMENT:
1) screw driver to remove the clamp around the flexible piping
2) containment bag for the C-clamps
3) containment bag to cover the bottom of the flange assembly
4) containment bag for center manway cover
5) containment bag for sounding pipe covers
6) duct tape
7) piece of foam to place the flange assembly once the flange assembly is removed
8) air powered wrench and adjustable wrench

5.3.1 The WMCO RST must have taken radiation dose rates on the surface of the dome at the five manways per silo prior to removing any manway or sounding pipe cover

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(see Section 4.1.2). If any dose rate is above 100 mrem/hr, no manway or sounding pipe cover will be allowed to be removed. The Radon Treatment System will have to be operated (see Section 3.0) before any manway or sounding pipe cover can be removed.

5.3.2 Prior to removing the manway and/or sounding pipe covers, a manometer will be attached to the silo by the K-65 Task Leader to check the pressure inside the silo. If the silo is pressurized, the removal of the manway and sounding pipe covers will not begin. The pressure inside the silo must be at equilibrium or in a vacuum prior to proceeding with the removal to the manway and sounding pipe covers. Log pressure readings in Table 3.2.8.

5.3.3 Prior to removing the manway and/or sounding pipe covers, the K-65 Task Leader and the WMCO RST must have the sample results of the radon sampling from the silos. The results will be written in the RST Log Book documenting the date, time, silo number, sample result, and RST signature. The radioactivity that can be release from the silo must be below 4 Curies. The result of the radon sample must be less than 3×10^6 pCi/l before the silo can be opened to the environment. If the above limits are not met, the Radon Treatment System must be operated (see Section 3.0) before the manway and/or the sounding pipe covers can be removed.

For the removal of the sounding pipe covers:

5.3.4 If the center manway is going to be used for the sand installation, remove the sounding pipe covers that are going to be used in Step 6.3.3. If the side manways are going to be use during the sand installation, remove the sounding pipe covers that are going to be used in Step 6.4.4.

5.3.5 Use the air powered wrench and adjustable wrench to remove all of the bolts and nuts from the specified sounding pipes. A typical bolt and nut is 5/8 inch X 3 inch unfin heavy hex bolt and nut, 5/8 inch 11 NC-2 (see Figure 5.3.5).

5.3.6 Remove the sounding pipe covers and place the covers inside a containment bag.

5.3.7 The WMCO RST will take Working Level air samples at the open manway to determine the amount of radioactivity that is being released from the silo. The air samples will determine if the proper respiratory protection is being worn by workers near the manways.

The radioactivity should be less than 4 Curies escaping from the silo after most of the radon has been removed as a result of operating the Radon Treatment System. If the radioactivity is greater than 4 Curies, the covers will be secured on the sounding pipes and the Radon Treatment System will be operated (see Section 3.0).

5.3.8 Move the sounding pipe covers and containment bag to the edge of the silo just off the dome.

For the removal of the flange assembly:

5.3.9 Verify that the valve is closed and locked out on the flange assembly prior to removing the flexible piping (see Figure 5.3.9).

5.3.10 Detach the flexible piping from the flange assembly by loosening the clamp surrounding the flexible piping (see Figure 5.3.10). Tape a piece of plastic over the end of the flexible piping and place the piping toward the edge of the silo so the piping will not be damaged during the sand installation.

5.3.11 Remove the C-clamps from the existing manway flange (see Figure 5.3.11) and place the clamps in a plastic bag. Place the bag at the edge of the silo so the clamps can be located easily.

5.3.12 Remove the old containment bag from the flange assembly and the manway (see Figure 5.3.12). Dispose the old containment bag in the proper waste container.

5.3.13 Have two worker lift the existing flange assembly off the manway flange. Set the removed flange assembly next to the manway on the piece of foam (see Figure 5.3.13).

5.3.14 The WMCO RST will take Working Level air samples to determine the amount of radioactivity that is being released from the silo. The air samples will determine the proper respiratory protection is being worn by workers near the manways.

The radioactivity should be less than 4 Curies escaping from the silo after most of the radon has been removed as a result of operating the Radon Treatment System. If the radioactivity is greater than 4 Curies, all sounding pipe and manway covers will be secured following the procedures in Section 6.5 and the Radon Treatment System will be operated (see Section 3.0).

5.3.15 Place a plastic containment bag over the bottom of the flange assembly over the manway flange and tape the containment bag to the PVC piping just below the butterfly valve (see Figure 5.3.15).

5.3.16 Move the flange assembly off the dome surface to the edge of the silo just off the silo dome.

For the removal of the center manway:

5.3.17 Use the air powered wrench and adjustable wrench to remove all of the bolts and nuts from the center manway flange (see Figure 5.3.17).

5.3.18 Remove the manway cover and place the cover inside a containment bag.

5.3.19 The WMCO RST will take Working Level air samples to determine the amount of radioactivity that is being released from the silo. The air samples will determine the proper respiratory protection is being worn by workers near the manways.

The radioactivity should be less than 4 Curies escaping from the silo after most of the radon has been removed as a result of operating the Radon Treatment System. If the radioactivity is greater than 4 Curies, all sounding pipe and manway covers will be secured following the procedures in Section 6.5 and the Radon Treatment System will be operated (see Section 3.0).

5.3.20 Move the manway cover and the containment bag to the edge of the silo just off the silo dome surface.

NOTE: Once the proper manway covers have been removed, the spreader/broadcaster and the remote controlled camera should be place in the two manways with minimal delay. Once the equipment is in place, the installation of the sand should immediately begin.

FIGURE 5.2.1

RADON TREATMENT PIPING LOCATION

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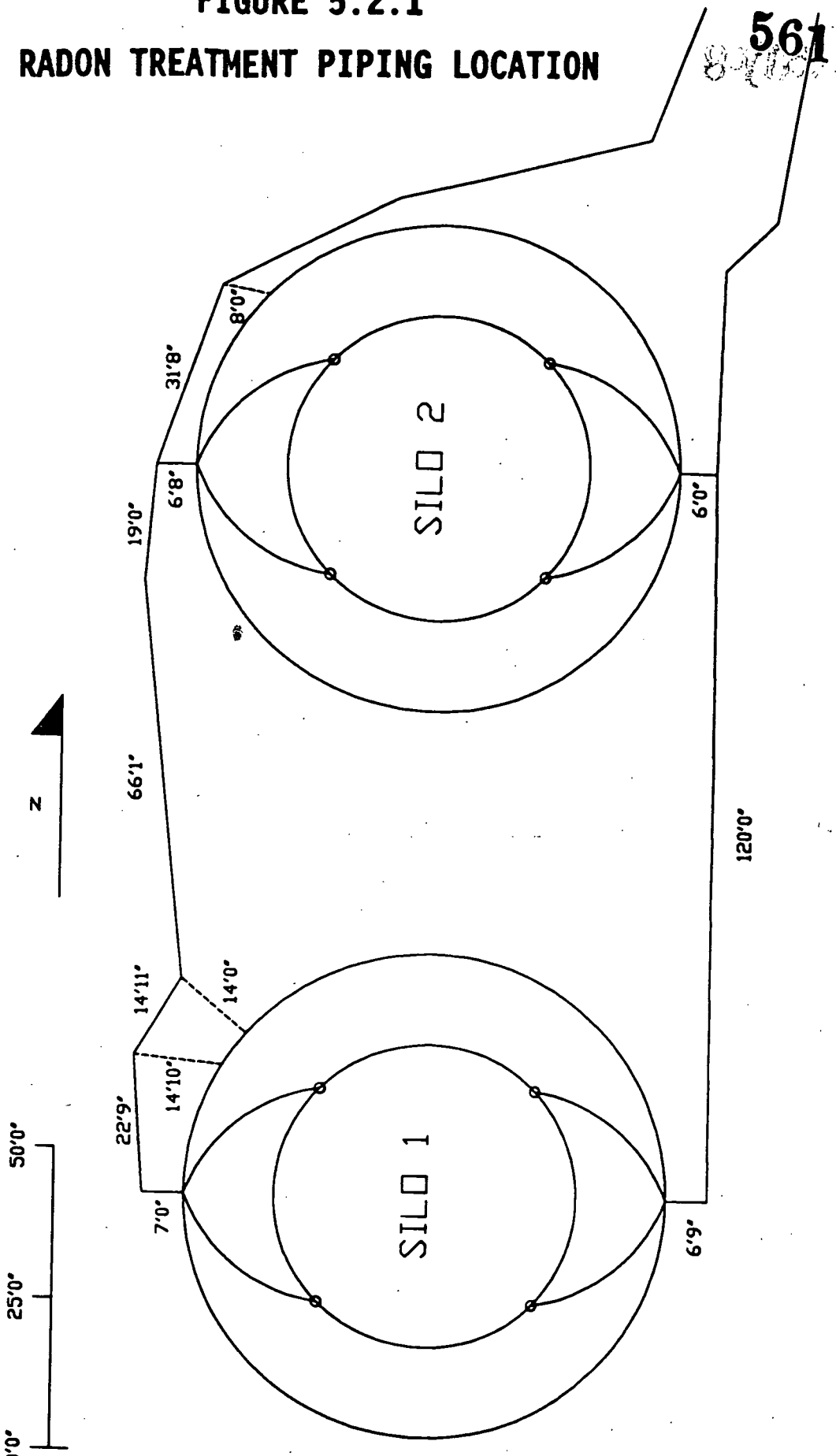

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FIGURE 5.3

SOUNDING PIPE AND MANWAY LOCATIONS

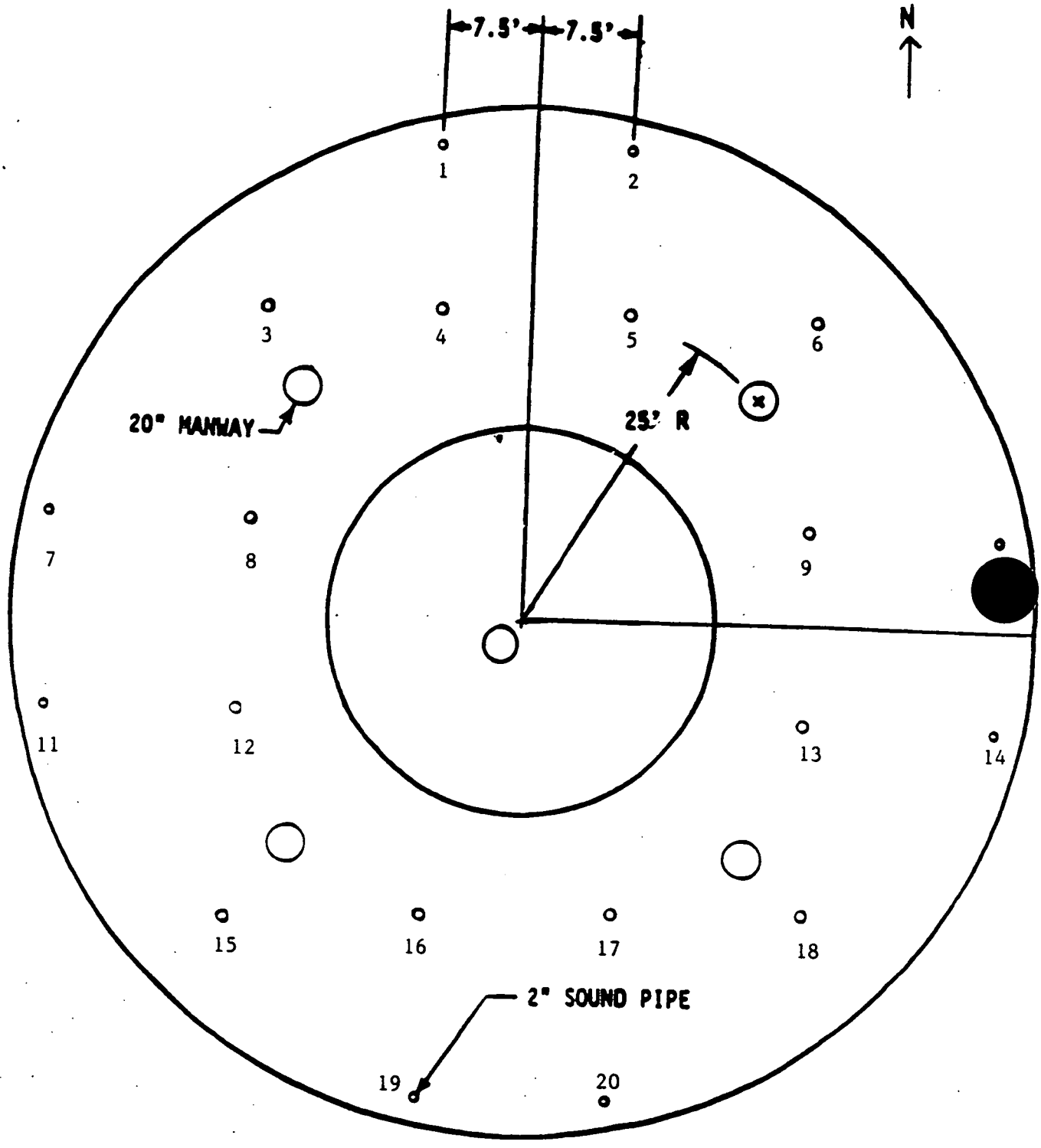

FIGURE 5.3.5

TYPICAL SOUNDING PIPE

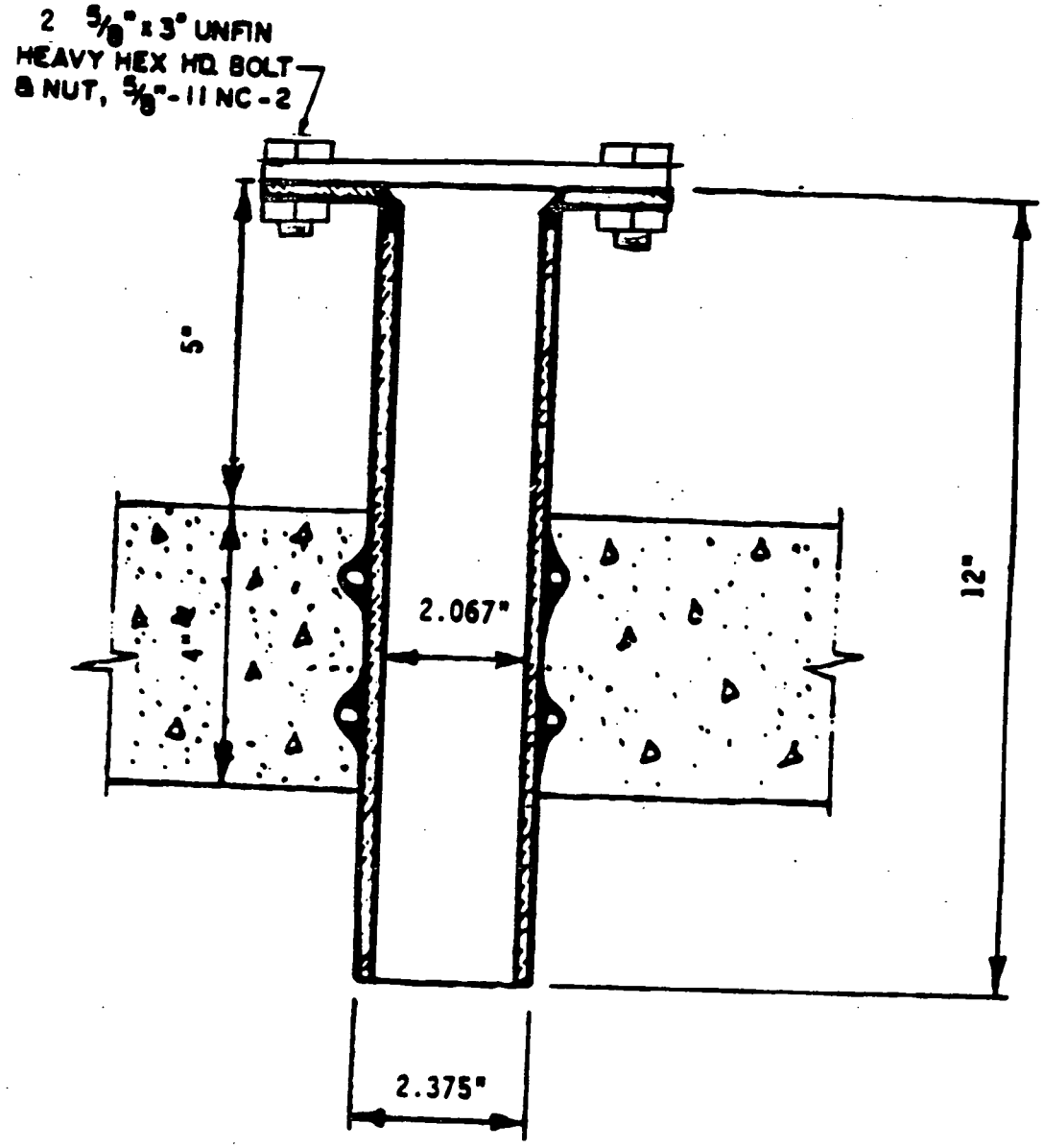

FIGURE 5.3.9

EXISTING FLANGE ASSEMBLY

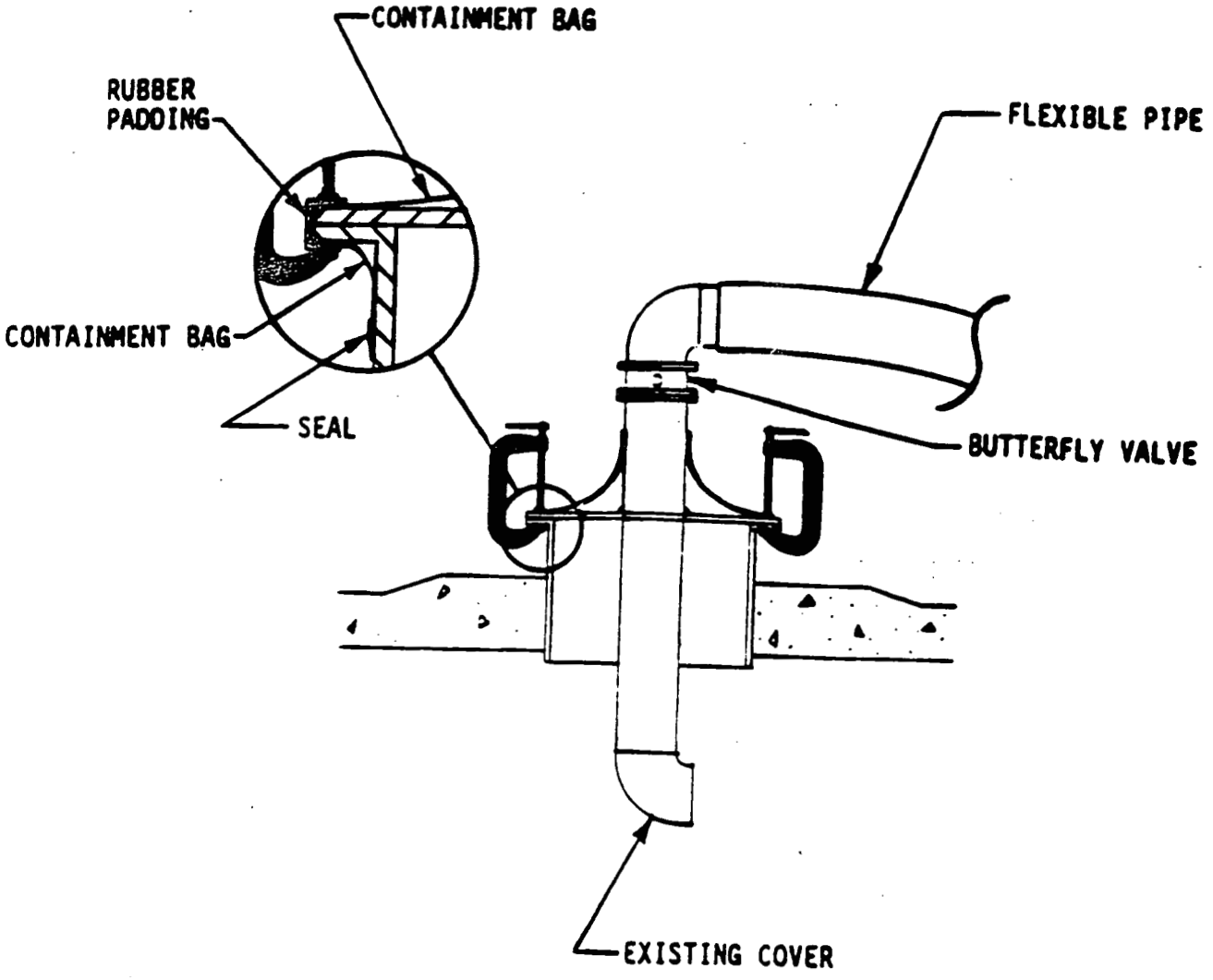

FIGURE 5.3.10

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FLANGE ASSEMBLY WITH FLEXIBLE PIPE REMOVED

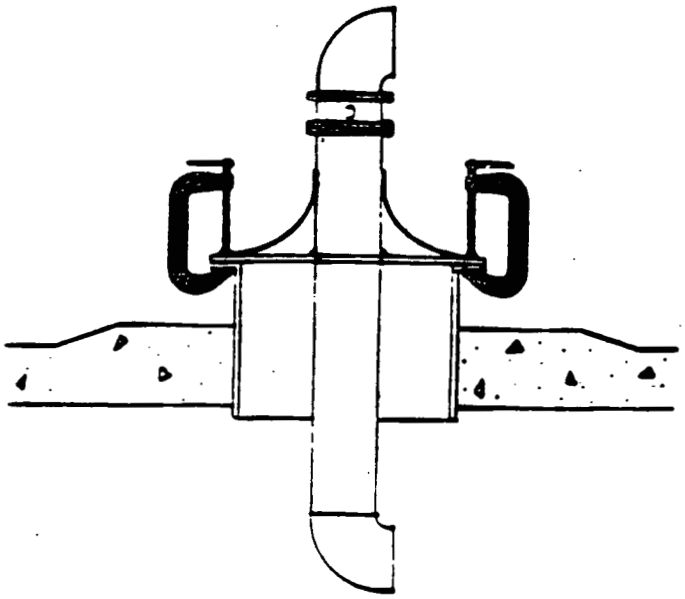

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FIGURE 5.3.11

FLANGE ASSEMBLY WITH C-CLAMPS REMOVED

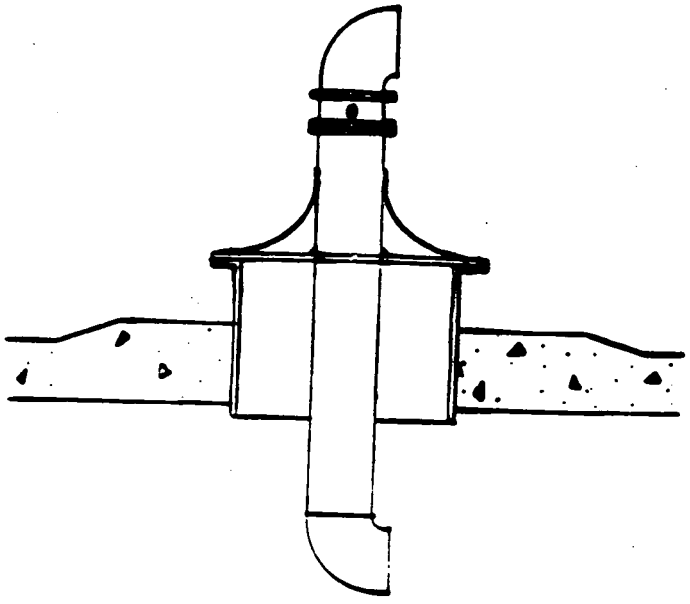

FIGURE 5.3.12

FLANGE ASSEMBLY WITH OLD CONTAINMENT BAG REMOVED

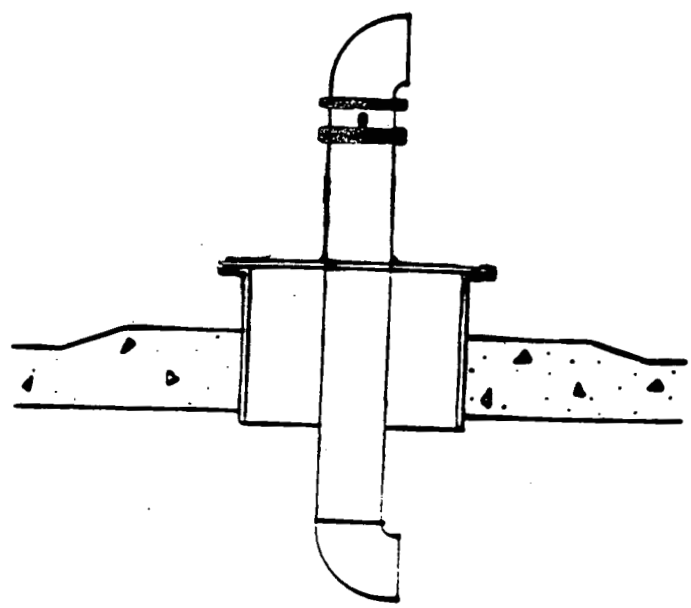

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FIGURE 5.3.13

FLANGE ASSEMBLY RESTING ON THE SILO DOME SURFACE

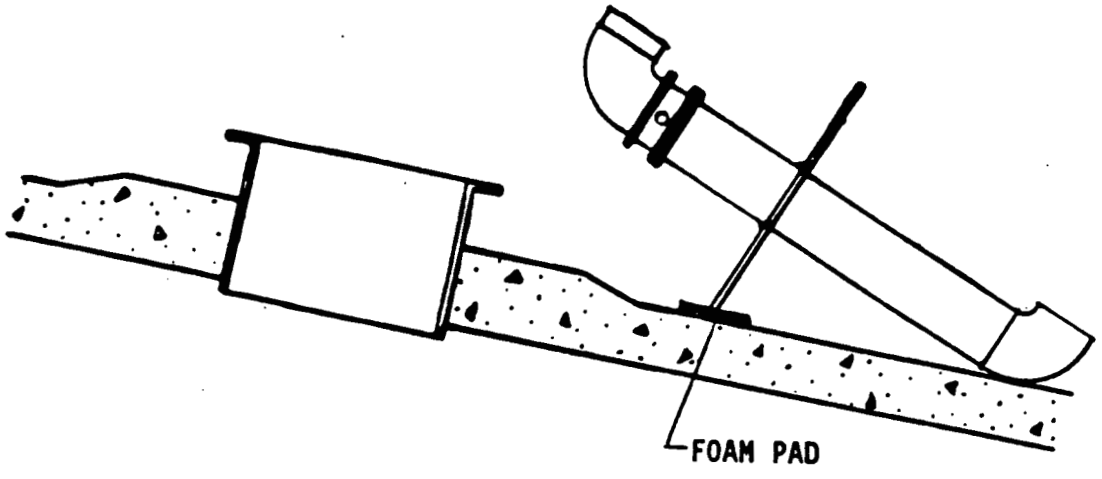

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FIGURE 5.3.15

FLANGE ASSEMBLY REMOVED FROM MANWAY

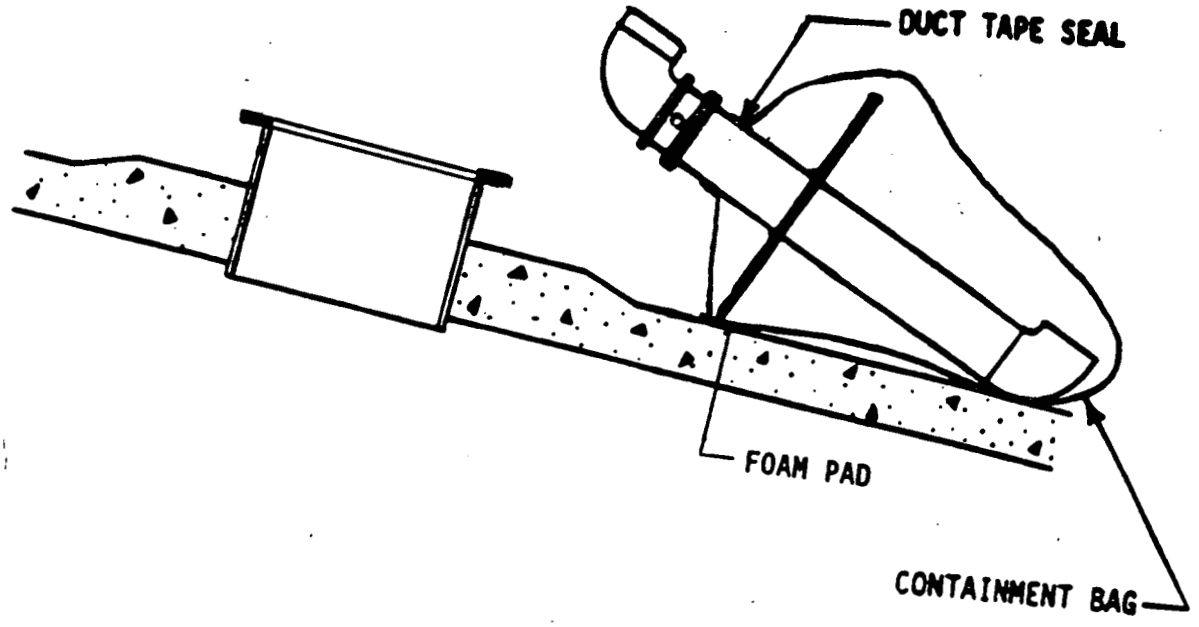

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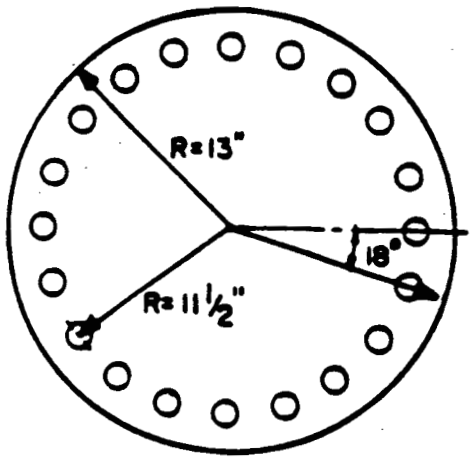
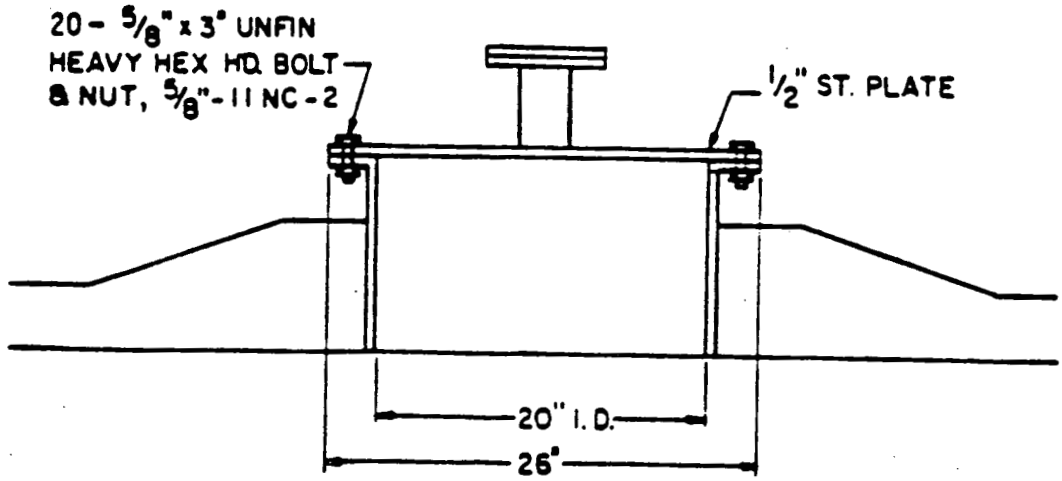
FIGURE 5.3.17

EXISTING CENTER MANWAY COVER



USE 20 BOLTS FOR MANWAY CLOSURE WITH RED RUBBER GASKET



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6.0 SAND INSTALLATION

Section 6.0 is intended as a functional plan that will be followed during the installation of sand inside the K-65 Silos. The plan includes requirements that must be met by all personnel during the installation of the sand. All items listed in Section 4.0 must be completed with the Checklist Signature Sheet filled out before starting the installation of sand. All work performed inside the K-65 Silos exclusion area during the sand installation must be done under the cognizance of the WMCO RST and the K-65 Task Leader. All Health and Safety requirements will be documented on the WMCO Radiation Work Permit (RWP). Environmental Safety and Health requirements will be specified on the Construction Environmental Safety and Health Work Survey (CESHWS).

SAND SPECIFICATIONS:
The type of sand to be used for the sand installation inside the K-65 Silos is a fine masonry-like sand with typical masonry sand specifications and moisture content which does not exceed three percent of the tested absorption of the material.

MASONRY SAND

U. S. STANDARD SIEVE SIZE	PERCENT PASSING DISTRIBUTION
#04	99%
#08	99%
#16	93%
#30	80%
#40	76%
#50	45%
#70	22%
#100	12%
#200	6%

The Subcontractor shall grab sample the sand at start-up for each day and once per every 50 cubic yards to assure that the sand consistently meets the specifications for this project. Written results of the grab sample analysis will be provided to RUST and WMCO. The Subcontractor will be responsible for securing an adequate amount of sand meeting the required specifications for installation without delay, once the installation process begins.

The sand supply shall be covered with a water shedding material during periods of work stoppage or when otherwise exposed to precipitation.

6.1 PROTECTION REQUIREMENTS FOR PERSONNEL

Section 6.1 explains the requirements in protective clothing, radiation monitoring devices, and respiratory protection that will be met by each person entering the K-65 exclusion area during the installation of sand. The WMCO RST will check each person prior to gaining access in the exclusion area to assure all the following requirements have been met.

6.1.1 Before entering the K-65 exclusion area, each person must be wearing the proper anticontamination clothing. Each person will be wearing disposable anticontamination suit and hood. The hands will be covered by rubber gloves with cloth liners that are

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approved by RST. Work gloves will be placed over the rubber gloves when handling equipment and tools. Each worker will be wearing the proper safety boots. Each worker shall have the anticontamination suit properly taped at the wrist and ankle so no flesh is exposed. All openings or tears in the anticontamination clothing will be taped closed with duct tape and approved by the RST.

6.1.2 Each person entering the K-65 exclusion area must be wearing a TLD and SRPD badges properly. The RST will read the SRPD each time a person exits the exclusion area or every two hours to assure each individual is within the allowable whole body exposure limits. The allowable whole body exposure limits for personnel involved with the sand installations will be 300 mrem/week, 2.4 rem/quarter, and 5 rem/year for each person for the Subcontract personnel and and RUST personnel not working full time at the FMPC. The whole body exposure limits for RUST personnel working full time at the FMPC and WMCO personnel will be 150 mrem/week, 1 rem/quarter, 5 rems/year for each person.

6.1.3 During the installation of the sand, two manway covers will be removed therefore a full-face forced air respirator must be worn by each person inside the K-65 exclusion area and will continue to wear this type of respirator inside the exclusion area until all manway covers are secured again.

6.1.4 While the manway and sounding pipe covers are removed, each person outside the K-65 exclusion area up to 50 meters or 164 feet from the exclusion area must wear a full-face air purifying respirator. Each person will continue to wear this respirator while in this area until all manway and sounding pipe covers are secured again. Personnel beyond 50 meters from the K-65 exclusion area are not required to wear respiratory protection.

6.1.5 If the breathing air equipment malfunctions while the manway and/or sounding pipe covers are removed, all personnel will immediately leave the K-65 exclusion area and replace the full-face forced air respirator with a full-face air purifying respirator up to 50 meters or 164 feet from the exclusion area. RUST and the K-65 Task Leader will inspect the breathing air equipment to see if the equipment can be repaired quickly. If not, Subcontract personnel must reinstall and secure the covers on the manway and sounding pipes using SCBA equipment following the procedures in Section 6.5.

6.1.6 The following criteria for respiratory protection will be followed for Working Level (WL) grab sampling during the sand installation:

0 to 0.03 WL: No respirator is required

0.03 to 16.5 WL: full-face air purifying respirator

16.5 to 660 WL: full-face forced air respirator

greater than 660 WL: SCBA equipment

6.2 K-65 SILOS DOME LOAD LIMITATIONS

Section 6.2 explains the load limitations for each silo dome surface and dome cap. Each person must be familiar with these limitations and must follow these limitations throughout the project.

6.2.1 All equipment and material supplies must be staged in such a way that no forces act on the berm within three feet of the silo walls. Staging of equipment and material supplies must be accomplished in such a way that no weight is placed on the 12 inch PVC piping for the radon treatment system (see Figure 5.2.1 for piping location).

6.2.2 The maximum amount of total distributed load that can ever be placed on the silo surface (excluding the dome cap) during the sand installation cannot exceed 1000 pounds and all weight applied by the equipment will be distributed to 20 pounds/square foot. A total of 7000 pounds can be placed on the dome caps since this load is distributed to the outer edge of the dome cap and all weight applied by the equipment on the dome cap will be distributed in some fashion so a point load is not applied on the dome cap.

6.2.3 No vibrational forces will be permitted to act on the silo domes, dome caps, or walls without adequate dampening and cushioning. Written approval by WMCO is required on this matter.

6.2.4 Personnel shall minimize congregating together in groups larger than three persons on the dome surface and the dome cap. No more than five people total are allowed on the silo dome and dome cap surfaces at any one time. A minimal amount of workers should be on the dome surface and dome cap at all times.

6.3 SAND INSTALLATION TECHNIQUE THROUGH THE CENTER MANWAY

Section 6.3 is intended as a functional plan that will be followed during the installation of sand inside the K-65 Silos. The plan covers installing the sand through the center manway. The installation of sand should begin immediately after the equipment staging is completed since the silo is open to the environment.

6.3.1 Install the remote controlled camera in the open side manway.

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6.3.2 Check the picture on the monitor inside the silo to familiarize the viewer of the inside of the silo. Start the VCR and record a few seconds of inside the silo to get use to the remote controls and to make sure the VCR is still working.

6.3.3 Install the measuring rods in the sounding pipes, two per quadrant of the silo (see Figure 5.3) for a total of eight in various locations, that will be used to measure the depth of the sand layer during the sand installation. Reflective tape or other marking needs to be used so the depth of the sand layer can be identified by viewing the monitor through the camera.

6.3.4 Once the camera and the VCR is ready and the measuring rods are in place, start the conveyor and spreader/broadcaster systems.

6.3.5 Continue filling the feed hopper with sand that meets specifications to assure the sand installation proceeds without delay.

6.3.6 The crew members should continuously check the equipment during the sand installation to assure the equipment is operating properly. These members should have in their possession a two-way communication system in case the equipment malfunctions. A message should immediately be transmitted to the controls of the equipment to shut down the equipment.

6.3.7 A crew member should always be next to the controls for the equipment and continuously possess a two way communication system, so the equipment can immediately be shut down if the equipment malfunctions.

6.3.8 A crew member should always be watching the monitor to assure the sand is being install inside the silo properly and must possess a two way communication system in case the sand is not being installed properly, the equipment can immediately be shut down.

6.3.9 If the equipment has to be shut down due to a malfunction or at the end of a work day, all manways and sounding pipe covers will have to be covered and secured immediately. The procedures in Section 6.5 must be followed before the construction site is abandoned.

6.3.10 The installation of sand in a silo will continue until a uniform four foot layer of sand is placed over the silo residues. This layer need not have a level surface, however, the minimum thickness of the sand layer is four feet and the maximum thickness must not

exceed 5.5 feet and the total volume of sand used per silo must be less than 930 yd^3. No sand shall come to rest in contact with the silo dome.

6.3.11 The progress of the sand layer will be continuously checked using the measuring rods and the camera monitor.

6.3.12 Once the sand layer has been completely install inside the silo, the Subcontractor must demonstrate through all sounding pipe except the ones underneath the dome cap (see Figure 5.3) to K-65 Task Leader and RUST Construction Manager that the layer of sand is within the required specifications. The procedure for the removal of the sounding pipe covers is described in Section 5.3. The equipment should remain in place in case more sand needs to be installed.

6.3.13 When the depth of the sand layer has been approved by the K-65 Task Leader and RUST Construction Manager, all open manways and sounding pipes will be covered and secured following the procedure in Section 6.5.

6.3.14 The installation of sand is ready to begin in the next silo. First, the Radon Treatment System must be operated on the next silo following procedures in Section 2.0 and 3.0.

6.3.15 The construction site must be ready to proceed with the sand installation in the next silo by following the steps listed in Section 4.0. These steps must be completed and the Checklist Signature Sheet must be signed by the appropriate personnel before the equipment is ready to be staged.

6.3.16 The equipment will be staged at the next silo following the procedures in Section 5.0.

6.3.17 Once the equipment has been staged, the procedure described in Section 6.0 will be followed to install the sand layer in the next silos.

6.3.18 The installation in a silo will continue until a layer of sand meeting the required specifications has been installed in the silo and the layer of sand has been checked and signed off by K-65 Task Leader and RUST Construction Manager.

6.3.19 When the depth of the sand layer has been approved by the K-65 Task Leader and RUST Construction Manager, all open manways and sounding pipes will be covered and secured following the procedure in Section 6.5.

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SOUNDING PIPE	ESTIMATED DEPTH
1	_____
2	_____
3	_____
4	_____
5	_____
6	_____
7	_____
8	_____
9	_____
10	_____
11	_____
12	_____
13	_____
14	_____
15	_____
16	_____
17	_____
18	_____
19	_____
20	_____

K-65 TASK LEADER: _____ RUST CONSTRUCTION MANAGER: _____

6.4 SAND INSTALLATION TECHNIQUE THROUGH THE FOUR SIDE MANWAYS

Section 6.4 is intended as a functional plan that will be followed during the installation of sand inside the K-65 Silos. The plan covers installing the sand through the four side manways. The installation of sand should begin immediately after the equipment staging is completed since the silo is open to the environment.

6.4.1 Install the remote controlled camera in the other open side manway.

NOTE: The center manway is available to install the camera, but if the center manway is not going to be used for the installation of sand, this manway should be avoided to be used for the camera. If possible use the other side manway to install the camera.

6.4.2 Check the picture on the monitor inside the silo to familiarize the viewer of the inside of the silo. Start the VCR and record a few seconds of inside the silo to get use to the remote controls and to make sure the VCR is still working.

6.4.3 Install the measuring rods in the sounding pipes, four in the quadrant that the sand is being installed (see Figure 5.3), that will be used to measure the depth of the sand layer during the sand installation. Reflective tape or other marking needs to be used so the depth of the sand layer can be identified by viewing the monitor through the camera.

6.4.4 Once the camera and the VCR is ready and the measuring rods are in place, start the conveyor and spreader/broadcaster systems.

6.4.5 Continue filling the feed hopper with sand that meets specifications to assure the sand installation proceeds without delay.

6.4.6 The crew members should continuously check the equipment during the sand installation to assure the equipment is operating properly. These members should have in their possession a two-way communication system in case the equipment malfunctions. A message should immediately be transmitted to the crew member at the controls of the equipment to shut down the equipment.

6.4.7 A crew member should always be next to the controls for the equipment and continuously possess a two way communication system, so the equipment can immediately be shut down if the equipment malfunctions.

6.4.8 A crew member should always be watching the monitor to assure the sand is being install inside the silo properly and must possess a two way communication system in case the sand is not being installed properly, the equipment can immediately be shut down.

6.4.9 If the equipment has to be shut down due to a malfunction or at the end of a work day, all manways and sounding pipes have to be covered and secured immediately. The procedures in Section 6.5 must be followed before the construction site is abandoned.

6.4.10 The installation of sand in a quadrant of the silo will continue until a uniform four foot layer of sand is placed over the silo residues. This layer need not have a level surface, however, the minimum thickness of the sand layer is four feet and the maximum thickness must not exceed 5.5 feet and the total volume of sand used per silo must be less than 930 yd^3. No sand shall come to rest in contact with the silo dome.

6.4.11 The progress of the sand layer will be continuously checked using the measuring rods and the camera monitor.

6.4.12 Once the sand layer has been completely install in a quadrant inside the silo, the Subcontractor must demonstrate through each sounding pipe in that quadrant except the ones underneath the dome cap (see Figure 5.3) to K-65 Task Leader and RUST Construction Manager that the layer of sand is within the required specifications. The procedure for removing the

remaining sounding pipe covers is described in Section 5.3. The equipment should remain in place in case more sand needs to be installed in the silo.

6.4.13 When the depth of the sand layer has been approved by the K-65 Task Leader and RUST Construction Manager, all open manways and sounding pipes will be covered and secured following the procedure in Section 6.5.

6.4.14 The equipment will be staged at the next manway, following the procedures in Section 5.0.

6.4.15 Once the equipment has been staged, the procedure described in Section 6.0 will be followed to install a sand layer in the next quadrant of the silos.

6.4.16 The installation in a silo will continue until a layer of sand meeting the required specifications has been installed in the four quadrants of the silo and the layer of sand has been checked and signed off by K-65 Task Leader and RUST Construction Manager. All open manways and sounding pipes will be covered and secured following the procedures in Section 6.5.

6.4.17 The installation of sand is ready to begin in the next silo. First, the Radon Treatment System must be operated on the next silo following procedures in Section 2.0 and 3.0.

6.4.18 The construction site must be ready to proceed with the sand installation in the next silo by following the steps listed in Section 4.0. These steps must be completed and the Checklist Signature Sheet must be signed by the appropriate personnel before the equipment is ready to be staged.

6.4.19 The equipment will be staged at the next silo following the procedures in Section 5.0.

6.4.20 Once the equipment has been staged, the procedure described in Section 6.0 will be followed to install the sand layer in the next silos.

6.4.21 The installation in a silo will continue until a layer of sand meeting the required specifications has been installed in the silo and the layer of sand has been checked and signed off by K-65 Task Leader and RUST Construction Manager.

6.4.22 When the depth of the sand layer has been approved by the K-65 Task Leader and RUST Construction Manager, all open manways and sounding pipes will be covered and secured following the procedure in Section 6.5.

SOUNDING PIPE	ESTIMATED DEPTH
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

K-65 TASK LEADER: _____ RUST CONSTRUCTION MANAGER: _____

6.5 MANWAY AND SOUNDING PIPE COVER REINSTALLATIONS

Section 6.5 is intended as a functional plan to reinstall the manway and sounding pipe covers. All manways and sounding pipes will need to be covered and secured whenever the equipment has malfunctioned, radiation levels on the dome surface has exceeded 100 mrem/hr, the radioactivity from the open manways has exceeded 4 Curies, the end of a work day, or the installation of sand through the manway has been completed.

EQUIPMENT:
1) screw driver to secure the clamp around the flexible piping.
2) piece of foam to place the flange assembly on the dome surface.
3) air powered wrench and adjustable wrench.
4) Five 20 inch inner diameter rubber gasket to replace the old rubber gasket, if needed, on the flange assembly or center manway cover.
5) Twenty 2 inch inner diameter rubber gasket to replace the old rubber gasket, if needed, on the sounding pipe cover
5) glue for the installation of a new rubber gasket.
6) 60- 5/8" X 3" unfin heavy hex head bolt and nut, 5/8"-11 NC-2.
7) Eight C-clamps and eight rubber squares to secure the center manway during the sand installation.

For reinstalling the covers for the sounding pipes:

6.5.1 Remove the sounding pipe cover from the containment bag.

6.5.2 Check the condition of the flange gasket. If the gasket has been damaged or missing, replace the gasket with a new one.

6.5.3 Have a crew member move the sounding pipe covers from the edge of the silo onto the open sounding pipes.

6.5.4 Secure the sounding pipe covers and gaskets with new bolts and nuts, two per sounding pipe (see Figure 5.3.5).

6.5.5 The RST will take air samples to verify the manway is sealed and no radon is leaking out in the environment. If radon is detected, check the gasket to assure the gasket did not doubled over when securing the cover. If the gasket was installed correctly, check the security of the bolts and nuts.

6.5.6 After the sand layer has been installed, remove the used containment bags and other waste off the silo berm and place the waste in the appropriate waste containers at the base of the berm as directed by RUST Construction Manager.

For reinstalling the flange assembly:

6.5.7 Remove the plastic containment bag that was placed over the bottom of the flange assembly (see Figure 6.5.7).

6.5.8 Check the rubber gasket on the flange assembly. If it is damaged, replace the old gasket with a new one.

6.5.9 Have two crew members move the flange assembly from the edge of the silo to next to the opened manway.

6.5.10 Place the flange assembly on the piece of foam so the flange assembly does not damage the foam layer on the dome surface (see Figure 6.5.10).

6.5.11 Have two crew members position the flange assembly in the manway (see Figure 6.5.11). Make sure the open end of the pipe inside the silo is directed toward the silo wall.

6.5.12 Secure eight C-clamps equally spaced around the manway flange (see Figure 6.5.12).

6.5.13 Attach the flexible piping on the flange assembly and secure the hose clamp (see Figure 6.5.13).

6.5.14 Make sure the butterfly valve is closed and lock out the butterfly valve.

6.5.15 Remove the used containment bags and other waste off the silo berm and place the waste in the appropriate waste containers at the base of the berm as directed by RUST Construction Manager.

6.5.16 The RST will take air samples to verify the manway is sealed and no radon is leaking out in the environment. If radon is detected, check the gasket to assure the gasket did not doubled over when securing the cover. If the gasket was installed correctly, check the security of the C-clamps and add more C-clamps if necessary.

For reinstalling the manway cover on the center manway:

6.5.17 Remove the manway cover from the containment bag.

6.5.18 Check the condition of the flange gasket. If the gasket has been damaged or missing, replace the gasket with a new one.

6.5.19 Have a crew member move the manway cover from the edge of the silo onto the open center manway.

6.5.20 If the installation of sand through the center manway is not finished, secure 8 C-clamps equally spaced around the center manway flange.

6.5.21 If the installation of sand through the center manway is completed, secure new 20 bolts and nuts (see Figure 6.5.21).

6.5.22 The RST will take air samples to verify the manway is sealed and no radon is leaking out in the environment. If radon is detected, check the gasket to assure the gasket did not doubled over when securing the cover. If the gasket was installed correctly, check the security of the C-clamps or bolts and nuts and add more C-clamps if necessary.

6.5.23 Remove the used containment bags and other waste off the silo berm and place the waste in the appropriate waste containers at the base of the berm as directed by RUST Construction Manager.

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FIGURE 6.5.7

FLANGE ASSEMBLY REMOVED FROM MANWAY

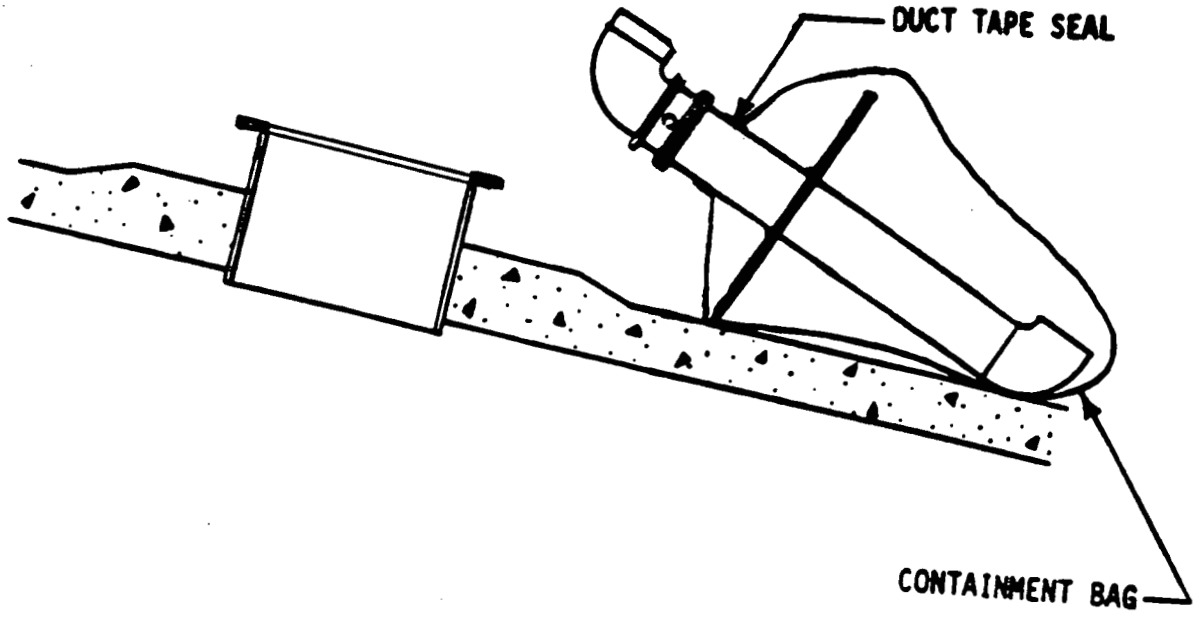

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FIGURE 6.5.10

FLANGE ASSEMBLY RESTING ON THE SILO DOME SURFACE

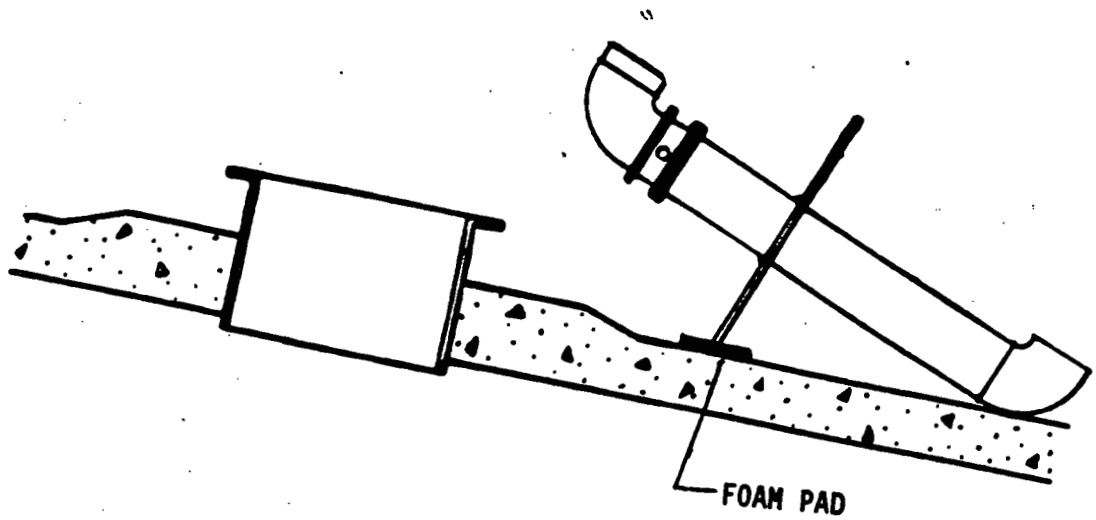

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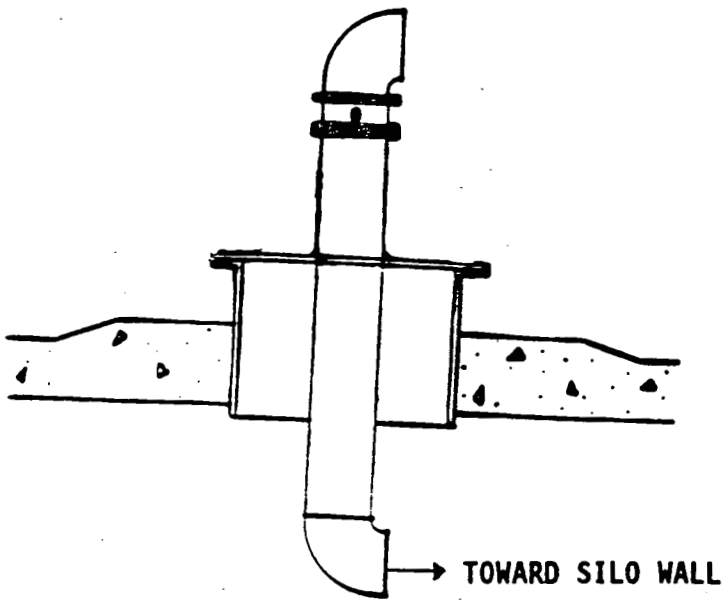
FIGURE 6.5.11

FLANGE ASSEMBLY WITH C-CLAMPS REMOVED



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