

# **DEMOLITION PLAN**

**FOR THE**

**Asarco: Reverb and Contop Furnace Matte and Acid  
Plant Structures Demolition Project**

**PREPARED BY:**

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## **1.0 INTRODUCTION**

This Demolition Plan (Plan) has been prepared for the Reverb and Contop Furnace Matte demolition and transportation, Converter Building exploratory dig and Converter opening, and the selective demolition in Acid Plants 1 and 2, and the Evaporator Vessel demolition at the ASARCO facility in El Paso, Texas. This Plan was developed for use in conjunction with the site specific Health and Safety Plan (HASP) and previous site specific demolition plans along with all other associated plans. These are distinct documents that form the project operations plans intended to guide field personnel, contractors and other involved parties in all aspects of field operations.

### **1.1 Purpose and Scope**

The purpose of this Plan is to describe the activities that will be conducted to accomplish the selective demolition of the structures and equipment outlined in the change order (4) agreement dated January 10, 2011. This Plan will address the tasks to be performed prior to the initiation of demolition activities, the sequence of building and structure demolition activities, the specific work activities associated with the demolition of the various building structures and equipment, and the handling requirements for materials and debris to be generated during the demolition activities. The following sections further describe these activities.

### **1.2 Site Description**

The facility site is at the former Asarco Smelter site located at 2301 W. Paisano Drive in El Paso, Texas.

The work which is to be performed consists of: demolishing the solidified matte in the Reverb and Contop Furnaces and the loading and transportation of matte material to the Bedding Building, exploratory digging in the Converter Building, the opening of (3) Converters in the Converter Building, and selective demolition in Acid Plants 1 and 2 and the demolition of the Evaporator Vessel and associated piping/motors. The majority of the site is paved with either concrete or asphalt paved roads. Access to the site is restricted with perimeter fencing and on site security.

## **2.0 SITE PREPARATION**

Site preparation activities will include, but are not limited to, the following:

- Secure Demolition Permit;
- Installing dust control measures;
- Establishing work zones, equipment and material staging areas;
- Verifying the isolation & disconnection and capping/relocation of utility lines; and

The following sections further describe the site preparation activities.

## 2.1 Notifications, Permits and Submittals

Brandenburg will:

- Secure & maintain a demolition permit with the City of El Paso, Texas for the new demolition areas.
- Brandenburg will extend and modify the current demolition notification

## 2.2 Health and Safety

A Site-specific Health and Safety Plan has already been developed from the previous work activities and will continue to be implemented and followed. All personnel involved in the demolition activities will thoroughly understand and acknowledge the essential elements of the Site-specific Health and Safety Plan prior to the start of on-site activities.

At the initiation of demolition activities, an orientation session will be held at the site for all Brandenburg employees and subcontractors working at the site. In addition, daily health and safety meetings will be held each morning prior to the start of work and immediately after the lunch break on specific topics, visitor protocols, and ongoing activities throughout the duration of the demolition activities.

## 2.3 Construction Equipment

The construction equipment to be used during the demolition Project will include hydraulic excavators equipped with concrete hammers, grapples, and shears; front-end loaders; crane; skid steer loaders and man-lifts. The major construction equipment will be supplied by Brandenburg and smaller type equipment such as man-lifts, air compressors, etc. will be rented from a local vendor by Brandenburg for use during the demolition Project.

## 2.4 Work Zones

Work zones will be established and enforced during the demolition Project. These zones will be demarcated using signs, barricade tape, snow fencing, and/or other physical barriers. The work zones will include the exclusion zone and support zone. The location of the work zones and the load-out traffic pattern will be determined by the Project superintendent following a logistical evaluation of the site and reviewed with ERM.

The Exclusion Zone will consist of the demolition and staging area portions of the site, as applicable. Specific locations of the Exclusion Zone may be modified based on the progress of work activities to each portion of the site.

The Support Zone will be recognized as the support/administrative facilities, sanitary facilities and parking areas. These areas will be clearly marked with appropriate signs for identification purposes.

Access to the work zones will be controlled by Brandenburg. All personnel and visitors requiring access to the work zone will be required to contact the Brandenburg supervisor to be escorted on the demolition site prior to entry

## 2.5 Utility Identification

The identification of site utilities will be coordinated with the ERM Project representative to demarcate the following utilities:

- Sanitary sewer lines;
- Stormwater drains and systems;
- Electric lines;
- Cable Trays;
- Compressed Air lines;
- Water lines;
- Process Piping;
- Instrumentation;
- Natural gas lines;
- Fiber optic lines; and
- Overhead utilities.

Each utility will be identified with individual flags, signs or other devices. All identification devices will be visible and noted on a site utility drawing for reference purposes.

## 2.6 Dust Suppression

During all phases of the demolition activities, airborne dust emissions will be controlled. Dust suppression systems will be installed throughout the interior and/or exterior work areas to minimize or reduce the generation of visible dust emissions. Engineering controls for dust suppression will generally consist of the use of water misting and spraying devices. If conditions warrant, a large area mister such as a Dust Boss or equivalent will be employed to ensure fugitive emissions are mitigated. The Dust Boss resembles a snow making machine and can cover a large area with a fine mist of water, effectively controlling dust.

Dust suppression via water misting and spraying will use a quantity of water that will be sufficient enough to control dust, but not enough to leave residual water accumulations on the ground surface. Water misting and spraying devices will be utilized as necessary in various portions of the work zone and will assist in reducing visible dust emissions in work areas.

Work procedures and/or dust controls will be adjusted as needed to ensure that visible dust is controlled at the site boundary.

## 2.9 Work Scope

The major components of Change Order 4 include:

- Reverb and Contop Furnace Matte
- Converter Building exploratory digging and the opening of (3) converters
- Selective demolition in Acid Plant 1

- Selective demolition in Acid Plant 2
- Evaporator Vessel demolition

### **3.0 Preparation Activities**

Demolition activities will be conducted as described in the following sections.

- Identify the materials and debris contained in the buildings and structures that must be removed prior to the start of demolition activities;
- Paint mark the limits of the structure, piping and electrical conduit removal
- Verify the isolation of utilities associated with the buildings and structure(s) and equipment present within;
- Establish a demolition work zone for personnel safety;
- Implement dust suppression control measures

#### **3.1 Material and Debris Removal**

Materials and debris present within the structures will consist predominantly of ferrous & non-ferrous materials, refractory, concrete, brick and fiberglass insulation.

All debris; with the exception of the scrap metals, will be removed, transported and dumped in the Bedding Building for disposition by the Trust.

The only scrap metals which will be retained by ERM will be: (5) vertical heat exchangers, the titanium tube bundles from the evaporator and the lead constructed mist precipitator components; which will remain the property of ERM, said ERM scrap will be placed in an agreed upon location within the Acid Plants

Brandenburg scrap will be shipped from an agreed upon lay down area to an off-site recycling facility.

##### **3.1.1 Site Vac and Wash Down**

ERM will be responsible for the cleaning of all necessary materials in the Acid Plants prior to the demolition of the Acid Plants and the Evaporator Vessel

##### **3.1.2 Asbestos Abatement**

An asbestos survey performed by AnE Consulting, Inc. identifies asbestos-containing materials located within the dismantling area. The results of the inspection indicated that greater than 1% asbestos construction materials; as described in the tables and survey sampling data exist in the buildings and structures.

General Practices:

###### **Regulated Areas**

- All Class I & II asbestos work will be conducted within regulated areas.
- Access to the regulated area shall be limited to authorized persons.

**Demarcation**

Warning signs that demarcate the regulated area will be provided and displayed at each location where a regulated area is required to be established. The warning signs shall bear the following information: Danger, Asbestos, Cancer and Lung Disease Hazard, Authorized Personnel Only, Respirators and Protection Clothing Are Required in this Area.

**Respiratory Selection**

Brandenburg and/or their sub-contractor will provide their employees the appropriate respirator as specified in Table 1 paragraph (h)(2)(iii), (iv),(v)-(h)(4)(ii) of 29 CFR 1926.1101 and maintain a respirator program in accordance with 1910.134(b), (d), (e), and (f).

Brandenburg and/or their sub-contractor will ensure that the employee uses the respirator as provided below:

During all Class I work.

During all Class II work where ACM is not removed in a “substantially intact state”.

During all Class II work which is not performed using wet methods.

During Class II work where a “negative exposure assessment” has not been prepared.

During any work where exposure occurs above the PEL or excursion limit.

**Protective Clothing**

Brandenburg and/or their sub-contractor will provide and require the use of protective clothing, such as Tyvek coveralls, head coverings, gloves and foot coverings for all employees performing abatement activities. The competent person will examine work suits worn by employees at least once per work shift for rips or tears that may occur during performance of work and will mend or replace work suits immediately if needed.

**Hygiene Facilities and Practices**

Will be provided and performed as required in section (j) of 29 CFR 1926.110.

**Engineering Controls**

HEPA vacuums will be used as needed.

Wet methods will be used.

**Specific Removal****Vinyl Asbestos Tile and Mastic**

Asbestos containing floor tile will be removed within sealed critical areas by way of hand scrapers to “pop up” each tile. The tile removal will use wet methods during the removal work. Mastic associated with the removal of asbestos floor tile shall be accomplished utilizing a chemical adhesive remover. The vinyl asbestos tile and mastic will be packaged and transported to Bay 10 of the Bedding Building.

**Asbestos Cement Electrical Duct**

The duct will be removed by utilizing asbestos laborers to remove the sections of duct; scissor lifts and lulls will be utilized to access and lower section of duct for removal. The

ducts will be removed and wrapped in polyethylene sheeting and transported to Bay 10 in the Bedding Building

## **3.2 Universal Waste Removal**

### **Fluorescent Light Tubes / Ballast**

Fluorescent light tubes will be removed intact. They will be placed in DOT- approved cardboard shipping containers and sent to an approved disposal facility for final disposition as RQ Mercury, UN2809 Class 8 PGII carrying the EPA characteristic waste code of D009 for mercury. Light Ballast will be removed from within the fixtures in order to verify whether or not they contain PCB's. All ballast which are not clearly marked Non-PCB will be treated as PCB-containing. The PCB Ballast will be placed into DOT 17-H open top drums, and sent to an approved disposal facility as RQ Poly Chlorinated Biphenyls UN2315, Class 9, PGIII carrying the EPA hazardous waste code of PCB2. Non-PCB ballast will be handled and disposed of as a non-hazardous waste.

### **High Intensity Discharge Lamps (Mercury / Sodium Vapor)**

These bulbs will be removed from within the facility intact. They will be packed in DOT drums containing insulating material in order to prevent breakage. The drums will then be labeled and shipped to an approved disposal facility.

### **Mercury Containing Electrical Devices**

Mercury contained within electrical devices will first be removed from the individual components and moved to the chemical staging area. The devices will be staged in a work area where 40 hour HAZMAT trained workers equipped with respirator / mercury vapor cartridge will either lab-pack the materials for Mercury retortion, or Brandenburg will pour off the mercury devices into a recovery flask. If pour off is the chosen method, air sampling will be done to verify that mercury vapors are not being released into the atmosphere. The bulked mercury will then be sent to an approved reclamation facility. If lab-packed, the mercury devices will be placed into appropriate DOT containers which will be labeled, and then shipped to an approved disposal facility as RQ Mercury, UN2809 Class 8 PGII carrying the EPA characteristic waste code of D009 for mercury.

### **Pb Acid Batteries**

Lead acid batteries will be removed from the facility during remediation work. The materials will be staged in the drum holding area where they will be checked to verify the shipping integrity of each individual battery. The batteries will then be placed on a pallet with approved shipping cardboard covering placed over the top. The batteries will then be secured to the pallet using both banding straps and shrink wrap materials. The batteries will then be loaded and transported to an approved reclamation facility.

### **Nickel Cadmium Batteries**

Nickel Cadmium batteries will be removed from the facility during remediation work. The materials will be staged in the drum holding area where they will be checked in order to verify the shipping integrity of each individual battery. The batteries will then be packaged in accordance with applicable DOT regulations for ultimate disposition at an approved facility as RQ Hazardous Waste Solid, Class 9 PGIII UN3082; this material will also carry the EPA characteristic code D005 for Cadmium.

### 3.3 Utility Decommissioning

The isolation of the utilities shall be performed by ERM and/or facility utility personnel prior to the initiation of demolition activities. Brandenburg will verify the disconnection of each utility. Removal of utilities will not occur unless each line has been checked and clearly marked. Brandenburg's disconnection verification procedure requires a visible break in all utility lines, with green paint applied to disconnected utilities and red paint applied to live utilities. Disconnections and color-coding are typically performed by Brandenburg employees.

Brandenburg will perform Zero Energy State verification of all utilities for the site structures. A Zero Energy State Verification Form shall be signed both by the Brandenburg Site Superintendent and the ERM Project representative, stating that all utilities are at zero energy state, or that specific controls are in place to prevent injury to site workers, (lockout/tagout procedures). The completed and signed form will be attached to this Site Specific Safety Plan.

### 3.4 Demolition Zone

Demolition zones will be established within the exclusion zone around each day's demolition area to ensure the safety of on-site personnel during demolition activities. The demolition zone will move concurrently with the progress of demolition activities. Only those personnel specifically assigned to work or operate equipment will be allowed in the demolition zone. Personnel responsible for dust suppression and water management activities will be kept at a safe distance from the demolition area.

Barricades, caution tape and signs warning of demolition activities will be posted around the perimeter of each demolition zone. A drop zone will be established within the demolition zone to protect against pieces of debris that may fall during demolition activities. The drop zone will be large enough to accommodate for any material kick-out or bounce after landing on the ground. A member of the project demolition team on the ground will be responsible for policing the drop zone. A fire-watch zone will be delineated within the demolition zone if torch cutting will be employed. Whenever torch work or an open flame is used for demolition, a demolition team member will be present with a fire hose and/or extinguisher.

### 3.5 Scope of Areas

The dismantling and demolition of the designated buildings & structures, associated equipment and interior components will be conducted using conventional demolition equipment such as hydraulic track excavators equipped with a combination of shears, concrete breakers /grapple attachments, man- lifts, skidsteer, rock trucks and front end loaders. Front-end loaders with grab buckets will remove and segregate the scrap steel and debris generated by the demolition for recycling purposes and on-site disposal.

Dismantling/demolition operations that involve torch cutting will be accompanied by fire watch personnel. All work procedures will be conducted in general accordance with the Site-specific Health and Safety Plan.

#### Reverb and Contop Furnace Matte

Brandenburg will demolish and remove the solidified matte from the Reverb and Contop Furnaces. The matte has been exposed from previous demolition activities. The matte will be

broken up into small pieces with the use of an excavator with a hammer; the excavator will then use a bucket to load matte into trucks for transportation to the Bedding Building. ERM will direct Brandenburg as to which bays to deposit all materials generated from the demolition work. The dimensions for the matte work are shown on the REVERB BOTT ISO-VIEW drawing. Water will be used to suppress dust as needed during these activities. Brandenburg will continue to hammer and dig out material until the bottom of the matte is reached or until ERM instructs Brandenburg that the desired depth has been reached. This only includes the matte material which will break into pieces using a hydraulic concrete breaker.

#### Converter Building

1. Laborer crews will use torches to open a 10-foot wide section of steel plating on the west side of (3) converters in order to expose refractory lining, if refractory is found Brandenburg will demolish the refractory in order to expose an opening in the converters so that any suspect solidified copper material can be seen.
2. Brandenburg will excavate loose material across a 150-foot long by 40-foot wide area inside the Converter Building. The depth of the excavation will be roughly 2-3 foot deep. ERM will direct Brandenburg of said area prior the start of the excavation. The purpose of the excavation is to explore the area for a suspect historical spill.
3. Brandenburg will dig no more than (6) 8-foot deep exploratory potholes inside the Converter Building. ERM will direct Brandenburg as to where said potholes will be dug.
4. Brandenburg will demolish any loose materials; piping, panels, etc..., on the west side exterior of the Converter Building, these materials will be demolished using a combination of laborers working in man-lifts using torches and also the use of heavy equipment.

#### Acid Plant #2

Brandenburg will use heavy equipment and laborers with torches to demolish select areas within Acid Plant #2. Laborers will first enter Acid Plant #2 and remove all universal waste and any asbestos containing materials before any demolition takes places within areas containing universal waste and asbestos containing materials. After the removal of any asbestos, salvage equipment, and universal waste, heavy equipment will be used to demolish various equipment and structures within Acid Plant #2, excavators with grapples, hammers, buckets, magnets, and shears may be used to perform said demolition work. Also, laborers with torches may pre-cut certain beams in order to set-up structures for the heavy equipment. Laborers using torches may follow heavy equipment in order to trim certain areas once the heavy equipment has left the immediate area. All generated scrap will be staged near-by and loaded into scrap trucks/boxes and all other debris generated will be transported to the Bedding Building, ERM will direct Brandenburg as to which bays to deposit said materials in. All structures, which are to be demolished, will be marked by ERM and Brandenburg prior to any demolition crews entering the areas.

Description of exact items to demolish:

- Demolish the eight mist precipitators and associated building down to the top of the respective concrete pedestals.
- Demolish the fiberglass constructed ductwork and associated support structures from the south side of the mist precipitator building to the top of the two scrubber vessels.
- Demolish the fiberglass constructed ductwork from the bottom of the scrubber vessels up to the y-branch connection south of the scrubber tanks.

- Demolish the fuel oil storage tank, water separator and portable air compressor located on the immediate west side of the building down to the top of the respective concrete pedestals.
- Demolish the two rectifiers on the immediate west side of the mist precipitator building.
- Demolish the two packed scrubber vessels located on the south side of the building down to the top of the raised concrete pedestals.
- Demolish the two scrubber water tanks and respective platforms & stairs located between the scrubber vessel pedestals.
- Demolish the No. 14 motor control center building and equipment contained therein down to the top of the respective floor slab and/or pedestals.
- Demolish the two rectifiers located on the immediate north exterior side of the No. 14 motor control center building.
- Demolish the elevated pipe rack along the east side of the mist precipitator building from the support bent on the north side of the Water Treatment Plant up to the final gas treatment structure.
- Demolish the fiberglass constructed process flue gas ducts and associated supports from the north side of the mist precipitator building to the final gas treatment drying tower.
- Demolish the east/west section of the fiberglass constructed SO<sub>2</sub> duct and associated supports from the braced support tower located north of the exhaust gas stack up to the branch connection on the aforementioned flue gas duct.
- Hoist the three vertical “green” heat exchangers from tower support structure and place on the ground for cleaning/decommissioning by ERM.
- Demolish the inter-pass tower vessel and associated platforms down to the structural steel support structure.
- Demolish the inter tower pump tank, final tower pump tank, and drying tower pump tank and associated circulating pumps & motors down to the top of the respective concrete pedestals.
- Demolish the insulated welded steel duct from the top of the inter-pass tower down to the cold inter heat exchanger.
- Demolish the welded steel duct from the bottom of the inter-pass tower up to the bottom of the cold inter heat exchanger.
- Demolish the final tower vessel and associated platforms down to the top of the steel support structure.
- Demolish the elevated welded steel duct and associated support structure from the top of the final tower up to the platform attached to the northwest side of the exhaust stack.
- Demolish the welded steel duct from the bottom of the final tower up to the vertical cold heat exchanger.
- Demolish the drying tower and associated platforms down to the top of the steel support structure.
- Demolish the welded steel duct from the top of the drying tower down to the main east & west compressors located on the west side of the structure.
- Demolish the section of welded steel duct from the top of the main east & west compressors up to the first braced support tower on the north side of the final gas treatment structure.
- Demolish the two centrifugal compressors & motors and associated elevated platform structure down to the top of the respective concrete pedestals.
- Demolish the small elevated acid tank and associated support structure located on the north side of the drying tower down to the top of the respective concrete pedestals.
- Demolish the steel support structure from the aforementioned final gas treatment towers down to the top of the respective concrete pedestals.
- Demolish the elevated pipe rack from the tower support structure up to the west wall of the No. 13 sub-station building.

### Acid Plant #1

Brandenburg will use heavy equipment and laborers with torches to demolish select areas within Acid Plant #1. Laborers will first enter Acid Plant #1 and remove all universal waste and any asbestos containing materials before any demolition takes place within areas containing universal waste and asbestos containing materials. After the removal of any asbestos, salvage equipment, and universal waste, heavy equipment will be used to demolish various equipment and structures within Acid Plant #1, excavators with grapples, hammers, buckets, magnets, and shears may be used to perform said demolition work. Also, laborers with torches may pre-cut certain beams in order to set-up structures for the heavy equipment. Laborers using torches may follow heavy equipment in order to trim certain areas once the heavy equipment has left the immediate area. All generated scrap will be staged near-by and loaded into scrap trucks/boxes and all other debris generated will be transported to the Bedding Building, ERM will direct Brandenburg as to which bays to deposit said materials in. All structures, which are to be demolished, will be marked by ERM and Brandenburg prior to any demolition crews entering the areas.

#### Description of exact items to demolish:

- Demolish the four mist precipitators and associated support structure down to the top of the respective concrete pedestals.
- Demolish the fiberglass constructed ductwork from the bottom of the four mist precipitators to the top of the two scrubber vessels.
- Demolish the two packed scrubber tower vessels down to the top of the respective concrete pedestals.
- Demolish the elevated pipe rack along the west side of the mist precipitator structure from the bent on the southeast side of the cooling tower up to the trestle on the east side of the drying tower structure.
- Demolish the elevated fiberglass constructed duct and associated supports from the north side of the mist precipitator structure up to the support bent on the east side of the east & west blower compressors.
- Hoist the three vertical "green" heat exchangers from tower support structure and place on the ground for cleaning/decommissioning by ERM.
- Demolish the drying tower vessel and associated platforms down to the top of the steel support structure.
- Demolish the welded steel duct from the top of the drying tower down to the east & west blowers.
- Demolish the final absorption tower and associated platforms down to the top of the steel support structure.
- Demolish the elevated welded steel duct and associated support structure from the top of the final absorption tower up to the platform attached to the southeast side of the exhaust stack.
- Demolish the welded steel duct from the north side of the final absorption tower to the bottom of the No. 5 vertical heat exchanger.
- Demolish the interim absorption tower vessel down to the top of the steel support structure.
- Demolish the insulated welded steel duct from the top of the interim absorption tower down to the bottom of the No. 2 vertical heat exchanger.
- Demolish the oleum tower vessel located on the west side of the interim absorption tower down to the top of the respective concrete pedestal.
- Demolish the drying tower pump tank, final absorption tower pump tank, interim absorption tower pump tank and associated circulating pumps & motors down to the top of the respective concrete pedestals.

- Demolish the tower support structure down to the top of the respective concrete pedestals.
- Demolish the masonry block constructed control room building and equipment contained therein down to the top of the respective floor slab and/or concrete pedestals.

### Evaporator Vessel

Brandenburg will use heavy equipment and laborers with torches to demolish select areas around the Evaporator Vessel. Laborers will first enter the area and remove all universal waste before any demolition takes place within areas containing universal waste. After the removal of any salvage equipment and universal waste, heavy equipment will be used to demolish various equipment and structures within the area around the Evaporator Vessel, excavators with grapples, hammers, buckets, magnets, and shears or cranes may be used to perform said demolition work. Also laborers with torches may pre-cut certain steel in order to set-up structures for the heavy equipment. Laborers using torches may follow heavy equipment in order to trim certain areas once the heavy equipment has left the immediate area. All generated scrap will be staged near-by and loaded into scrap trucks/boxes and all other debris generated will be transported to the Bedding Building, ERM will direct Brandenburg as to which bays to deposit said materials in. All structures which are to be demolished will be marked by ERM and Brandenburg prior to any demolition crews entering the areas.