SPECIFICATIONS

FOR

BUILDING DEMOLITION OF HANGAR 2

AT

WILLOW RUN AIRPORT
YPSILANTI, MICHIGAN

DETROIT METRO • WILLOW RUN
WAYNE COUNTY AIRPORT AUTHORITY

WCAA SOLICITATION NO. 140078

ATTACHMENT E (SPECIFICATIONS)

April 8, 2014

Issued for Bid

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BUILDING DEMOLITION OF HANGAR 2 / WILLOW RUN AIRPORT

REVISED SP-10 – AIRPORT SAFETY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. The Contractor shall carry out its operations in compliance with the "Wayne County Airport Authority Safety Standards February 2013", Revised February 14, 2014, with attached Forms (70 pages total), issued with this Section.

END OF SP-10

Wayne County Airport Authority

Safety Standards

February 2013

Date Issued: February 2013
Date Revised: February 14, 2014

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Date Issued: February 2013
Date Revised: February 14, 2014

1.0 General Requirements

This document is specifically intended for the use of Construction Managers, Vendors, Contractors and Subcontractors who perform work on or at (Airport Authority) Detroit Metropolitan Airport (DTW) or Willow Run Airports (YIP) and facilities. It is made available to amplify your Safety Program. All or parts of the contents will apply to your contract depending upon the type of contract and the sequence in which the phases are conducted. ***BE ADVISED you will still be subjected to a Construction and Alteration Permit for work to be performed (if C/A permit project).***

The following information is provided as an example in which to determine what items to include in the safety program for work performed and does not constitute the requirements of a complete, comprehensive safety policy or Safety Program. It shall be the Contractors responsibility to provide a safe and healthful work environment for their workers on-site during the performance of the contract or work performed from a purchase order or work order. This shall include the Contractor and all its Subcontractors, all trades and supervision, suppliers, Airport Authority personnel, visitors and additional parties having access to the designated project work areas at the Airport Authority's facility. The safety goal of Airport Authority construction projects is to achieve zero fatalities, zero permanent disabilities, and zero lost time accidents.

The generalized overviews presented in this document are statements of expectations that the Contractor will be measured against. Failure to meet these requirements may be grounds for the removal of the individual employee from the worksite and also could lead to grounds for termination of the Contract by the Airport Authority.

The Contractor must not interfere with or make more difficult or expensive Airport Authority's compliance with any law, statue, code, ordinance or regulation. Airport Authority will notify the Contractor, orally or in writing, and the Contractor shall within forty-eight hours of receiving Airport Authority's notification make whatever changes are necessary to remedy the situation, including, without limitation, changes in the work schedule, installation of safety devices. Airport Authority's exercise of its rights under this guideline will not be grounds for an increase in the Contract Sum under the Contract.

The Airport Authority has the right to monitor (Contractor shall still be responsible for assuring safe work practices) the Contractors' operations for safety performance, workmanship, protection of operations, work progress, housekeeping, and compliance to design specifications. It is a general practice that the Airport Authority will work through the Contractor's supervision and not directly with the employee. The Airport Authority has the right to participate with and investigate any accident or incident.

Contractor shall develop and implement a system for assessing appropriate requirements applicable to its employees, including removal from Airport Authority property, for violation of safety laws statutes, codes, ordinances and regulations, safety requirements specified by Job Hazard Analysis; safety requirements specified by the Contract, including, without limitation, any other condition that presents a safety hazard to the employee or others. Contractor shall prepare and maintain a detailed written report of each instance where it has assessed discipline for a safety related infraction including identification of the employee, the nature of the infraction and their discipline assessed.

Prior to beginning any work, the Contractor shall conclusively demonstrate to the Airport Authority that the Contractor has in place and actively maintains a comprehensive random and post accident drug and alcohol testing program that meets or exceeds the standards for post accident and random testing in

accordance with Department of Transportation (DOT) Drug and Alcohol Testing - 49 Code of Federal Regulations (CFR) Part 40 (hereinafter "Drug Testing"). Written proof of Drug Testing shall be submitted to the Airport Authority simultaneously with the required Payment and Performance Bonds and Insurance. The Drug Testing requirement shall apply to all subcontractors of the Contractor.and Insurance. The Drug Testing requirement shall apply to all subcontractors of the Contractor.

All persons entering the project area designated as the construction site shall strictly follow Michigan OSHA, MDEQ, FAA, DOT, and TSA regulations.

These established safety requirements shall govern Contractors and all persons within the designated construction site and are outlined to avoid infractions of common accepted safety practices. Safety Program – The Contractor shall submit its Safety Program to the Airport Authority and obtain approval prior to issuance of the Notice to Proceed. The Safety Program includes, but is not limited to the following:

- Contractor's Corporate Safety Policy
- Contractor's Site Specific Safety Plan
- Construction Safety and Phasing Plan (CSPP) – The Contractor shall abide by the CSPP, approved by the FAA and provided by the Airport Authority (for all Airfield, PFC, and AIP funded projects only).
- Safety Plan Compliance Document (SPCD) – The SPCD details how the contractor will comply with the CSPP. The Contractor shall prepare the SPCD and obtain approval by the Airport Authority prior to issuance of the Notice to Proceed (for all Airfield, PFC, and AIP funded projects only).

Regular progress meetings will be conducted during construction. Part of the meeting will be dedicated to safety. During these meetings, the Contractor shall submit to WCAA on a monthly basis the following safety information (Attachment #1):

- Estimated man-hours worked from the previous period;
- Number of near misses from the previous period;
- Number of accidents from the previous periods;
- Number of recordable injuries from the previous period; and
- Summarization of any accident that took place from the previous period.

The Contractor shall carry out its operations in a manner that will cause a minimum of interference with air traffic, and shall be required to cooperate with the Federal Aviation Administration (FAA), Wayne County Airport Authority (Airport Authority) the airlines, and other contractors working in the area. All work shall be completed in accordance with the Contract Documents including the Safety Program and FAA Advisory Circular 150/5370-2F, Operational Safety on Airports During Construction or current edition as of bid date.

If the Contractor uses resources from any union halls for staffing, those individuals shall have a current OSHA 10 hour certification as well as go thru safety orientation with the Contractor. Copies of any names of individuals who are used from the local halls shall be submitted with a copy of the certification to the Airport Authority or the Airport Authority's representative one week prior to allowing the individual onsite.

The Contractor shall supply, place, maintain, move and store the items listed herein, as appropriate, to facilitate construction and protect air traffic. The Contractor shall maintain an adequate extra supply of these items on site.

The following information is provided as an example in which to determine what items to include in the safety program for work performed and does not constitute the requirements of a complete, comprehensive safety policy or Safety Program. It shall be the Contractors responsibility to provide a safe and healthful work environment for their workers on-site during the performance of the contract or work performed from a purchase order or work order. This shall include the Contractor and all its Subcontractors, all trades and supervision, suppliers, Airport Authority personnel, visitors and additional parties having access to the designated project work areas at the Airport Authority's facility. The safety goal of Airport Authority construction projects is to achieve zero fatalities, zero permanent disabilities, and zero lost time accidents.

These established safety requirements shall govern Contractors and all persons within the designated construction site and are outlined to avoid infractions of common accepted safety practices. These safety requirements shall not be construed as complete and any requirements of the guidelines in conflict with Michigan OSHA and FAA shall be superseded by Michigan OSHA or FAA regulations.

Tools, equipment or materials shall not be left or placed on beams, overhead walkways, or places where they may fall, causing injury.

To prevent possible explosive or incendiary devices from being hidden in areas close to Airport Facilities, equipment, aircraft, or vehicles, no containers (tool boxes, storage containers, materials trailers shall be left unsecured or unattended in public areas.

The Contractor shall not bring any tool through passenger screening. No tools shall be left unsecured in public areas. Any temporary doors that lead to construction areas that are accessible by the public shall be equipped with a push button cipher lock (installed at the contractor's expense). The access number to the door shall be provided to Airport Authority designees.

The Contractor is not permitted to carry liquids, gels, or aerosols into sterile areas except for those liquids, gels, or aerosol necessary for operational or medical needs, all of which shall be subject to inspection.

Eye protection shall be worn at all times.

While working on the airfield hearing protection is mandatory. It is up to each contractor and subcontractor to determine if a hearing conservation program is necessary. The Contractor will comply with industry standards for hearing protection of personnel and visitors as appropriate.

Upon request the Airport Authority will submit any historical noise surveys to the Contractor.

Contractor shall verify and assure that every employee who operates any mobile equipment on Airport Authority properties shall have a current valid driver's license.

The Contractor shall comply with the National Electric Code (NEC) requirements regarding ground fault circuit interrupters for construction field tools and equipment.

In matters concerning interpretation of the foregoing requirements, the decision of the Airport Authority will be final and binding.

Onsite vehicles are to have no more passengers than seats available on the vehicle. Personnel carts, golf carts or similar vehicles, where permitted, shall only have as many riders as seats available. Failure to follow this requirement will lead to removal of personnel from the project.

The Contractor shall maintain a Safety Program, for the purpose of safety, security, orientation, education, training, enforcement, and distribution.

If a fire line or any type of fire suppression service is going to be taken out of service, the Contractor must coordinate with the Airport Authority's Public Safety Fire Marshal or a designated representative from the Airport Authority's Fire Division at least three days in advance. In addition, the contractor shall complete an impairment notification to the insurance carrier. Impairment kits can be obtained by contacting the Airport Authority building operator, Airport Authority Maintenance Division, or Airport Authority Risk Management Unit.

If a security system (cameras, gates, lifts, doors, etc) is going to be taken out of service, the Contractor shall coordinate with the Airport Authority Security Division at least three days in advance. Pending certain security threat levels, permission may not be granted to take down a security system.

Potable water line installation will require coordination with the Airport Authority Facilities and Infrastructure Division. In addition, a permit application may have to be completed and submitted to the Airport Authority Planning, Design, and Construction Division.

The Contractor shall follow Detroit Water and Sewer Department guidelines for the installation and storage of potable water lines. Installation, storage, and testing results shall be coordinated with the Airport Authority Facilities and Infrastructure Division.

All pavement, concrete or surface painting shall be done from April 1 thru November 1. Painting that is performed outside these dates that do not take or pass inspection after the following season will be repainted at the Contractor's expense.

Employees shall not operate any equipment or vehicles more than 16 hours consecutively.

Any individual failing to follow these safety requirements will be directed by the Contractor to immediately abate the unsafe act, behavior, or equipment.

All Contractor equipment brought onsite for use on or during the construction project shall be kept in a safe operating condition. Worn or damaged equipment shall be repaired, replaced or taken out of service (locked out) and removed from the job site.

Contractor shall keep its work area in a clean and safe condition.
The use of makeshift, defective or inadequate scaffolding, rigging, or staging is prohibited.

The Contractor shall provide barriers, railings or coverings for all areas including, but not limited to, elevated work platforms, holes, excavations, roof openings, along roof edges, manholes, and/or unfinished work causing floor obstructions. Outside excavations, barriers, and safety signs shall be adequately illuminated during darkness.

No Contractor is permitted to use any powered industrial moving equipment, trucks, tools, or ladders owned or rented by, the Airport Authority.

The Contractor shall provide physical barriers along the perimeter of its work site and place signs identifying the area as a construction site. In some cases where the general public or open airfield is to

be protected, additional and/or specialty barriers might be required and will need to be determined by Airport Authority.

No Contractor is permitted to use any powered industrial moving equipment, trucks, tools, or ladders owned or rented by, the Airport Authority.

All individuals in the designated construction areas are required to wear hardhats, safety glasses, protective footwear, and any other protective clothing or gear as required by safety codes and regulations or as deemed necessary by the Contractor.

Contractors shall not perform work overhead of any member of the general public. The Contractor shall use physical barriers to prevent access by non-construction personnel to areas with overhead construction work. If the Contractor cannot restrict access to the overhead work area, work will cease until a method of restricting access is developed and implemented.

Welding screens and/or curtains will be used in areas where cutting or welding operations are being performed where non-construction personnel may be exposed to weld flash or sparks. Refer to Airport Authority Hot Work permit requirements.

Non-Airport Operations Areas (Non-AOA) road closures shall be coordinated with Airport Authority Planning, Design, and Construction Division. If road closures are required at YIP, then YIP Management shall be involved as well. Coordination shall take place at a minimum of five days prior to closure. Public roadways will be closed following the Michigan Uniform Traffic Code procedures.

Prior to mobilization the Contractor shall complete Contractor Employee Review, Contractor Safety Guidelines (Attachment 2). This document shall be kept on site and updated for every new employee who will work on the project.

Regular progress meetings will be conducted during construction. Part of the meeting will be dedicated to safety. During these meetings, the Contractor shall submit to WCAA the following safety information:

2.0 General Airfield Safety

This section is instead to be used to assist those Contractors who have access to the airfield. Warning lights shall meet the requirements of FAA Advisory Circular 150/5370-2F, or current edition as of bid date, Operational Safety on Airport during Construction. The Contractor's vehicles shall meet the requirements of FAA Advisory Circular 150/5210-5D or current edition as of bid date, Painting, Marking, and Lighting of Vehicles Used on an Airport.

Low profile barricades shall be in accordance with the details in the Contract Documents and meet the requirements of FAA Advisory Circular 150/5370-2F, or current edition as of bid date. The barricades shall be furnished, maintained and relocated during each phase by the Contractor. At the completion of the Contract, the entire quantity of barricades shall be delivered to the Airport Authority complete and in good working order and shall become property of the Airport Authority. Barricades shall be as detailed and installed per the Drawings along the affected pavement edge or access to a closed runway, taxiway or apron.

Safety fence shall be furnished and installed at the locations as indicated on the Contract Documents and/or directed by the Designer.

The power vacuum sweepers shall be Tymco, Model HSP-600 or Elgin Model Crosswind or an approved equal. Depending on the size of the project and construction activity on aircraft operations area, a broom type sweeper may be allowed by the Designer. The Contractor shall provide a minimum of one sweeper per taxiway intersection at all times.

Taxiway ending marker shall be furnished and installed at the locations as indicated on the Contract Documents and/or directed by the Designer. Taxiway ending marker shall meet the requirements of FAA Advisory Circular 150/5345-44J, Type L-858C, or current edition as of bid date.

Airfield Rescue and Firefighter (ARFF) roads cannot be taken out of service.

Equipment that is used for material handling on the airfield shall have working headlights and brake lights. Any equipment that exits the AOA onto public roadways is subject to MDOT regulations.

Contractor to coordinate jet fuel line work with Airport Authority Operations prior to disturbance.

The Contractor shall not pull any associated airfield lighting electrical cables through manholes, junction cans, pavement cans or through those devices if there are other cables present. All electrical cables shall be locked-out, tagged-out, and de-energized prior to work activities.

Contractor shall provide all lighted X's that are required on airfield work. Contractor will be responsible for placement, relocation, maintenance, and removal of the lighted X's.

Contractor will provide all lighted, low profile, water or sand filled, taxiway/runway barricading.

If working on the AOA, the Contractor will be required to prepare an FAA Safety Plan Compliance Document (SPCD) that is a part of the Safety Program.

Airport Operations Area (AOA) zipper road closure shall be coordinated with the DTW or YIP Airfield Operation Units. Coordination shall take place at a minimum of five days prior to closure.

The Contractor shall submit an FAA Form 7460-1 at least 60 days prior to any crane erections. All construction involving cranes shall further be coordinated at least 72 hours in advance, excluding weekends, with the applicable DTW and YIP Airfield Operation Division or Airport Authority Planning, Design, and Construction Division. This does not include the time required for airspacing. The following information and actions are required:

1. Location of the Crane.

2. Maximum extendable height.

3. Hours of operation.

4. The top of each crane boom shall be marked by a 3' x 3' orange and white checkered flag — each box being 1' square.

5. Each crane shall be lowered at night and during periods of poor visibility as directed by Airport Authority
   Airfield Operation Units or Airport Authority Planning, Design, and Construction Division. In the event the crane is approved to remain extended during the hours from sunset to sunrise, the highest point of the crane boom will be lit with a red obstruction light in accordance with AC 70/7460-1, and the Michigan Tall Structures Act.

3.0 Specific Airfield Safety

Taxiway ending marker shall be furnished and installed at the locations as indicated on the Contract Documents and/or directed by the Designer. Taxiway ending marker shall meet the requirements of FAA Advisory Circular 150/5345-44J, Type L-858C, or current edition as of bid date.

Runway Closure Marker (lighted X) shall meet the latest edition of FAA AC 150/5345-55, or current edition as of bid date, Lighted Visual Aid to Indicated Temporary Runway Closure. Runway Closure Marker shall be Sherwin Industries, Inc. S1701 product or an approved equal in accordance with the details shown on the Contract Documents and as approved by the Designer. At the completion of the project the Runway Closure Markers and all associated equipment shall become the property of the Airport Authority. The following are requirements for the Runway Closure marker:

A. Be a portable, towable unit that can be quickly removed from the runway. Includes a two inch bal hitch on the trailer tongue and second hitch mounted on the rear of the trailer.

B. Consist of clear incandescent lamps or transmit a white color, arranged in the shape of a letter "X" with arms crossed at an appropriate angle to make the “X” discernible. The arms shall be painted aviation yellow on all sides so that the unit will be clearly visible when it is in position.

C. Be energized by a portable power supply, water-cooled diesel engine.

D. Be controlled so that the lighted signal will flash all lights simultaneously at an approximate rate of 2.5 seconds “on” (+/- 20%) and 2.5 seconds “off” (+/- 20%).

E. Provide the following daytime and nighttime visual reference during Visual Flight Rule (VFR) conditions when placed on centerline and within 250 feet of the runway end:

F. Visible to the pilot at a range of at least 5 nautical miles.

G. Recognizable as a letter "X" from a range of at least l-1/2 nautical miles.

H. Provide lamp dimming capability for nighttime operations.

I. Produce a signal that provides a horizontal coverage to at least 15 degrees on each side of the runway centerline, and a vertical coverage from 0 degrees to 10 degrees above horizontal, both day and night, at a range of 1-l/2 nautical miles.

J. Adjustable aiming and leveling to allow tilting to an optimum angle of three degrees from vertical.

K. Withstand a minimum wind speed of at least 40 mph without affecting aiming or operation.

L. Include an illuminated failure indicator that is visible from the back (runway side) of the unit.

M. Include an operations placard in a conspicuous location that instructs operators to visually check the operation of the device every two hours.

N. One person set up in less than 5 minutes.

O. Diesel portable power with adapter to run directly from electrical outlets.

P. Trailer hitch options including tandem towing for on-airport operations.

Q. Ability to provide up to 120 hours of continuous operation.

R. Fail safe protection to ensure that the unit stays on as continuous light if the flasher unit should fail.

S. Dimensioning and lights arrangement shall follow FAA recommendations of AC 150/4535-55, or current edition as of bid date.

The power vacuum sweepers shall be Tymco, Model HSP-600 or Elgin Model Crosswind or an approved equal. Depending on the size of the project and construction activity on aircraft operations area, a broom type sweeper may be allowed by the Designer. The Contractor shall provide a minimum of one sweeper per taxiway intersection at all times.

In compliance with FAA AC 150/5370-2F, or current edition as of bid date, the Contractor shall prepare a Safety Plan Compliance Document (SPCD). This document shall include a general statement by the Contractor that he/she has read and will abide by the CSPP. Any details not identifiable for the CSPP should be included within the SPCD. The SPCD is similar to the CSPP but shall not contain duplicate information. The contractor must submit the SPCD to the Airport Authority for approval prior to the issuance of the NTP. The SPCD shall include but not be limited to the following Checklist as applicable to the scope of the project:

Coordination. Discuss details of proposed safety meetings with the Airport operator and with contractor employees and subcontractors.

Phasing. Discuss proposed construction schedule elements, including:

- Duration of each phase.
- Daily start and finish of construction, including "night only" construction.
- Duration of construction activities during:
    - Normal runway operations.
    - Closed runway operations.
    - Modified runway "Aircraft Reference Code" usage.

Areas and operations affected by the construction activity. These areas and operations should be identified in the CSPP and should not require an entry in the SPCD.

Protection of NAVAIDS. Discuss specific methods proposed to protect operating NAVAIDS.

Contractor access. Provide the following:

- Details on how the Contractor will maintain the integrity of the Airport security fence (contract security officers, daily log of construction personnel, and other).
- Listing of individual requiring driver training (for certificated airports and as requested).
- Radio communications.
    - Types of radios and backup capabilities.
    - Who will be monitoring radios.
    - Whom to contact if the Air Traffic Control Tower (ATCT) cannot reach the Contractor's designated person by radio.

- Details on how the contractor will escort material delivery vehicles.

Wildlife management. Discuss the following:
- Methods and procedures to prevent wildlife attraction.
- Wildlife reporting procedures.

Foreign Object Debris (FOD) management. Discuss equipment and methods for control of FOD, including construction debris and dust.

Hazardous material (HAZMAT) management. Discuss equipment and methods for responding to hazardous spills.

Notification of construction activities. Provide the following:
- Contractor points of contact.
- Contractor emergency contact.
- Listing of tall or other requested equipment proposed for use on the airport and the time frame for submitting 7460-1 forms not previously submitted by the Airport operator.
- Batch plant details, including 7460-1 submittal.

Inspection requirements. Discuss daily (or more frequent) inspections and special inspection procedures.

Underground utilities. Discuss proposed methods of identifying and protecting underground utilities.

Penalties. Penalties should be identified in the CSPP and should not require an entry in the SPCD.

Special conditions. Discuss proposed actions for each special condition identified in the CSPP.

Runway and taxiway visual aids. Including marking, lighting, signs and visual NAVAIDs. Discuss proposed visual aids including the following:
- Equipment and methods for covering signage and airfield lights.
- Equipment and methods for temporary closure markings (paint, fabric, other).
- Types of temporary Visual Guidance Slope Indicators (VGSI).

Markings and signs for access routes. Discuss proposed methods of demarcating access routes for vehicle drivers.

Hazard marking and lighting. Discuss proposed equipment and methods for identifying excavation areas.

Protection of runway and taxiway safety areas. Including object free areas, obstacle free zones, and approach/departure surfaces. Discuss proposed methods of identifying, demarcating, and protecting airport surfaces including:
- Equipment and methods for maintaining Taxiway Safety Area standards.
- Equipment and methods for separation of construction operations from aircraft operations, including details of barricades.
- Other limitations on construction should be identified in the CSPP and should not require an entry in the SPCD.

The Safety Program, including the SPCD, shall be submitted to the Airport Authority for review.

Contractor shall be familiar with all existing and limiting conditions that will or may have a bearing on the performance of the Contract with regard to safety. Any limiting conditions shall be identified in writing.

Throughout the duration of the Contract, any practice or situation that the Designer determines to be unsafe or a hindrance to regular Airport operations shall be immediately rectified.

The following publications contain definitions/descriptions of critical Airport operating areas. The areas defined below pertain to airfield safety requirements and are referenced throughout the Contract Documents. Copies of these publications are available from the FAA at www.faa.gov. Advisory Circular 150/5370-2F, or current edition as of bid date, "Operational Safety on Airports During Construction": Sets forth guidelines to assist Airport operators in complying with FAR Part 139, "Certification and Operation/Land Airports Serving Certain Air Carriers" and with the requirements of federally funded construction projects.

FAR Part 77, "Objects Affecting Navigable Airspace," Current Edition: Establishes standards for determining obstructions to navigable airspace. Civil Airport imaginary surfaces are defined in the publication. It also sets forth requirements for notice of certain proposed construction or alteration. Notice of construction provides a basis for recommendations for identifying the construction or alteration in accordance with AC 70/7460-1, "Obstruction Marking and Lighting," or current edition as of bid date.
AC 150/5300-13, "Airport Design" or current edition as of bid date: Establishes design, operational and maintenance standards for Airports. Standard terms used in the Contract Documents are defined below:

Runway Safety Area (RSA) - The defined surface surrounding the runway over which aircraft should, in dry weather, be able to cross at normal operating speeds without incurring significant damage. A safety area is graded, drained and compacted. It is free of any holes, trenches, humps or other significant surface variations or objects, other than those which must be there because of their essential aeronautical function. The safety area requires the capability of supporting maintenance, firefighting, and rescue vehicles under normal (dry) conditions.

Object Free Area (OFA) – An area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigations or aircraft ground maneuvering purposes.

Obstacle Free Zone (OFZ) – The OFZ is the airspace below 150 feet above the established Airport elevation and along the runway and extended runway centerline that is required to be clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance protection for aircraft landing or taking off from the runway, and for missed approaches. The OFZ is subdivided as follows:

Runway OFZ. The airspace above a surface centered on the runway centerline.
Inner-approach OFZ. The airspace above a surface centered on the extended runway centerline. It applies to runways with an approach lighting system.

Outer-approach OFZ. The airspace above the surfaces located on the outer edges of the runway OFZ and the inner-approach OFZ. It applies to runways with approach visibility minimums lower than ¾-statute mile.

Taxiway Safety Area (TSA) – A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

The work shall proceed in such a manner as to provide safe conditions for all workers and personnel. The sequence of operations shall be such that maximum protection is afforded to ensure that personnel and workers in the work area are not subject to any dangerous conditions.

Prior to commencement of construction activity, the Contractor shall notify in writing, at least 72 hours in advance, Airport Authority Operations and the Designer of its intentions to begin construction, stating the proposed time, date, and area of which construction is to occur in order for the appropriate Notice-to-Airmen (NOTAM) to be issued. During the performance of this Contract, the Airport facility shall remain in use to the maximum extent possible. The Contractor shall not allow employees, subcontractors, suppliers, or any other unauthorized persons to enter in any Airport area which may be open for aircraft use.

Should any of the following problems or hazards arise during construction, the Contractor shall immediately rectify/correct the problem or hazard to the satisfaction of the Designer and the Airport Authority: Trenches, holes, or excavations at or adjacent to any active runway or in safety areas. Unmarked/unlighted holes or excavation at any active apron, taxiway, taxilane, or related safety area. Mounds or piles of earth, construction materials, temporary structures, or other objects in the vicinity of any active taxiway, taxilane, or in a related safety, approach, or departure area.

Vehicles or equipment (whether operating or idle) on any active runway, taxiway, taxilane, or in any related safety, approach, or departure area. Vehicles, equipment, excavations, stockpiles, or other materials which could degrade or otherwise interfere with electronic signals from radios or navigational aids (NAVAIDS). Runway surfacing projects resulting in excessive lips greater than 1 inch for runways and exceeding 3 inches for edges between the old shoulder and new surfaces at runway edges and ends.

Unmarked utility, NAVAID, weather service, runway lighting, or other power or signal cables that could be damaged during construction. Objects (whether or not marked or flagged) or activities anywhere on or in the vicinity of the Airport which could be distracting, confusing, or alarming to pilots during aircraft operations.

Unflagged/unlighted low visibility items (such as tall cranes, drills, and the like) anywhere in the vicinity of active runways, or in any approach or departure area. Misleading or malfunctioning obstruction lights or unlighted/unmarked obstructions in an approach to any active runway.

Inadequate approach/departure surfaces needed to assure adequate landing/takeoff clearance over obstructions or work or storage areas. Inadequate, confusing or misleading (to user pilots) marking/lighting of runways, taxiways, or taxilanes, including displaced or relocated thresholds. Water, dirt, debris, or other transient accumulation which temporarily obscures pavement marking, pavement edges, or derogates visibility of runway/taxiway marking or lighting. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of Airport operations areas. Trash or other materials with foreign object damage (FOD) potential, whether on runways, taxiways, or aprons, or in related safety areas. Inadequate barricading or other marking which is placed to separate construction or maintenance areas from active aircraft operating areas.

Failure to control vehicle and human access to active aircraft operating areas. Construction/maintenance activities or materials which could hamper the response of aircraft rescue and firefighting (ARFF) equipment from reaching all aircraft or any part of the runway/taxiway system, runway approach and departure areas, and aircraft parking locations. Bird attractants on Airport, such as edibles (food scraps, etc.), miscellaneous trash, or ponded water.

4.0 Underground Work – Excavation, Shoring, Sheeting Trenching, Saw Cutting, and Drilling

The Contractor shall identify any known underground interferences or discrepancies on all available drawings that can be provided by contacting the Designer, Airport Authority Planning, Design, and Construction office and the Airport Authority Facilities & Infrastructure Division at:

WCAA Planning, Design, and Construction Office/Capital Improvement
Hours: Monday thru Friday 8:30 am – 4:00 pm

WCAA Facilities & Infrastructure Office
Hours: Monday thru Friday 8:30 am – 4:00 pm

Prior to commencing any excavation (on or off AOA), drilling (on or off the AOA), driving fence posts (along the AOA), trenching (on or off the AOA), saw cutting (AOA only), the Contractor shall review drawings with Airport Authority personnel to insure that all underground obstructions and utilities are identified. In addition the contractor shall contact MISS DIG and coordinate with the Airport Authority Call Center to assign the verification of utilities by Airport Authority Maintenance. Both MISS DIG and Airport Authority Maintenance and the Contractor shall attempt to locate utilities. The Contractor will be completely responsible for all damage to underground utilities. The Contractor shall coordinate request for sweeps of utilities by completing the Contractor Request For Sweep Form (Attachment #3) at least 72 hours prior to any excavations. One sweep of the identified area is covered under contract. After the sweeps have been completed, the Contractor shall complete the Trenching/Saw Cutting/Drilling/Excavation Checklist (Excavation Checklist) (Attachment #5). The Contractor shall not proceed until the Excavation Checklist has been signed by an Airport Authority representative or designee. If the sweep encompasses more than 5,000 linear feet or one acre, the request shall be made at least two weeks prior to completing the Excavation Checklist. Airport Authority will notify the Contractor a minimum with 24 hours after receiving notice. At that time the Airport Authority will indicate if it can complete the sweep. If it can't, the Contractor will be responsible to complete the sweep and/or use MISS DIG.

After the area has been successfully swept, the Contractor shall properly complete, sign, date, and distribute the Excavation Checklist (Attachment #5). Contractor may not commence excavation without an executed Excavation Checklist.

Each utility shall be swept in the following manner:

- Flags can be used but shall be color coordinated as suggested below. In addition the "acronym" for that utility shall be written on one side of the flag with a permanent marker.
- Stakes can be used. The top two inches of the stake shall be painted in color as suggested below. In addition the "acronym" for that utility shall be written on one side of the stake with a permanent marker.
- Painting is only authorized on asphalt, concrete, and metal surfaces. Markings shall be color coordinated as suggested below. The acronym for the utility shall be used for each utility. A line that shows the direction of the utility shall emanate from the acronym in each direction.
- All marking of utilities shall be every 50 feet.

	Acronym	**Color**
Electrical Loops (non AOA)	Use "Elec"	Red
Airfield Electrical	Use "Elec"	Red

Natural Gas	Use “Nat Gas”	Yellow
Sanitary	Use “Sanit”	Brown
Storm	Use “Storm”	Brown
Combined Sewers	Use “Combo”	Brown
Water (potable and fire)	Use “Water”	Blue
FAA Copper	Use “FAA Cop”	Red
FAA Fiber	Use “FAA Fib”	Orange
WCAA Fiber	Use “Fiber”	Orange
Telephone	Use “Tele”	Orange
Jet Fuel	Use “Jet Fuel”	Yellow
Glycol	Use “Glycol”	Blue
Oil	Use “Oil”	Yellow
Gasoline	Use “Gas”	Yellow
Diesel	Use “Diesel”	Yellow
Steam	Use “Steam”	Black
Condensate	Use “Conden”	Black

*if abandoned still shall stake, mark, or flag but write down “aband” before the abbreviated prefix indicated above.

The individual marking, staking, or flagging shall mark the utilities in a way that coincides with the drawings that are referenced on the Request for Sweep Form.

If a utility or any underground obstruction is found it shall be reported immediately to the Designer or the Airport Authority Project Supervisor.

Contractor employees in an excavation shall be protected from cave-ins by an adequate protective system unless the excavation is:

- Made entirely of stable rock, or
- Less than 5 feet deep and determination has been made that there is no potential for a cave-in.

Excavation shall be protected using proper barricading materials which shall be installed a minimum of 6 feet back from excavation (unless in conflict with airfield requirements). Barricade material can be wood, steel cables, or chain supported at intervals so that the barricade does not sag or drop below the required height. Caution tape is not an approved barricade material. Guardrail/jersey barriers may be required and shall provide a top rail, mid rail, and toe board at proper elevations and be able to withstand a minimum 200 pound of force without collapsing.

The Contractor is responsible for documenting utility information for use during construction and preparation of as-builts.

Should the Contractor need additional sweeps to be performed by the Airport Authority, the Contractor shall submit a new Contractor Request for Sweep Form (Attachment #3).If a sweep of an area already swept is requested, the Contractor shall be responsible for all associated costs of the subsequent sweep(s), including time for Airport Authority personnel.

The Contractor, as needed, will conform to the Miss Dig Facility Damage & Safety Prevention Act.

5.0 Fall Protection Control

Fall Hazard Control requires that Contractors comply with fall prevention and protection procedures in accordance with Michigan Occupational Safety and health Administration (MIOSHA) Part 45.

The Contractor shall not use any tie off points unless pre-approved by the Airport Authority.

Fall Protection wile b required on specific mobile equipment and platforms.

Installation of fall protection systems on the ground:

- As much as practicable, fall protection such as nets, and lifelines, are installed on material and equipment on the ground.

Reducing fall hazards in the construction process:

- As much as practicable, permanent stairs, floors, decking, handrails, and walls are installed as the structures are being built. Also, material and equipment such as structural steel and tanks are erected in sections and painted on the ground to reduce fall exposures.

Safe access:

- Methods to provide safe access to work areas are included in the JHA. Safe access includes ladders, scaffold, stairways, and ramps. Climbing structural steel and equipment is not allowed.

Training:

- Before employees are allowed to use a particular fall protection method or system, they are properly trained on proper use and limitations of the system. The training is the responsibility of their supervisor.

When not protected by any other means of fall protection such as safety nets or scaffold with proper guardrails, employees shall use full body harnesses, shock absorbing lanyards with double locking snap hooks, and an adequate anchorage (fall arrest equipment). To achieve 100 percent fall protection, employees may need to use a double lanyard system and/or vertical or horizontal lifelines, retractable lifelines, or other such approved devices. Employees shall rig fall arrest equipment so that they can neither free fall more than 6 feet nor contact any lower object. Anchorage points for fall arrest equipment shall be capable of supporting 5,000 pounds per employee and located above the employee's body harness attachment point where practicable. Anchorage points shall be independent of any anchorage being used to support or suspend scaffolds or other platforms.

When vertical lifelines are used, each employee shall be protected by a separate lifeline. The lifeline shall be properly weighted at the bottom and terminated to preclude a device such as a rope grab from falling off the line. Horizontal lifelines should be limited to two persons at one time between supports. Horizontal lifelines shall be designed, installed, and used under the supervision of a qualified person. The horizontal lifeline shall be designed to maintain a safety factor of at least two.

Prior to each use, employees shall visually inspect all fall arrest equipment for cuts, cracks, tears or abrasions, undue stretching, overall deterioration, mildew, operational defects, heat damage, or acid or other corrosion. Equipment showing any defect shall be withdrawn from service.

All fall arrest equipment subjected to impacts caused by a free fall or by testing shall be removed from service.
Employees should store all fall arrest equipment in a cool dry place not subjected to direct sunlight.
Employees shall not use fall arrest equipment until they have been properly trained in its use.

Foremen shall ensure fall protection is available and used as required for all employees they are responsible for.

Fall arrest equipment shall not be used for any other purpose such as tow ropes or hoist lines.
Proper guardrails shall be installed on open sides of all walkways and runways where the fall distance exceeds 4 feet.

Proper guardrails shall be installed on all open sided floors where the fall distance exceeds 4 feet.

All floor openings or floor holes shall be protected by guardrails or hole covers. If hole covers are used, they shall be strong enough to support the maximum intended load, secured against displacement, and properly labeled. If the cover is subject to vehicular traffic, it shall be capable of supporting at least two times the axle load of the largest vehicle expected to cross over it. When operating a scissor lift work platform, the lift shall have guardrails on all open sides and the door access chains or rails in place.

Employees operating aerial lifts shall wear a body harness and lanyard attached to the aerial lift. Employees shall not attach the lanyard to an independent structure. Employees riding in a crane suspended work platform shall wear a body harness and lanyard attached to the grab rail of the platform.
Employees working on wall forms or rebar shall wear a body harness and lanyard in addition to a positioning device when exposed to a fall in excess of 6 feet. Position devices shall be rigged to prevent a free fall greater than 24 inches.

Stairs, ladders, or ramps shall be provided for all access ways where there is a change in elevation greater than 19 inches.
When guardrails are used for fall protection, they shall consist of a top rail, intermediate rail, and toeboard. The top rail shall have a vertical height of 42 inches, the midrail shall be at 21 inches, and the toeboard 4 inches. Guardrail systems shall be constructed so that there are no openings greater than 19 inches. When wood railings are used, the post shall be of at least 2 inch by 4 inch stock spaced not to exceed 8 feet, the top rail shall be of at least 2 inch by 4 inch stock, and the intermediate rail shall be of at least 1 inch by 6 inch stock. If pipe is used, it shall be at least 1-1/2 inch nominal diameter. If structural steel is used, it shall be of 2 inch by 2 inch by 3/8 inch angles or equivalent. If wire rope is used for railings, it shall have a diameter of at least 1/2 inch and be stretched taut to allow no more than a 3 inch deflection. Guardrail systems shall be capable of supporting a force of at least 200 pounds applied within 2 inches of the top edge.

Guardrail systems shall be constructed so that when a 200 pound force is applied in a downward direction, it will not deflect to a height less than 39 inches.

If wire rope is used for top rails, it shall be flagged at no more than 6 foot intervals with high visibility material.
Manila or synthetic rope shall not be used as guardrails. Employees shall not stand or sit on guardrails.

If an employee ever feels that any piece of his or her fall protection equipment is unacceptable or unsafe, he/she must contact his/her super-visor, who will immediately turn the equipment in for replacement. Harnesses, lanyards, hooks, etc., shall be visually inspected for the condition of rivets, buckles, stitching, D-rings, tabs, frayed or broken strands, cuts and abrasions, burns, rot, soundness of latching and locking mechanisms, and general appearance. Any piece of fall protection equipment that does not pass inspection will be immediately destroyed and replaced. Any piece that is subjected to loading will be immediately destroyed and replaced.

6.0 Fire Prevention

The Contractor shall provide appropriate fire extinguishers for its employees.

The Contractor shall not shut down or in any way interfere with the normal operation of the Airport Authority's sprinkler or fire control system. In all cases where the Contractor requires draining of a sprinkler system, a request shall be made with the Airport Authority Fire Division.

The Contractor shall not attach any tooling, equipment, rigging or any other device to a sprinkler pipe. Ladders shall not be placed against sprinkler pipes.

Contractor shall field verify location at sprinkler heads prior to performing cutting, burning, and/or welding operations. If in doubt, contact the Airport Authority Fire Marshall. Any damage to a sprinkler system shall be reported and repaired immediately.

Materials, trucks, ladders, racks and all other equipment shall be kept clear of aisles, exits, and firefighting equipment, sprinkler risers, fire alarm boxes, electrical lighting, power panels, and valves.

No burning, cutting , welding, or heat generating operation shall be allowed in any area on Airport Authority property without first obtaining a Wayne County Airport Authority - Hot Work permit from the Airport Authority Fire Division (Attachment #4).

Only the Airport Authority Fire Division will issue welding and burning permits. An inspection of the work area will be conducted prior to issuance of the permit. Issuance of the permit will allow heat generating operations to be performed in the areas stated on the permit only. Permits are good for the shift they are issued on. If work is going to continue on the next shift, a new permit is required unless approved by the Airport Authority Fire Division.

Oxygen and acetylene cylinders not in use, shall be properly stored and capped, and secured by a chain or rope. All flammable liquids shall be stored in approved safety containers. Airport Authority Fire Division shall give permission before any quantity in excess of 5 gallons is brought onto the Airport Authority's property. Oily rags and/or rags soaked with flammable liquids shall be stored in approved safety containers only. Paint and painter's equipment, drop sheets, cleaning materials, shall be stored in a clear area away from any heat generating operation.

Lids shall be replaced on all opened paint and/or solvent containers. All solvents are to be stored in approved safety containers.

7.0 Crane/Derricks/Lifting Equipment/Rigging

All crane operators shall be thoroughly knowledgeable in the operations of the crane, rigging equipment, and other MISOHA requirements relating to lifting.

NOTAMS may be required depending upon the location and height of the lift. Contractor shall contact Airport Authority Airfield Operations (734) 942-3685 prior to any crane activity. Lifting shall not be done over any employees. Tag lines shall be used for all lifts greater than 20 feet. No lifts shall be made when winds are sustained over 25 mph. Outrigger shall be shored so they do not damage property. Contractor will be responsible for any property damage to paved or concrete surfaces.

A prelift review shall be performed by the Contractor for every critical lift. A Critical lift shall be defined as a lift with a hoisted load that is within 15% of the maximum load limits (normal) of the equipment that is being used. Before a critical lift is performed the Contractor shall submit a Critical Lift Plan that is prepared and approved by a Professional Engineer that is registered with the State of Michigan. The Critical lift Plan will include the following:

- Description of the lift
- Crane Position
- Lift Height
- Load Radius
- Boom and angle
- Size and weight of load
- Percent of cranes capacity
- Personnel involved
- Rigging plan
- Communications methods
- Ground Conditions
- Inspection Procedures
- Procedures for hosting (if applicable)
- The critical lift plan will also document the source (i.e. weight, crane and rigging capacities, inspections, and wind speeds).

8.0 Hazardous Energy Control

Examples of energy sources that are required to be locked out and tagged regardless of who has custody are:
Any time repairs or modifications are made to electrical systems, either temporary or permanent, they shall be locked out. Locks shall be applied to the main disconnect switch whenever possible. A tag shall accompany all locks.

Electrical systems that provide electrical power to equipment, such as pumps and electrical motors, shall be locked out by the Contractor until such time that system is released. Depending upon the location of the work, the disconnects may have to be coordinated with the Airport Authority Electrical Unit or an Airport Authority Building Operator.

Electrical systems that provide electrical power to the airfield signage and lighting.
Lines, valves and similar systems that are being tested pneumatically or with Inert gases, such as oxygen, shall be tagged and locked out to prevent an accidental discharge of the pressure within the line. In addition, areas affected by the pneumatic test shall be barricaded against entry and inspected by the Contractor prior to commencement of the test.

Air lines, hydraulic lines, gas lines, blanking, pressure storage units, valves, capacitors and other such sources that could be inadvertently activated or discharged causing a hazardous condition, shall be locked out, blanked or otherwise neutralized to prevent accidental activation.

Any steam, natural gas, refrigeration, chemical feed, glycol, water, fuel oil, diesel, and jet fuel lines that could be inadvertently activated or discharged causing a hazardous condition, shall be locked out, blanked or otherwise neutralized to prevent accidental activation and or a hazardous condition. In some cases double block and bleed maybe required.

Access to all electrical systems will be coordinated by the Airport Authority Electrical Unit. This includes access to all panels, breakers, switches, relays, substations, and all relevant switch gear. All initial desegregation and reenergizing will be coordinated through the Airport Authority Electrical Unit.
Access to all utilities and equipment not including electrical systems can be coordinated with the Airport Authority Maintenance and the Facilities and Infrastructure Divisions.

In some cases a "system" may be turned over to a Contractor or Vendor for repairs and testing. If a system is turned over to a Contractor or Vendor for testing and repairs, the lock-out rules below in this Part still apply.
To get a system energized or de-energized, the Contractor will get approval from the Airport Authority Project Representative. This will require coordination with various Airport Authority departments. If a system is de-energized, back-up utility service may be necessary (i.e. electrical generator) pending the details of the work and proposed outage.

Shutting down systems will be conducted in a manner that will minimize interruption. The Contractor shall complete the Utility Interruption Form (Attachment #6) and submit it to the Airport Authority Project Representative at least five business days in advance prior the shut down. The Airport Authority Project Representative will coordinate with those tenants/lease holders who will be affected by the shut down. All outages will be conducted on midnights unless authorized by the Airport Authority Project Representative.
To take overall control and custody of a system for a period of time, the contractor shall complete and execute the Airport Authority Utility System Custody Form (Attachment #7) five business days in advance prior to work with all the proper notifications

Systems that are 480 volts or more will not be turned over to Contractors, unless authorized by the Airport Authority Electrical Department.

If more than one employee is required to lockout and tag a circuit or piece of equipment, a multiple padlock device (hasp) shall be used.
Depending upon the location of the work, some disconnects may have to be coordinated with the Airport Authority Building Operator/Tennant.

This procedure establishes a lockout practice for securing machinery and equipment during periods of construction and maintenance. It is essential that all Contractors are consistent with their lockout procedure to ensure the safety of all employees. A lockout procedure is to render inoperative electrical systems, air lines, hydraulic lines, mechanical devices, pumps, conveyors, fuel, glycol, water, gasoline, jet fuel, pipelines, valves and all other such energy and stored energy systems that may accidentally be energized or discharged while employees are working on them before they are ready and released for service.

Contractors shall administer their own lockout program where not identified by this document. The Contractor shall issue all locks and applicable tags to their foreman, general foreman, superintendents and employees as necessary. The Contractor shall maintain a lock and tag log. Tags are required to have the Contractor's name, phone number, employee name, and supervisor name easily identified on each tag. Contractors shall use lock boxes in all areas except:

- Airport Lighting Vaults at Willow Run and Detroit Metro
- North Terminal Substation #1
- North Terminal Substation #2
- North Terminal Substation #3
- North Terminal Substation #4
- Wayne County Airport Authority Boiler Plant/Powerhouse (Building 611).
- Metro Energy Center
- McNamara Terminal Substation #1
- McNamara Terminal Substation #2
- McNamara Terminal Substation #3
- McNamara Terminal Substation #4
- McNamara Terminal Substation #5
- McNamara Terminal Substation #6
- McNamara Terminal Substation #7
- McNamara Terminal Substation #8
- Building Substations – Willow Run
-

Areas above (1-15) are locations that have pre-designed lock out tag out boards, podiums, and/or Airport Authority provided lock boxes that will be utilized. After equipment has been locally de-energized (i.e. regulator or switch gear) by Airport Authority Electricians, Airport Authority Electricians will lock out the device with an Airport Authority administrative lock and HASP. The Contractor will be required to place their HASP on the Airport Authority HASP at the local disconnect. Afterwards the contractor will be required to hang their personal locks and tags at the local disconnect on their HASP. The Airport Authority will lock all the administrative keys inside the podium or the Airport Authority provided lock box. During work activities the equipment will be locked out and under control of the Airport Authority Electrical Unit. If a Contractor needs to access the electrical room or vault to remove locks and tags they shall coordinate with the Airport Authority Electrical Unit.

All other areas where lock out tag outs are to be completed and not specified above in item K will be considered as remote locations. At remote locations the Contractor and the Airport Authority will follow the same procedures as listed above, but will keep the administrative keys in a lock box at a designated location.

When Airport Authority employees are to work on equipment that contractors are also working on, WCAA employees will place their personal locks and tags on the Airport Authority HASP.

All energy sources shall be locked out and a "DANGER" tag affixed to the equipment or System indicating who installed the lock, Contractor's name, phone number (24-hour contact), and the reason the system was locked out. Each employee shall be responsible for hanging his or her own lock and tag on the proper piece of equipment before starting work. No employee or other Contractor may work on a lock and tag belonging to another employee. Contractor supervision shall be responsible for assisting employees in locating the proper piece of equipment to be locked out and tagged. Each employee involved with "lockout" shall have a lock with an individual key. No locks with duplicate or master keys shall be used. Contractors are required to identify locks by either tags, paint or die markings. Unidentified locks are subject to removal by using the "lock removal procedure."

After locking out and tagging a circuit, an attempt to energize the equipment shall be made by depressing or turning "on" all starting stations before work begins. In no case shall work begin before circuits and equipment are tested to ensure that they are, in fact, de-energized.

Any employee who removes a tag or lock belonging to another employee or person, or overrides a tag or lock in any way, may be removed from the Airport property. Written authorization has to be obtained from the foreman, general foreman, superintendent and Project Manager of the responsible Contractor when a lock has been left on a piece of equipment and the originator is not available for removal.

When locks and tags are required, Contractors employees working on that system shall notify their appropriate supervisor. The supervisor, or his designee, shall see that appropriate locks and tags are provided. When work is completed, the appropriate supervisor is also to be notified when locks and tags are removed.

After equipment or systems are turned over to the Airport Authority, no work or Airport Authority modifications will be performed without compliance to Airport Authority's Lockout/Tagout Program.

There may be some equipment that cannot be physically locked out using any type of device. If a situation exists where equipment cannot be locked out the contractor shall notify the Airport Authority and a Job Hazard Analysis is to be prepared.

9.0 Confined Space Entries

The Airport Authority has several "confined spaces" which will require a written permit prior to entry in accordance with the MIOSHA standard for permit required confined spaces Part 90 and Part 490.

Airport Authority's confined space procedures can be obtained by contacting the Airport Authority Risk Management department. After reviewing the Airport Authority Confined Space Procedures, the contractor shall evaluate and follow their confined space entry guideline. It is up to each contractor to perform a pre-entry inspection and to classify the confined space. If a classification cannot be achieved the contractor is to work with the Airport Authority Environmental and Risk Management Units.

Airport Authority Fire Division will not act as "Standby" for confined space services.
Any Contractor involved in a confined space entry shall meet all State, Federal, and Airport Authority standards, relative to confined spaces, including:

- MIOSHA requirements.
- Demonstration of proof that their employees who enter, act as standby attendants, issue permits, or perform rescue team functions have been properly trained.
- Issuance and posting of their confined space entry permits by qualified permit issuers.
- Providing appropriate confined space instrumentation to measure oxygen levels, explosive atmospheres, or the presence of toxic gases.
- Providing rescue equipment.

Airport Authority personnel will not perform the above confined space entry procedures for Contractors or provide any instrumentation or equipment. However, the Airport Authority will provide the necessary equipment where Airport Authority personnel will also be entering the confined space.

When Airport Authority employees are also entering the same confined space as the Contractors, Airport Authority employees will control the confined space entry.

10.0 Hazardous Materials/Environmental

Work on Airport Authority projects may involve hazardous materials. If working in buildings with suspect materials please contact the Airport Authority Environmental unit for clarification on those suspected material.

Hazardous materials can be easily identified using the U.S. Department of Transportation (DOT) labeling and identification system. All hazardous materials arriving on site shall be properly labeled, stored, and managed as required by the Material Safety Data Sheet (MSDS) for that material, or as directed by Airport Authority Fire, Airport Authority Environmental and Airport Authority Risk Management. If shipments are being shipped to Willow Run, then Willow Run Maintenance (734-485-6672) shall be notified separately as well as Airport Authority Environmental, Airport Authority Fire, and Airport Authority Risk Management.

All wastes shall be properly stored, labeled, managed, and disposed of in accordance with the Airport Authority project specifications and Michigan Department of Environmental Quality (MDEQ) regulations, or as otherwise directed by the Airport Authority Environmental personnel.

Contractors and Subcontractors are required to have copies of all MSDS's for all materials brought on site.
If suspect unknown hazardous materials are identified, then the job should stop until further direction by the Airport Authority Environmental and Risk Management Departments.

If potentially hazardous waste/materials have been indicated in the bid documents and could be foreseen in a project, proposal, or work order, then the contractor is expected to have onsite the proper personal protective equipment and instruments for detection and safety.

Contractor shall provide mitigation plans for projects that include abatement or remediation.

Contractor to immediately report spills to Airport Authority Operations and MDEQ. Reports are to conform to MDEQ requirements.

11.0 Roofing Operations

Access to the rooftops shall be coordinated with the Airport Authority Project Representative.

Bitumen kettles will not be permitted on the Airport Authority's property until the Airport Authority Fire Division has inspected them. Once approved, the Airport Authority Fire Division will designate the location of the kettle. The Contractor or Subcontractor shall provide fire extinguishing equipment suitable for the operation. Propane tank shall be properly protected.

Smoking, cutting, burning, or welding will not be permitted on any roof where roofing operations are being performed.

Where large quantities of bitumen are required for roofing operations, the material will be mechanically pumped to the roof.

Reduce the possibility of fires by keeping work areas clean. This shall be done on daily basis.

Fall protection requirements shall be adhered to including perimeter protection, harnesses with lifelines, warning line system within 6 feet of roof edge.

Access to the roof and ladders shall be cleared by Airport Authority Security and the Building operator.

12.0 Removal of Existing Equipment

This section does not pertain to large-scale demolition work. Removal of abandoned or existing equipment, hangers, piping, conduit, etc. is a major safety concern at the construction site throughout the duration of the contract. When reviewing the scope of work, a site hazard assessment will be completed by the Contractor, with all safety and environmental concerns addressed, including methods of removal. Mechanical means of removal will be used versus oxy-gas cutting, whenever possible.

Special consideration should be given for the use of mechanical shearing where removing of building structure will be involved and the structure is contaminated with lead paint. Hydraulic lines can be cut easily. Residual hydraulic oil in lines can cause dangerous flashback if cut with a torch. Even though the lines are drained, not all of the hydraulic fluid can be removed. Galvanized conduit and raceways filled with wires can be cut with the shear. This eliminates potentially hazardous vapors, gases, and fumes coming from the galvanizing and wiring.

Selection of the mechanical equipment will be the responsibility of the Contractor, but shall meet the approval of the Airport Authority. To avoid nuisance odors and possible disruptions to adjacent populated work areas and the general public, work may have to be performed during low peak periods. All rented equipment will be equipped with suitable audio and/or visual back up alarms and shall meet applicable government requirements.

13.0 Vehicle Operation on the AOA

All vehicles accessing the AOA shall be placarded with a company name and logo or some other form of identification. All vehicles shall be limited to the Airport zipper road, paved leasehold areas and/or construction areas unless specifically authorized by the DTW or YIP Airfield Operations Unit.

All construction vehicles/mechanized equipment authorized within the Movement Area or related safety areas shall be marked with a flag on a staff attached to the uppermost portion of the vehicle/motorized equipment so that the flag will be readily visible. The flag shall be at least a 3' x 3' square having a checkered pattern of international orange and white squares at least 1' on each side in accordance with FAA Advisory Circular 150/5210-5.D, or current edition as of bid date.

During nighttime hours, all equipment operating on the Airport exceeding 15 feet in height shall be lit with a red obstruction light in accordance with FAA Advisory Circular 70/7460-1, or current edition as of bid date. This light is to be located on the uppermost portion of the equipment.

All construction equipment that exceeds 20 feet in height are required to be "airspaced" as determined by the FAA Form 7460-1. This will require the contractor to notify the DTW or YIP Operations Units so that may have to issues a NOTAM.

Contractor utilized bicycles, motorcycles and two-wheeled scooters are prohibited on the AOA. Vehicle(s)/equipment shall be operated in a manner that does not interfere with aircraft operations. All vehicle(s)/equipment shall yield right of way to all aircraft and emergency vehicles. Vehicles/mechanized equipment operators shall obey all traffic signs and markings.

Vehicles/equipment shall not stop or be parked so as to block a driveway, AOA access gate, fire lane or aircraft
Vehicles/equipment shall not stop or be parked in areas other than those prearranged and approved by the DTW or YIP Airfield Operation Units.

No equipment or vehicles may be parked within six feet of an AOA fence. The established speed limit on the Ramp and AOA is 15 mph. Vehicle(s)/equipment shall not be operated by individuals under the influence of any substance which impairs the ability to do so in a safe manner

If an incident occurs on the AOA the incident shall be reported immediately to the DTW or YIP Airfield Operation Units by contacting (734) 942-3685. Airport Authority DTW and YIP Airfield Operations and Airport Authority Public Safety have the right to investigative all incidents and issue citations. The Contractor is still obligated to produce their own incident report to be submitted to the Airport Authority upon request. The Contractor is required to submit an incident report no later than 24 hours after the incident.

Vehicle/mechanized equipment operators are not permitted to move about the Airport, outside the designated construction area, at night unless the vehicle has operating head lights, tail lights and brake lights, or is under the escort of a properly lighted vehicle. Head lights shall not be set on high beam when moving about the Airport at night.

Vehicles/mechanized equipment authorized on the Movement Area (runways, taxiways, and ramps) and/or associated safety areas shall be equipped with an electrically powered, amber color, 360-degree omni-direction light, mounted on the vehicle such that it is conspicuous from any direction.

At no time shall a vehicle enter the Movement Area and/or associated safety areas unless it is authorized by the DTW or YIP Airfield Operation Units and is in continuous radio communication with the Control Tower. If a vehicle is not radio equipped to communicate with the Control Tower, an escort vehicle equipped with such a

radio shall lead or direct the movement of this vehicle while operating on the Movement Area unless the construction area is completely closed to Airport movement and cordoned off. Coordination of escorts shall be prearranged with the DTW or YIP Airfield Operation Units. Any individual authorized unescorted access to the Movement Area or associated safety areas shall have completed the driver training program administered by the DTW or YIP Airfield Operations Department.

Seat belts shall be utilized on equipment/vehicles that are designed for usage.

The Airport Authority may remove and impound, at the owner's expense, any vehicle/equipment which is disabled, abandoned, improperly parked, or represents an operational hazard

All vehicles/equipment shall be appropriately secured such that neither aircraft blast nor wind will result in their movement.

14.0 AOA Contractor Escorts

AOA Contractor Escorts and Flagging
The Contractor shall provide an adequate number of escorts/flaggers for material deliveries along haul routes and the movements of the Contractor's vehicles/mechanized equipment and personnel within the Movement Area and Non-Movement Areas as authorized by the DTW or YIP Airfield Operation Units. To arrange for employees to become an escort the contractor shall complete the following:

> For DTW Projects: those selected Non-Movement Area escort employees are required to be badged by Airport Security, go through Security Identification Display Area (SIDA) training program, and pass the computerized test. Office hours for Credentials are Monday thru Friday from 8:30 am until 4:00 pm (closed 11:30-12:30 for lunch). The office can be contacted at (734) 932-3606 or visit the Airport Authority's website at www.metroairport.com and click on the "Badging" link on the top tool bar for additional information on Badge processing. Upon successfully completing the security requirements, those employees who have been selected as escorts shall contact the Airport Authority Airfield Operations Access and Permits office to coordinate finalization of the permit and to coordinate training on the AOA with an DTW or YIP Airfield Operations agent. Training is performed at 10:00 am and 1:00 pm each day Monday thru Friday. The DTW Operations and Permits office can be reached at 734-942-3823.

Movement Area escort/flagging employees are required to complete and pass an additional eight hour class on Ground Vehicle Operations. For scheduling contact Airfield Operations Training Unit at (734) 942-3595. For YIP Projects: All employees are encouraged, but only Supervisory personnel (Foreman, Site Superintendants, Project Managers, etc.) are required to be trained and badged. These badged individuals will be responsible for escorting their employees and Subcontractors in closed and cordoned construction sites. The YIP Operations Unit, or designee, will perform any escorts in open AOA Movement Areas. Badge applicants are to complete the required badge paperwork (available at the office or online at http://www.willowrunairport.com/information/BadgingAccessControl.asp) and attend a 1.5 hour Airport Security/AOA Driver's Safety Training Class at the Operations/Security Office (734) 485-6675. Training is provided at 10:00 am and 1:30 pm Tuesdays and Thursdays, by appointment only. A $20 non-refundable badge processing fee, payable in cash or money order only, will be charged for each badge.

During any absence of the approved escort(s)/flagger(s) or for periods that they are unable to perform their specified duties, all work within the Movement Area and associated safety areas for projects shall stop. Additionally, all personnel and equipment shall be escorted to approved locations outside the Movement Area and related safety areas. NO contract time extension will be granted for time lost due to the absence of escort(s). Work shall resume only with the return of the approved escort(s).

The escort/flagger shall ensure that all equipment maintains proper clearances from moving aircraft.

For flaggers/escorts contracted through the Airport Authority, the Contractor shall be responsible for the cost of each required flagger/escort at the hourly rate identified on the Wayne County Airport Authority Flagging/Escorting Service Request Authorization Form (See WCAA Airside Operations). The Contractor shall also be responsible for completing and submitting this form.

15.0 Special Construction Rules on the AOA

When airfield construction is being performed on the AOA the following rules will apply unless modified in writing by the DTW or YIP Airfield Operation Units. All construction activities on the AOA shall include a specific Construction Safety Phasing Plan (CSPP) and a Safety Plan Compliance Document (SPCD)as required by the FAA. The SPCD will address compliance to and details required by the CSPP and include any other topics of discussion that might be mentioned during the safety phase planning meeting.

The safety phase planning meeting shall be held prior to mobilization to the AOA. Any Airport construction and/or alteration requires the Contractor to complete and submit FAA Form 7460-1 Notice of Proposed Construction or Alteration (available from the FAA Air Traffic Division Regional Office), and www.FAA.gov at least 60 days prior to the start of the project.

The Contractor shall complete and submit FAA Form 7460-1 for all equipment and/or temporary structures, utilized during any Airport construction and/or alteration that exceeds a height of 20 feet above ground level. This includes

- Cranes;
- Derricks;
- Stockpiles of materials or equipment; and
- Earthmoving equipment.

A copy of all completed FAA Form 7460-1's and the FAA's determination(s) shall be on file with the Department of Aviation prior to commencing the erection or construction of the item(s) proposed by the Contractor. The Contractor will provide the DTW or Yip Airfield Operation Units with the FAA determination number, for internet review, or paper copy of the full determination. The Contractor shall erect and maintain fencing, barricades, signs and warning devices used to delineate the perimeter of all construction areas, as approved by the Airport Authority Airfield Operation Units.

All escorts performed within the Movement Area and/or associated safety areas, shall be provided by an authorized Escort. The Airport Authority Airfield Operation Units and the Airport Authority Security Division shall designate all access points into the AOA. All points of entry into the AOA, which are under the Contractor's control, shall be secured and/or guarded and should be coordinated with the Airport Authority Security Division or YIP Airfield Operations/Security Division. Deliveries are to be strictly controlled (by the Contractor) using personnel specifically acquainted with these rules. The Contractor shall provide properly manned escort vehicles as required to guide and escort all deliveries to the work area(s).
All work outside an approved construction area shall be submitted, in writing, 72 hours in advance, excluding weekends

Unless otherwise specified by the DTW or YIP Airfield Operation Units or Airport Authority Planning, Design, and Construction Division, all work outside an approved construction area shall be marked in accordance with Barricade Details Checklist included at the end of this document. All barricades, lighting and warning devices used to delineate any construction or hazardous area(s) are to be provided by the Contractor.

At no time shall personnel, vehicles or equipment be located or enter any of the following areas unless authorized by DTW or YIP Airfield Operation Units or Airport Authority Planning, Design, and Construction Division.

- Within 250 feet parallel to an active runway centerline (to be indicated on the CSPP and/or SPCD).
- Within 400 feet parallel to an active runway centerline without equipment and stockpile removal.

- Within 1,000 feet of the end of active runways (each end to be indicated in the CSPP and/or SPCD).
- Within 160 feet parallel to an active taxiway centerline operating with Group V aircraft without proper approval.
- Active NAVAID Critical Areas.

On the Movement Area and/or associated safety areas during times of inclement weather or unusual events as determined by the DTW or YIP Airfield Operation Units. During such times all work is to be suspended. All equipment shall be removed to approved staging areas

Trenches and/or Excavations Trenches and/or excavations shall not be allowed in the following areas without closure or restriction of the adjacent Movement Area:

- Within 250 feet parallel to a runway centerline.
- Within 400 feet parallel to a runway centerline, without proper trench and excavation cover.
- Within 160 feet parallel to a taxiway centerline operating with Group V aircraft without proper approval.
- Within 1,000 feet of the end of a runway.
- Active NAVAID Critical Areas.

Barricading/plating of trenches and/or excavations shall be in accordance with the requirements contained in Barricade Details Checklist. No trenching is allowed under AOA fence without prior approval and coordination by the Airport Authority Security Division. All stockpiled material(s)/supplies shall be constrained in a manner to prevent movement resulting from aircraft blast or wind conditions. Material(s)/supplies shall not be stored within 500 feet of aircraft turning areas or movement areas. Stockpiled material(s)/supplies shall not exceed 15 feet in height unless the Contractor has complied with all requirements for airspacing and secured approval from the DTW or YIP Airfield Operation Units or Airport Authority Planning, Design, and Construction Division. All material(s)/supplies shall be positioned so it will not obstruct the line of sight from the Control Tower to the Movement Area. Marking and lighting shall be in accordance with the requirements contained in Barricade Details Checklist.

Stockpile material may not be within 6 feet of an AOA fence. Nighttime work, not covered by the Contract Documents, requires 72 hours advanced approval, excluding weekends, by the DTW or YIP Airfield Operation Units. Lighting for nighttime work shall be shielded and positioned downward so as not to hinder the vision of the air traffic controllers in the control Tower or the pilots of moving aircraft.

Debris, waste, and loose materials shall not be allowed on the Movement Area. If debris and/or loose materials are observed to be on active portions of the Movement Area, the Contractor will be responsible for correcting the discrepancy immediately. At the direction of the DTW or YIP Airfield Operation Units, debris problems occurring during construction, NOT corrected by the Contractor in a timely manner, will be corrected by the Airport at the Contractor's expense. The Contractor is responsible for controlling dust problems resulting from construction and clean-up processes, as defined by the DTW or YIP Airfield Operation Units or WCAA Planning, Design, and Construction Division, resulting from construction and clean up processes. The Contractor may be working in an air operations area in which a high degree of care is necessary to control debris and dust. Spilled material on active roadways, runways, taxiways and aprons will be swept up immediately. The Contractor will be aware that the construction area may be subject to jet blast and significant wind velocities. Dust control measures will be required to prevent loose material from blowing within or outside the air operations area.

If the Contractor uses or if a haul road crosses any area used by aircraft, service or emergency vehicles, a vacuum power broom and/or hand sweeping will be used to keep this area clean of debris which could damage aircraft

engines or propellers. The Contractor will be liable for any damages that occur. Power brooms and sweepers shall be vacuum capable. Prior to opening any Runway, Taxiway, Ramp, Apron or Associated Safety Area, that has been closed for construction; the Contractor shall arrange for an inspection by the DTW or YIP Airfield operations director or his/her designee.

All barricades used by the Contractor to designate an unusable or hazardous area on the AOA, shall be secured in place against movement or jet blast. The Contractor shall ensure that all barricades and hazard lighting are operational prior to departing the construction area at the end of each workday.
In accordance with FAR Part 139, The DTW or YIP Airfield Operation Units shall, prior to the release of work crews, inspect all areas to ensure that:

- Paved areas are free of surface variations in accordance with FAR Part 139.
- All unpaved safety areas are cleared and graded and have no potentially hazardous ruts, humps, depressions or other surface variations.
- All trenches or excavations within active Runway and/or Taxiway safety areas are backfilled to support the weight of an aircraft or Aircraft Rescue and Fire Fighting (ARFF) equipment.
- If the trenches, excavations or hazardous areas have been authorized to remain in place, they are to be adequately plated and marked and lighted in accordance with Barricades Detail Checklist.

Location of haul routes on the Airport site shall be approved by the DTW or YIP Airfield Operation Units or Airport Authority Planning, Design and Construction Division. All haul routes on the Airport shall be marked, when necessary, and maintained by the Contractor. These routes shall be restored to their original condition upon completion of the construction project. Markings, if required, shall be provided by the Contractor, in accordance with specifications established by the DTW or YIP Airfield Operation Units or Airport Authority Planning, Design, and Construction Division, and Airport Authority Security. Construction equipment shall not be permitted to operate upon paved areas unless the equipment has pneumatic tires or special means, approved by the Airport Authority Planning, Design, and Construction Division, provided to protect the pavement.

Construction equipment shall not exceed a height of 20 feet above the Airport surface without approval by the Airport Authority Airfield Operation Units. All construction involving cranes shall be coordinated at least 72 hours in advance, excluding weekends, with the Airport Authority Airfield Operation Units or Airport Authority Planning, Design, and Construction Division. This does not include the time required for airspacing. The following information is required:

- Location of the Crane.
- Maximum extendable height.
- Hours of operation.
- The top of each crane boom shall be marked by a 3' x 3' orange and white checkered flag — each box being 1' square.
- Each crane shall be lowered at night and during periods of poor visibility as directed by Airport Authority Airfield Operation Units or Airport Authority Planning, Design, and Construction Division. In the event the crane is approved to remain extended during the hours from sunset to sunrise, the highest point of the crane boom will be lit with a red obstruction light in accordance with AC 70/7460-1

16.0 Special Construction Rules on the AOA

Construction is a dynamic process; it is ever changing in physical and environmental forms until the construction process is completed. At the Airport Authority all contractors who are required to perform construction work shall use the job hazards analysis process. Its purpose is to develop a preliminary hazard analysis on proposed work operations as to their potential for injury, property damage, or both. Once potential hazards have been identified, identify procedures to eliminate or mitigate their potential for occurrence.

Direct benefits of the hazard analysis are as follows:

- Potential for injury or property damaged is eliminated;
- Indentifies hazards;
- Improves safety;
- Defines job procedures;
- Provides training;
- Increases awareness;
- Provides improvement in job methods;

During the planning stages of the project work, activities are flagged that require job hazard analysis. Further work operations requiring job hazards analysis may be identified by weekly workarounds, responses to accidents or audits, safety meetings, or committee meetings, or if work activities change that have not been addressed.

17.0 Housekeeping

Leads, hoses, and extension cords shall be hung up with a nonconductive material, off all floors, stairways, and walkways. Trash such as drinking cups, cans, and scraps from lunch are not to be thrown down, but disposed of properly in marked containers.

Available material, equipment, concrete forms, pipe, etc., are to be orderly, stacked out of walkways, and from in front of doors, stairways, and ladders.

Oil, grease, and other such liquid spills shall be cleaned up at the time of spill and are not to be left unattended. Each craft is responsible for housekeeping in its respective work areas.

Where such items as protruding rebar and anchor bolts create an impalement hazard or tripping hazard they shall be properly protected and conspicuously marked.

Trash barrels and 55 gallon drums shall not be hoisted by holes cut in the sides; adequate means of support shall be used.

18.0 Site Sanitation

Potable water:

- An adequate supply of potable water shall be provided on all projects.
- Portable containers used to dispense drinking water shall be capable of being tightly closed, and equipped with a tap. Water shall not be dipped from containers.
- Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not be used for any other purpose.
- The common drinking cup is prohibited.
- Where single service cups (to be used but once) are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups shall be provided.

Nonpotable water:

- Outlets for nonpotable water, such as for industrial or firefighting purposes only, shall be identified by signs to clearly indicate that the water is unsafe and is not to be used for drinking or washing purposes.
- There shall be no cross-connection, open or potential, between a system furnishing potable water and a system furnishing non-potable water. Toilets at construction sites:

Washing facilities:

Employees can use public restroom expects when projects engaged in activities where employees are exposed to sludge, chemicals, or other harmful contaminates must provide adequate washing facilities onsite. This can be accomplished by receiving permission to use the WCAA non-public facilities or constructing a temporary wash station. This would require a potable water holding tank, soap, towels, and weather protection. Such facilities should be mobile and maintained in close proximity to work locations and along the route of travel to the parking area.

Food consumption:

−In an attempt to prevent the possibility of contracting a hand-to-mouth disease, all employees must wash their hands before breaks, lunch, and going home. All consumables such as food, candy, dip tobacco, cigarettes, coffee, sodas, etc., should be not stored or consumed in the work area. These items should not leave the personal car parking lot unless sanitary lunch areas are designated for that purpose.

19.0 Compressed Gasses

Care shall be exercised in handling all compressed gas cylinders. They shall not be dropped, jarred, or exposed to temperature extremes. Cylinders shall have the valve cap or valve protection device in place at all times, except when in actual use or connected to a welding set. Cylinders shall not be rolled and shall not be lifted by the valve or valve cap; a suitable cradle or other device shall be used. Cylinders shall have their contents properly identified.

Cylinders not having fixed hand wheels shall have keys, handles, or non-adjustable wrenches on the valve stems while the cylinders are in service. Compressed gas cylinders, whether full or empty, shall be stored and transported in an upright position and chained or otherwise secured so they cannot fall or be upset. Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease) a minimum distance of 20 feet or by a 5 foot high noncombustible barrier. Cylinders shall not be placed where they might become part of an electric circuit or within 5 feet of an electrical outlet. Employees shall never force connections which do not fit nor shall they tamper with the safety relief devices of cylinder valves.

Before the regulator is removed from a cylinder, the valve shall be closed and all pressure released from the regulator. A leaking cylinder shall not be used. Such cylinders shall be taken outdoors away from sources of ignition. The supervisor shall be notified. A flame shall never be used to detect gas leaks. The recessed top of cylinders shall not be used as a place for tools.

Oxygen--Oil, grease, or similar materials shall not be allowed to come in contact with any valve, fitting, regulator, or gauge of oxygen cylinders:

- Oxygen shall never be used as a substitute for compressed air.
- When an oxygen cylinder is in use, the valve should be opened fully in order to prevent leakage around the valve stem.

Acetylene--Acetylene cylinders shall be properly secured and always used, transported, or stored in a vertical position. Cylinders shall be protected from sparks, flames, and contact with energized electrical equipment:

- An acetylene cylinder valve shall not be opened more than one and one-half turns of the spindle and preferably no more than three-fourths of a turn.
- Employees shall not use acetylene in a free state at pressures higher than 15 psi.

20.0 Safe Supports and Scaffolds

Each project shall designate at least one competent person to oversee scaffold operations. Operations shall include scaffold erection, moving, dismantling, altering, repairing, etc. The competent person shall ensure the proper type of scaffolding is selected for each task, and that only experienced and properly trained employees erect, move, dismantle, alter, or repair scaffolds. The competent person shall ensure each scaffold is erected in accordance with Contractors requirements, manufacturer's specifications, and applicable OSHA standards.

The competent person shall inspect each scaffold prior to employees accessing the scaffold, before each shift, and after any occurrence that could affect the scaffold's structural integrity and shall tag or ensure the scaffold is tagged according to the scaffold tagging procedure.

Scaffold Tagging Procedure

Prior to assigning an employee or crew to work off of a scaffold, the foreman responsible for the employee or crew shall interface with a scaffold competent person to ensure the scaffold is complete and properly tagged. The foreman shall then visually inspect the scaffold to verify it is complete and properly tagged according to the following:

- Green Tag--This scaffold was built to meet OSHA regulations; it is safe to use.
- Yellow Tag--This scaffold does not meet OSHA regulations; personal fall arrest systems are required. This tag is used in situations where guardrails cannot be constructed on all open sides of a scaffold platform because of an interference or obstruction.
- Red Tag--This scaffold is not complete; DO NOT USE.

Employees shall not use a scaffold unless it is properly tagged according to the scaffold tagging procedure.
Scaffold Requirements No employee, or any material or equipment, shall be supported or permitted to be supported on any portion of a pole structure, scaffold, ladder, walkway, or other elevated structure, crane or derrick, etc., without it first being determined that such support is adequately strong and properly secured in place.

Employees shall check all scaffolding prior to use to ensure it is of sufficient strength and rigidity to safely support the weight of persons and material to which it will be subjected. Employees shall not use a scaffold from 4 to 6 feet in height, having a minimum horizontal dimension of less than 45 inches, unless there is present a standard guardrail, with midrail and toe board, to provide adequate employee protection. Employees shall not use a scaffold over 6 feet in height unless there is present a standard guardrail, with midrail and toeboard to provide adequate employee protection.

Scaffold planks shall be secured in place and extend over their end supports by not less than 6 inches (unless cleated) nor more than 12 inches. Scaffolds shall not be moved without first removing all loose tools, materials, and equipment resting on the scaffold deck.

The footing or anchorage points for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks shall not be used to support scaffolds or planks. Scaffolds shall be erected level and plum and rigidly braced to prevent swaying and displacement. Scaffolds shall not be altered or moved horizontally while being used or occupied except when specifically designed for such use. Movable scaffolds shall have the casters or wheels locked to prevent movement.

The width of all scaffolds, ramps, and platforms shall be sufficient to prevent congestion of persons, materials, or equipment, and in no case shall they be less than 18 inches wide. They shall extend to the entire platform depth. Synthetic or natural fiber rope shall not be used as guardrails. Employees working on suspended scaffolds shall be protected by an independent lifeline, body harness, and lanyard. Safe access shall be provided for all scaffolds. Structural members should not be used as a means of access.

Employees shall not use a scaffold unless it is properly tagged according to the project scaffold tagging procedure.
Only competent persons may erect, dismantle, or alter a scaffold. Only scaffold grade planks (appropriately marked) shall be used for work platforms. Scaffold planks shall not be painted with non-transparent materials which could obscure defects. Scaffold foundations shall utilize the manufacturer's footer plates.

Mobile Scaffolds:

Platforms shall be tightly planked for the full width of the scaffold except for necessary entrance opening. Platforms shall be secured in place. All tools and equipment shall be removed from the scaffold before it is moved or repositioned. The rollers shall be secured to the scaffold frame by using a manufactured pin or by No. 9 wire to prevent displacement. Standard guardrail systems shall be used on all open sides of the scaffold.

Swinging Scaffolds:

On suspension scaffolds designed for working load of 500 pounds, no more than two workers shall be permitted to work at one time. On suspension scaffolds with a working load of 750 pounds, no more than three workers shall be permitted to work at one time. Each employee shall be protected by an approved full body harness attached to an independent lifeline.

The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the employee in case of a fall.

21.0 Ladders

Wooden ladders shall not be painted so as to obscure a defect in the wood; only a clear, nonconductive finish shall be used. All ladders shall be inspected frequently and regularly. Ladders with weakened, broken, or missing steps; broken side rails; or other defects shall be tagged and removed from service.

Ladders and scaffolds shall be sufficiently strong for their intended use. Portable metal ladders shall not be used in the vicinity of energized electrical circuits. (Exception: Such ladders may be used in specialized work, such as high voltage substations, where nonconductive ladders might present a greater hazard. These ladders shall be properly marked.)

Ladders shall not be placed in front of a door that opens toward the ladder, unless the door is open, locked, or guarded. When ascending or descending ladders, employees shall have both hands free and shall face the ladder. Only one employee shall work from a ladder at one time (except for hook type ladders). If two employees are required, a second ladder shall be used. Ladders shall not be used as scaffold platforms. Boxes, chairs, etc., shall not be used as ladders. Employees shall not use a ladder until they have been properly trained in its use.

Each quarter, a formal ladder inspection must be performed by a competent person designated by the Project Manager. If the ladder passes the inspection, it shall be tagged with a colored tie-wrap for the respective quarter. If it fails, it shall be tagged with a "DO NOT OPERATE" tag until repairs are made. When the ladders are being inspected, the Quarterly Ladder Inspection form must be filled out by the competent person.

Straight Ladders:

Portable straight ladders shall not be used without nonskid bases. The ladder shall be placed so that the distance between the bottom of the ladder and the supporting point is approximately one fourth of the ladder length between supports. Straight ladders shall not be climbed beyond the third step from the top.

When working from a portable ladder, the ladder must be securely placed, held, tied, or otherwise made secure to prevent slipping or falling. When dismounting from a ladder at an elevated position (as at a roof), the employee shall ensure that the ladder side rails extend at least 3 feet above the dismount position, or that grab bars are present.

Two Step Ladders:

Employees shall wear a body harness and lanyard, and tie off to a secure anchor whenever both hands must be used for the job or are exposed to a fall in excess of 6 feet. Ladders shall not be spliced together to form a longer ladder. A ladder shall not be placed against an unsafe support. Employees climbing a ladder with a fall exposure greater than 24 feet shall be protected by an approved cage, ladder climbing device, or by the use of a body harness, lanyard, lifeline step Ladders. The top two steps shall not be used. Step ladder legs shall be fully spread and the spreading bars locked in place. Step ladders shall not be used as straight ladders. When an employee is working on a step ladder over 6 feet high, the employee shall use a body harness and lanyard attached to a substantial anchor.

22.0 Material Handling/Ergonomics

An employee shall obtain assistance in lifting heavy objects or power equipment shall be used.
When two or more persons carry a heavy object that is to be lowered or dropped, there shall be a prearranged signal for releasing the load.

When two or more persons are carrying an object, each employee, if possible, should face the direction in which the object is being carried (The right way to lift is easiest and safest. Crouch or squat with the feet close to the object to be lifted, secure good footing, take a firm grip, bend the knees, keep the back vertical, and lift by bending at the knees and using the leg and thigh muscles. Employees shall not attempt to lift beyond their capacity. Caution shall be taken when lifting or pulling in an awkward position.)

Employees should avoid twisting or excessive bending when lifting or setting down loads. When moving a load horizontally, employees should push the load rather than pull it. When performing a task that requires repetitive lifting, the load should be positioned to limit bending and twisting. The use of lift tables, pallets, and mechanical devices shall be used in these instances. When using such tools as screwdrivers and wrenches, employees should avoid using their wrists in a bent (flexed), extended, or twisted position for long periods of time. Employees should maintain their wrists in a neutral (straight) position.

When gripping, grasping, or lifting an object such as a pipe or board, the whole hand and all the fingers should be used. Gripping, grasping, and lifting with just the thumb and index finger should be avoided.

23.0 Hand Tools

All tools, regardless of ownership, shall be of an approved type and maintained in good condition. (Tools are subject to inspection at any time. A foreman has the authority and responsibility to condemn unserviceable tools, regardless of ownership.) Defective tools shall be tagged to prevent their use and shall be returned to the tool room for repairs.

Employees shall always use the proper tool for the job performed. Hammers with metal handles, screwdrivers, knives with metal continuing through the handle, and metallic measuring tapes shall not be used on or near energized electrical circuits or equipment. Tools shall not be thrown from place to place or from person to person; tools that must be raised or lowered from one elevation to another shall be placed in tool buckets or firmly attached to hand lines.

Tools shall never be placed unsecured on elevated places. As impact tools such as chisels, punches, drift pins, etc., become mush-roomed or cracked, they shall be dressed, repaired, or replaced before further use.
Chisels, drills, punches, ground rods, and pipes shall be held with suitable holders or tongs (not with the hands) while being struck by another employee. Shims shall not be used to make a wrench fit. Wrenches with sprung or damaged jaws shall not be used.

Pipe shall not be used to extend a wrench handle for added leverage unless the wrench was designed for such use.
Tools with sharp edges shall be stored and handled so that they will not cause injury or damage. They shall not be carried in pockets. Wooden handles that are loose, cracked, or splintered shall be replaced. The handle shall not be taped or lashed with wire. All cutting tools such as saws, wood chisels, drawknives, or axes shall be kept in suitable guards or in special compartments.

Tools shall not be left lying around where they may cause a person to trip or stumble. When working on or above open grating, a canvas or other suitable covering shall be used to cover the grating to prevent tools or parts from dropping to a lower level where others are present or the danger area shall be barricaded or guarded. The insulation on hand tools shall not be depended upon to protect users from shock.

24.0 Hand Tools

The noncurrent carrying metal parts of portable electric tools such as drills, saws, and grinders shall be effectively grounded when connected to a power source unless:

- The tool is an approved double-insulated type.
- The tool is connected to the power supply by means of an isolating transformer or other isolated power supply, such as a 24 volt dc system.

All powered tools shall be examined prior to use to ensure general service-ability and the presence of all applicable safety devices. The electric cord and electric components shall be given an especially thorough examination and documented on the Electrical Inspection Log. Powered tools shall be used only within their capability and shall be operated in accordance with the instructions of the manufacturer.

All tools shall be kept in good repair and shall be disconnected from the power source while repairs are being made. Electrical tools shall not be used where there is a hazard of flammable vapors, gases, or dusts.
All power tools and cord sets shall be protected by ground fault circuit interrupters.

25.0 Heaters

UL approved salamanders, radiant heaters, and space heaters are the only approved heaters on the jobsite. Heaters shall be kept at least 20 feet from buildings and other combustible items or as approved by the WCAA Fire Marshal. Job-made heaters, solid fuel salamanders, and open fires are prohibited on the jobsite.

26.0 Barrier Tape Identification System

In order to uniformly identify particular hazards, a barrier tape identification system has been developed for use by all employees working on the construction site. It has been developed so that any employee working on the jobsite, regardless of craft, can recognize and avoid a hazard when properly marked.
The following barrier tape identification system shall be used:

- General Purpose--Yellow tape (may have black in it). Used for low hazard areas where access should be monitored and controlled. "Use caution when crossing."
- General--Red tape (may have black in it). "Do not cross."
- Logistics--Multicolor triangular flagging. Used to identify lay-down areas, walkways, etc. "Use caution when crossing."
- Radiation--Yellow with magenta (purple) tape. Possible radiation hazard, X-ray, etc. "Do not cross."

The supervisor erecting the barrier tape shall hang a tag on the tape that indicates the hazard, name of employer, name of person erecting the tape, and date erected. The barriers shall be erected far enough back from the hazard to allow for adequate warning and protection from the hazard. The barrier shall be constructed so that it will stand against adverse weather conditions and construction traffic. If the hazard is of a magnitude which requires additional protection (hard barricades, lights, etc.), the supervisor responsible for erecting the barricade shall see that additional protection is provided. It is the erector's responsibility to maintain the barrier as long as the hazard is present. It is also his or her responsibility to take down and dispose of the barrier when its use is not needed.

27.0 General Electric Rules

All electrical work shall be in compliance with the latest edition of the National Electrical Code, unless otherwise provided by MIOSHA regulations. Electrical installations and maintenance shall be performed only by qualified electricians.

Extension cords used with portable electric tools shall be the 3 wire type, shall be protected from damage, and shall not be fastened with staples, hung from nails, or suspended from wires. Splices shall have soldered wire connections with insulation equal to the cable. Worn or frayed cables shall not be used.

Except where bulbs are deeply recessed in the reflector, bulbs on temporary lights shall be equipped with guards. Temporary lights shall not be suspended by their electric cords unless designed for suspension.

Receptacles for attachment plugs shall be of approved, concealed contact type. Where different voltages, frequencies, or types of current are supplied, receptacles shall be of such designs that attachment plugs are not interchangeable.

Cable passing through work areas shall be covered or elevated at least 7 feet off the ground. Unprotected cables, extension cords, etc., shall NEVER be run over by vehicles, heavy equipment, JLGs, scissor lifts, etc.
Boxes for disconnecting means shall be securely and rigidly fastened to the surface upon which they are mounted and fitted with covers.

Employees shall not be permitted to work in such proximity to any part of an electric power circuit that he or she may contact the same in the course of his or her work unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it by effective insulation or other means. In work areas where the exact location of underground electric power lines is not known, workers using jackhammers, bars, or other hand tools which may contact an energized line shall be provided with insulated protective gloves.
For 15 and 20 ampere receptacle outlets on single-phase, 120 volt circuits for construction sites which are not a part of the permanent wiring of the building or structure, ground fault circuit interrupters (GFCIs) shall be used for employee protection.

Employees shall test GFCIs before they are used on a daily basis and, if there is a malfunction, shall report the problem to his or her supervisor. Each month, the Project Manager shall designate a competent person in electrical safety to test the GFCIs and report the results on the GFCI Monthly Test form. All outlets, "bang-boxes," etc., shall be tagged with a monthly inspection tag. When the competent person checks the GFCIs, the month and day they were tested shall be marked.

All electrical circuits, equipment, and conductor enclosures shall have a grounding system, which is permanent and continuous, of such capacity to conduct safely any fault current likely to be imposed on it, and has sufficiently low resistance to limit the voltage to ground and facilitate the operation of the circuit breaker in the circuit. The continuity and resistance of grounding systems shall be tested immediately after installation, after any repair or modification, and annually thereafter.

All electrical powered equipment and machinery shall be de-energized and locked out before any maintenance or repair work is performed. Where overhead power lines are encountered on a jobsite and equipment has the potential to contact the lines, the safe minimum clearances shall be followed. The lines shall be either relocated in cooperation with the utility or Owner, or safe clearance barriers shall be erected. Example: install poles and wire rope that has reflective tape or other acceptable attention getting markings at safe minimum clearance locations away from the power lines. Ground level signs shall also be constructed to make operators aware of the hazard above. The safe minimum clearances are as follows.

All employees who face the risk of electric shock from working on, near, or with electrical circuits, which is not reduced to a safe level by electrical installation, shall be trained in the recognition, avoidance, and control of specific electrical hazards.

28.0 Disposal Chutes

Whenever materials are dropped more than 20 feet to any exterior point of a building, an enclosed chute shall be used. When debris is dropped through holes in the floor without the use of chutes, that area where the material is dropped shall be enclosed with barricades not less than 42 inches high and not less than 6 feet back from the projected edges of the opening above. Warning signs of the hazards of falling material shall be posted at each level.

29.0 Non-AOA Motor Vehicles and Mechanized Equipment

All vehicles in use shall be checked at the beginning of each shift to assure that all parts, equipment, and accessories that affect safe operation are in proper operating condition and free from defects. All defects shall be corrected before the vehicle is placed in service.

No person shall use any motor vehicle, earth moving, or compacting equipment having an obstructed view to the rear unless:

- The vehicle has a reverse signal alarm distinguishable from the surrounding noise level, or
- The vehicle is backed up only when an observer signals that it is safe to do so.

Heavy machinery, equipment, or parts thereof which are suspended or held aloft shall be substantially blocked to prevent falling or shifting before employees are permitted to work under or between them.

ATTACHMENT #1

DETROIT METRO • WILLOW RUN
WAYNE COUNTY AIRPORT AUTHORITY

Attachment 1
Contractor Safety Guidelines

DATE: _____

COMPANY NAME: _____ **PROJECT:** _____

COMPANY TYPE (General Contractor, Mechanical, etc.): _____

SCOPE OF WORK: _____

ADDRESS: _____ **TELEPHONE NO.:** _____

_____

_____

_____

RESOURCES

1. Name of company Safety and Health Contact: _____
   Title: _____
2. What percent of this person's time is spent on safety and health related matters? _____ %
3. What professional safety and health certifications does this person hold (e.g., CSP, PE, CIH)? _____
4. How many other full-time safety and health representatives are employed by your company? _____
5. Name of Safety Representative proposed for this project: _____
   Title: _____
   What percent of this person's time will be spent on safety and health related matters? _____ %
   Submit copy of Safety Representatives qualifications with completed questionnaire.

	Yes	No
6. Does your company have a written procedure to ensure that adequate safety and health program resources, such as budget, equipment, training, and manpower are included in each project bid? If yes, submit a copy with completed questionnaire.		

PROGRAM ELEMENTS

	Yes	No	Page No.
1. Does your company have a written safety, health, and accident prevention program (SP)? If yes, submit a copy with your completed questionnaire. If the answer is no, the bid may be disqualified.			
2. Does your company have a written program to ensure safety and health issues are preplanned into each project and work operation (e.g., job hazard analysis, checklists, etc.)? If yes, submit a copy with the completed questionnaire or reference page number in the SP.			

		Yes	No	Page No.
3.	Does your company have a written safety incentive program that will be implemented on this project? If yes, submit a copy with the completed questionnaire or reference page number in the SP.			
4.	Does your company have a written accident/incident investigation procedure? If yes, submit a copy with the completed questionnaire or reference page number in the SP.			
	Do your written procedures require near-miss incidents to be investigated?			
5.	Does your company have a written safety and health training program? If yes, submit a copy with the completed questionnaire or reference page number in the SP. If the answer is no, the bid may be disqualified.			
	If yes, does the program include the following?			
	New employee/project orientation			
	Weekly "toolbox" meetings			
	Daily job briefings			
	Supervisor safety training			
	Task specific training			
	OSHA required training			
	Other _____			
6.	Does your company have a written procedure to ensure that only employees who are qualified by training and experience are allowed to operate equipment, tools, machinery, and vehicles? If yes, submit a copy with the completed questionnaire or reference page number in the SP.			
7.	Does your company designate and train competent and authorized people as required by the applicable OSHA standards (e.g., electrical, scaffold erection, etc.)?			
8.	Does your company have a written procedure to audit projects to ensure all projects are in compliance with applicable laws, requirements, etc.? If yes, submit a copy with the completed questionnaire or reference page number in the SP.			
9.	Does your company have a written procedure to screen subcontractors based on their past safety performance? If yes, submit a copy with the completed questionnaire or reference page number in the SP.			
10.	Does your company use a screening process to ensure employees are physically able to perform work as assigned? If yes, submit a copy with the completed questionnaire or reference page number in the SP.			

DRUG FREE WORKPLACE PROGRAM

		Yes	No	Page No.
1.	Does your company have a written drug free workplace program that includes drug testing? If yes, submit a copy with your completed questionnaire. If the answer is no, the bid may be disqualified.			

		Yes	No
2.	If the answer to Question 1 is yes, does your written drug free workplace program include the following?		
	Pre-employment drug and alcohol testing		
	Post accident drug and alcohol testing		
	For cause drug and alcohol testing		
	Random drug and alcohol testing		
	Supervisor and employee training		

OSHA CITATIONS

		Yes	No
1.	Has your company received any **Federal or State Plan** OSHA citations within the last 3 years?		
2.	If the answer to question 1 is yes, how many of each of the following types of citations have you received?		
	Willful		
	Imminent danger		
	Serious		
	Nonserious		
	De minimus		

Give a brief description of the nature of the citation(s), or attach a copy of the citation(s).

ACCIDENT AND ILLNESS STATISTICS

	Indicate year.			
1.	How many man-hours has your company worked in each of the last 3 years?			
2.	How many OSHA recordable injuries did your company experience in each of the last 3 years?			
3.	Based on the below listed formula (a), what are your incident rates for each of the last 3 years? If the rates are above the current national average, the bid may be disqualified.			
4.	How many lost time accidents/days away from work accidents has your company experienced in each of the last 3 years?			
5.	Based on the below listed formula (b), what is your lost workday case rate/days away from work case rate for each of the last 3 years? If the rates are above the current national average, the bid may be disqualified.			
6.	How many fatalities has your company experienced in each of the last 3 years? If yes, please provide a description of the fatalities below.			

7. Submit a copy of your OSHA 200/300 logs for the last 3 years with your completed questionnaire.

   (a) $\frac{\text{Number of injuries and illnesses x 200,000}}{\text{Man-hours worked}}$

   (b) $\frac{\text{Number of lost time injuries and illnesses x 200,000}}{\text{Man-hours worked}}$

WORKER'S COMPENSATION EXPERIENCE MODIFICATION RATE

1. List your company's Worker's Compensation Experience Modification Rate for each of the last 3 years. If most recent year has a rate greater than one, the bid may be disqualified.
2. Submit, on your insurance company letterhead, your Worker's Compensation Experience Modification Rate for each of the last 3 years with your completed questionnaire.

Is there any additional information you feel we need to properly evaluate your company's safety and health program? If yes, please explain below or attach additional sheets.

Name of Person Completing Questionnaire (please print): _____

Signature of Person Completing Questionnaire: _____

Title: _____ Date: _____

ATTACHMENT #2

Attachment 2 – Contractor Employee Review
Contractor Safety Guidelines

THIS DOCUMENT MUST BE KEPT ONSITE AND UP TO DATE

Date:_____

Project Number:_____

From: _____

Prime Contractor

_____ _____

Sub-Contractor #1 Sub-Contractor #2

_____ _____

Sub-Contractor #3 Sub-Contractor #4

After reviewing general safety, emergency response, and specific area safety requirements with all of your on-site assigned employees and sub-contractors, please have them sign and indicate their badge ID number or the last five numbers of their social security number on this sheet. If the employee or sub-contractor refuses to sign, the superintendent shall print the employee's name and write "employee has been read the requirements but refuses to sign."

"My Superintendent/Foreman/Supervisor has been explained to me the Wayne County Airport Authority Contractor Safety Guidelines. I understand the requirements. I understand that my deviation from these requirements could be cause for my dismissal from this project."

Signature	Date	Badge ID or Last 5 SSN:	Company Name:

Signature	Date	Last 5 SSN:	Company Name:

Signature	Date	Last 5 SSN:	Company Name:

ATTACHMENT #3

DETROIT METRO • WILLOW RUN
WAYNE COUNTY AIRPORT AUTHORITY

Attachment 3 -Contractor Request For Sweep Form

Name of Company the Requesting the Sweep:_____
Company Name Project or Contract Number

Date and Time Submitted from General to Company Performing the Sweep:_____
Print Date Print Time

Name/Contact of the Individual Requesting Sweep:_____
Print Name Phone Number

Name/Contact of the Individual that will perform the Sweep:_____
Print Name Phone Number

Drawing Numbers Reviewed:_____
_____
_____
_____
_____

Location/Time/Date Drawings were Reviewed:_____
Location Time Date

Name of your WCAA Project Represenative:_____
Print Name

Was the WCAA Project Representative with you when you reviewed the Drawings: Yes or No
Circle One

After reviewing the drawings on file we are requesting that WCAA perform sweeps for the following utilities:

O Electrical Non-AOA	O Electrical AOA	O Natural Gas
O Sanitary	O Storm	O Combined Sewers
O Water (fire and potable)	O FAA Copper	O FAA Fiber
O WCAA Fiber	O Jet Fuel	O Glycol
O Oil	O Telephone	O Gasoline
O Steam	O Condensate	O Diesel
O Other:_____	O Other:_____	O Other:_____

I understand that my company will be performing onsite utility sweeps or I will be request a qualified vendor to conduct onsite sweeps I understand that I must also attach a sketch to indicate the limits of the area I am requesting to be swept. If I require additional sweeps outside the limits or require other utilities to be swept I understand a new form must be completed. One this form has been exercised the work sweeps will begin. After the sweeps have been completed I will complete the Excavation Checklist prior to any underground work that will be performed with the limits of the sketched area.

_____ _____
Signature of the Individual Requesting the Sweep Date

ATTACHMENT #4

DETROIT METRO • WILLOW RUN
WAYNE COUNTY AIRPORT AUTHORITY

Wayne County Airport Authority – Hot Work Permit
Site Survey For: Cutting, Welding, Burning, AND/OR
Tar Kettle Work at ALL DTW/YIP Locations.

IN CASE OF EMERGENCY CALL 911

Survey Requested By: (Company Name, Tenant, Airline, or Department):	**Contact Person:**	**Contact Number:**

AFTER INSPECTION THIS WILL PERMIT_____
Name of Company Doing The Work

TO_____
Identify the Ignition Source and the Job to Be Done

FROM_____:_____ **AM/PM** **TO**_____:_____ **AM/PM** _____/_____/_____ (day/month/year)

Extend TO:_____:_____ **AM/PM** **TO**_____:_____ **AM/PM** **BY** _____/_____/_____ (day/month/year)

Extend TO:_____:_____ **AM/PM** **TO**_____:_____ **AM/PM** **BY** _____/_____/_____ (day/month/year)

The operator shall take the necessary precaution to eliminate all possible fire hazards and to prevent damage to any construction work, building materials, equipment and all other property, both public and personal involved in connection with their work to be done. The provisions of the following shall apply at all times. If a portable **WELDING CART** is being utilized, then at least **ONE PORATBLE EXTINGUSIHER MUST** be attached to the cart with a **MINIUM RATING of 2A-10BC**. **THESE ARE THE MINIMUM REQUIREMENTS**. If it is determined that the hazard warrants additional extinguishers and/or other life safety precautions, then the permit holder will be REQUIRED to meet all the conditions before beginning their operations.

BY ORDER OF THE FIRE MARSHALL
THE FOLLOWING CONDITIONS SHALL BE INSPECTED PRIOR TO APPROVAL

C	N/C	Working On Walls or Ceilings	C	N/C	Within 35 feet of Work
		Combustible Coverings shall NOT be used			Fixed site combustibles and flammable liquids shall be protected with covers, guards, or metal shields
		Combustibles shall be moved away, from the opposite side of the wall being worked on			Combustible floors shall be wet down, covered with damp sand, metal or other shields
		Covers suspended beneath work to collect sparks shall be non-combustible			Movable combustible materials and flammable liquids shall be relocated outside the work area.
C	**N/C**	**Work on Enclosed Equipment**			The floors shall be swept clean of combustibles
		The Equipment will be cleaned of All combustibles			All Wall and floor openings shall be covered
		The container will be purged of all vapors and verified with a gas detection meter			
		Equipment has been safely taken out of service and properly locked and tagged out.	**C**	**N/C**	**Tar Kettle Operations**
C	**N/C**	**Work in Enclosed Equipment (Confined Spaces)**			A minimum of two (2) portable extinguishers with a minimum rating of 2A-20BC shall be maintained in a proper working order not closer than ten (10) feet nor more than fifty (50) feet from the TAR KETLE operations area.
		Contractor shall properly ventilate the space and have a gas meter onsite full time to monitor the space. Contractor must have their own recue equipment onsite and be Confined Space Entry Trained			Propane fuel tanks shall be secured and maintained at all times. Also, all supply hoses and regulators shall be maintained in the appropriate manner (i.e. free of leaks, tears, cuts
C	**N/C**	**Fire Watch**	**C**	**N/C**	**Miscellaneous**
		No ignition source within 100 feet of aircraft			If working in a fuel farm or fueling station a verify that the contractor has a written Safety Plan
		Operator shall supply extinguishers of appropriate size and type. They shall be located not more than fifty (50) feet from the operations			While working in ANY terminal contractor must use a ventilator or smoke eater to remove the welding hot work fumes
		Operator shall be trained in use of extinguishing equipment and in sounding of fire alarm and notifications. It is the responsibility of the Company/Tenant to ensure that operating personnel have received such training.			
		Provided during operations, with FINAL inspections thirty (30) minutes after operations cease			

AT THE TIME OF THE SURVEY THE ABOVE CONDTIONS WERE FOUND. ANY NON-COMPLAINT ITEMS SHALL BE CORRECTED BEFORE OPERATIONS BEGIN

ISSUED BY:_____ **DATE:**_____ **TIME:**_____ **INC.#**_____

REMARKS:_____
_____

ATTACHMENT #5

DETROIT METRO • WILLOW RUN
WAYNE COUNTY AIRPORT AUTHORITY

ATTACHMENT 5
TRENCHING/SAW CUTTING/DRILLING/EXCAVATION CHECKLIST

Airport (circle) DTW or YIP

Work Area

Permit # or Contract #:

Name of Vendor That Did the Sweep:

Date Underground Work Will Start:

Contact Person:

Date Underground Work Will End:

A. Specific Location and Description of Work: **M**

B. Sketch of Location Attached? Yes No

C. Is Activity on AOA? Yes No

C. If on AOA have the closures and barricades been approved by WCAA Operations? Yes No

C. Size of Trench or Excavation: Feet Long x Feet Wide x Feet Deep

D. Check the line that have been marked:

a.	Electrical (non AOA)	h.	Combined Sant/Storm	o.	Jet Fuel
b.	Airfield Electrical	i.	Water (fire/potable)	p	Glycol
c.	Natural Gas	j.	FAA Copper	q.	Oil
d.	Sanitary	k.	FAA Fiber	r.	Telephone
e.	Diesel	l.	Gasoline	s.	Combined Sewer
f.	Steam	m.	Condensate	t.	Navaid
g.	Storm	n.	WCAA Fiber	u.	other

Contact WCAA Call Center? Yes No If yes, who?
Did You Submit Request for Sweep? Yes No

When? If no, why not?
Confirmation # List Who?

Contact MISS DIG or Others Yes or No

When? If no, why not?

E. Other Known Obstructions:

a.	Footings	c.	Concrete Encasements	
b.	Pilings	d.	Other	(Specify)

F. Precautions to be Taken:

a.	De-energize Lines	c.	Insulate Operator
b.	Ground Tools	d.	Hand Excavate

G. Type of Soil:

Type A	Type C
Type B	Solid Rock

I. Drawing Numbers Used for Reference:

J. If the sweep area goes beyond the sketch or beyond the timeframe allotted a new permit must be completed.

THE ABOVE DATA HAS BEEN CHECKED WITH BLUEPRINTS ON FILE. WHEN CLOSE CLEARANCES ARE INDICATED, HAND EXCAVATION MUST BE USED TO DETERMINE THE EXACT LOCATION. EXISTING LINES AND INTERFERENCES IN THE VICINITY OF WORK MUST BE MARKED BY STAKES INDICATING LOCATION AND DEPTH PRIOR TO EXCAVATION. WCAA DOS NOT INSURE THAT ALL DRAWINGS REVIEWED ARE COMPLETEY ACCURACTE

Contractor Signature Date

WCAA Representative/Project Manager Date

THE ABOVE WORK SHALL NOT COMMENCE UNTIL SIGNED BY WCAA REPRESENATIVE. THE SIGNATURE BY THE WCAA REPRESENATIVE/PROJECT MANAGER IN NO WAY CHANGES THE CONTRACTOR'S RESPONSIBILITY FOR LOCATING ALL UNDERGROUND UTILITIES AND REPAIR OF DAMAGED UTILITIES, AS REQUIRED BY THE CONTRACT. THE WCAA REPRESENATIVE/MANAGER CANNOT BE HELD RESPONSIBLE FOR THE SAFETY REQUIREMENTS FOR THE EXCAVATION. THIS DOCUMENT IS TO BE SUBMITTED AS PART OF YOUR SUBMITTALS TO THE WCAA PROJECT MANAGER

ATTACHMENT #6

Attachment 6 - Utility Interruption Form

Permit # or Contract #_____ Circle Airport: DTW or YIP

Utility System – List System(s) to be taken out of Service (Gas, Water, Electrical) and General Location	Buildings/Systems/Equipment to be effected	Maximo Work Order #	Shut Down Date and Time	Start Up Date and Time	Contractor Rep Initials	WCAA Rep Initials
1.						
2.						
3,						
4.						
5						
6						
7						

Contractor Representative Signature and Date

WCAA Representative Signature and Date

This document is to be forwarded to the WCAA Project Representative and the WCAA Facilities & Infrastructure Divisions at least five (5) business days prior to work. The shutdowns will not be authorized unless this form signed and received in advance as specified. Please use additional forms as needed. WCAA Project Representative will be required to notify those affected by the shut down. In some cases a back-up utility source may be necessary – PLEASE SEE PROJECT REPRESENATIVE TO DETERMINE IF BACK-UP UTILITY SOURCES ARE REQUIRED. Upon authorization of the document a copy will must forwarded to the Maintenance Call Center located at Building 703. The Call Center Representative will assure it gets forwarded to the correct departments.

ATTACHMENT #6

DETROIT METRO • WILLOW RUN
WAYNE COUNTY AIRPORT AUTHORITY

Attachment 6 - Utility Interruption Form

Permit # or Contract #_____ Circle Airport: DTW or YIP

Utility System – List System(s) to be taken out of Service (Gas, Water, Electrical) and General Location	Buildings/Systems/Equipment to be effected	Maximo Work Order #	Shut Down Date and Time	Start Up Date and Time	Contractor Rep Initials	WCAA Rep Initials
1.						
2.						
3,						
4.						
5						
6						
7						

Contractor Representative Signature and Date

WCAA Representative Signature and Date

This document is to be forwarded to the WCAA Project Representative and the WCAA Facilities & Infrastructure Divisions at least five (5) business days prior to work. The shutdowns will not be authorized unless this form signed and received in advance as specified. Please use additional forms as needed. WCAA Project Representative will be required to notify those affected by the shut down. In some cases a back-up utility source may be necessary – PLEASE SEE PROJECT REPRESENATIVE TO DETERMINE IF BACK-UP UTILITY SOURCES ARE REQUIRED. Upon authorization of the document a copy will must forwarded to the Maintenance Call Center located at Building 703. The Call Center Representative will assure it gets forwarded to the correct departments.

Wayne County Airport Authority
Barricades Detail Checklist

This Barricades Detail Checklist shall be used as a guidance document for biding purposes. Actual barricades to utilized shall be submitted with the bid. Alternates shall be proposed prior to the award of a contact.

Class A Barricades
Twelve inch (12") by twelve inch (12") timber or equivalent (minimum 8 feet long) with lights. Maximum height of eighteen inches high as follows:

- 12" High Board
- Shall not weigh less than 300 lbs
- Some applications may require steady burn red-lenses as directed by WCAA Airfield Operations
- Maximum spacing between warning lights on adjacent barricades shall be seven feet (7') unless other specified.
- Four inch dome light shall meet the following requirements:
    - 12v – 300 MZ
    - 65 Flashed per minute
    - 150 Candelas

Class B Barricades
Eight inch (8") by eight inch (8") timber or equivalent (minimum 8 feet long) with lights. Maximum eighteen inches high as follows:

- Eight inch (8") High Board
- Shall not weigh less than two-hundred (200 lbs)
- Some applications may require steady burn red-lenses as directed by WCAA Airfield Operations
- Maximum spacing between warning lights on adjacent barricades shall be six feet (6') unless other specified.

Class C Barricades
Four inch (4") by four inch (4") timber or equivalent (minimum 8 feet long) with lights. Maximum seventeen inches high as follows:

- Eight inch (8") High Board
- Shall not weigh less than ninety (90 lbs)
- Some applications may require steady burn red-lenses as directed by WCAA Airfield Operations
- Maximum spacing between warning lights on adjacent barricades shall be six feet (6') unless other specified.

Wayne County Airport Authority
Barricades Detail Checklist

Plates

The use of plates on an airport construction project requires WCAA Airside Operations approval. If plates are allowed, the following criteria will apply:

1. Plates shall be provided by the Contractor.

2. Plates shall be 3/4 to 1 inch in thickness, as required by traffic, of 60 KSI yield strength steel.

3. Plates shall have 45 degree beveled edges.

4. Plates shall be sized such that not more than 1/3 of the plate area covers a trench or excavation.

5. Plates shall not cover trenches or excavations that exceed 24 inches in width.

6. No more than 3 plates will be used on any one trench or excavation.

7. No more than 6 plates will be used on the project at any one time.

8. All plates shall be secured in such manner that movement does not occur during use by aircraft or vehicular traffic.

SP-20 - AIRPORT SECURITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. The Prime Contractor is required to obtain a copy of the Security Requirements and to disseminate them to the appropriate sub-contractors.

B. As a minimum, SP-20 applies to the work being performed. Additional requirements may be incorporated due to Local, State or Federal Regulations or increased security levels at the Airport.

C. The Contractor shall be required to supply, place, maintain, move and store the items listed herein, as appropriate, to facilitate construction and protect air traffic. The Contractor shall maintain an adequate extra supply of these items on site.

PART 2 - EXECUTION

2.1 GENERAL REQUIREMENTS AND CONTRACTOR RULES

A. Any construction, alteration or modification that would modify the Airport's TSA-approved Airport Security Program (ASP) requires sixty (60) days advance notice to Airport Security Management. Failure to comply with this requirement may delay the project. The lead time is required for the Airport to seek and receive TSA approval for the changed condition

B. The Contractor is responsible for submitting a Security Accountability Plan which describes measures for the control and accountability of Airport ID badges, tools and site security.

C. Per Federal Regulation 49 CFR 1520, all construction documents shall be controlled. The documents shall either be identified as 'Security Sensitive Information' or 'For Official Use Only'. Documents that identify critical infrastructure and/or security systems shall be marked with the following statement:

> 'WARNING: This record contains Sensitive Security Information that is controlled in 49 CFR Part 1520. No part of this record may be disclosed to persons without a "need to know", as directed in 49 CFR part 1520, except with the written permission of the Administrator or the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For US government agencies, public disclosure is governed by 5 USC 552 and 49 CRF Part 1520.' All other documents shall be marked Official Use Only – Public availability to be determined under 5 USC 552."

1. Contact an Airport Security Manager if you require clarification on proper document.

D. All individuals working inside or traversing Security Sensitive Areas shall possess Airport Identification Badges obtained from the Airport's Credentials Office (734) 942-3606. All forms and information are available at www.metroairport.com - click the 'badging' link on the bottom of the page.

1. Unescorted access requires a DTW photo ID Badge. Contractors should contact the Airport's Credentials Office for specific Badge processing procedures or refer to the Airport's website.
2. Contractor access is restricted to the construction site only; access to any other area(s) is not permitted.
3. Access through security doors and gates can be granted by submitting a written request to an Airport Security Manager.
    i. Access requests must specify the door(s) or gate(s) where access is being requested, along with justification for need/use.
    ii. If access is required to other tenant or airline locations, written permission of the leaseholder is required.
4. Lost or Stolen ID Badges shall be immediately reported to the Airport Security Credentials Office 734-942-3606 or to the 24/7 Security Control Center (SCC) at 734-942-5304.
5. All Airport ID Badges must be returned to the Airport upon completion of the project. The ID Badges are valid for approved construction projects only; this does not include warranty work. If warranty work is to be provided, the Contractor shall make arrangements with the Credentials Office to have their paperwork and badges updated to reflect the change in status.
6. Fines may be imposed for not notifying the Airport when an individual no longer requires access at the Airport.
7. Badge deposits will be forfeited for Badges not returned within ninety (90) days of deactivation/completion of the project.

E. The Contractor shall not paint over, damage, alter or tamper with any component of the Electronic Security System (ESS), including signs, unless authorized by a Security Manager.

F. Shop drawings and submittals for any Security equipment must be pre-approved by a Security Manager prior to purchase and installation.

G. To prevent possible explosive or incendiary devices from being hidden in areas close to Airport facilities, equipment, aircraft, or vehicles, no containers (tool boxes, storage containers, material trailers) shall be left unsecured or unattended in any Security Sensitive Area.

H. The Contractor shall not park any vehicles, or store any construction materials, within six (6) feet of the AOA perimeter fence. Lay down areas for materials must be pre approved by an Airport Security Manager.

I. Due to the potential for damage, contractors shall coordinate and receive pre-approval from an Airport Security Manager prior to lifting any equipment or material over the Airport's AOA Fence.

1. The Contractor may be required to have an Airport Contract Security Officer on site during this work. The Contractor shall be responsible for all costs associated with the Contract Security Officer coverage. The Contractor shall complete a Security Services Request Form to schedule the contract security services.

J. Contractors shall not excavate under, or around, the AOA fence without prior approval from an Airport Security Manager.

1. Depending on the duration and extent of the excavation, the Contractor may be required to have an Airport Contract Security Officer at the site during this work. The Contractor shall be responsible for all costs associated with the Contract Security Officer coverage. The Contractor shall complete a Security Services Request Form to schedule the contract security services.
2. To prevent AOA access, all excavations that traverse the AOA line shall be adequately enclosed or covered prior to the end of each workday. Prior to completion of work for the day, the Contractor shall contact Airport Security to have the site inspected and approved before the Contractor leaves the site.

K. All other requirements in the Airport Security Program, Security Rules for Contractors, Badging Procedures, and all local, state, and Federal laws and regulations also apply.

L. Failure to comply with the Security Rules and Procedures may result in an Administrative Penalty, work stoppage and/or removal from the site.

1. Any TSA Civil Penalty issued to the Airport as a result of a Contractor's security violation will be passed onto the Contractor.

2.2 PUBLIC – TERMINAL REQUIREMENTS

A. The Contractor and/or his employees shall not prop open any gates or doors that allow access to any Security Sensitive Area; this includes any temporary wall(s) separating the public from any construction area.

1. Temporary walls shall meet Security access requirements (fence standards or ESS system) to prevent access to persons or prohibited items. A Contract Security Officer(s) is required (at the cost of the Contractor) must be posted at any unsecured opening leading to a Security Sensitive Area.

2. If a temporary opening is made that would allow access into a Security Sensitive Area, the Contractor shall erect a partition to prevent access until the area is inspected and approved by an Airport Security Manager.
   i. The partition shall be sufficient to prevent access of persons or prohibited items. The requirements may change depending on the location of the partition.

B. The Contractor shall not install any openings/doors that would allow access to the Security Sensitive Area unless approved in advance and tested by Airport Security. The Contractor may be required to have an Airport Contract Security Officer at the site during this work.

1. All new Security doors or gates shall have the appropriate signs and be numbered using the Airport Security's numbering system. The signs shall match (look and material) the existing security signs and shall be provided by the Contractor at their expense. Security shall approve all signs prior to production. Signs must be in place prior to door or gate activation.

C. Prior to any area being opened to the public, Airport Security shall conduct a security sweep of the area. Contact Airport Security (734) 942-5304 48 hours in advance to schedule the sweep.

D. Any new building or structure that will be open to the traveling public shall host the Airport's public address system; contact WCAA Technology Services (734-247-0000), for additional information.

E. Concrete bollards shall remain secured in front of the terminal buildings at established locations, at all times. Temporary movement of the bollards to accommodate the movement of equipment or material shall be coordinated in advance (at least 24 hours) with an Airport Security Manager.

F. Dumpsters are not permitted within 300' (three hundred feet) of the public areas of the terminal buildings.

2.4 STERILE AREA REQUIREMENTS

A. The Contractor and/or his employees shall not prop open any gates or doors that allow access to any Security Sensitive Area. This includes doors contained temporary walls to keep the public from any construction area.

1. Temporary walls shall meet Security access requirements (fence standards or ESS system) to prevent persons and prohibited items. Contract Security Officers are required (at the cost of the Contractor) for any security sensitive access opening.

2. If a temporary opening is made that would allow access into a Security Sensitive Area, the Contractor shall erect a partition to prevent access until the area is inspected and approved by an Airport Security Manager.
   i. The partition shall be sufficient to prevent access of persons or prohibited items. The requirements may change depending on the location of the partition.

B. The Contractor shall prevent unauthorized pedestrian or vehicular access to the Security Sensitive Areas from the construction site.

C. The Contractor shall not install any openings/doors that would allow access to the Security Sensitive Area unless approved in advance and tested by Airport Security. The Contractor may be required to have an Airport Contract Security Officer at the site during this work.

1. All new Security doors or gates shall have the appropriate signs and be numbered using Airport Security's numbering system. The signs shall match (look and material) the existing security related signs and shall be provided by the Contractor at their expense. Security shall approve all signs prior to production. Signs must be in place prior to door or gate activation.

D. Concrete bollards shall remain secured in front of the terminal buildings at established locations, at all times. Temporary movement of the bollards to accommodate the movement of equipment or material shall be coordinated in advance (at least 24 hours) with an Airport Security Manager.

E. Staging of equipment, storage of materials or dumpsters are not allowed within 300' (three hundred feet) of the public areas of terminal buildings.

F. The Contractor shall coordinate equipment or personnel access through passenger screening with Airport Security in advance.

G. The Contractor is not permitted to carry any prohibited items (see TSA website www.tsa.gov for current list of prohibited items) that are not necessary for operational or medical needs. These items may be subject to inspection.

1. No prohibited items (including tools) shall be left unsecured or unattended in a Security Sensitive Area at any time.

H. Any temporary door(s) that lead to a construction area that is accessible by the traveling public shall be equipped with a coded lock or the Airport's Intellikey Lock (purchased and installed at the Contractor's expense).

1. The access number to the door shall be provided to a WCAA Security Manager and Inspectors. These areas must remain secured at all times.
2. Removal of any temporary structure requires a Security sweep and must be coordinated with Airport Security with 48 hour advance notice.

I. Prior to any area being opened to the public, Airport Security shall conduct a security sweep of the area. Contact Airport Security (734) 942-5304 48 hours in advance to schedule the sweep.

J. Prior to any area that was closed for construction being opened to the public all prohibited items that are to remain in the area must be audited by the Concession Department. Go to www.tsa.gov for a complete list of TSA prohibited items.

2.4 AIR OPERATIONS AREA (AOA) REQUIREMENTS

A. The Contractor and/or his employees shall not prop open any gates or doors that allow access to any Security Sensitive Area. This may include temporary walls to keep the public from any construction area.

1. Temporary walls shall meet Security access requirements (fence standards or ESS system) to prevent persons and prohibited items. Contract Security Officers are required (at the cost of the Contractor) for any security sensitive access opening.

2. If a temporary opening is made that would allow access into a Security Sensitive Area, the Contractor shall erect a partition to prevent access until the area is inspected and approved by an Airport Security Manager.
   i. The partition shall be sufficient to prevent access of persons or prohibited items. The requirements may change depending on the location of the partition.

B. The Contractor shall prevent unauthorized pedestrian or vehicular access to the Security Sensitive Areas from the construction site.

C. The Contractor shall not install any openings/doors that would allow access to the Security Sensitive area unless approved and tested by Airport Security.

1. The Contractor may be required to have an Airport Contract Security Officer at the site during this work.

D. All new Security doors or gates shall have the appropriate signs and be numbered using Airport Security's numbering system.

1. The signs shall match (look and material) the existing security related signs and shall be provided by the Contractor at their expense. Security shall approve all signs prior to production. Signs must be in place prior to door or gate activation.

E. All jet way stair doors are required to have 'restricted area' signs installed on the sterile side of the door.

1. The signs shall match (look and material) the existing security related signs and shall be provided by the Contractor at their expense.

F. At the Contractor's expense, a double sided cipher lock must be installed on jet way stair doors, preventing access from both the sterile area to the AOA and the AOA to the sterile area.

G. Entry and exit to job sites shall be through approved vehicle checkpoints, only.

1. If the Contractor requires access after the regularly scheduled hours at manned vehicle checkpoint locations, the Contractor shall submit a Security Officer Request and the Contractor will be responsible for the cost of the additional hours
2. For locations that are not currently being manned, the Contractor will be required to pay for the contract security officer. In addition, a temporary booth may be required (see Temporary Booth).
3. At locations other than one of the established vehicle checkpoints, the contractor must meet all security requirements for "vehicle checkpoints". Installation of any additional requirements will be the cost of the Contractor.
4. All construction/installation vehicles, while on the AOA, shall have a DTW vehicle pass displayed on the dashboard. In addition, any persons that are required to drive on the Air Operations Area (AOA) will be required to undergo a ramp drivers training with Airfield Operations. DTW vehicle passes may be obtained from the Airport Credentials Office and Airfield ramp orientation is scheduled through Airfield Operations Office (734-942-3823). DTW vehicle permits may be obtained from the Airport Credentials Office. Airfield ramp orientation is scheduled through Airfield Operations Office (734-942-3823).
5. All construction/installation vehicles shall display company logo affixed to the drivers' and passengers' door.
    i. Logos shall be no less than 12" x 12" and can be magnetic, printed or pasted on, but shall be commercially made.
6. All drivers must have valid company proof of insurance maintained in their vehicles at all times.

2.5 SECURED AREA REQUIREMENTS

A. The Contractor and/or his employees shall not prop open any gates or doors that allow access to any Security Sensitive Area. This may include temporary walls to keep the public from any construction area.

1. Temporary walls shall meet Security access requirements (fence standards or ESS system) to prevent persons and prohibited items. Contract Security Officers are required (at the cost of the Contractor) for any security sensitive access opening.

2. If a temporary opening is made that would allow access into a Security Sensitive Area, the Contractor shall erect a partition to prevent access until the area is inspected and approved by the Airport Security.
   i. The partition shall be sufficient to prevent access of persons or prohibited items. The requirements may change depending on the location of the partition.

B. The Contractor shall prevent unauthorized pedestrian or vehicular access to all the Security Sensitive Areas from the construction site.

C. Entry and exit to job sites shall be through approved vehicle checkpoints, only.

1. If the Contractor requires access after the regularly scheduled hours at manned vehicle checkpoint locations, the Contractor shall submit a Security Officer Request and the Contractor will be responsible for the cost of the additional hours
2. For locations that are not currently manned, the Contractor will be required to pay for the contract security officer. In addition, a temporary booth may be required (see Temporary Booth).
3. At locations other than one of the established vehicle checkpoints, the contractor must meet all security requirements for “vehicle checkpoints”. Installation of any additional requirements will be the cost of the Contractor.
4. All construction/installation vehicles, while on the AOA, shall have a DTW vehicle pass displayed on the dashboard. In addition, any persons that require driving on the Air Operations Area (AOA) will be required to undergo a ramp drivers training with Airfield Operations. DTW vehicle passes may be obtained from the Airport Credentials Office and Airfield ramp orientation is scheduled through Airfield Operations Office (734-942-3823).
5. All construction/installation vehicles shall display company logo affixed to the drivers' and passengers' door.
   i. Logos shall be no less than 12" x 12" and can be magnetic, printed or pasted on, but shall be commercially made.
6. All drivers must have valid company proof of insurance maintained in their vehicle at all times.

2.6 CONTRACT SECURITY SERVICES

A. The Contractor shall utilize the Airport’s Contract Security Service for any work that affects the security of the Airport (i.e., access points, fencing, doors, gates, etc.).

B. The Contract Security Service shall be provided at the Contractor's expense. The Contractor shall complete the Contract Security Officer Service Request Form prior to service being provided.

C. Contract Security Officer requests shall be made at least forty-eight (48) hours in advance. A cancellation fee may apply without proper cancellation notice.

D. Depending on the location, the Contractor may be required to pay for an additional Contract Security Officer to perform vehicle inspections and/or act as a physical barrier for any vehicle access point that will be manned.

E. Contract Security Officer Service will only be provided at gates where an existing booth and ESS are in place. If the Contractor requires access at any other location, the Contractor shall supply a booth as specified below. The Airport may (if available) provide the Airport's portable booth for temporary use by the contractor and if approved by a Security Manager (See Temporary Booth requirements).

2.8 FENCE

A. The Contractor shall submit plans for any fence installation or relocation (temporary or permanent) which shall include fence layout and a phasing plan to Airport Security sixty (60) days in advance for approval. Failure to comply with this requirement may delay the project. The lead time is required for the Airport to seek and receive TSA approval for the changed condition.

B. The Contractor or his employees shall not cut, remove, alter or displace any AOA perimeter fencing, ESS or signs without prior approval from an Airport Security Manager.

1. The Contractor shall contact Airport Security at least 24 hours in advance for approval prior to removing any fencing, ESS or signs.

C. Prior to removing or altering any existing AOA perimeter fencing, a permanent or temporary fence shall be in place and have been inspected and approved by an Airport Security Manager.

D. Any temporary fence shall still meet all security fence requirements.

E. AOA perimeter fencing may require the installation of the Airport's perimeter detection system (Infinity 2000) depending on the project. Airport Security will make this determination based on the particular project.

F. Any AOA fence that is displaced whether temporarily or permanently, or any new AOA fence shall be 10 (ten) foot chain link with top and bottom tension wires.

1. There shall be at least five (5) fence ties attaching the fabric to each post and at least 5 ties (ea. top and bottom) attaching the tension wire to each section of fence.
2. The fence shall be topped with dual, "V" Type, outriggers with a minimum of three (3) strands of barbed wire on each outrigger.
3. The barb wire shall be fastened securely.
4. The fence fabric is to be placed on the public side of the fence posts.

5. No gap of four inches (4”) or greater from the bottom of the fence or gate to the ground, between a gate leaf and post or between gate leaves is permitted.
6. To allow proper clearance for Airport Fire and Maintenance equipment, all vehicle gates shall allow a minimum clear opening of sixteen feet (16’).
7. To prevent gates from sagging, there shall be support cross braces for a minimum of two (2) sections on either side of the gate leaves.
8. To prevent erosion concerns, all fencing shall have at least three (3) feet of flat ground on either side.
9. All fence posts shall be secured in concrete.
10. If new or replacement fence is installed adjacent to existing fence that is at a different height, the fence shall transition to the different height in not more than one section.

G. Decorative wrought iron fence is an acceptable alternative in certain locations. Aegis II – Invincible manufactured by Ameristar Fence Products is the current Airport approved standard. The wrought iron fence shall have one inch (1”) 14 gauge aluminum pickets, steel cross members and posts and be at least 10’ (ten feet) high with an additional height to support the curving in the same direction as an outrigger. Pickets shall be spaced at a maximum of four inches (4”) between each picket.

1. The fence shall be installed by Airport-approved methods which vary depending on the material in which the fence is installed on.

H. Installation of any type of fence on top of cement where the posts are bolted to the surface of the cement requires properly sized bolts to ensure the fence is secured properly.

1. The Airport’s Inspector or Engineer shall approve the installation.

I. Guardrail is required in areas where the fence's proximity to the roadway, turning or high traffic areas could potentially result in damage to the fence due to vehicular traffic.

1. To prevent damage, guardrail shall be placed at least three feet (3’) from the AOA fence in all parking areas and areas immediately adjacent to an AOA checkpoint booth and associated gates.
2. The guardrail shall be installed on the AOA side of the fence and meet DOT highway standards.
3. The guardrail is to be of sufficient height to prevent semis and other large trucks from backing into or along the fence.

J. As an alternate, fence may be installed on top of concrete jersey barrier wall. Alternates must be approved by an Airport Security Manager.

K. Anchored concrete parking bumpers (heavy duty truck style) may be installed in parking areas as an alternate to guardrail.

1. Bumpers are to be placed a minimum of four (4) feet from the AOA fence in areas that allow public parking and must be secured into the ground.
2. The bumpers will be required to be placed further from the fence in locations where large vehicles park.

3. In lieu of parking bumpers, curbing may be placed at least six (6) feet from the AOA fence in all parking areas along the AOA fence (further for truck parking).
4. The curbing shall be of sufficient height to prevent easy access. Guardrail or other associated protection may be required in high traffic or other areas determined by Airport Security at risk of damage from vehicles or equipment.

L. Fence and Gate Signs requirements.

1. All signs shall be the same size, material and design as existing Airport signs.
2. All signs shall be securely fastened to the fence posts to prevent alarming the perimeter detection system.
3. All non-parking areas or driveways adjacent to the AOA fence shall have "NO PARKING" signs installed every one-hundred feet (100').
4. The Contractor shall install "Restricted Area Keep Out" signs every one-hundred (100') on the Public Side of the fence and on all gates.
   i. The sign shall be reflective with red background and white lettering - 12" (twelve inches) high by 24" (twenty four inches) wide. The signs shall be securely fastened to the fence posts.
5. In all parking areas adjacent to the AOA fence, shall have "Head-In Parking Only" signs installed every one-hundred feet (100').
6. The Contractor shall install a gate identification sign on the Public Side of the gate.
   i. The signs shall be made of reflective material and securely fastened. Gate signs shall be 12" wide by 18" high and have white letter/number on a blue background for Intellikey locations. Non-Intellikey locations shall be black letters/number on a white background.
7. The Contractor shall install fence identification signs on the Public Side of the fence.
   i. The signs shall be made of reflective material and securely fastened. Identification signs is installed every 1,000 feet and shall be 12" wide by 6" high and have green letter/number on a white background.
   ii. Airport Security will provide the identification numbering sequence. Contractor may be required to re-number a section larger than the work area to maintain the Airport's numbering sequence in order.

M. To comply with 49 CFR 1542.207, the Contractor shall supply and install an "Intellikey" locking mechanism on all manual security gates. Contact a Security Manager for further information on parts and components.

1. The lock shall be programmed by Airport Security and shall become the property of Airport Security and will not be returned to the Contractor.
2. All Intellikey locks become the Airport's property at the conclusion of the project, even if being utilized on temporary fence line.
3. The fence post that the locking unit shall be attached to is to be two (2) inches minimum in diameter.
4. A spacing of no more than 4 inches (4") is required between gate posts to allow for adequate clearance for the mechanism. Additional posts may be required to be installed above and below the Intellikey lock to prevent any gap issues.
5. Intellikey locks shall be bolted and welded to the gate leaf, per the Manufacturers' instructions.

6. The Intellikey lock shall be mounted so that the battery compartment is located on the secure/AOA side of the gate.
7. To prevent any damage to the Intellikey locks, a drop rod shall be installed on all gate leaves; this prevents the wind from pulling on the locks.

N. All culverts, drains, ditches or piping shall be secured to prevent pedestrian access. Piping diameter of 14" or greater that extends from the public to the security sensitive area shall also be secured by means approved by an Airport Security Manager. There should be no gaps greater than 4 inches (4"). If rebar is used, all cross rebar should be welded and secured into the ground at a depth of at least 36".

1. The location shall be identified utilizing the Airport's identification system and a sign shall be installed at the contractor's expense.

O. Fence shall not be installed within three feet (3') of any utility pole or device that could be used to climb over the fence.

1. If unavoidable, the device shall be equipped with an anti-climb device. The anti-climb device or method shall be approved by an Airport Security Manager prior to any installation.

P. Landscaping shall not be placed in areas that would prevent monitoring of the AOA fence from perimeter roads or CCTV systems.

Q. Landscaping shall not be placed in areas that would create a climb point or may cause further decay or damage to the fence due to vegetation, roots or other growth.

R. Fencing shall not be installed within six feet (6') of existing landscaping.

2.8 PASSENGER SCREENING CHECKPOINT

A. The Contractor shall first receive approval of the Screening Checkpoint layout, new installation or redesign by the TSA and Airport Security. At least sixty (60) day advance notice is required to the Airport for changes to the Airport Security Program.

1. This approval is required prior to commencing any construction. Failure to comply with this requirement may delay the project.

B. CCTV shall be installed and integrated into the Airport's CCTV live and recorded systems – see CCTV Section. The layout, number of cameras, type of cameras and type of installation shall be submitted for approval to an Airport Security Manager prior to fabrication and installation.

1. A local monitor connected to the existing CCTV system shall be installed to allow for the review of recorded video playback and live cameras.
   i. The location of the monitor shall be approved by Airport Security prior to installation.
2. CCTV coverage shall be of the entire screening checkpoint area including any associated exiting areas. This includes all access points into and out of the screening area.

3. There shall be additional CCTV coverage to allow for the verification of the direction of travel of an individual approaching and leaving the screening checkpoint area.

C. Emergency Screening Checkpoint direct line phone and Silent Alarm Button with ESS Interface shall be installed at each screening lane.

1. Contact Technology Services (734) 247-0000 for phone and alarm specifications and Airport Security for ESS interface.

D. A “Caution Alarm” shall be installed

1. The alarm shall have a twist to reset switch/button.
2. The alarm shall be interfaced into the CCTV and ESS.
3. The alarm shall include a local Audible and visual alarm.
   i. The audible alarm shall deactivate after 30 seconds but the visual alarm shall remain active until the reset of the Caution Alarm.
4. The activation alarm shall match all exiting buttons within the terminals. Placement of the all the alarm equipment shall be coordinated with a Security Manager.
5. The exit lane may require an additional “Caution Alarm” activation button depending on checkpoint layout.
6. As part of the “Caution Alarm” system, manual or automatic isolation gate(s) and associated CCTV coverage may be required to be installed adjacent to the screening checkpoint and exit lane(s). Exact location shall be determined by TSA and Security.

E. Installation of a full partition gate shall be installed in front of the screening checkpoint and any associated exit lane to allow for complete closure.

1. The gate shall not allow for any persons or items to be introduced into the sterile area from under, through or over the gate.
2. The gates shall have ESS installed with alarm contacts, CCTV coverage and be card reader controlled.

F. The exit lane shall have a LEO authorization ESS reader installed with red “denied” and green “authorized’ lights.

1. The lights and reader shall be tamper proof.
2. Area shall be covered by CCTV.

G. The Contractor shall install necessary TSA Airport Foreign Advisory Notice signs and associated bulletin boards and all other signs including x-ray and magnetometer numbers.

1. Numbers shall be a minimum of 2 inches high of a contrasting color. The numbers shall be placed on all equipment

H. Contractor shall install a Sterile Area access corridor adjacent to the screening checkpoint to allow Airport and Emergency personnel access to the sterile are at the permit holders expense. A camera will be installed so that the corridor door shall be monitored via the Airport’s CCTV system with both live and recorded video.

1. Corridor access will be controlled by a maglock door with card reader integrated into the ESS (see ESS requirements).
2. The Corridor shall be a one way door.
3. Design and layout will be similar to that of existing access corridors at other screening checkpoints. The corridor shall be unobstructed to the screening operations and away from the public's view.
4. An addendum to the permit must be submitted for approval. The addendum shall include the layout/design of the corridor and associated equipment.
5. The Contractor shall provide CCTV coverage at the new corridor location. Cameras are to be similar to that at other screening locations. Security shall pre-approve CCTV placement (See CCTV requirements).
6. Provide all other fire and security signs (this includes informational and directional signs currently located at the existing corridor.
7. Install a securable bulletin board within the corridor. The board shall match existing boards. Exact location to be approved by Security.

2.9 PERMANENT VEHICLE CHECKPOINT

A. All equipment shall be approved by an Airport Security Manager prior to purchase installation and operation. Contact an Airport Security Manager for detailed specifications of the ESS equipment.

B. A booth is required for vehicle access checkpoints.

1. Installation of the booth shall meet all Manufacturers' specifications.
2. Final booth location must be approved by a Security Manager.
3. Booth design and layout and shall be approved by an Airport Security Manager prior to fabrication and installation.
4. The booth shall be designed and fabricated with inbound and outbound doors and windows similar to existing checkpoint booths.
5. The doors shall have locks and be equipped with a seven (7) pin interchangeable core to accommodate the Best Core System.
6. Booth shall be a minimum of eight feet (8' length) by five feet (5' width) in size and gray in color.
7. Provide cabling for phone service (at Contractor's expense)
8. Booth shall be equipped with a heavy duty heater and air conditioner.
9. Install a minimum of 2 interior duplex 110VAC GFI outlets (front and back of booth interior).
10. Install two exterior LED bulb spotlights with day/night activation on each corner of the booth.
11. Install exterior mirrors on the inbound and outbound sides of the booth.
12. Front and back counters shall be installed at a height of 36" and include at least one drawer per counter.
13. Install radiant heaters on both sides of the exterior eaves.
14. Booth shall be elevated at least 18" above grade with OSHA required sized steps with OSHA approved handrail.
15. Provide and install pull down tinted shades for all windows (similar to other booth locations). Shades must not interfere with either of the door slides.
16. Provide an anti-fatigue mat installed on the entire floor.
17. Provide and install a two-way radio.
    i. Radio shall be the base station option with power supply and desktop microphone. The radio is to be delivered to the Airport for

programming and installation. Contact WCAA Technology Services (734-247-0000), for specific model numbers and requirements.

18. The booth shall have at least a one (1) year warranty.

C. The booth shall be at enough distance from the automatic gate so that when a vehicle is stopped for physical verification, the safety loop for the gate is activated but also that the enhanced gate arm can be down. Final equipment layout shall be pre-approved by an Airport Security Manager.

D. Inside the booth there shall be toggle switches that open the automatic gates. The toggles shall be independent of each gate opening.

1. The Security Officer shall open the NEMA enclosure via the interior ESS card reader. The enclosure shall contain toggle switches to open and close the individual automatic gate leafs and barriers.
2. An alarm shall enunciate in the ESS when these toggle switches are used.
3. An alarm shall enunciate in the ESS when the enclosure is opened without a valid card swipe.

E. Provide independent CCTV coverage (see CCTV requirements). An Airport Security Manager shall approve all CCTV locations during the design phase.

F. Permanent Vehicle Checkpoint shall be equipped with automatic gates and enhanced barriers. The contractor will be required to pass the System's Acceptance Test, prior to the completion of the project (see ESS section for requirements).

1. Installation of the automatic gate and enhanced barriers shall meet all Manufacturer's specifications.
2. Gate design and layout shall be approved by an Airport Security Manager prior to fabrication and installation. This includes card reader, loop, photo sensor placement, etc.
3. A key switch shall be installed, within the booth, that prevents activation of any ESS device (i.e., gate, barrier etc.,) if removed.
4. To access the gate from any side, a valid card read and PIN entry is required (The reader is to operate the same as other card readers in the system).
   i. The card readers shall be placed at an approved height and distance so that a vehicle is not activating the ground loops for the gate while swiping at the reader but on the loop when at the booth for verification.
   ii. Once the system has validated the card, the appropriate gate shall open.
   iii. Once the system has validated the card, the green tamper proof "Authorized" light within the booth shall illuminate.
      1. If the card is not validated, the red tamper proof "Denied" light within the booth shall illuminate, the gates shall remain secured. A lockout alarm also enunciates the ESS.
   iv. There shall be two loop detectors for the entrance (inbound) side. First is a safety, tailgating and loitering detector, the second is a safety loop.
   v. If a pop-up type barrier is installed – The barrier shall work in conjunction with the automatic gates.

1. The traffic control light shall remain 'RED' until the gate is fully open and the barrier is fully down.
2. Once the gate is fully open and barrier fully down the traffic control light shall turn 'GREEN'.
3. Additional photo eyes may be required between the gate and the barrier. See Manufacturers' specifications.

5. To exit, the gate shall open once a vehicle is detected on the 1st ground loop. NOTE: At some locations a card reader to exit may be required.
   i. There shall be three loop detectors for the exit (outbound) side. First is to activate the opening of the gate; the second and third are safety loops.
   ii. If a pop-up type barrier is installed – the barrier shall work in conjunction with the automatic gates.
      1. The traffic control light shall remain 'RED' until the gate is fully open and the barrier is fully down.
      2. Once the gate is fully open and barrier fully down the traffic control light shall turn 'GREEN'.
6. Once the vehicle clears the last ground loop detector, the gate shall automatically close.
   i. If a pop-up type barrier is installed the barrier lifts back up into position.
   ii. The signal light shall illuminate 'RED' once the vehicle clears the ground loop and as soon as the closing process has begun for both the gate and the barrier.
7. Once open, if the gate does not close in a predetermined time, an alarm will enunciate in the ESS.
8. Once the gate is secured, it shall take another valid card read to reopen the gate.
   i. If the safety edge of the gate is activated the gate will automatically re-open and an alarm shall enunciate in the ESS.
9. Any attempt to open the gate without a valid card read shall enunciate an alarm in the ESS.
10. When a vehicle is detected on a ground loop prior to a valid card read, after a predetermined time, an alarm will enunciate in the ESS.

G. Vehicle checkpoints shall have installed enhanced (cable re-enforced) gate arm operators and each opening.

1. The gate arms shall be a similar model to existing equipment in current use at the Airport and must be approved by Security.
2. Installed per Manufacturers' specifications.
3. The gate arms shall have a minimum clear opening of sixteen feet (16').
4. A lightweight 'stop' sign shall be installed on the gate arms (see other locations for example).
5. The gate arms will function manually with the switches inside of the booth at the front counter.
6. An override function shall be programmed into the ESS to allow for remote activation of the gate arm.
7. Environmental Friendly oil shall be used.
8. Seal all expansion joints around the foundations.
9. The enhanced gate arms shall have the ability to be controlled from the ESS.

H. Provide for at least three (3) parking spaces on the public side for contract security officers. The parking spots shall be signed "Security Parking Only".

I. To prevent damage, guardrail shall be installed on the inbound and outbound lanes of the booth. Guardrail layout and specifications shall be submitted to an Airport Security Manager for approval prior to installation. All guardrails shall be painted safety yellow and meet DOT highway standards.

J. Guardrail shall be installed on the AOA side of the fence around the checkpoint at a minimum of 500' (five hundred) feet on either side of the gates. Contact an Airport Security Manager for approval prior to installation. All guardrails shall be painted safety yellow and meet DOT highway standards.

K. Concrete jersey barriers shall be installed at least sixty (60) feet on both public and AOA sides of the gate to form a chute.

1. The barriers shall match other checkpoint locations
2. The barriers shall be painted safety yellow.
3. The barriers shall have reflective tape/signs installed.

L. Provide for adequate slope and drainage to prevent water ponding in or around the booth and associated security equipment.

M. Provide and install all necessary signs. The signs shall be same size and design of other locations and made with outdoor reflective materials. The signs shall be approved by Security prior to fabrication and installation. Listed below are some of the required signs:

1. "Stop - Wait Until Traffic is Clear" - mounted on the inbound lane, prior to start of the barrier chute, with a white Stop-Line painted on the ground adjacent to the sign.
2. "Stop" sign - installed adjacent to the gate arm operators on the inbound and outbound lanes.
3. "Wait Until Gate is Closed Before Proceeding - No Tailgating" - on both sides of the inbound and outbound automatic gate leafs.
4. "Restricted Area – Keep Out" on each gate leaf.
5. "Warning - Restricted Area - No Public Access Shall Show Valid Airport ID" - shall be mounted on the top front of the booth facing the public side.
6. 'Per TSA Regulations – All Vehicles and persons are subject to search' - shall be mounted on the top front of the booth facing the public side. The sign shall be the same size and design as other checkpoint booth signs.
7. "No Pedestrians" – mounted on all gate leafs.
8. "Stop – Ensure Gate is secure before departing" on the secured side at the end of the barrier chute with a white Stop-Line painted on the ground adjacent to the sign.
9. Install Checkpoint Identification number on booth.

N. Provide validation reader to be used with the Airport's ESS. The readers shall be interfaced with green "Authorized" and red "Denied" indicator lights located inside the booth that shall illuminate upon authorization or denial from the ESS.

1. The lights shall be tamper proof.
2. The reader installation within the booth shall allow for easy and frequent access.

O. Provide wiring for the installation of a wireless reader.

P. Protection posts are required to surround all security equipment (i.e., card readers, panels, gates, operators, etc.) to prevent damage.

1. Layout of protection posts shall be approved by Security.
2. Posts must have plastic protective covers.

Q. Paint all lanes, hold short and directional lines.

2.10 TEMPORARY VEHICLE CHECKPOINT

A. Contractor may be required to furnish additional Security personnel at the entrance to the job site, prior to the AOA checkpoint. Security will provide the specific procedures required for the position.

1. The Airport's Contract Security company is not required to be used, but may be used at the Contractor's expense.

B. All equipment shall be approved by an Airport Security Manager prior to installation and operation. Contact an Airport Security Manager for detailed specifications of the above equipment.

C. Installation of CCTV & ESS may be required and will be at the discretion of Airport Security.

1. This may include the installation of wireless camera and reader readers.

D. Temporary booths shall be furnished and installed at the locations as indicated in the drawings and/or as directed by Airport Security.

1. Contractor shall furnish all utilities required to heat, air condition, and light the booth for the duration of the project.
2. The Contractor shall maintain the booth for the duration of the Contract, including repair of air conditioning, heating, lighting, removal of garbage, and cutting of grass around the booth.
3. If available Security can provide a temporary booth for use by the Contractor.
    i. If Security's booth is utilized, booth must be returned in same or better condition than at the beginning of project.
    ii. Contractor will be required to complete a booth condition check list prior to use.

E. The booth shall be no less than five feet wide by eight feet long (5'x8').

1. Shall have one counter or table (minimum size 16"x36").
2. Two doors to allow contract security officers to check entering and exiting vehicles.
3. Windows on all sides, large enough for contract security officer to observe from a seated position.
4. One chair with turning radius of 360 degrees, at a height which allows contract security officer to observe restricted areas through windows.
5. Trash cans (dumping daily responsibility of Contractor.

F. The Contractor shall provide a portable toilet facility near the booth for the use of the Contract Security Officer and shall be maintained by the Contractor.

G. The Contractor will be responsible for maintenance of the booth during the duration of the project and will return the booth in the same condition or better should updates need to be completed by the contractor.

H. The Contractor will be responsible for providing power to the booth. If a generator is used it must be maintained by the contractor (including fuel) for the duration of the project. The contractor must be available to respond at all times while the booth is powered by a generator.

I. On a case-by-case basis, with Security approval, Contract Security Officer Service may be provided without a booth if the request is for "one time" access with a period of less than eight (8) hours. The Contractor will be responsible for all vehicle expenses.

J. The Contractor shall remove all temporary booths from the project site at the completion of the project.

1. Booths provided by the contractor remain the property of the Contractor.

K. Install enhanced (cable re-enforced) gate arm operators. The gate arm operator switch shall be installed at the front counter of the temporary booth.

1. The gate arms shall be a similar model to existing equipment in current use at the Airport and must be approved by Security.
2. Installed per Manufacturers' specifications.
3. The gate arms shall have a minimum clear opening of sixteen feet (16').
4. A lightweight 'stop' sign shall be installed on the gate arms (see other locations for example).
5. The gate arms will function manually with the switches inside of the booth at the front counter.
6. Environmental Friendly oil shall be used.
7. Seal all expansion joints around the foundations.
8. The enhanced gate arms shall have the ability to be controlled from the ESS.

L. To prevent ESS and booth damage, guardrail or other approved barriers, shall be installed on the inbound and outbound lanes of the booth.

M. Concrete jersey barriers shall be installed at least sixty (60) feet on both public and AOA sides of the gate to form a chute.

1. The barriers shall match other checkpoint locations.
2. The barriers shall be painted safety yellow.
3. The barriers shall have reflective tape/signs installed.

N. Provide and install all necessary signs. The signs shall be same size and design of other locations and made with outdoor reflective materials. The signs shall be approved by Security prior to fabrication and installation. Listed below are some of the required signs:

1. "Stop - Wait Until Traffic is Clear" - mounted on the inbound lane, prior to start of the barrier chute, with a white Stop-Line painted on the ground adjacent to the sign.
2. "Stop" sign - installed adjacent to the gate arm operators on the inbound and outbound lanes.

3. "Wait Until Gate is Closed Before Proceeding - No Tailgating" - on both sides of the inbound and outbound automatic gate leafs.
4. "Restricted Area – Keep Out" on each gate leaf.
5. "Warning - Restricted Area - No Public Access Shall Show Valid Airport ID" - shall be mounted on the top front of the booth facing the public side.
6. 'Per TSA Regulations – All Vehicles and persons are subject to search' - shall be mounted on the top front of the booth facing the public side. The sign shall be the same size and design as other checkpoint booth signs.
7. "No Pedestrians" – mounted on all gate leafs.
8. "Stop – Ensure Gate is secure before departing" on the secured side at the end of the barrier chute with a white Stop-Line painted on the ground adjacent to the sign.
9. Install Checkpoint Identification number on booth.

PART 3 - ELECTRONIC SECURITY SYSTEM (ESS)

3.1 ELECTRONIC SECURITY SYSTEM (ESS) REQUIREMENTS

A. Installation of any ESS equipment and associated hardware shall meet all Manufacturers' specifications.

B. The Contractor is responsible for all costs associated with installation of the ESS equipment.

C. The Contractor is required to submit detailed plans for the installation of the ESS within sixty (60) days prior to the expected completion date. Failure to submit the plan may result in delay.

D. Final tie into and programming of the existing security equipment shall be completed by the Airport's ESS service provider at Contractor's cost. Contact a Security Manager for installation requirements and additional information.

1. The Airport's on-site technicians cannot be pulled from normal duties to be used by the Contractor. Additional coverage will have to be coordinated, with the costs to be incurred by the Contractor.

E. All parts and equipment associated with the ESS must match existing hardware and be approved by a Security Manager prior to purchase and installation.

1. Installation shall include all CCTV interfacing, Intellikey, Perimeter Detection and ESS programming.

F. All ESS equipment inside of terminals shall be installed within Special System Rooms (SSR) within independent lockable cabinets dedicated to Security equipment.

G. Protection posts are required to surround all security equipment (i.e., card readers, panels, gates, operators, etc.) to prevent damage.

1. Layout of protection posts shall be approved by Security.
2. Posts must have plastic protective covers.

H. Fiber installation shall be approved by the WCAA's Technology Services Division and meet its requirements.

1. Other communication means may be considered depending on location. The Contractor/designer is required to submit a Networking/Communications Plan to an Airport Security Manager for approval.

I. All ESS equipment and associated wiring installed shall be labeled. This includes panels, cameras, wiring etc.

1. The labeling plan must be approved by a Security Manager prior to implementation.

J. The Contractor shall provide or obtain a 1 year warranty on all parts and service associated with the ESS equipment and installation. The warranty period will not start until Security testing is complete and the items have passed.

K. The system shall be designed and installed to prevent tampering with any of the ESS components. This includes, but is not limited to, tamper resistant screws, tamper switches and key locks.

L. All wiring shall be shielded cabling in conduit and unless otherwise approved, may not be exposed. All wiring that is to be maintained underground, shall meet the specifications for underground rated wiring.

M. All equipment that is to be exposed to the elements, shall meet Airport Security's standards for weather conditions (i.e. NEMA rated enclosures).

1. The enclosures shall be installed on the secured side of the location within lockable security dedicated cabinets.

N. The Contractor shall submit an addendum to the permit indicating the ESS installation specifications and layout for approval by Security prior to start of work and shall provide As-Built of the ESS installation.

O. All ESS doors shall have card readers and door handles installed on both sides of door regardless if crash bar or other door hardware is installed.

1. Some locations may allow for the installation of a Request to Exit (REX) device and may be installed only after approved by a Security Manager.

P. All fire rated ESS doors require latching hardware per Fire Code.

Q. Proper signage is the Contractor's responsibility as part of any ESS installation or relocation (i.e., door signs, panel labeling).

R. Power for all ESS components shall be routed to a dedicated breaker panel with automatic generator emergency hook-up.

1. The breakers shall be labeled.
2. Contact Airport electricians for generator load requirements and connector specifications.

S. Motion Detectors, door cords or key switch overrides are not allowed in conjunction with any ESS door installation.

T. Fire System Interface

1. The fire system output for releasing the doors in an alarm state shall be interfaced with the Airport's ESS doors. The fire system shall provide an alarm output relay for both alarming and monitoring of the fire system status directly from the ESS.
2. The Contractor shall install an override for the fire system while the system is undergoing maintenance or should a system failure occur.
3. When the fire system activates, the system should release power to the maglocks in the specific zone.
   i. An alarm shall enunciate in ESS that identify the maglock has lost power due to the fire alarm. All other functions of the card reader and door status monitoring shall not be affected.

U. Testing of any new equipment shall be completed by the Contractor using the Security Acceptance Test Forms.

1. The Contractor will be required to submit their test sheets to Security for review and approval.
2. Once the Contractor has completed their testing, Security will complete final acceptance testing.

V. As part of Project Close-Out, a Security Manager will complete and authorize a Performance and Installation Completion Form (Test Sheet) as part of the equipment and installation test. Unless otherwise approved by a Security Manager, the equipment may not be utilized until it has been tested and approved by Security.

3.2 PEDESTRIAN OPERATIONAL DOOR: The following is a synopsis of ESS pedestrian door operations. This information applies to both single and double leaf pedestrian doors.

A. Installation of the door shall meet all Manufacture's specifications.

B. The door shall be tied in to the ESS system to allow for remote monitoring and control of the door. Programming shall allow for items such as Tamper Alarms, Prop Alarms, Intrusion Alarms, Power Alarms, etc…

C. A maglock shall be installed at the top of the door.

1. Depending on the specific operation and configuration of the door, a dual leaf door may require either one single maglock covering both leafs or may require a maglock dedicated to each leaf.

D. Card readers shall be installed on both sides of the door. To access the door from either side, a valid card read and PIN entry is required. The readers are to operate the same as other card readers in the system.

1. Some doors may allow for the installation of a Request to Exit (REX) device, depending on the specific location. This design must be pre-approved by an Airport Security Manager. If approved, the public side of the door will require a card reader meeting the specifications presented.

2. Depending on the specific operation and configuration of the door, a dual leaf door may be required to be programmed as two independent doors, resulting in 4 reader's total.
3. If the reader is exposed to the elements, a protective reader cover and/or shield may be required.
4. The reader shall have a tamper installed that is tied in to the ESS.

E. Once the system has validated the card entry, or the REX is engaged, the maglock will release allowing the door to be opened.

F. Once the door is secured, it shall take another valid card read or activation of the REX, to be reopened.

G. A horn and strobe shall be mounted adjacent to the door on the public side.

1. The horn and strobe shall be mounted high enough and have adequate protection to deter tampering.
2. The horn/strobe shall have a timer where the audible portion of the alarm resets (programmable time) while the strobe remains active until reset by the ESS system.
   i. Currently, most horns are set to 30 seconds.
3. On a Prop Alarm, the horn and strobe will activate after a predetermined time set within the ESS system.
   i. The horn and strobe will automatically reset after the door is closed and the Prop Alarm has reset.
4. On an Intrusion Alarm, the alarm and horn and strobe shall activate immediately. The strobe will remain active until reset remotely through the ESS system.
5. Under certain circumstances, such as a close courters situation, Airport Security may require that the horn and strobe be modified or adjusted for volume concerns or may be removed from the configuration.

H. If the fire alarm is activated, see Fire System Interface requirements, the maglock will automatically release. An alarm will enunciate in the ESS that the fire alarm is active for that door. If the door is then opened, an Intrusion Alarm will activate in the ESS, as well as the local horn and strobe.

I. Depending on the location and operational purpose of the door, additional functionality may be required such as:

1. Emergency Pull Station release
2. Remote push button or toggle release

J. The component enclosure shall be installed in the immediate vicinity of the primary door.

1. The enclosure shall be lockable and shall be key-cored to match the other enclosures in that particular building.
2. The enclosure shall have a tamper installed that is tied in to the ESS.
3. The enclosure shall be installed in such a manner that it remains easily accessible and has adequate clearance for maintenance purposes.

4. The enclosure shall have external labeling that matches that being used in the software programming to identify the cabinet. Labeling shall also indicate that the contents are “Property of Airport Security – 734-942-5304”.

K. Live and recorded CCTV coverage of the area may be required. See CCTV Requirements.

L. Airport Security will provide the Contractor with the details on the specific make and models of ESS currently in use.

M. In order to streamline maintenance and inventory requirements and/or to ensure that certain system requirements and functionality are maintained, Airport Security may require that specific brands or models of equipment are utilized.

3.3 DELAY HARDWARE OPERATIONS**:** The following is a synopsis of the delay hardware operations (The Contractor will be required to pass the Acceptance Test, prior to completion of the project.):

A. Installation of the door shall meet all Manufacturers’ specifications.

B. To access the door from the public side of the door, a valid card read and PIN entry is required (The reader is to operate the same as other card readers in the system).

1. A REX or card reader on the restricted side of the door will allow access into the building. The door location will determine the requirements for the restricted side of the door. Security to approve the device(s) proposed.

C. Once the system has validated the card or the Request to Exit (REX) is activated, the maglocks will release allowing the door to be opened.

D. A horn and strobe shall be mounted adjacent to the door on the public side.

1. The horn and strobe shall be mounted high enough and have adequate protection to deter tampering.
2. The horn/strobe shall have a timer where the audible portion of the alarm resets (programmable time) while the strobe remains active until reset by the security system.
3. On a Prop Alarm, the horn and strobe will activate after a predetermined time set with the ESS system
   i. The horn and strobe will automatically reset after the door is closed from the prop alarm.
4. On a forced open (Intrusion) alarm, the alarm shall activate and remain active until reset remotely through the ESS system.

E. Once the door is secured, it shall take another valid card read to reopen the door.

F. If the crash/touch bar is held for greater than 3 seconds, an irreversible timer will engage causing the door to unlock in 15 seconds. When the maglock releases and the door is opened, an alarm shall enunciate in the ESS.

1. The locking mechanism shall have the ability to be reset remotely within the ESS.
2. The strobe shall remain active until reset remotely by the ESS.
3. No key switch overrides are allowed in the crash bar.

G. If the fire alarm is activated, the maglock will automatically release, and the local horn and strobe will activate.

1. An alarm will be enunciated in the ESS that the fire alarm is active for that door.
2. An Intrusion Alarm will be activated if the door is opened.

3.4 BAG BELT OPERATION: The following is a general synopsis of baggage door operations: (The Contractor will be required to pass the Acceptance Test, prior to completion of the project.):

A. Installation of the door shall meet all Manufacturers' specifications.

B. Monitoring of all baggage system doors that lead from any sterile or public area to the secured area is required.

C. To access the door, a valid card read and PIN entry is required (The reader is to operate the same as other card readers in the system). The door operator should not allow the door to be opened without authorization from the ESS system.

1. The door operator should not allow the door to be opened without authorization from the system. An alarm will enunciate in the Security Control Center (SCC) if the door is opened without an authorized card read.
2. Once access is granted via the reader, the green "Open Door" light on the reader will light allowing access to the door operator controls.
3. To open the door, press the door "Open" button on the door operator controls. (Note: the "Open" button must be pressed while the green "Open Door" light is lit on the card reader. If the button is not pressed during this time, the individual will need to re-swipe their badge in the reader.)

D. Auxiliary lights shall be installed near the card reader. The green "Closed/secured" indicator light should stay lit until the door begins to open. Once the door has started to open, the red "Open/unsecured" light will activate – activated off of the door contacts. The lights shall be tamper proof.

E. To close the door, press and hold the door "Close" button until the door is secure and the green "Close" light is activated on the door operator. No swiping of the card reader is required to close the door.

F. Once the door is closed, it shall take another valid card read to be reopened.

G. Any attempt to open the door without a valid card read shall enunciate as an alarm in the ESS and activate the local horn/strobe.

H. Depending on the system operations, the door may be allowed to be propped open. An alarm shall enunciate in the ESS if the door fails to secure after a pre-determined time or after the system has sent the close command.

I. Any override of the card reader shall enunciate an alarm in the ESS.

J. The door shall have restricted area signs installed.

3.5 OVERHEAD CARGO DOOR OPERATIONS: The following is a synopsis of the Overhead Cargo door operations (The Contractor will be required to pass the Acceptance Test, prior to completion of the project.):

A. Installation of the door shall meet Manufacturer's specifications.

B. To access the door, a valid card read and PIN entry is required (The reader is to operate the same as other card readers in the system). The door operator should not allow the door to be opened without authorization from the ESS system.

C. Auxiliary lights shall be installed near the card reader. The green "Closed/secured" indicator light should stay lit until the door begins to open. Once the door is fully open, the red "Open/unsecured" light will activate. The lights shall be tamper proof.

D. Once access is granted via the reader, the green "Open Door" light on the reader will light allowing access to the door operator. To open the doors press the door "Open" button. If the button is not pressed during this time, the individual will need to re-swipe their badge in the reader.)

E. To close the door press and hold the door "Close" button until the door is secure and the green "Closed" indicator light is lit. Swiping at the card reader is not required to close the door.

F. Once the door is closed, it shall take another valid card read to be reopened.

G. Any attempt to open the door without a valid card read shall enunciate as an alarm in the Security Control Center.

H. All cargo doors shall be numbered and signed to meet the Authority's standards.

I. A local horn and strobe will activate if the door is not closed in a predetermined time. In addition, am alarm will annunciate in the Security Control Center. (The horn and strobe will automatically reset after the door is closed from the prop alarm.)

1. The horn and strobe is to be mounted adjacent to the door on the public side. The horn and strobe shall be mounted high enough and have adequate protection to deter tampering.
2. The horn /strobe shall have a timer where the audible portion of the alarm resets (programmable time) while the strobe remains active until reset by the security system.

J. Cargo doors that will be left are not allowed to be left open without being manned or active loading or unloading is being performed.

3.6 AUTOMATIC GATE OPERATIONS

A. Installation of the gates shall meet all Manufacturers' specifications.

B. All gates shall have a minimum clear opening of 16 (sixteen) feet.

C. Gate design and layout shall be pre-approved by an Airport Security Manager prior to fabrication and installation. This includes the locations of the card readers, photo sensors and/or ground loops.

D. High speed chain driven gate shall be used. The gate operator shall be approved by Security prior to purchase and installation.

E. The control panel for the security system and the gate operator shall be placed on the restricted side of the fence. All panels and gate controllers shall be lockable.

F. To access the gate from either side of the gate, a valid card read and PIN entry is required (The reader is to operate the same as other card readers in the system).

1. The location of the card readers shall be coordinated with security as to not allow the presence of a vehicle on the ground loops when utilizing the card reader.
2. Card readers shall be on a stanchion and there shall be a high and low card reader. The height of the stanchion and placement of the card readers shall be pre-approved by Security to ensure that the height and location is sufficient.

G. Once the system has validated the card, the appropriate gate shall open.

1. At locations where a booth is present - Once the system has validated the card, the green "Authorized" light within the booth shall illuminate. See booth requirements.

    a. If the card is not validated, the red "Denied" light within the booth shall illuminate and the gates remain secured.

H. At a minimum, there shall be two loop detectors for the entrance (inbound) side. First is a safety, tailgating and loitering detector, the second is a safety loop.

1. The placement of the loops shall follow Manufacturer's recommendations but must be pre-coordinated with Security so that a vehicle at the card reader is not on the loop but a vehicle at the booth is on the loops. In addition, the loops shall not be placed too close to the gate that the metal in the gate will interfere with the operation of the gate.

I. To exit, the gate shall open once a vehicle is detected on the 1st ground loop. NOTE: At some locations a card reader to exit may be required.

1. There shall be three loop detectors for the exit (outbound) side. First is to activate the opening of the gate (unless there is a card reader) the second and third are safety loops.
2. Once the vehicle clears the last ground loop detector, the gate shall automatically close.
3. When a vehicle is detected, after a predetermined time, on a ground loop prior to a valid card read, an alarm will enunciate in the ESS.

J. Once open, if the gate does not close in a predetermined time, an alarm will enunciate in the ESS.

K. Once the gate is secured, it shall take another valid card read to reopen the gate.

1. If the safety edge of the gate is activated, the gate will automatically re-open and an alarm shall enunciate in the ESS.

L. Any attempt to open the gate without a valid card read shall enunciate an alarm in the ESS.

M. The gate shall have safety edges installed and be ties into the ESS.

N. The gate shall have PTZ CCTV coverage installed that allows for 24/7 live and recorded viewing of the location. The camera(s) location shall be approved by Security. See CCTV requirements.

O. To prevent damage, protection posts shall be installed to protect the card readers, gate operators, gate opening, panels etc.

1. The protection posts shall be of a sufficient height to protect the equipment (example – same height or higher at card reader to deflect vehicle mirrors).
2. The protection posts shall have yellow plastic protective covers.

P. A manual key switch shall be installed at each gate operator to allow an override of the ESS system for maintenance or in emergency situations.

1. The key switch cylinder shall accept the 7 pin “Best” series key cores (Notify an Airport Security Manager for installation of an Airport Core for the key switch).
2. The key switch shall be installed on the AOA/Secured side of the gate.
3. The key switch shall enunciate an alarm in the ESS when operated.

Q. The slope of the gates shall be such to provide proper drainage and prevent ponding of water, erosion and/or ice building up.

3.7 CCTV REQUIREMENTS: Depending on the type of operation and location, CCTV coverage of the area may be required.

A. Installation of the CCTV system shall meet all Manufacturers’ specifications.

B. All components used shall be compatible with the existing CCTV system and shall be approved prior to installation.

C. Airport Security will specify the type and number of cameras required.

D. Final tie into the existing security equipment shall be by a contractor authorized to work on said equipment (i.e., Honeywell, Verint. Etc.)

1. Programming shall include live and recorded video and all associated monitor programming. Frame rate, quality and video retention shall at least meet current requirements and must be pre-approved by Security.
2. The system design shall be coordinated with Security.

E. All parts and equipment associated with the CCTV system shall match existing hardware and be approved by a Security Manager prior to installation.

1. Installation shall include all CCTV interfacing and ESS programming (i.e. camera call up for alarms).

F. All associated camera system equipment shall be installed within SSR rooms within independent lockable dedicated security cabinets.

G. Camera video is required to be incorporated into both the Airport's live and digital Recording System. The interface into the recording system shall be by a company authorized by the vendor to perform such installation.

1. It shall be the Contractor's cost if additional equipment is needed to support the installation of the new camera(s). This may include but not be limited to licensing, expansion of recording system, additional hardware, etc.
2. The Contractor is responsible for expansion of the system to allow for at least 15% expansion. Using current unused portions of the CCTV system will not be allowed.

H. The Contractor is responsible for all costs associated with installation of the CCTV System equipment.

1. The Airport's on-site technicians cannot be pulled from normal duties to be used by the Contractor. Additional coverage will have to be coordinated, with the costs to be incurred by the Contractor.

I. Testing of any new equipment shall be completed by the Contractor using Security Acceptance Test Forms. The Contractor will be required to submit their test sheets to Security for review and approval. Once the Contractor has completed their testing, Security will complete final acceptance testing.

J. The Contractor shall obtain a one (1) year warranty on all parts and service associated with the CCTV equipment and installation. The warranty period will not start until Security testing is complete and the items have passed.

K. The system shall be designed and installed to prevent tampering with any of the CCTV components. This includes, but is not limited to, tamper resistant screws, tamper switches and key locks.

L. All wiring shall be shielded cabling in conduit and unless otherwise approved, may not be exposed. All wiring that is to be maintained underground, shall meet the specifications for underground rated wiring.

M. All equipment that is to be exposed to the elements, shall meet Airport Security's standards for weather conditions (i.e. NEMA rated enclosures).

N. The CCTV installation specifications and layout shall be pre-approved by Security prior to start of work.

1. As-Built of the CCTV installation are required.

O. CCTV shall be enclosed in an Environmental housing and be installed to be tamperproof.

P. Exterior Environmental Housings shall be heated.

Q. Camera Electronics shall be heated.

R. Wipers may be required as specified by an Airport Security Manager.

S. All video and control communications shall be via fiber optics or networking unless otherwise approved.

1. Use of existing fiber shall be approved by the Airport Authority – Contact Technology Services (734) 247-0000.

T. All CCTV components make and models shall be approved prior to installation.

U. All camera towers installed shall have "anti-climb" protection and protection posts. Tower height and placement shall be pre-approved by Security.

V. Lighting shall be provided to illuminate the viewing area.

W. Camera wiring shall be in conduit.

X. At a minimum, 30 day recording storage shall be provided for all cameras installed.

END OF SP-20

SECTION 02120

WASTE MANAGEMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coordinating transport vehicles and containers.

B. Preparing transport vehicles/containers for off-Site transportation.

C. Loading and securing materials in transport vehicles/containers.

D. Weighing transport vehicles/containers.

F. Transporting and disposal/recycling of the following materials from Site to approved TSDFs:

1. Hazardous materials and hazardous waste, including hazardous solids, liquids, and/or sludges.

2. Non-hazardous industrial/process materials and wastes, including solids, liquids, and/or sludges.

3. Used and waste oil.

4. CFC's

5. Universal wastes including fluorescent and HID light bulbs, mercury containing devices, and batteries.

6. TSCA concrete solid, liquid, oil, and/or sludge wastes including PCB light ballasts and PCB-impacted building materials.

7. Decommissioned electrical equipment.

8. Regulated asbestos-containing materials.

9. Salvageable ferrous and non-ferrous scrap metal.

G. Maintaining transportation records as required by regulatory agencies.

H. Obtaining documents from TSDFs.

1.2 REFERENCES

A. WCAA General Terms and Conditions

B. United States Federal Government - Code of Federal Regulations (CFR)

1. 40 CFR 261 - Identification and Listing of Hazardous Waste.

2. 40 CFR 262 - Standards Applicable to Generators of Hazardous Waste.

3. 40 CFR 263 - Standards Applicable to Transporters of Hazardous Waste.

4. 40 CFR 265 - Interim Status Standards for GM and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.

5. 40 CFR 273 - Standards for Universal Waste Management.

6. 40 CFR 279 - Standards for the Management of Used Oil.

7. 40 CFR 761 - Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.

8. 49 CFR 171 - General Information, Regulations, and Definitions.

9. 49 CFR 172 - Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements.

10. 49 CFR 173 - Shippers - General Requirements for Shipments and Packaging.

11. 49 CFR 174 - Carriage by Rail.

12. 49 CFR 176 - Carriage by Vessel.

13. 49 CFR 177 - Carriage by Highway.

E. Applicable State of Michigan and local rules and regulations.

1.3 DEFINITIONS

A. CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act.

B. Contractor Waste - Waste associated with and created as a result of work performed by a CONTRACTOR.

C. DOT - Department of Transportation.

D. Waste - Any material or residue that cannot be reused or recycled and requires off-Site transportation.

E. Non-hazardous Materials - Materials not regulated by 40 CFR 261, 40 CFR 273, 40 CFR 279, and 40 CFR 761 or equivalent State of Michigan regulation.

F. PCB Wastes - Materials as defined in 40 CFR 761.

G. RCRA Characteristic Wastes - Materials as defined in 40 CFR 261 Subpart C.

H. RCRA Listed Wastes - Materials as defined in 40 CFR 261 Subpart D.

I. Ton – A unit of weight in the U.S. Customary System, an avoirdupois unit equal to 2,000 pounds. Also called "short ton", "net ton".

J. TSCA – Toxic Substance Control Act.

K. TSDF - Treatment, storage, and disposal facility, and includes solid waste, hazardous waste and TSCA waste disposal facilities.

L. Used and Waste Oil - Materials as defined in 40 CFR 279 and applicable State of Michigan regulations.

M. Demolition Waste – Solid waste generated as a result of demolition of structures, surface improvements, utility services and equipment not otherwise salvageable.

1.4 PROGRESS SUBMITTALS

A. Waste Management Plan: 7 days prior to mobilization to the Site, submit to DESIGNER for review a plan for waste identification, handling, interim storage and transportation and disposal. Include relevant transporter and TSDF identification and regulatory classification and status, methods of transportation and disposal, contingency plans for spills during interim loading, security plan, storage and transportation. Identify TSDF-specific requirements for waste profiling, sampling and analysis to determine acceptance.

B. TSDF Requirements:

1. All TSDF and other recycling/reuse or disposal facilities proposed by the CONTRACTOR must be approved for use by the WCAA.

2. Refer to Article 3.2 of this Section for TSDF Selection.

3. For each TSDF, provide TSDF requirements to DESIGNER including:

a. TSDF-specific packaging requirements for shipments.

b. TSDF restrictions by wastestream, which may cause rejection of transported materials.

c. Wastestream-specific pre-approvals required by federal or state agencies prior to acceptance of wastestream by TSDF.

d. Restrictions on delivery schedules.

e. Type and frequency of routine additional sampling and analysis of materials by wastestream, which are required during transport and disposal activities prior to delivery to TSDF.

f. Additional sampling and analysis of materials that will be conducted by TSDF during receipt of shipments to verify waste profiles.

4. Each TSDF shall disclose the name and telephone number of the contact at the lead agency responsible for TSDF primary permits who has knowledge of and can verify the existence of existing corrective action programs which may impact the ability of TSDF to accept materials from Site.

C. Agency Approvals: For any wastestream requiring agency pre-approval, provide letters of approval from applicable federal and state agencies which approve the disposal of materials from Site at each proposed TSDF 14 days prior to off-Site transportation of materials.

D. Operating Licenses and Permits:

1. Include letter from each proposed TSDF stating that it is in compliance with its federal, state, and local permits and that permits are current for the duration of the off-Site disposal activities from Site. Provide letter 7 days prior to commencing transportation of materials from Site.

2. Include copies of valid operating licenses and permits from each transporter for each proposed transport vehicle/container 7 days prior to entry to Site.

E. Transportation Routes: Submit plans showing transportation routes or alternate routes which will be used to transport materials to each TSDF 7 days prior to commencing transportation of materials from Site. Comply with applicable federal, state, and local regulations.

F. Shipping and Disposal Documents:

1. Include blank sample forms of proposed shipping and disposal documents at least 7 days prior to use.

2. Provide copies of waste profile forms to secure disposal site approval. DESIGNER will complete profiles and prepare for WCAA's signature.

3. Include completed copies of shipping and disposal documents including manifests and/or bills of lading on standard approved forms, including a copy of each form signed

by the transporter prior to leaving Site and a copy of each form signed by TSDF accepting the shipment.

4. Use shipping and disposal documents of consignment state where so required. Obtain shipping documents from consignment state 7 days prior to shipment from Site.

5. Include completed certificates of disposal/destruction/treatment/recycling as applicable and issued by the TSDF following acceptance and final disposition of the shipment.

G. Supplemental Indemnification: For each TSDF which provides a supplemental indemnification (e.g., Superfund Indemnification), obtain such indemnification for the benefit of WCAA.

H. Weigh Scale Documents:

1. When required by WCAA, include copies of weigh scale tickets on approved forms signed by an authorized receiving TSDF including the following information:

a. Location, date, and time of weighing.

b. Measured weights.

c. Vehicle and container identification.

d. Shipment identification number.

e. Provide copies of both weigh scale records to WCAA as part of waste shipment documentation.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Do not spill, leak, or otherwise release materials from transport vehicles and containers during loading and unloading operations or while in transit from Site to TSDF.

B. Do not generate dusting conditions when loading bulk solids.

C. Do not generate fume or misting conditions when loading bulk liquids.

D. Clean up spills or leaks that occur in transit to TSDF at no additional cost to WCAA.

1.6 SEQUENCING AND SCHEDULING REQUIREMENTS

A. Schedule Work to coordinate with activities of WCAA, other contractors, and CONTRACTOR's own activities.

1.7 QUALITY ASSURANCE

A. Perform Work of this Section in accordance with CONTRACTOR's Site-specific Health and Safety Plan, Decommissioning/Cleaning Plan and Waste Management Plan.

1.8 EXISTING CONDITIONS

A. Various types of materials and wastes are located throughout the Site and will be generated through the course of decommissioning, cleaning and demolition operations identified in the Contract Documents.

B. An estimated quantity of 750 cubic yards of contaminated concrete, block, and soils regulated under TSCA is located on Site and must be removed and disposed of properly.

PART 2 PRODUCTS

2.1 POLYETHYLENE SHEETING

A. Continuous sheeting, minimum 6 mil thick, fabricated from a single ply of construction grade polyethylene plastic.

2.2 TUB LINER

A. Tub Liners for Bulk Solid Shipments: Pre-manufactured fitted polyethylene tub liner or continuous single sheet of polyethylene sheeting.

2.3 CONTAINERS, PACKING MATERIAL, AND LABELS

A. Comply with DOT, federal, State of Michigan and local regulations. See Article 1.2 of this Section for references.

PART 3 EXECUTION

3.1 EXAMINATION

A. Notify DESIGNER sufficiently in advance of intention to commence activities at Site that requires attendance by DESIGNER as provided hereinafter.

B. Activities requiring attendance by DESIGNER include:

1. Placement of tub liner in bulk solid transport vehicles/containers.

2. Final securement of loaded materials prior to transport from Site.

3. Decontamination of transport vehicles/containers prior to leaving Site.

C. Do not cover loaded material prior to DESIGNER's inspection.

3.2 TSDF SELECTION

A. All unused or off-specification products, chemicals or other materials shall be managed in the following order:

1. Sent back to supplier, or

2. Profiled as a waste.

B. For hazardous, industrial and other wastes:

1. Dispose of waste at proposed facilities subject to WCAA's approval.

2. Complete a list of proposed facilities as required in Form of Bid.

3.3 WASTE PROFILING

A. DESIGNER will profile waste using SDSs, available information and the results of representative sampling and analysis.

B. DESIGNER will classify materials for off-Site disposal according to wastestream based on waste profile, analytical results and other pertinent data/information.

C. Identify appropriate disposition of all determined wastestreams to be removed from Site in accordance with applicable regulations for each wastestream. CONTRACTOR shall be responsible for disposition of materials to WCAA-approved TSDFs.

D. Waste profile will be signed by WCAA or an authorized agent of WCAA except for CONTRACTOR waste, which is the responsibility of the CONTRACTOR.

E. Submit signed waste profiles to TSDFs accepted by WCAA.

3.4 SEGREGATION OF MATERIALS

A. Do not segregate materials for disposal until waste profiles are approved by each TSDF.

B. Segregate and prepare materials for transportation and disposal in accordance with the delivery acceptance requirements of the transporter and TSDF and governing regulations.

3.5 PREPARATION AND SECUREMENT OF TRANSPORT VEHICLES/CONTAINERS

A. Do not load materials for transport or disposal without DESIGNER's review.

B. Comply with applicable federal, state, and local regulations concerning shipping vehicles, containers, and materials.

C. Visibly display number for each transport vehicle/container.

D. Secure materials in transport vehicles/containers in accordance with regulations governing transportation of materials.

E. Bulk Solid Shipments:

1. Clean the receiving box of the transport vehicle/container of loose debris or foreign material. Line the receiving box or container with a tub liner that is continuous along the bottom and sides. Place the tub liner on the floor, run up the sides, and drape over the sideboards. Neatly push the tub liner into corners to prevent tearing during loading and transport.

2. Load bulk materials into transport vehicles or containers in a manner, which will not damage the placed tub liner. Limit the freefall of bulk materials being loaded. Place cushioning materials under and around each container for shipments of drummed/containerized materials.

3. Replace damaged tub liner, which is incapable of providing containment.

4. Following loading, fold the tub liner over the loaded materials and place an overliner of polyethylene sheeting over the materials prior to securing with an approved tarpaulin in a manner to prevent loss of materials or fugitive dust emissions.

5. Lining requirements will be waived where CONTRACTOR can demonstrate, to the satisfaction of DESIGNER, that all of the following conditions are met:

   a. The receiving box or container is of leakproof construction and capable of maintaining a leakproof condition.

   b. The cover to be placed over the receiving box or container will prevent fugitive dust emissions.

   c. The receiving box or container is constructed of materials, which can be decontaminated and CONTRACTOR has supplied evidence to the satisfaction of the WCAA that arrangements have been made with TSDF to decontaminate the box or container after disposal of materials at TSDF.

6. Prepare and label asbestos abatement waste for transportation and disposal in accordance with requirements in Section 02132 - Asbestos Removal.

F. Bulk Liquid Shipments:

1. Inspect bulk liquid tankers prior to use.

2. Verify that attached piping and valves are in good working order.

3. Verify that all necessary valves are closed prior to loading.

4. Inspect for leaks during loading. Correct all leaks that are observed. Cleanup of materials impacted by leaks during loading is the responsibility of CONTRACTOR. Replace bulk liquid containers that leak and are unsuitable for transport at CONTRACTOR's cost.

G. Drummed/Containerized Shipments:

1. Load and segregate drummed/containerized shipments in accordance with DOT requirements.

2. Place cushioning materials under and around each container for shipments of drummed/containerized materials.

3. Verify that each drum/container is tightly closed and labeled in accordance with DOT and RCRA regulations.

4. Secure the load to prevent shifting of the load during transport.

3.6 DECONTAMINATION

A. Decontaminate or clean transport vehicles and containers after loading and prior to leaving Site to satisfaction of WCAA. Remove material on the tires and axles of trucks and material on the vehicle resulting from loading operations.

3.7 DOCUMENTATION FOR THE TRANSPORTATION OF MATERIALS

A. Document the transport and disposal of materials to TSDFs on appropriate state and/or federal manifests or bills of lading as applicable. Prepare, maintain, and provide DESIGNER with copies of manifests, bills of lading, and/or other records for each shipment of materials from Site. Maintain shipping documents from the time the materials leave Site to the time of release to TSDFs. Shipping documents for the transportation and disposal of materials will be signed by WCAA or an authorized agent of WCAA, except for Contractor Waste.

3.8 NOTIFICATION

A. Notify applicable federal, state, and local representatives, or authorities having jurisdiction over the route and mode of transport, in advance of commencing transportation.

3.9 TRANSPORTATION

A. Comply with applicable requirements of federal and State of Michigan regulations.

B. Transport material removed from Site directly to TSDF approved by WCAA. Do not change either the route or mode of transport after commencing off-Site operations without WCAA's prior written approval.

C. Mark and placard shipments in accordance with federal, state, and local regulations as applicable.

D. Employ transport vehicle operators trained in conformance with federal, state, and local regulations applicable to the wastestreams to be transported.

E. Materials shall be transported using vehicles licensed for the wastestream being transported.

3.10 DISPOSAL

A. Make all arrangements with TSDFs for the receipt and acceptance of materials removed from Site.

B. Ensure that materials removed from Site are properly prepared and will be accepted by TSDF. Dispose of materials at TSDFs approved by WCAA, which are in compliance with applicable regulations and permitted to receive materials from Site.

C. Weigh transport vehicles/containers at receiving TSDF weigh scales both before and after discharging their contents.

D. Submit copy of weigh ticket from TSDF weigh scales to DESIGNER.

E. Such measurements will be used by WCAA to verify proper delivery of materials which have been removed from Site and for payment purposes.

F. Immediately return to Site any transported material delivered to a facility which is rejected by TSDF.

END OF SECTION

SECTION 02132

ASBESTOS REMOVAL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Notification.

B. Examination.

C. Preparation.

D. Air Monitoring.

E. Personnel Protection and Decontamination Procedures.

F. Wet Removal.

G. Glove Bag Removal.

H. Vacuum Removal.

I. Dry Bulk Removal.

J. Asbestos Handling and Management.

K. Cleanup and Clearance of Work Areas.

L. Field Quality Control.

1.2 REFERENCES

A. WCAA General Terms and Conditions.

B. Section 02120 – Waste Management.

C. United States Federal Government - Code of Federal Regulations (CFR):

1. 25 CFR 1926 - 1101 – Asbestos.

2. 29 CFR 1910, 1915, and 1926 - Occupational Exposure to Asbestos.

3. 29 CFR 1910.1001 - Occupational Safety and Health Act (OSHA) Asbestos Regulations.

4. 40 CFR 61 Subpart M - National Emission Standards for Hazardous Air Pollutants (NESHAP) Asbestos Regulation.

5. 40 CFR Part 763, Section 1, Polarized Light Microscopy.

6. 49 CFR Part 171, 172, 178 - Department of Transportation (DOT).

D. ASTM E-162 Flame Spread Index.

E. Method 7400 of the National Institute for Occupational Safety and Health (NIOSH).

F. Applicable State of Michigan regulations.

1.3 DEFINITIONS

A. "Aggressive-method" means removal or disturbance of building material by sanding, abrading, grinding or other method that breaks, crumbles, or disintegrates intact ACM.

B. "Amended water" means water to which surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate ACM.

C. "Asbestos" includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that has been chemically treated and/or altered. For purposes of this standard, "asbestos" includes PACM, as defined below.

D. "Asbestos-containing material (ACM)", for purposes of this Contract means any material containing more than one percent asbestos.

E. "Authorized person" means any person authorized by the employer and required by work duties to be present in regulated areas.

F. "Building/facility owner" is the legal entity, including a lessee, which exercises control over management and record keeping functions relating to a building and/or facility in which activities covered by this standard take place.

G. "Class I asbestos work" means activities involving the removal of TSI and surfacing ACM and PACM.

H. "Class II asbestos work" means activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.

I. "Clean room" means an uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.

J. "Competent person" means, in addition to one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them, one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them: in addition, for Class I and Class II work who is specially trained in a training course which meets the criteria of EPA's Model Accreditation Plan (40 CFR Part 763) for supervisor, or its equivalent and, for Class III and Class IV work, who is trained in a manner consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92 (a)(2).

K. "Critical barrier" means one or more layers of plastic sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.

L. "Decontamination area" means an enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

M. "Disturbance" means activities that disrupt the matrix of ACM or PACM, crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM. Disturbance includes cutting away small amounts of ACM and PACM, no greater than the amount which can be contained in one standard sized glove bag or waste bag in order to access a building component. In no event shall the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or waste bag which shall not exceed 60 inches in length and width.

N. "Glovebag" means an impervious plastic bag-like enclosure affixed around not more than a 60 x 60-inch asbestos-containing material, with glove-like appendages through which material and tools may be handled.

O. "High-efficiency particulate air (HEPA) filter" means a filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

P. "Regulated area" means an area established by the employer to demarcate areas where Class I, II, and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the permissible exposure limit. Requirements for regulated areas are set out in subsection (e) of this section.

Q. "Regulated asbestos-containing materials (RACM)" means, as defined by NESHAP, (a) friable asbestos material, (b) Category I non-friable ACM that has become friable, (c) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting or abrading, or (d) Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

R. "Removal" means all operations where ACM and/or PACM are taken out or stripped from structures or substrates, and includes demolition operations.

S. "Surfacing ACM" means surfacing material which contains more than one percent asbestos.

T. "Surfacing material" means material that is sprayed, troweled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).

U. "Thermal system insulation (TSI)" means ACM applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain.

V. "Thermal system insulation ACM" is thermal system insulation that contains more than one percent asbestos.

1.4 PROGRESS SUBMITTALS

A. Asbestos Abatement and Project Design: Prior to mobilization, submit an Asbestos Abatement Project Design to DESIGNER for review. The Design shall describe temporary controls and enclosure design, removal methods by material type (e.g. pipe insulation, floor tile, etc.), waste management practices, decontamination procedures and equipment, encapsulants and wetting agents to be used, identify asbestos professionals and appropriate current training records and licenses, and any other information important to the execution of the asbestos abatement activities. The Design must be written by a licensed Asbestos Abatement Designer from the State of Michigan.

B. Evidence of certification as an asbestos contractor in accordance with the State of Michigan, certification of project supervisor as an asbestos supervisor, and certification of abatement workers as asbestos abatement worker.

C. Product Data: Submit use instructions and recommendations from manufacturers of surfactants intended for use at the Site. Include data, which supports that material complies with requirements.

1.5 REGULATORY REQUIREMENTS

A. Applicable federal, State of Michigan, and local rules and regulations.

B. Submit proper regulatory notification as required by Department of Environmental Quality – NESHAP, Department of Licensing and Regulatory Affairs including the MIOSHA Asbestos Program.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Conform to procedures and applicable regulations when hazardous or contaminated materials are present.

B. Comply with the requirements of CONTRACTOR's approved Site-Specific Health and Safety Plan, Asbestos Abatement and Management Plan and Spill Prevention and Pollution Control Plan.

1.8 SEQUENCING AND SCHEDULING

A. Notify DESIGNER 14 business days prior to commencement of abatement activities.

B. CONTRACTOR must attend coordination meeting with DESIGNER prior to initiation of abatement activities. Meeting to be conducted by DESIGNER and minutes taken to document discussions.

C. Schedule Work to coordinate with activities of DESIGNER, WCAA, other contractors, and CONTRACTOR's own activities.

1.9 QUALITY ASSURANCE

A. Perform Work of this Section in accordance with CONTRACTOR's Asbestos Abatement and Project Design reviewed by DESIGNER.

1.10 QUALIFICATIONS

A. CONTRACTOR shall be licensed by the State of Michigan to perform asbestos removal.

B. All CONTRACTOR employees engaged in asbestos removal operations shall have valid and current licenses issued by the State of Michigan.

C. CONTRACTOR shall identify a competent person to oversee all Site activities associated with this project. The competent person shall satisfy all requirements in 29 CFR 1926.32 & 1926.1101.

PART 2 PRODUCTS

2.1 DISPOSAL BAGS

A. Minimum 6-mil thick, leak-tight, polyethylene.

2.2 REINFORCED POLYETHYLENE SHEETING

A. NFPA 701, Translucent, nylon reinforced, laminated, flame resistant, polyethylene film, 6 mil minimum thickness.

B. Largest size possible to minimize seams.

2.3 SHIPPING CONTAINERS

A. Impermeable containers shall be suitable to receive and retain any asbestos-containing or asbestos-contaminated materials until they are disposed of at an approved disposal facility.

B. The containers shall be labeled in accordance with this Section. Containers shall be both airtight and watertight and conform to DOT Standard 49 CFR 178.224.

C. Hard wall shipping containers shall be used to contain items reasonably expected to puncture plastic and shall be constructed of fiber, hard plastic, or metal, with locking, airtight lids.

2.4 DUCT TAPE

A. In 3-inch widths with an adhesive which is formulated to aggressively stick to sheet polyethylene.

2.5 SPRAY CEMENT

A. Spray adhesive in aerosol cans, which is specifically formulated to stick tenaciously to sheet polyethylene.

2.6 WETTING AGENTS

A. Amended water or a removal encapsulant.

B. For amended water, provide water to which a surfactant has been added.

C. A mixture of surfactant and water which results in wetting of ACM and retardation of fiber release during disturbance of the material.

2.7 GLOVE BAG

A. Minimum 6 mil thick and equipped with a tool pouch, latex gloves with sleeve collars or molded attachment to bag, and provisions for spray wand and HEPA vacuum connections. Provide supports for bag as necessary to prevent separation due to weight of wet debris falling into the bag.

2.8 LOCKDOWN ENCAPSULATES

A. Encapsulates used after asbestos removal to lockdown fugitive fibers shall carry a Class “A” fire resistance rating and shall have an ASTM E-162 flame spread index of 15 or less. The intent shall

be given to the encapsulate by means of the addition of non-toxic, nonflammable colorings before application. The encapsulate shall be installed according to the manufacturer's written instructions. Provide the following materials as applicable:

1. Prior American Coatings Corporation - FNE High-Temperature Sealant

2. All International Protective Coatings, Corp - Serpiflex Shield Concentrate

3. Inspect Certified Technologies - CerTane 1000 Post Removal Encapsulant

4. Set up a H.B. Fuller Company, Fosters Products Division - HI TEMP Asbestos Sealer 84-18

2.9 LABELS

A. Individually label each bag or separately wrap ACM in accordance with federal, state and local regulations, guidelines and policies, and disposal facility requirements. Pre-labeled bags are preferred. At a minimum, label each item with three labels with text as follows:

CAUTION
CONTAINS ASBESTOS FIBERS
AVOID OPENING OR BREAKING CONTAINER
BREATHING ASBESTOS IS HAZARDOUS TO YOUR HEALTH

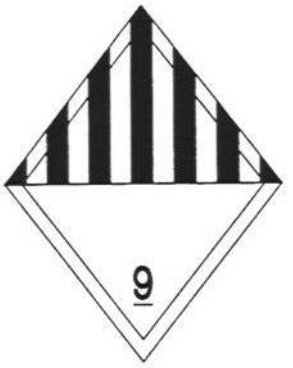
Or

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

B. DOT label format and color shall conform to DOT Standard 49 CFR 172.407. DOT labels shall display the following legend/information:

RQ, ASBESTOS, NA 2212

Labels shall be diamond shape and shall be located near the marking text. Labels shall consist of a diamond a minimum of 100 millimeters (mm) on each side with each side having a solid line inner border 5.0 to 6.3 mm from the edge. The label shall be white with seven black vertical stripes on the top half. Black stripes and white spaces shall be equally spaced. The lower half of the label shall be white with the class number "9" underlined and centered at the bottom. Refer to DOT 40 CFR 172.446 for label format.



Generator identification information shall be affixed to each package. DOT label format and color shall conform to DOT Standard 49 CFR 172.304. Generator identification information labels shall display information in accordance with EPA 40 CFR Part 61.150(a)(1)(v).

PART 3 EXECUTION

3.1 NOTIFICATION

A. Submit NESHAP notification as required. The notification shall be postmarked or delivered at least 14 days prior to the removal of any asbestos material.

B. The original notification shall be updated as required by federal and state regulations during the course of the project. Changes to the original notification may be required when changes to the project start or completion date, or the quantity of asbestos to be removed changes.

3.2 EXAMINATION

A. Prior to commencing asbestos removal work in each area, perform a detailed inspection of the Work Area to ensure all requirements have been met.

3.3 EXISTING CONDITIONS

A. CONTRACTOR is to assume that the roofing and roof flashing is non-friable, asbestos containing material and must remove and dispose of accordingly.

B. Transite is found in the form of corrugated panels on the exterior of the building and internal fire curtains. Transite is also found in the electrical switch boxes.

3.4 PREPARATION

A. Setup personnel decontamination showers or other facilities in accordance with federal, state and local laws and regulations.

B. Class I and II work shall be conducted within regulated areas in accordance with federal, state and local laws and regulations.

C. Contained Work Area:

1. Prior to any asbestos removal work in each area, prepare a Contained Work Area, if necessary, as required by federal and state regulations, policies, and guidelines.

2. All stationary objects within the Contained Work Area not intended for removal or stripping of asbestos shall be covered with plastic sheeting.

3. Inspect the affected area and seal all openings, including but not limited to doors, windows, vents, and registers. All sources of air movement, including the air handling system shall be shut off or temporarily modified to restrict air movement in the Work zone.

4. Provide a system to collect all water used by the CONTRACTOR. Collected water shall be passed through a water filtration system prior to being discharged into the sanitary sewer.

5. Set up a decontamination facility for each Work Area, housing a dirty room, a changing room, a shower area, and an equipment area in accordance with Laws and Regulations.

6. Barriers used for the construction of the Contained Work Area shall be equipped with transparent viewing ports, which allow observation of all stripping and removal.

7. Conduct HEPA ventilation/filtration and sealing off of each area in accordance with federal, state, and local regulations, guidelines, and policies. Seal off the area with a minimum of 2 layers of 6-mil plastic sheeting applied to walls, floors, ceiling, and fixtures as necessary for a negative pressure differential in the Work Area.

8. In the event of a power failure, provide sufficient standby electrical power to allow operation of ventilation equipment and lighting in the Work Area.

9. Inspect the Contained Work Area and submit written certification to DESIGNER that the Contained Work Area is in accordance with federal and state regulations, policies, and guidelines, prior to commencing removal activities.

D. Asbestos-containing Waste Material Holding Area: Provide an on-Site secure temporary ACM holding area at locations selected by CONTRACTOR's Competent Person. Obtain WCAA's approval for such areas prior to use for asbestos-containing waste material holding.

3.5 PERSONNEL PROTECTION AND DECONTAMINATION PROCEDURES

A. General: The CONTRACTOR shall take all safety measures and precautions necessary to protect its employees and building occupants in accordance with OSHA Standard 29 CFR 1926, EPA Standard 40 CFR, Part 61, Subpart M, and applicable state regulations. The CONTRACTOR shall

be solely responsible for enforcing personnel protection requirements. Table 3.1 summarizes the minimum levels of personnel protection required during work of this Section.

TABLE 3.1 MINIMUM PERSONAL PROTECTION REQUIREMENTS[a]

ACTIVITY	**RESPIRATORY PROTECTION**	**DISPOSABLE CLOTHING**	**SHOWER REQUIRED AFTER WORK**	**DECONTAM-INATION UNIT**
Removal of "loose items" prior to work – no potential asbestos exposure	None	No	No	No
Removal of "loose items" prior to work – potential asbestos exposure – Class IV Removal	HMHER	Yes	No	Yes
Gross removal	PAPR	Yes	Yes	Yes
Glove bag and wrap and cut removal	PAPR[c]	Yes	Yes[b]	Yes
Asbestos-containing debris removal	PAPR[c]	Yes	Yes[b]	Yes
Asbestos cement board removal	HNHER	Yes	No	Yes
Asbestos floor tile & other nonfriable removal	HMHER	Yes	No	No
Lockdown	HMHER	Yes	Yes[b]	Yes
Activities after Lockdown	HMHER	No	No	No
Loading ACM and PACM on truck (outside work area)	HMHER	Yes	No	No

[a] These are minimum requirements only. The CONTRACTOR is fully responsible for the personal protection of all workers at the site. Where conflict or interpretation differences arise, the text of the specification supersedes all tables.

[b] Requirement may be waived by the WCAA on an individual case by case basis. Refer to text of Specifications.

[C] Requirement may be altered by the WCAA on an individual case by case basis if CONTRACTOR provides a negative exposure assessment for alternate proposed respiratory protection.

PAPR Full-face mask powered air purifying respirator.
HMHER Half-face mask high efficiency respirator.
FFHER Full-face mask high efficiency respirator.

3.6 AIR MONITORING

A. The WCAA'S REPRESENTATIVE shall perform air sampling outside of asbestos Regulated Work Areas (RWA's) during the project to demonstrate CONTRACTOR compliance, proper Work procedures and to ensure areas outside the RWA's remain below regulatory limits.

B. Air samples will be collected at the discretion of the WCAA'S REPRESENTATIVE during each shift. Air samples will be collected and analyzed using NIOSH Method 7400.

C. The CONTRACTOR, at its expense, shall collect and analyze personal air monitoring samples from each Work Area. Sampling shall be repeated during each different Work activity. Sample collection and analysis shall be performed using the OSHA Reference Method as outlined in 29 CFR 1926.1101. Written results of CONTRACTOR testing will be provided to the WCAA within 48 hours after completion of the tests.

D. Copies of air monitoring results will be distributed as necessary to comply with hazard communication requirements of applicable federal and state regulations.

3.7 WET REMOVAL

A. To the maximum extent possible, use wet methods to remove ACM.

B. Apply a fine spray of the Amended Water and/or removal encapsulant to prevent fiber releases during removal. Sufficiently saturate ACM to prevent emission of airborne fibers in excess of either OSHA, PEL, or ceiling exposure standards. At a minimum, apply Amended Water and/or removal encapsulant in accordance with manufacturer's written instructions.

C. Remove or clean up ACM in small sections to prevent excessive exposure potentials. Place removed materials including plastic sheeting, tape, cleaning materials, clothing, and other disposable materials or items used on the Site in minimum 6-mil thick plastic bags, sealed and labeled for disposal.

D. Accomplish wetting by a fine spray (mist) of Amended Water or removal encapsulant. Saturate the material sufficiently to wet the substrate without causing excess dripping. Allow sufficient time for water or removal encapsulant to penetrate material thoroughly. If Amended Water is used, spray the material repeatedly during the Work process to maintain a continuously wet condition. If a removal encapsulant is used, apply it in strict accordance with manufacturer's written instructions. Perforate outer covering of any installation which has been painted and/or jacket in order to allow penetration of Amended Water or removal encapsulant or, where

necessary, carefully strip away the covering while simultaneously spraying Amended Water or removal encapsulant on the installation in order to prevent fiber release.

E. Continuously mist Work Areas with Amended Water and/or removal encapsulant whenever necessary to prevent fiber release.

F. Remove saturated ACM in small sections from all areas. Do not permit ACM to dry out. As it is removed, pack the material simultaneously, while still wet, into disposal bags. Twist, bend over, and seal the neck of each bag with minimum 3 wraps of duct tape. Place the bag into another bag.

3.8 GLOVE BAG REMOVAL

A. Establish a Regulated Work Area (RWA) via asbestos barrier tape, signage and/or construction barriers of 6 mm poly.

B. Pre-clean any gross contamination, from the immediate Work Areas using HEPA vacuum equipment and/or wet cleaning methods as appropriate. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, shall not be used.

C. Use proper tools for removal of ACM and jacketing on piping, including tools necessary for cleanup after removal, all small enough to fit inside the tool pouch.

D. Install the glove bag around ACM to be removed. Be sure that tools, cleaning, and sealing materials are in the bag prior to installation. Check seals on bags prior to starting removal and recheck as work progresses. Spray material with Amended Water, allow water to soak in then respray. Cut insulation cover with a knife and remove insulation material from pipes.

E. After insulation is removed, wipe down pipe to remove remaining fibers and thoroughly wash the inside of the bag, pipe or equipment surfaces, and tools. Without removing the wand from the bag, change the spray bottle to an encapsulant material, then respray the inside of bag, pipe or equipment, and ends of exposed insulation material. Evacuate the bag with HEPA vacuum; remove tools from bag; remove bag from pipe, folding inward the sides of the bag, then twist and tape the open end, the wand opening, and the vacuum opening.

F. Twist, bend over, and seal the open end of each removed glove bag with minimum 3 wraps of duct tape. Place the bag into another bag and twist, bend over, and seal the neck of each bag with minimum 3 wraps of duct tape.

G. Label each disposal bag with 3 text labels.

3.9 VACUUM REMOVAL

A. Establish a Regulated Work Area (RWA) via asbestos barrier tape, signage and/or construction barriers of 6 mil poly.

B. Conduct vacuum removal of ACM with vacuum units that are equipped with HEPA type filters.

C. Vacuum cleaners used for collection of dust and other loose bulk material:

1. Commercial or industrial vacuum cleaners equipped with HEPA filters capable of removing dust to 0.3 microns diameter at a demonstrated efficiency of 99.97 percent.

2. Minimum Static Lift: 185 inches of water.

3. Minimum Air Flow: 160 cu ft per minute.

4. Minimum Capacity: 4 cu ft.

5. Capable of vacuuming liquids.

6. Suitable for installation on a free-rolling platform.

D. The use of brooms and shovels to clean up friable ACM is prohibited.

3.10 DRY BULK REMOVAL

A. Bulk removal must be reviewed by DESIGNER pre-approved by WCAA. It may only be used where wet methods would present a safety hazard.

B. Dry removal methods may include one more of the following:

1. HEPA filtration system.

2. Glovebag system.

3. Triple wrap of material to be removed in sections.

3.11 ASBESTOS HANDLING AND MANAGEMENT

A. Manage wastes generated consistent with the procedures set forth in Section 02120 - Waste Management. All roll-off boxes used to receive ACM must be lined, labeled, and lockable in accordance with applicable regulations.

B. Handle, package, and label asbestos wastes in accordance with 40 CFR 61.150 and CCR, title 13, section 66263.23, and Article 2.9 of this Section.

C. Asbestos materials shall be kept wet during packaging and shall be placed in leak tight containers or wrapping.

D. Asbestos shall be carefully lowered to the ground or lower floor without dropping, throwing, sliding, or otherwise damaging or disturbing the material.

E. Asbestos that's removed from locations more than 50 feet above ground level and not removed as units or in sections shall be transported to the ground via leak-tight chutes or containers.

F. Keep hazardous and non-hazardous asbestos wastes segregated from one another.

3.12 CLEANUP AND CLEARANCE OF WORK AREAS

A. Clearance Procedure: Clearance of the Work Area shall be conducted in accordance with the three-step procedure described below.

Step 1.	Preliminary Cleanup	Visual inspection
Step 2.	Lockdown	----------
Step 3.	Final Clearance	Visual Inspection

1. Preliminary Cleanup

    a. Remove any visible accumulation of asbestos material and debris. Wet clean all surfaces and objects in the Work area and any other contaminated area. Remove asbestos waste in impermeable containers from the Work Area.

    b. After cleaning the Work Area, wait 24 hours to allow for the settling of dust and again wet clean or clean with HEPA vacuum equipment all surfaces in the Work Area. (Waiting time of 24 hours may be waived by the Professional) After completion of the second cleaning operation, perform a complete visual inspection of the work area to ensure that it is free of visible contamination.

    c. Upon request from the CONTRACTOR, the WCAA'S REPRESENTATIVE will perform a visual inspection. If the WCAA'S REPRESENTATIVE finds visible accumulations of dust in the Work Area, the CONTRACTOR shall repeat the wet cleaning as heretofore specified at the CONTRACTOR's expense.

2. Lockdown

    a. After successful completion of the initial visual inspection, all surfaces and building components from which ACM and PACM were removed (ceilings, walls, piping, and floors) shall receive lockdown encapsulate.

    b. When the encapsulate is dry, all exposed surfaces shall be wet cleaned and/or HEPA vacuumed. After cleaning, wait a minimum of 16 hours to allow for settling of dust and then wet clean and/or HEPA vacuum again.

3. Final Clearance

a. Upon request from the CONTRACTOR, a final visual inspection will be performed by the WCAA'S REPRESENTATIVE for the purpose of observing whether the condition of cleaned areas is free of dust, dirt, and debris. Evidence of asbestos contamination identified during the inspection will necessitate further cleaning as heretofore specified at the CONTRACTOR's expense.

b. The WCAA'S REPRESENTATIVE will collect air clearance samples if the abatement was conducted using a negative pressure enclosure or in other RWA's at their discretion. The area will be released if the clearance samples are below acceptable clearance levels (State of Michigan clearance criteria of .05 fibers per cubic centimeter of air). If levels are above acceptable clearance levels, the CONTRACTOR must repeat Steps 2 and 3 at the CONTRACTOR's expense.

3.13 FIELD QUALITY CONTROL

A. Visual Inspection in a Contained Work Area:

1. Prior to removal of any ACM and PACM, the CONTRACTOR shall notify the DESIGNER and request a pre-removal inspection. Posting of warning signs, Work Area isolation, installation of decontamination system and all other preparatory steps shall have been taken prior to notification. The CONTRACTOR shall not begin asbestos removal until the DESIGNER reviews the Work Area preparations.

2. Upon completion of ACM removal work in each area, visually inspect each Work Area and confirm asbestos-free conditions prior to conducting confirmatory air testing.

3. This inspection will not occur earlier than 24 hours after activities within the area have ceased.

4. Maintain the Contained Work Area in place until WCAA provides approval for their removal.

END OF SECTION

SECTION 02134

CLEANING OF PITS, TRENCHES, AND SUMPS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Inspection of all pits, trenches, and sumps.

B. Bulk removal of dirt, sediment, and waste.

C. Dry scraping of surfaces and removal of collected dirt, sediment, and waste.

D. Power washing of surfaces and collection and handling of wastewater.

1.2 REFERENCES

A. WCAA General Terms and Conditions.

B. Section 02120 – Waste Management.

1.3 DEFINITIONS

A. Stained surfaces: surfaces impacted by petroleum products and other waste from former manufacturing processes resulting in significant visual accumulation of residue or discoloration.

1.4 PROGRESS SUBMITTALS

A. Decommissioning/Cleaning Plan: 7 days prior to mobilization to Site, submit Decommissioning/Cleaning Plan to DESIGNER for review. The plan shall include written procedures, schedules, and CONTRACTOR drawings as applicable to address cleaning of all necessary pits, sumps and trenches. The Decommissioning/Cleaning Plan shall, as a minimum, address each of the following items:

1. The methods and procedures that will be used to perform decommissioning/cleaning. The methods and procedures must take into consideration the type of contamination present.

2. Strip-out of ancillary equipment.

3. The sequencing and scheduling of cleaning.

4. Management of decontamination fluids and residuals.

1.5 REGULATORY REQUIREMENTS

A. Applicable federal, State of Michigan, and local rules and regulations.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not spill, leak, track, spread or otherwise release materials from decontamination area.

B. Do not generate dusting or misting conditions outside of decontamination area.

1.7 SEQUENCING AND SCHEDULING

A. Schedule Work to coordinate with activities of WCAA, other contractors, and CONTRACTOR's own activities.

D. Sequence activities to complete decontamination in the following order:

1. Dismantle and remove equipment that may obstruct cleaning.

2. Remove and consolidate accumulated waste in a designated container.

3. Remove gross oil staining from the concrete surface.

4. All wastewater generated by the CONTRACTOR must be collected, placed and stored in the temporary storage tank(s) mobilized to the Site for that purpose and disposed of off-Site at an approved facility.

E. Schedule Work to precede demolition.

1.8 QUALITY ASSURANCE

A. Perform Work of this Section in accordance with CONTRACTOR's Decommissioning/Cleaning Plan.

1.9 EXISTING CONDITIONS

A. Pits, sumps and trenches are located throughout the facility.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that asbestos abatement is completed and that obstructing equipment is ready to be safely dismantled.

3.2 PREPARATION

A. Remove equipment in accordance with the approved Decommissioning/Cleaning Plan without spreading or tracking the accumulated waste on underlying floor areas.

B. Provide, erect, and maintain temporary barriers to protect surrounding areas and prevent recleaning of clean pits, trenches, and sumps or other clean areas in the vicinity of the work area.

C. Prepare for and conduct confined space entry procedures as needed.

D. Maintain emergency and spill response equipment in each area during cleaning activities.

E. Notify DESIGNER at least 24 hours before cleaning activities will commence.

3.3 REMOVAL ACTIVITIES

A. Locate each pit, trench, and sump.

B. Inspect each pit, trench, and sump and determine the extent of required cleaning. Verify extent of cleaning with DESIGNER.

C. Facilitate testing of waste and affected structure surfaces by DESIGNER as necessary.

D. Conduct cleaning activities in accordance with Decommissioning/Cleaning Plan. At a minimum, cleaning shall include:

1. Initial removal of bulk liquids, solids, and residues from pits, trenches, and sumps with dry mechanical methods consisting of hand scraping, shoveling, vacuuming or other similar means. Vacuum all dust and particles as final initial step. Material removed shall be containerized separately based on origin and waste compatibility.

2. Conduct cleaning operations in the areas specified utilizing Method 1

<u>Method 1: High Pressure Water Blast</u>

The water blast system utilized for the rigorous decontamination shall be capable of operation from water temperatures ranging from 75° F to 180° F. The CONTRACTOR's Decommissioning/Cleaning Plan shall address washing equipment and methods. The

system shall be capable of operation at a pressure of 3,000 to 10,000 PSI. The maximum jet reactive force shall not exceed 20 pounds when operating at 10,000 PSI and at a maximum water usage rate of 4.0 GPM. At no time during the operation of the water blast system shall the water usage rate exceed 8.0 GPM per individual blast unit. The system shall be capable of operation with water and abrasive or with water only. Blast media, if utilized, shall be water soluble and ***non-detergent***. Splashback shall be held to a minimum and the use of deflector shrouds or other means of control may be required for worker protection and/or liquid containment.

3. All residues generated should be managed in accordance with Section 02120 – Waste Management.

E. Obtain written approval from WCAA for alternate cleaning methods prior to implementation.

F. Proceed with decontamination utilizing best efforts to remove gross staining from concrete surface.

G. Conduct cleaning in a manner that will minimize recleaning due to cross-contamination between clean and unclean areas.

H. Inspection and review of cleaning efforts will be completed by the DESIGNER.

3.4 WASTE MANAGEMENT

A. Segregate wastes consistent with procedures in Decommissioning/Cleaning Plan. PCB wastes should be segregated from non-PCB wastes for disposal.

B. Do not combine incompatible or inappropriate waste streams from separate pits/trenches/sumps.

C. Manage wastes generated consistent with the procedures set forth in Section 02120 – Waste Management.

END OF SECTION

SECTION 02141

PIPING AND EQUIPMENT
DRAINING AND CLEANING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Draining of aboveground water piping.

B. Purging of flammable product piping.

C. Draining and cleaning of equipment and appurtenances.

1.2 REFERENCES

A. WCAA General Terms and Conditions.

B. Section 02120 – Waste Management.

1.3 DEFINITIONS

A. RCRA – Resource Conservation and Recovery Act.

1.4 PROGRESS SUBMITTALS

A. Decommissioning/Cleaning Plan: 7 days prior to mobilization to Site, submit a decommissioning and cleaning plan to DESIGNER for review. The plan shall include written procedures, schedules, and CONTRACTOR drawings, as applicable, to address all piping and equipment requiring cleaning. Where applicable, outline the sequence of draining, flushing, and purging and the most suitable locations (low spots) to drain and capture purge liquids.

1.5 REGULATORY REQUIREMENTS

A. Applicable federal, State of Michigan, and local rules and regulations.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not spill, leak, or otherwise release materials from work areas.

B. Do not generate dusting or misting conditions outside of work areas.

1.7 SEQUENCING AND SCHEDULING

A. Sequence and schedule activities of this Section with Section 02120 - Waste Management to ensure efficient and timely performance of the Work.

B. Sequence activities to complete piping draining and cleaning as follows:

1. Inspect all piping to confirm the extent of the Work, including piping associated with aboveground storage tank. Clean tank of remaining product and residue.

2. Open, drain and purge all water, product and process piping of liquids/solids as required.

3. Purge natural gas with an inert gas as required.

4. Drain and empty all process and hydraulic equipment fluid reservoirs including elevators, truck levelers, trash compactors, conveyor systems, and others.

5. De-energize electrical equipment and drain dielectric fluids.

C. Schedule work to precede facility demolition.

1.8 QUALITY ASSURANCE

A. Perform work of this Section in accordance with CONTRACTOR's Site-specific Health and Safety Plan and Decommissioning/Cleaning Plan.

1.9 EXISTING CONDITIONS

A. WCAA/DESIGNER have determined that some remaining equipment and piping systems contain products, residues and/or other waste materials.

B. WCAA reserves the right to recover decommissioned electrical equipment, including transformers.

PART 2 PRODUCT (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that the Site conditions are ready to receive work.

B. Verify that sufficient containers are available for waste that may be generated.

C. Verify that the temporary storage area is prepared to receive the anticipated quantity waste drums and containers.

D. Verify product and process piping to be drained and cleaned and identify any product or process piping with solid or semi-solid residual materials or waste that cannot be removed by draining and or flushing.

3.2 DRAINING OF PIPING

A. Verify the most appropriate low spots to drain pipe lines where required.

B. Drain liquids to the lowest end, then from low spots into suitable clean containers. Segregate drained water from all other waste streams.

C. No free liquid is to remain in piping.

D. Discharge water to sanitary sewer system only with WCAA approval. If authorization to discharge directly to the sanitary sewer system has not been granted, transport container to the temporary storage area.

E. Verify all lines are drained and emptied in accordance with CONTRACTOR's Site-Specific Health and Safety Plan and Decommissioning/Cleaning Plan.

F. Provide air gaps in pipe lines every 250 feet.

3.3 PURGING OF NATURAL GAS PIPING

A. General.

1. Flammable product piping including natural gas.

B. Locate valves; determine if lines are still pressurized. Release pressure safely and in accordance with CONTRACTOR's Site-specific Health and Safety Plan and Decommissioning/Cleaning Plan.

C. Purge lines with an inert gas as necessary.

D. Cold cut lines as necessary using non-sparking tools.

E. Provide visible air gap in pipeline every 250 feet.

3.4 DRAINING AND CLEANING OF NON ELECTRICAL EQUIPMENT AND APPURTENANCES

A. General.

1. Includes hydraulic equipment, elevators, lifts, conveyor systems, and other process equipment.

B. Verify location of equipment requiring draining and cleaning.

C. Drain all liquids and empty reservoirs into suitable drums.

D. Where required by WCAA, flush equipment with clean water to remove solid/liquid residuals. Contain rinsate in properly labeled drums/containers.

E. No free liquid is to remain in equipment.

F. Remove bulk solid/sludge accumulation from equipment surfaces, including weld dust as directed by WCAA. Contain in properly labeled drums/containers.

G. Remove process related filters and any filter-related material or waste from surrounding areas. Contain in properly labeled drums/containers.

H. Properly label each drum of each waste stream.

I. Transport drums to the temporary storage area.

J. Manage conveyor chain and other equipment with accumulated waste that may be released during on-Site handling or off-Site transportation (drip pans, etc.) in a manner such that accumulated waste is prevented from contaminating floor and other surfaces/equipment in accordance with CONTRACTOR's Decommissioning/Cleaning Plan.

1. Place equipment into lined, sealed roll-off container or equivalent.

2. Provide interim storage prior to removal from the Site in a manner that prevents infiltration of rainwater.

3. Off-Site transportation of any equipment containing grease must occur in sealed containers.

4. Conduct cleaning of such equipment as necessary to facilitate salvage of the equipment as scrap.

3.5 DRAINING AND CLEANING OF ELECTRICAL EQUIPMENT

A. General.

1. Coordinate deactivation of all electrical service with WCAA and DESIGNER prior to the removal of any electrical equipment.

2. Verify the location of all electrical capacitors and transformers with DESIGNER.

3. To be completed prior to demolition of the structures.

B. Following all provisions of CONTRACTOR'S Health and Safety Plan and Decommissioning/Cleaning Plan, provide qualified and licensed electrician to disconnect and discharge any stored current in remaining transformers and capacitors. Notify DESIGNER at least 3 days prior to commencing these activities.

C. Drain dielectric fluids from transformers, bushings, and switches for testing by DESIGNER. Take care not to spill, drip, track, or otherwise release dielectric fluids. CONTRACTOR will be responsible for costs incurred due to CONTRACTOR release of dielectric fluids.

D. Salvage designated electrical equipment in accordance with Section 02223 –Demolition and Removals.

3.6 WASTE HANDLING

A. Handle, store and label all drums and containers in accordance with applicable federal and State of Michigan regulations.

B. Waste sampling, characterization and analysis will be provided by DESIGNER.

C. Do not combine waste streams from equipment unless approved by WCAA.

D. Dispose of materials in accordance with Section 02120 – Waste Management.

END OF SECTION

SECTION 02200

SITE RESTORATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Filling, backfilling, and compacting excavated areas and pits to the level of the existing building slab or to the level of the existing pavement, whichever is applicable.

B. Site drainage modifications.

C. Demobilization.

1.2 REFERENCES

A. WCAA General Terms and Conditions.

B. Section 02223 – Demolition and Removals.

C. MDOT Standard Specifications for 21AA aggregate, Class II granular material, Turf Establishment, and Turf and Landscaping Materials.

D. ASTM D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil

E. ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes

F. ASTM D 4972 - Standard Test Method for pH of Soils

G. ASTM D 2974 - Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

1.3 PROGRESS SUBMITTALS

A. Site Restoration Plan: 7 days prior to mobilization to the Site, submit a Site Restoration Plan for review to DESIGNER. The plan shall include written procedures, schedules, and CONTRACTOR drawings as applicable to address the final site restoration activities, including but not limited to stormwater drainage, runoff and management, and Site safety.

B. Materials Sources: Submit name of imported materials source.

1.4 REGULATORY REQUIREMENTS

A. Applicable federal, State of Michigan, and local rules and regulations.

B. Applicable City of Ypsilanti laws, codes and ordinances.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Do not spill, leak, or otherwise release materials from work areas.

B. Do not generate dusting or misting conditions outside of work areas.

1.6 SEQUENCING AND SCHEDULING

A. Schedule work to coordinate with activities of WCAA, other contractors, and CONTRACTOR's own activities.

B. Obtain all required permits from authorities prior to placing regulated equipment into use. Copies of all applications and/or permits must be shared with DESIGNER upon mobilization of such equipment.

1.7 QUALITY ASSURANCE

A. Perform work of this Section in accordance with CONTRACTOR's Site-specific Health and Safety Plan, and Site Restoration Plan.

B. WCAA may employ and pay for services of the independent testing laboratory for tests required to show compliance with the specifications.

1.8 EXISTING CONDITIONS

A. Pits, sumps and trenches are located throughout the facility.

B. Slopped truck docks are located at the east and west sides of the building.

PART 2 PRODUCTS

2.1 FILL MATERIALS

A. Granular Fill – Granular fill in compliance with MDOT Specifications for Granular Material Class II.

B. Surface Aggregate – Aggregate in compliance with MDOT Specifications for 21AA aggregate.

C. Excavation Materials - Excavated materials may be used as fill upon approval by WCAA.

D. Earthen Materials - Excavated earthen materials may be used as fill only in WCAA designated areas which are to remain earthen.

E. WCAA Furnished Material – Crushed concrete located on the Willow Run Airport Site approximately at the corner of A Street and 4th Street.

2.2 SOURCE QUALITY CONTROL

A. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before us on Site.

B. If tests indicate materials do not meet specified requirements, change material.

PART 3 EXECUTION

3.1 EXAMINATION

A. Identify required lines, levels, contours, and datum locations.

3.2 PREPARATION AND FILLING

A. Remove any loose or soft material in the excavation.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with granular fill.

C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

E. Backfill voids resulting from demolition and excavation to obtain grade required around structures.

F. Backfilling around structures:

1. Exposed subgrade surface shall be compacted before structural fill is placed.

2. Prevent displacement of structural components during backfilling operations. Backfill opposite sides simultaneously with a maximum backfill elevation difference of 6 feet.

3. For walls that are unbraced at the top edge, backfill can be place upon concrete reaching required strength, as noted above.

4. For walls that are braced at the top edge, backfill can be placed only when the next level floor framing or cover slabs are in place and the concrete has reached the required strength, as noted above.

G. Fill to existing pavement or floor elevations or grades shown and required for drainage. Maintain surface and slopes for drainage during operations.

H. Placement:

1. Maintain surfaces free of water, debris, and excessively wet, frozen, and other deleterious materials.

2. Place and compact backfill materials in loose lifts not exceeding 12 inches in thickness.

I. Fill to contours and elevations indicated using unfrozen materials.

J. Employ a placement method that does not disturb or damage other work, using the appropriate equipment to achieve proper compaction.

K. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

L. Maintain optimum moisture content of fill materials to attain required compaction density.

M. Fill: Place and compact materials generated from crushing concrete or provided by WCAA in equal continuous layers not exceeding 10 inches compacted depth.

N. CONTRACTOR must provide granular fill once WCAA supplied fill material is depleted.

O. Slope grade away from building minimum 2 inches in 10 ft, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

P. Compaction Density:

1. Unless otherwise specified or indicated compaction density requirements shall be at least 95 percent of its maximum Modified Proctor Dry Density ASTM D 1557.

3.3 FILL AT SPECIFIC LOCATIONS

A. Leave granular MDOT 34R in leaching pits and dress to level of existing paving or floor with additional MDOT 34R as needed.

3.4 FIELD QUALITY CONTROL

A. Frequency of Tests:

1. Soil density tests shall be taken uniformly throughout the placing of fill material so that quality control can be maintained at all times. WCAA may test as follows:

    a. One field density test for each 25 cubic yards of structural fill, minimum one each lift.

    b. One field density test for each 50 cubic yards of controlled fill, minimum one each lift.

    c. One field test per day for each type of fill on any day when fill is placed, regardless of quantity.

B. If tests indicate work does not meet specified requirements, remove work, replace and retest.

3.5 RESTORATION

A. Install leach pits in locations identified in Design Documents if WCAA elects to have building slab remain.

B. If WCAA exercises Option 1, restore excavated areas to top of existing slab elevation.

C. If WCAA exercises Option 2, modify existing catch basins and grade surfaces to drain to catch basins as noted in Design Documents.

D. Remove all protuberances from remaining concrete slabs including attachment bolts from former equipment and remnants of all structures.

E. Mill concrete surfaces as necessary to provide an even surface.

F. Sweep the concrete slab, if it has been decided that it shall remain. Provide an even swept surface free of trip and fall hazards.

G. Base Bid Work includes restoration of the utility excavations. In those areas where the excavation was in an area where there was no existing pavement, restoration includes filling with earthen material, placement of four inches of topsoil and seeding. In the areas where there was pavement (including gravel), restoration includes filling with compacted aggregate material either furnished by the WCAA or MDOT 21AA furnished by CONTRACTOR.

H. If the WCAA exercises any of the Options, the areas affected must be topped with four inches of topsoil and seeded.

I. Remove unused stockpiled materials, rubbish, and debris and leave area in a clean and neat condition.

J. Erect fencing contingent with AOA Security requirements and specifications after the WCAA has approved a fencing plan. Erect fencing in the deepest area excavated or saw cut for utility removals north of existing building footprint.

3.6 TOPSOIL AND SEEDING

A. The topsoil must be capable of supporting growth of one of the specified permanent grass seeds. It must be a friable loam but not of heavy clay nor of very light sandy nature. It must be free of unsuitable materials including:

1. Frozen material or material containing snow or ice.

2. Trees, stumps, branches, or other wood/lumber.

3. Wire, steel, cast iron, cans, drums, or other foreign material.

4. Materials containing hazardous or toxic constituents at hazardous or toxic concentrations.

5. Reasonably free of roots or rocks larger than 1 inch, weeds, vegetation, and seeds of noxious weeds.

B. Acidity Range (pH): 5.5 to 7.5, determined in accordance with ASTM D4972.

C. Containing minimum 4 percent and maximum 25 percent organic matter determined in accordance with ASTM D2974.

E. Topsoil must be one or a combination of the following classifications of soil; ASTM D2487 Group Symbol SP, SM, ML, or OL.

F. A representative sample must be submitted for approval by the WCAA.

G. The grass seed and mulch along with the placement shall comply with Sections 816 - Turf Establishment and 917 - Turf and Landscaping Materials of the MDOT 2012 Standard Specifications for Construction.

3.7 SITE DEMOBILIZATION

A. Restore the demolition area so that all slabs, parking areas and other Site areas are free of debris and all other materials to the satisfaction of WCAA.

B. Remove and dispose of all waste materials in accordance with Section 02120 – Waste Management.

C. Demobilize CONTRACTOR equipment, supplies and support vehicles.

D. Disassemble and remove CONTRACTOR temporary facilities upon authorization from WCAA.

END OF SECTION

SECTION 02223

DEMOLITION AND REMOVALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hangar 2 and eastern covered truck loading dock are to be demolished to slab on-grade.

B. Removal of all above-grade concrete piers, pedestals, tank saddles and walls for disposal. All Hangar 2 slabs on grade, footings and foundations are to remain unless authorized by the WCAA. Do not excavate or disturb existing surrounding pavement unless authorized by the WCAA.

C. Off-Site processing of ferrous and nonferrous metals for scrap metal recycling (unprepared).

D. Loading and shipping of all salvage metals.

E. Removal and salvage of items designated by WCAA.

F. Protection of existing industrial, sanitary and storm sewer lines and all catch basin and manhole covers.

G. Removal of a decommissioned aboveground storage tank and its associated piping.

1.2 REFERENCES

A. WCAA General Terms and Conditions

B. Section 02120 – Waste Management

1.3 DEFINITIONS

A. Demolition: removal of above grade structures and all other designated improvements within the work area using hydraulic excavators equipped with shears, grapples and other suitable attachments to achieve mechanical removal and processing of all materials.

1.4 PROGRESS SUBMITTALS

A. Code Compliance: Submit copies of all required permits and inspection certificates or other code/ordinance compliance documents obtained by CONTRACTOR from the code/ordinance enforcement authorities, prior to commencing demolition activities.

B. Demolition/Dismantling Plan: 7 days prior to mobilization to the Site, submit a Demolition/Dismantling Plan for review to the DESIGNER. The plan shall include written procedures, schedules, and CONTRACTOR drawings as applicable. The Demolition/Dismantling Plan shall, as a minimum, address each of the following items:

1. The methods and procedures that will be used to perform each scheduled demolition and removal task.

2. The sequencing and scheduling of demolition and removal tasks.

3. Detailed drawings showing the location of all lay-down and scrap processing areas.

4. The means/methods for final demolition of Hangar 2 identifying the techniques to be employed to remove structures without damage to surrounding structures not included in the Work.

5. The source and means/methods to obtain and apply water to the demolition work to control fugitive emissions.

6. WCAA must approve all demolition techniques.

7. The CONTRACTOR's Demolition/Dismantling Plan must be written and submitted by a Michigan professional engineer with expertise in structural engineering.

1.5 REGULATORY REQUIREMENTS

A. Applicable federal, State of Michigan, and local rules and regulations.

B. Applicable City of Ypsilanti laws, codes and ordinances.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not spill, leak, or otherwise release materials from work areas.

B. Do not generate dusting or misting conditions outside of work areas.

1.7 SEQUENCING AND SCHEDULING

A. Sequence and schedule activities of this Section with Section 02120 – Waste Management to ensure efficient and timely performance of the Work.

B. Obtain all required permits from authorities.

C. CONTRACTOR is to coordinate all Site activities with other contractors for the safe completion of the Work including completing utility isolation.

D. Verify affected utilities are properly disconnected. Utilities to remain will be identified by WCAA/DESIGNER.

E. Conduct decommissioning and asbestos abatement prior to facility demolition.

F. WCAA will release structures in writing authorizing demolition to proceed. Do not proceed with demolition without written authorization.

G. Maintain vehicular access to Site entrances and exits at all times during Work.

1.8 QUALITY ASSURANCE

A. Perform work of this Section in accordance with CONTRACTOR's Site-specific Health and Safety Plan and Demolition/Dismantling Plan.

1.9 EXISTING CONDITIONS

A. Surrounding Hangar 2 are the Airfield Operations Area (AOA) and Willow Run Airport taxiway. These areas must not be impacted by demolition activities for Hangar 2.

B. Removal of a decommissioned aboveground storage tank is included in this scope of work.

C. Removal and proper disposal of expansion joint material must be completed prior to any demolition work or concrete crushing.

D. The existing guardrail along Tyler Road is to be protected and maintained.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify utilities are properly disconnected.

B. Verify and mark all industrial, sanitary and storm sewer manholes and utilities to remain as directed. Mark, identify and secure all manhole covers. CONTRACTOR will replace, with comparable material of the same quality and size, at his expense, manhole covers that are missing at the completion of the Work.

C. DESIGNER will verify all other asbestos abatement and decommission cleaning work is completed prior to authorizing CONTRACTOR to commence demolition.

D. Verify Site conditions are ready to receive work.

E. DESIGNER may conduct additional air monitoring during demolition activities.

3.2 PREPARATION

A. Do not close or obstruct access or egress to the Site.

B. Do not disable or disrupt adjacent property, utilities, roadways or other private or public property.

C. Security and work area fencing are to be erected and maintained.

1. CONTRACTOR must submit a fencing plan and specifications to WCAA for approval prior to erecting temporary fences.

2. Fences must remain until authorization for site demobilization has been authorized by WCAA. Any airport fences removed during Work must be re-erected with the same specifications.

D. Disconnect and remove any existing utilities within demolition areas unless otherwise specified by WCAA/DESIGNER.

E. Complete required decommissioning and abatement work prior to demolition.

F. Implement dust control, erosion and sediment control, and stormwater runoff controls prior to and during demolition activities in accordance with all required permits.

G. Notify affected utility companies before starting work and comply with their requirements.

H. Wet work areas with water as needed to minimize dust.

I. Comply with all applicable noise control laws, regulations and/or ordinances.

J. Provide methods, means and facilities for pollution control during demolition operations. Have preparations ready to control and dispose of spills or releases. Report all spills or releases to the proper authorities and in accordance with federal and state requirements.

K. Removal of all vegetation (clearing and grubbing) and surface debris in preparation for demolition activities.

3.3 DEMOLITION AND REMOVAL

A. Provide for the safe, controlled removal of the structures during demolition.

B. No excavation is to occur, unless so specified by WCAA.

C. Removal of the following items to be salvaged by CONTRACTOR for the WCAA:

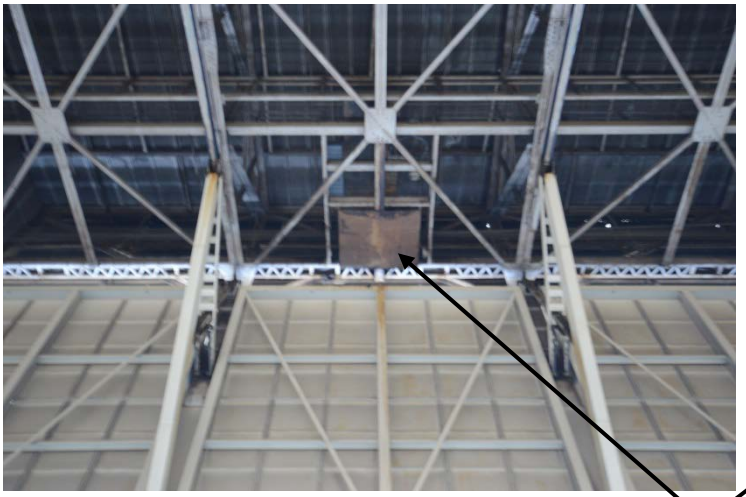
1. Tagged and designated electrical equipment located in the switch gear room. (See photos below)

Photo 1: Switch gear room located on south end of Hangar 2

Photo 2: Tagged electrical equipment

Photo 3: Designated electrical equipment for WCAA

2. Gear/pulley skid operator assemblies on bay doors 3, 4, and 8. (See photos below)



Location of operator to be salvage

Cables and electrical box not to be saved for WCAA

D. Demolish using mechanical means all structures in a safe, efficient and proper manner in accordance with CONTRACTOR's Demolition/Dismantling Plan. All demolition is to occur in a controlled manner.

E. Utilize water during demolition to minimize dust.

F. Segregate ferrous and nonferrous metals for recycling.

2. Sort metal to be recycled by type and grade.

3. Load for recycling.

G. Segregate wood, glass and other demolition debris. Stockpile for prompt loading and off-Site disposal. Do not allow stockpiled debris to remain on-Site. Do not bury materials on the Site.

H. Furnish WCAA copies of all weigh scale tickets from receiving mill/recycling facility as required.

I. Load transportation vehicles in a safe manner. Do not overload vehicles. Do not load vehicles in a manner that allows material to extend out of the truck bed.

J. Broom sweep exterior truck surfaces after loading to remove excess debris.

K. All trucks must be inspected by DESIGNER prior to leaving the Site.

L. Maintain good housekeeping throughout demolition operations. Do not allow for accumulated dirt or debris on-Site. Maintain equipment to sweep road surfaces. DESIGNER will stop work if good housekeeping and dust control methods are judged inadequate.

M. Upon WCAA approval, completely remove building slab, footings, foundations, tunnels and associated pits, and other below grade structures. WCAA approved concrete can be crushed on Site and used as fill if elected by WCAA.

N. Remove all pavements, sidewalks and other man-made above grade improvements outside of building footprint as designated by WCAA.

O. At the end of each day's work, leave Site in a safe and secure condition so that no part is in danger of toppling or falling.

P. Remove materials as work progresses. Upon completion of work, leave areas in clean condition.

Q. If the WCAA decides to have the building slabs remain, care must be exercised by CONTRACTOR during performance of the work to minimize any damage to the structural integrity of the slab.

R. Use hydraulic hammer to break floors of the pits, sumps and trenches as directed by DESIGNER.

S. Blasting will not be permitted.

END OF SECTION

SECTION 02226

UTILITY DECOMMISSIONING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Decommissioning of existing Site utilities including water distribution piping and equipment, natural gas distribution piping, electrical power, transmission, and distribution systems.

B. Removal of existing surface features including asphalt and concrete paving sidewalk and curbs to provide access to below grade structures and piping.

C. Protection of existing structures and utilities to remain.

1.2 PROGRESS SUBMITTALS

A. Code Compliance: Submit copies of all required permits and inspection certificates or other code compliance documents obtained by CONTRACTOR from the utility authorities, prior to commencing decommissioning activities.

B. Decommissioning Plan: Prior to mobilization to Site, submit Decommissioning Plan to DESIGNER for review.

1.3 REFERENCES

A. WCAA General Terms and Conditions.

1.4 DEFINITIONS

A. Associated Piping and Appurtenances: Piping and appurtenances (e.g., valves, collars, meters) directly or indirectly attached to or formerly attached to or adjacent to a tank. Associated piping may be above or below ground surface.

B. Clean Soil: Excavated soils and sediments which are inert and free of unacceptable contamination and which are suitable for reuse.

C. Contaminated Soil: Soils and sediments which are contaminated based on regulatory criteria, visual inspection, sampling and analysis or field screening.

D. SMDD: Standard Maximum Dry Density and in the context of this Section means the maximum dry unit weight determined in accordance with ASTM D1557.

1.5 QUALIFICATIONS

A. CONTRACTOR must provide qualifications, experience, and licenses of company specializing in preforming Work of this Section for approval by WCAA.

1.6 REGULATORY REQUIREMENTS

A. Conform to applicable code for demolition of structures, safety of adjacent structures, dust control, runoff control, and disposal.

B. Obtain required permits from utility authorities.

C. Notify affected utility companies before starting work and comply with their requirements.

D. Do not close or obstruct roadways, sidewalks, hydrants or valves without permits.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

A. Prior to commencement of the Work at the Site, inspect the Site with DESIGNER to review and establish the condition of surface features including existing roads, parking areas, buildings, wells, trees and other plants, grassed areas, fencing, service poles, wires, paving, and survey bench marks or monuments on or adjacent to the Site which may be affected by the Work. This inventory shall be mutually agreed between DESIGNER and CONTRACTOR and shall not thereafter be subject to dispute. Such inventory as may be amended, from time to time, will be used by DESIGNER to check compliance by CONTRACTOR with the requirements of the General Terms and Conditions.

B. Provide ongoing review, inspection, and attendance during performance of the Work to properly document conditions. Promptly inform DESIGNER of any existing condition at the Site affected by the Work which may require restoration, repair, or replacement. Do not cover up any of the Work without review by the DESIGNER.

C. Maintain and protect existing Site structures and facilities from damage which may be affected by the Work while work is in progress. Repair or replace damage resulting from the Work to DESIGNER's satisfaction.

D. Field verify exact locations of all utilities and appurtenances to be decommissioned.

E. Verify that utilities to be decommissioned are not in operation, all electrical components have been de-energized.

F. Ensure utilities have been properly isolated from those sections that are to remain in service.

3.2 EXISTING CONDITIONS

A. Perimeter drainage and storm water systems shall remain and be protected during demolition.

B. Maintain and protect the fire main to the plan north of building along with the water main to the plan south of Hangar 2.

C. The identified 1.5" water main line running to the landfill building must be maintained and protected during the Work.

D. Catch basins outside of the building footprint are to remain in place and be protected.

3.3 UTILITY DECOMMISSIONING GENERAL

A. Excavate as required for decommissioning purposes.

B. Saw cut on limits of asphalt pavement to be removed, full depth.

C. Saw cut on limits of concrete slabs for utility removal, minimum 3 inch depth.

D. Break up and remove existing asphalt, concrete and pavement.

E. All below slab utilities shall be completely removed if shown in the Design Documents to be removed.

F. All below grade sanitary, storm or water mains identified by WCAA/DESIGNER in Design Documents or any unknown utility connections that may be encountered during decommissioning activities shall all be removed from the exterior of the building to the nearest manhole or mainline that is designated to remain in service.

G. All abandoned penetrations into manhole or catch basin structures shall be removed and associated structures shall be properly repaired to water tight condition with means and methods appropriate for material of construction. Repair methods shall be submitted to the WCAA/DESIGNER for review and approval prior to use.

H. All abandoned blind tap penetrations into sewer mains shall be capped or plugged to a water tight condition using means and methods appropriate for material of construction. Cap and plug methods shall be submitted to WCAA/DESIGNER for review and approval prior to use.

I. If required, temporarily disconnect and cap designated mechanical services in accordance with requirements of the local authority having jurisdiction. Natural gas supply lines shall be temporarily removed or disconnected by qualified tradesmen in accordance with gas company's instructions. If required, temporarily remove and/or cap sewer and water lines to prevent leakage.

J. All roof and floor drains are to be cut and capped if building slab is to remain in place.

K. Maintain active or energized utilities traversing the premises throughout the project, unless designated for removal. Complete temporary relocation of lines [if required] by qualified tradespersons in accordance with the utility company requirements.

L. Temporarily cut and cap pipes and conduits which run into designated demolition areas.

M. At the end of each day's work, leave Site in a safe and secure condition so that no part is in danger of toppling or falling and unauthorized admittance is prohibited.

N. Remove materials as work progresses. Upon completion of Work, leave areas in clean condition.

O. CONTRACTOR shall provide surveyed locations and depths for bulkheads and below grade utilities that are exposed during the Work and left in place.

3.4 DECOMMISSIONING – WATER DISTRIBUTION PIPING AND EQUIPMENT

A. Main Supply Feed: excavate and disconnect from main supply feed as indicated, cap and bulkhead main.

B. Valves: excavate and remove all valve operators, accurately record locations of abandoned valves on Record Drawings.

C. Hydrants: remove vertical riser to a minimum depth of 2 feet below finished grade.

D. Bulkheads: excavate, cut piping and install bulkheads at locations as identified by WCAA/DESIGNER. Water main caps or bulkheads shall be installed in accordance with applicable standards and typical work practice for water distribution piping. Caps and bulkheads shall be water tight and suitable for operating pressure of the main line. Bulkheads for tunnels shall be of inorganic nature (concrete, brick, block and mortar) tied to the existing wall and of the sufficient structural integrity for compaction of the backfill. Cut, cap, and bulkhead repair methods shall be submitted to the WCAA/DESIGNER for review prior to use.

E. Valve Chambers: Remove valve and operator, remove internal piping, construct bulkheads at piping openings, excavate and remove chamber top slab, frame and cover to a minimum depth of 2 feet below finished grade, fill remainder of chamber with lean mix concrete using tremie methods.

F. Backfill excavations in accordance with Section 2200 – Site Restoration.

3.5 DECOMMISSIONING – NATURAL GAS DISTRIBUTION PIPING

A. Gas line connections must be confirmed by CONTRACTOR prior to any work.

B. Main Supply Feed: Locate and close all valves as required in order to terminate natural gas supply to piping to be decommissioned as indicated.

C. Purge and inert piping and equipment in accordance with DTE/MICHCON specifications.

D. Excavate at valves and disconnect piping from valves, cap all piping to remain in place and extract all piping using mechanical methods.

E. All high pressure gas lines connected to the building are to be purged, cut and capped at the 4" high pressure main.

F. Excavate and remove all piping, valves and appurtenances as identified by WCAA/DESIGNER.

G. Backfill excavations in accordance with Section 2200 – Site Restoration.

3.6 DECOMMISSIONING – ELECTRICAL POWER, TRANSMISSION AND DISTRIBUTION

A. Ensure all components are de-energized prior to commencing decommissioning activities. Coordinate with power authority.

B. Remove all oils and electrical components as indicated.

C. Return electrical meters to power authority as required.

3.7 FIELD QUALITY CONTROL

A DESIGNER or his subcontractor will perform tests in the field and in the laboratory on samples of uncompacted and compacted fill to determine if materials meet specification except as otherwise specified. Copies of test reports will be supplied to CONTRACTOR on request.

B. Frequency of Testing: At least 1 density test and 1 moisture content determination for each tank or each shift.

C. Method of Testing:

1. Maximum Dry Density of Backfill: Determined in the laboratory in accordance with ASTM D1557.

2. Bulk Wet Density of Backfill: determined in the field in accordance with ASTM D2922.

3. Moisture Content of Backfill in place: determined in accordance with ASTM D3017.

END OF SECTION

SECTION 02232

CFC AND REFRIGERANT REMOVAL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Refrigerant recovery, storage, handling, and transport.

B. Refrigerant oil recovery and handling.

C. Refrigerant equipment disposal.

1.2 REFERENCES

A. WCAA General Terms and Conditions.

B. United States Federal Government.

1. Section 608 of the Clean Air Act, 1990, as amended (CAA): refrigerant recycling requirements.

2. 29 CFR Parts 1910 and 1926 - Occupational Safety and Health Administration (OSHA) Standards, Subpart Z – Toxic and Hazardous Substances.

3. 40 CFR, Protection of Environment.

a. Part 82 – Protection of Stratospheric Ozone.

b. Part 260 – Hazardous Waste Management System: General.

c. Part 261 – Identification and Listing of Hazardous Waste.

d. Part 262 – Standards Applicable to Generators of Hazardous Waste.

e. Part 266 – Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities.

f. Part 279 – Used Oils (Used Refrigerant Oils).

4. 49 CFR Parts 100 – 180: Hazardous Materials Transportation Regulations.

5. "Final Rule Summary: Complying with the Section 608 Refrigerant Recycling Rule," (EPA 430-F-95-117, Revision 1) U.S. EPA, Office of Air and Radiation Stratospheric Protection Division, August 1995.

C. American Society of Heating, Air Conditioning, and Refrigerating Engineers (ASHRAE):

1. Standard 15 - Safety Standard for Refrigeration Systems.

2. Standard 34 - Designation and Safety Classification of Refrigerants.

3. Standard 147 - Reducing the Release of Halogenated Refrigerants from Refrigerating and Air-Conditioning Equipment and Systems.

D. Air Conditioning & Refrigeration Institute (ARI) Guideline K - Containers for Recovered Fluorocarbon Refrigerants.

E. National Fire Protection Association (NFPA).

F. Resource Conservation and Recovery Act (RCRA).

G. Toxic Substances Control Act (TSCA).

1.3 DEFINITIONS

A. CFC's and refrigerant gases: include chlorinated- fluorocarbons and other related gases used as refrigerants in air conditioning units, water coolers, cooling units within machinery control panels, refrigerators, heat exchangers and other equipment.

1.4 PROGRESS SUBMITTALS

A. Technician Certification: Within 7 calendar days of commencing work, provide to DESIGNER proof of required federal certification for all technicians performing work with refrigerants and refrigerant equipment.

B. Inventory of Recycling and Recovery Equipment: Within 7 days of commencing work, provide to DESIGNER an inventory of all recycling and recovery equipment to be used during removal activities, including required equipment certifications.

C. Decommissioning/Cleaning Plan: Within 7 days of commencing work, submit to DESIGNER for review, a detailed plan for recovery, recycling, storage, and transport of CFCs and refrigerants. The plan shall include written procedures, schedules, and CONTRACTOR drawings, as applicable, to address equipment requiring removal. Include anticipated health and safety procedures and equipment.

1.5 REGULATORY REQUIREMENTS

A. Obtain required permits from appropriate authorities.

B. Comply with applicable federal, State of Michigan, and local rules and regulations.

C. All equipment dismantled on-Site prior to disposal must have any refrigerant recovered in accordance with USEPA requirements.

D. Use procedures that maximize recycling of ozone-depleting compounds (including CFCs and HCFCs).

E. Obtain and provide to DESIGNER certification for recycling and recovery equipment, technicians, and reclaimers.

F. Technicians must provide documentation demonstrating federal certification to the proper level prior to performing any activity with CFCs or refrigerants. The proper level must be determined according to the EPA standards outlined below.

Type of Equipment Serviced	Level of Certification Required
Small appliances (<5 lbs)	Type I
High and very-high pressure appliances	Type II
Low pressure appliances	Type III
All types	Universal*

* Type IV Universal does not include motor vehicles

Individuals who purchase, handle, or transport refrigerant shall have at least Type I certification.

G. CONTRACTOR must clearly label each piece of equipment as being "refrigerant-free" or "CFC-free" following refrigerant recovery.

H. Conform to procedures and applicable regulations when hazardous or contaminated materials are present.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Maximize recovery and recycling of CFCs and other refrigerants. Do not vent such compounds into the atmosphere.

B. Comply with requirements of CONTRACTOR's approved Spill Prevention and Pollution Control Plan.

C. Comply with ASHRAE Standard 147.

1.7 SEQUENCING AND SCHEDULING

A. Notify DESIGNER 7 calendar days prior to commencement of removal activities.

B. CONTRACTOR must attend coordination meeting with DESIGNER prior to initiation of removal activities. Meeting to be conducted by DESIGNER and minutes taken to document discussions.

C. Schedule work to coordinate with activities of WCAA, other contractors, and CONTRACTOR's own activities.

1.8 QUALITY ASSURANCE

A. Perform work of this Section in accordance with CONTRACTOR's Decommissioning/Cleaning Plan.

1.9 EXISTING CONDITIONS

A. Equipment containing refrigerant gases is located throughout the facility.

1.10 QUALIFICATIONS

A. Technicians must verify that they meet federal certification training and testing requirements as outlined in Article 1.5 of this Specification.

PART 2 PRODUCTS

2.1 EQUIPMENT REQUIREMENTS

A. Recovery and recycling equipment manufactured on or after November 15, 1993, must be tested by an approved third party, which is a USEPA-approved testing organization, to ensure that it meets USEPA requirements.

B. CONTRACTOR must register recycling and recovery equipment with the appropriate USEPA office.

C. CONTRACTOR must provide certification for recycling and recovery equipment to be used during CFC and refrigerant removal activities.

D. Equipment Labeling.

1. Label each certified recycling and recovery unit in accordance with USEPA requirements. The label should be similar to the following:

THIS EQUIPMENT HAS BEEN CERTIFIED BY (approved equipment testing organization) TO MEET EPA's MINIMUM REQUIREMENTS FOR RECYCLING OR RECOVERY EQUIPMENT INTENDED FOR USE WITH (appropriate category of appliance).

2. The label must show the date of manufacture and, if applicable, the equipment's serial number. The label should be readily visible or accessible, be made of material expected to last, remain legible through the equipment's lifetime, and be affixed so that it cannot be removed from the equipment without damage to the label.

E. Recovery and recycling equipment manufactured before November 15, 1993, including homemade equipment, will be grandfathered if it meets the first column of Table 1 attached at the end of this Specification. Third party testing is not required.

F. Low-loss fittings must be used on equipment manufactured on or after November 15, 1993.

G. CONTRACTOR shall service and maintain recovery and recycling equipment in accordance with manufacturer's recommendations.

H. Leak-test each piece of recovery equipment every six months or per local regulations to ensure all units must meet the USEPA mandated evacuation levels.

I. Provide written proof of maintenance and leak testing activity (i.e. maintenance logs).

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify information provided to CONTRACTOR by others regarding condition or status of use of CFC-containing and refrigerant equipment.

3.2 PREPARATION

A. Disconnect electrical current to unit.

B. Provide, erect, and maintain temporary barriers to protect WCAA's operations.

C. Identify to DESIGNER the evacuated refrigerant temporary storage or warehouse area.

D. Obtain appropriate storage cylinders, drums, and/or tanks supplied by an authorized refrigerant contractor.

E. Label all recovery cylinders, drums, and tanks with a refrigerant identification label for the type of refrigerant that it will contain. Color-code all recovery tanks as required by law: yellow top, gray body. Do not accept any exchange or new tanks that are not color-coded or have an expired retest date.

3.3 VENTING RESTRICTIONS

A. CONTRACTOR must not knowingly vent ozone-depleting compounds used as refrigerants into the atmosphere during removal activities. Releases of ozone-depleting compounds are permitted by the USEPA only as outlined below:

1. "De minimis" quantities of refrigerant released in the course of making good faith efforts to recapture and recycle or safely dispose of refrigerant.

2. Refrigerants emitted during the normal course of operation of equipment. Substantial leaks must be repaired.

3. Releases of CFCs or HCFCs that are not used as refrigerants. Mixtures of nitrogen and R-22 that are used as holding charges or as leak test gases since the ozone-depleting compound is not used as a refrigerant. The CONTRACTOR may not avoid recovering refrigerant by adding nitrogen to a charged system; before nitrogen is added the system must be evacuated to the appropriate level as shown in Table 1 attached at the end of this Specification. Pure CFCs or HCFCs released from appliances will be considered refrigerants.

4. Small releases of refrigerant which result from purging hoses or from connecting or disconnecting hoses.

3.4 CONTAMINATION AVOIDANCE

A. Refrigerant shall not be mixed.

B. Remove and dispose of recovery/recycling filters when changing refrigerants.

C. Properly label refrigerant tanks in accordance with ARI Guideline K and USEPA requirements.

D. Recover residual refrigerant from the service gauge set and hoses after each service procedure, have a gauge set for each type of refrigerant.

E. Properly prepare recovery/recycling equipment to receive each refrigerant per manufacturer's specifications.

F. Properly prepare the recovery cylinder to receive each refrigerant per manufacturer's specifications. This includes completely removing the residual refrigerant remaining in the cylinder. Before changing refrigerant types, draw a vacuum to assure all possibility of contaminants in the refrigerant are removed.

3.5 REFRIGERANT RECOVERY

A. Evacuate refrigerants and oils contaminated with CFCs to established vacuum levels. Use certified recovery or recycling equipment.

1. If CONTRACTOR is using recycling and recovery equipment manufactured before November 15, 1993, comply with vacuum levels in the first column of Table 1.

2. If CONTRACTOR is using recycling and recovery equipment manufactured on or after November 15, 1993, comply with vacuum levels in the second column of Table 1.

3. For small appliances (less than 5 pounds), evacuation levels are as follows (CONTRACTOR to provide proof of recovery to DESIGNER):

   a. For "grandfathered" recovery equipment, recover 80 percent.

   b. For new recovery equipment when the compressor is not working, recover 80 percent.

   c. For all appliances, evacuate to 4 inches of mercury vacuum.

4. Refer to Article 3.10 of this Specification for used refrigerant oil handling.

B. Transfer evacuated refrigerant to appropriate labeled recovery tanks/storage containers supplied by a refrigerant contractor. Segregate refrigerant types.

C. If, due to leaks, the levels in Table 1 are not attainable or would substantially contaminate the refrigerant being recovered, the CONTRACTOR must:

1. Isolate leaking from non-leaking components, if possible.

2. Evacuate non-leaking components to the levels in Table 1 attached at the end of this Specification.

3. Evacuate leaking components to the lowest level attainable without significantly contaminating the refrigerant.

D. Label each piece of equipment evacuated of refrigerant.

E. Deliver all storage containers of evacuated refrigerants to the designated waste storage area. Store refrigerants in accordance with Article 3.6 of this Specification.

3.6 REFRIGERANT STORAGE

A. Ensure all containers are properly labeled.

B. Store refrigerants in compliance with all NFPA codes and standards and local codes and standards.

C. Do not store over 300 pounds of refrigerant in a mechanical equipment room as defined by ASHRAE Standard 15, NFPA or local jurisdictions.

D. Secure refrigerants stored in any room to limit access to certified technicians only and store in accordance with all local codes and standards. Refer to ASHRAE Standards 15 and 34.

E. Ensure adequate ventilation for storage in non-mechanical rooms and ensure refrigerant sensors are installed. Follow ASHRAE Standard 15 calculations.

F. Preferred storage is in a large volume ground level warehouse type location within a securely fenced, locked area. Calculate volume of largest refrigerant container versus room volume.

G. Segregate evacuated refrigerants by type.

3.7 RECOVERED REFRIGERANT HANDLING

A. Handle refrigerant that has been recovered from a system according to the options proposed by CONTRACTOR and as approved by WCAA.

3.8 REFRIGERANT TRANSPORT AND SHIPPING

A. CONTRACTOR is responsible for container integrity at all times and for preparing and properly labeling the recovery cylinders, drums, and tanks.

B. Comply with DOT regulations.

C. Comply with ARI Guideline K. Specifically, ensure that all cylinders for recovered refrigerants be painted gray with the top shoulder portion painted yellow and that proper identification appears on the label.

D. Comply with specific State of Michigan and local guidelines.

E. Securely and carefully transport containers to prevent abrasion of painted surfaces and avoid destruction of automatic shut-off mechanisms.

F. Complete a bill of lading for any shipment of used refrigerants.

3.9 REFRIGERANT EQUIPMENT SALVAGE

A. Salvage refrigerant equipment in accordance with Section 02223 – Demolition and Removals.

3.10 USED REFRIGERANT OIL HANDLING

A. General.

1. Used refrigerant oil is not considered hazardous waste provided that the used oil is recycled, the refrigerant is reclaimed, and the used oil has not been mixed with any hazardous wastes.

2. Used oils that contain CFCs after the CFC reclamation process are subject to regulatory limits if these oils are to be incinerated or otherwise burned.

3. Used refrigerant oil that is disposed of is subject to RCRA hazardous waste regulations.

4. Used oil with a PCB concentration of 50 parts per million or greater must be managed as TSCA waste.

B. Label containers used for refrigerant oil recovery with "Used Oil – May Contain CFCs".

C. DESIGNER will arrange for used oils to be tested for the following: flash point; F001 and F002 listed solvents, and total halogens, arsenic, cadmium, chromium, lead, and PCBs. Mix recovered refrigerant oil and other used oils only as permitted by 40 CFR Part 279, RCRA, TSCA regulations, and as approved by DESIGNER.

D. Do not mix used oil with any other chemical substances.

E. Used oil containers must be labeled with "USED OIL" and must be sound, free of cracks and holes, and otherwise non-leaking.

F. Recycle used oil, whenever possible, at an approved, licensed used oil reclamation facility.

TABLE 1

	Inches of Mercury Vacuum* Using Equipment Manufactured:	
Type of Appliance	***Before Nov. 15, 1993***	***On or After Nov. 15, 1993***
HCFC-22 Appliance** Normally containing less than 200 pounds of Refrigerant	0	0
HCFC-22 Appliance** Normally containing 200 pounds or more of Refrigerant	4	10
Other High-Pressure Appliance** Normally containing less than 200 pounds of Refrigerant	4	10

(CFC-12, -500, -114)		
Other High-Pressure Appliance** Normally containing 200 pounds or more of Refrigerant (CFC-12, -500, -114)	4	15
Very High-Pressure Appliance (CFC-13, -503)	0	0
Low-High Pressure Appliance (CFC-11, HCFC-123)	25	25 mm Hg absolute

Note:

* Relative to Standard Atmospheric Pressure of 29.9 Hg.

** Or Isolated Component of such an Appliance.

END OF SECTION

SECTION 02233

LIGHTING REMOVAL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Removal of all types of lighting fixtures as described.

B. Removal of fluorescent, mercury, and high-intensity discharge light ballasts.

1.2 REFERENCES

A. WCAA General Terms and Conditions.

B. Section 02120 – Waste Management.

1.3 DEFINITIONS

A. Lighting: All electrical fixtures interior and exterior lights on structures to be demolished. Fixtures vary by type and include fluorescent, incandescent, mercury vapor and high-intensity discharge lamps.

1.4 PROGRESS SUBMITTALS

A. Decommissioning/Cleaning Plan: Prior to mobilization to Site, submit a decommissioning and removal plan to DESIGNER for review. The plan shall include written procedures, schedules, and CONTRACTOR drawings, as applicable. Describe means and methods for the removal, handling, packaging, and labeling of lighting fixtures including lamps (bulbs), and light ballasts. Include all applicable safety requirements to access fixtures.

1.5 REGULATORY REQUIREMENTS

A. Applicable federal, State of Michigan, and local rules and regulations.

1. 40 CFR 761 – Disposal of Polychlorinated Biphenyls (PCBs).
2. 40 CFR 273 – Standards for Universal Waste Management.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not spill, leak, or otherwise release materials from work areas.

B. Maintain spill containment controls set forth in 40 CFR 761.65 pending disposal of PCB ballasts.

1.7 SEQUENCING AND SCHEDULING

A. Schedule work to coordinate with activities of WCAA, other contractors, and CONTRACTOR's own activities.

1.8 QUALITY ASSURANCE

A. Perform work of this Section in accordance with CONTRACTOR's Decommissioning/Cleaning Plan.

1.9 EXISTING CONDITIONS

A. Light fixtures are located throughout the facility and at various elevations.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions prior to starting work.

3.2 PREPARATION

A. Identify date of removal on drum and comply with all other applicable labeling requirements for each waste stream.

3.3 LIGHTING REMOVAL

A. Remove all fluorescent, incandescent, mercury vapor and high intensity lamps from fixtures.

B. Remove fixture and disassemble.

C. Segregate lamps by type, size and/or length.

D. Package light bulbs, mercury vapor bulbs fluorescent light tubes and high intensity lamps in cardboard boxes acceptable to the disposal or recycling facility.

E. Label containers in accordance with applicable requirements for Universal Waste.

3.4 FLUORESCENT LIGHT BALLASTS REMOVAL

A. Remove all fluorescent light ballasts from fixtures. Assume all ballasts to be PCB-containing.

B. Examine mercury vapor and high intensity discharge lamps fixtures for the presence of ballasts or condensers that may contain PCBs. Assume all ballasts and condensers to be PCB-containing.

C. Containerize and store all fluorescent light ballasts and condensers in DOT-approved 55-gallon drums in accordance with 40 CFR 761.65.

D. Identify the date of removal on drum and comply with all other marking requirements of 40 CFR 761.40 for disposal in accordance with applicable regulations.

E. Transport drums/container to the temporary storage area.

3.5 WASTE RECYCLING/DISPOSAL

A. Recycle/dispose of wastes generated in accordance with Section 02120 – Waste Management.

END OF SECTION

SECTION 02234

REMOVAL OF MERCURY DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Removal of mercury devices.

1.3 REFERENCES

A. WCAA General Terms and Conditions.

B. Section 02120 – Waste Management.

1.4 DEFINITIONS

A. Mercury Containing Devices: include mercoid switches, thermometers and other mercury containing metering equipment.

1.5 PROGRESS SUBMITTALS

A. Decommissioning/Cleaning Plan: Prior to mobilization to Site, submit a decommissioning and removal plan to DESIGNER for review. The plan shall include written procedures, schedules, and CONTRACTOR drawings, as applicable, to address the removal, handling, interim transportation and disposal of all mercury-containing devices.

1.6 REGULATORY REQUIREMENTS

A. Applicable federal, State of Michigan, and local rules and regulations.

1. 40 CFR 273 – Standards for Universal Waste Management.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Conform to procedures and applicable regulations when hazardous or contaminated materials are present.

B. Comply with the requirements of CONTRACTOR's approved Site-Specific Health and Safety Plan, Decommissioning/Cleaning Plan and Spill Prevention and Pollution Control Plan.

1.8 SEQUENCING AND SCHEDULING

A. Schedule Work to coordinate with activities of WCAA, other contractors, and CONTRACTOR's own activities.

1.9 QUALITY ASSURANCE

A. Perform Work of this Section in accordance with CONTRACTOR's Decommissioning/Cleaning Plan.

1.10 EXISTING CONDITIONS

A. Mercury-containing devices are located throughout the facility on natural gas lines, wall thermostats, thermometers and the Suprotex Deluge Sprinkler System.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that an adequate supply of containers is ready to receive the anticipated quantity of devices scheduled for removal.

3.2 PREPARATION

A. Assemble proper tooling and collection equipment.

B. Provide adequate lighting to support removal activities.

3.3 REMOVAL ACTIVITIES

A. Remove the mercury-containing device as applicable. Assess each device for damage or leaks.

B. Inspect the Suprotex Deluge Sprinkler System located on columns A1, A8, A13, A20, A27, A32, A39, A45 A50 and A57. Details may be found on the Albert Kahn Site Condition Drawing 14E. Locate and remove all mercury-containing devices.

C. If the mercury-containing device is not damaged or leaking, place the device in a sealable, non-leaking plastic container. If the mercury-containing device is damaged or leaking, place the entire device in a sealable, non-leaking plastic container.

D. Remove any mercury-containing buildup from the inside of the device, surrounding equipment, or flooring using suitable recovery equipment including vacuums. Place the debris in a sealable, non-leaking plastic container. Dispose of the entire device, if necessary.

E. Transport mercury-containing devices into a 5 gallon pail with lid containing sand or other absorbent materials during interim collection and transportation to waste storage pad.

F. Label all containers prior to or at the time of removal in accordance with applicable regulations. Label recyclable devices in accordance with applicable requirements for Universal Waste. Containers with mercury sludges or residue waste destined for disposal should be identified as D009 hazardous waste.

G. All mercury contaminated materials, including personal protection equipment, should be containerized and stored to satisfy State of Michigan regulations and policies. All mercury contaminated materials and sealable, non-leaking plastic containers containing mercury should be placed in secondary, sealable, non-leaking containers approved for Department of Transportation shipment. Label all containers appropriately and in compliance with regulatory requirements.

3.4 WASTE RECYCLING/DISPOSAL

A. Recycle/dispose of waste generated in accordance with Section 02120 – Waste Management.

END OF SECTION

SECTION 02235

BATTERY AND ELECTRICAL EQUIPMENT REMOVAL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Removal and storage of lead-acid, nickel-cadmium, gold, dry cell, flashlight, lantern, lithium, and other special purpose batteries.

B. Removal of all electrical equipment

1.2 REFERENCES

A. Section 02120 – Waste Management.

1.3 PROGRESS SUBMITTALS

A. Decommissioning/Cleaning Plan: Prior to mobilization to Site, submit a decommissioning and removal plan to DESIGNER for review. The plan shall include written procedures, schedules, and CONTRACTOR drawings, as applicable, to address the removal, handling, interim transportation and disposal of batteries and electrical equipment.

1.4 REGULATORY REQUIREMENTS

A. Applicable federal, State of Michigan, and local rules and regulations.

1. 40 CFR 273 – Standards for Universal Waste Management.

2. 10 CFR Part 31 and 32, as applicable.

3. Regulatory Issue Summary 2006-25.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Conform to procedures and applicable regulations when hazardous or contaminated materials are present.

B. Comply with the requirements of CONTRACTOR's approved Site-Specific Health and Safety Plan, Decommissioning/Cleaning Plan and Spill Prevention and Pollution Control Plan.

1.6 SEQUENCING AND SCHEDULING

A. Schedule Work to coordinate with activities of WCAA, other contractors, and CONTRACTOR's own activities.

1.7 QUALITY ASSURANCE

A. Perform Work of this Section in accordance with CONTRACTOR's Decommissioning/Cleaning Plan.

1.8 EXISTING CONDITIONS

A. Batteries and electrical equipment are located throughout the facility.

B. WCAA reserves the right to recover decommissioned electrical equipment, including transformers.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that an adequate supply of containers is ready to receive the anticipated quantity of devices scheduled for removal.

3.2 PREPARATION

A. Maintain appropriate spill response equipment for leaking batteries.

3.3 BATTERY AND ELECTRICAL EQUIPMENT REMOVAL AND STORAGE

A. Identify all batteries and electrical equipment scheduled for removal.

B. Remove and place batteries and electrical equipment in properly labeled containers and transport them to the temporary storage area for subsequent disposal or for off-Site transport to an authorized recycling facility or supplier. Use extreme care to avoid breakage.

C. Separate batteries by type (lead-acid, Ni-Cd, etc.) in the temporary storage area. Do not store lead-acid batteries in the same container with other battery types. Protect terminals during handling and packaging.

D. Label all containers prior to or at the time of removal in accordance with applicable regulations.

1. Label recyclable battery devices in accordance with applicable requirements for Universal Waste.

2. Label lead-acid battery containers destined for disposal as D002, D008 hazardous waste.

3.4 WASTE RECYCLING/DISPOSAL

A. Recycle/dispose of waste generated in accordance with Section 02120 – Waste Management.

END OF SECTION

SECTION 02238

CHEMICAL SWEEP

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Collection and packaging of products, chemicals and others wastes located throughout the Site including but not limited to industrial wastes, fertilizers, pesticides, maintenance/cleaning products, unused oils and lubricants, paint and paint products, unused lubricants, biocides, silica containing products, treatment chemicals, and laboratory chemicals.

1.2 REFERENCES

A. WCAA General Terms and Conditions.

1.3 DEFINITIONS

A. Miscellaneous containers: includes cans, bottles, drums, bags, boxes or other receptacles that, when inspected, are found to contain products, chemicals or other wastes in any volume.

1.4 PROGRESS SUBMITTALS

A. Decommissioning/Cleaning Plan: Submit a Decommissioning/Cleaning Plan to DESIGNER for review. The Decommissioning/Cleaning Plan shall include written procedures and schedules, as applicable, to address the collection of miscellaneous chemicals remaining from operation and maintenance activities at the Site. Include health and safety procedures required for safe removal, on-Site transportation and storage.

1.5 REGULATORY REQUIREMENTS

A. Applicable federal, State of Michigan, and local rules and regulations.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Comply with requirements of CONTRACTOR's approved Spill Prevention and Pollution Control Plan.

1.7 SEQUENCING AND SCHEDULING

A. Schedule Work to coordinate with activities of WCAA, other contractors, and CONTRACTOR's own activities.

1.8 QUALITY ASSURANCE

A. Perform Work of this Section in accordance with CONTRACTOR's Decommissioning/Cleaning Plan.

1.9 EXISTING CONDITIONS

A. Miscellaneous containers are located throughout the facility.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify the location and type of unused or off-specification product remaining at the Site.

B. Obtain SDS sheets for each chemical, or identify products for which no SDS sheet is available.

C. Determine proper handling and packaging requirements for each product.

D. Verify that the temporary storage area is prepared to receive the anticipated quantity of product scheduled for removal.

3.2 PREPARATION

A. Obtain the appropriate storage containers for the products, chemicals or other wastes to be removed. CONTRACTOR will provide all containers for disposal or reuse of the items.

B. Mobilize appropriate spill response measures or equipment.

C. Identify disposal or reuse options for each product, chemical or waste. Notify DESIGNER of the name, location, and phone number of vendors accepting the return of any product for reuse. If no reuse options are available, and facilities are unwilling to accept the product for reuse, notify DESIGNER in advance of the type and quantity of chemical, product or waste so that profiling, packaging, and disposal arrangements can be made.

3.3 REMOVAL ACTIVITIES

A. Assess each container with product, chemical or other waste for damage or leaks. Determine the appropriate container for disposal or reuse. If product, chemical or other waste is contained within piping or equipment decommission in accordance with Section 02141 – Piping and Equipment Draining and Cleaning.

B. If a container is damaged or leaking, place the entire device in a sealable, non-leaking plastic container.

C. CONTRACTOR shall select containers based on the waste characteristics including, but not limited, corrosivity, reactivity, and toxicity.

D. Conduct compatibility testing as necessary. Place only compatible materials in the same disposal container.

E. Clean and decontaminate surrounding contaminated flooring, satellite hazardous waste accumulation areas, and central hazardous waste storage as indicated by DESIGNER.

F. Label all containers in accordance with applicable regulations prior to or at the time of removal to the temporary interim storage area.

3.4 CHEMICAL DISPOSITION

A. Return any unused or off-specification chemicals to the supplier.

B. If waste items cannot be returned to the supplier, they shall be disposed in accordance with Section 02120 – Waste Management.

END OF SECTION

SECTION 02315

EXCAVATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Excavating earthen materials for removal of building volume below grade, pits, tunnels, tanks and other items. Excavating to remove concrete surface slab on-grade, subsurface footings, foundations, existing tunnel systems and other structures upon WCAA's approval.

1.2 REFERENCES

A. WCAA General Terms and Conditions.

1.3 PROJECT CONDITIONS

A. Verify that survey bench mark and intended elevations for the Work are as indicated.

1.4 CLASSIFICATION OF MATERIALS

A. Earth: All material not classified as rock or rubble, includes: clay, silt, sand, gravel, hardpan, disintegrated shale and rock debris, junk, brick, rubble, loose stones, and boulders less than 1/3 cubic yards in volume.

1.5 SUBMITTALS

A. Excavation Plan: 7 days prior to mobilization to the Site, submit a detailed Excavation Plan demonstrating compliance with specified requirements to DESIGNER for review. Include written procedures, schedules, and drawings as applicable and, at a minimum, address each of the following items:

1. Methods and procedures which will be used to perform excavation.

2. Sequencing and scheduling of excavation and backfilling in excavation areas.

3. Sloping of excavation faces and slope stability issues.

4. Show areas excavation and lines for saw cutting pavement.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. Contact “Miss Dig” or an underground utility marking subcontractor to identify, locate, and mark any utilities prior to any excavating.

C. Locate, identify and protect utilities that are to remain as indicated by WCAA/DESIGNER.

3.2 EXCAVATING - GENERAL

A. Saw cut existing paving necessary for the excavation on neat lines in accordance to Excavation Plan. Excavate as necessary for the demolition and removal of those structures included in the Scope of Work. Take care that areas of pavement not designated to be removed are not damaged.

B. If any pavement or floor is "undercut" from excavation, saw cut and remove paving or flooring to area where there is firm support. Extent or additional saw cutting must be approved by WCAA.

C. Apply necessary moisture to the construction area and haul roads to prevent the spread of dust. Following excavation and grading on this project the CONTRACTOR shall be responsible for disposing of excess material from the project to a location designated by the WCAA.

D. In the event that any unsuitable bearing material is encountered in excavation, bring to the attention of the WCAA, or his representative. A determination will be made prior to the Works continuance. If unsuitable bearing subgrade conditions were caused by the CONTRACTOR's operations at the Site, then the cost of reestablishing suitable bearing conditions shall be at the expense of the CONTRACTOR and as directed by the WCAA. If unsuitable bearing conditions are a natural occurrence the extra cost shall be paid by the WCAA.

E. Provide temporary drainage facilities to prevent damage when necessary to interrupt natural drainage or flow of artificial drains.

F. Use special care when excavating under and around existing facilities and structures. Prevent settlement of existing structures which may result from excavating.

G. Notify DESIGNER of unexpected subsurface conditions and discontinue work in area until notified to resume work.

H. CONTRACTOR may reuse any excavated material that conforms to the specification for backfill.

I. If requested by WCAA, CONTRACTOR shall excavate and remove, in their entirety, the Hangar 2

building slab, all subsurface footings and foundations, and other structures including the trench system and associated pits. All subsurface concrete is to be removed.

J. If requested by WCAA, CONTRACTOR is to remove all exterior man-made improvements within the property boundary, including but not limited to, light poles and pedestals, pavement, sidewalks, parking barriers, etc.

K. Remove excess excavated material from Site.

3.3 EXCAVATING CONTAMINATED SOILS

A. Excavate soils to depths and dimensions as directed by WCAA.

B. Stockpile potentially clean overburden soil in area designated on Site for confirmatory testing by DESIGNER or their subcontractor for later use as backfill material if it is confirmed to be clean.

C. Identify contaminated areas by survey stakes. Excavate each area identified to be contaminated and remove soil, sediments, and other solid materials determined to be contaminated.

D. Whenever possible, load contaminated excavated materials directly into haulage units permitted for transport of hazardous waste. Material may be temporarily staged prior to loading. Develop staging areas to prevent contact between clean and contaminated materials. Perform loading to minimize contamination of the exterior of haulage units and the loading area. Measures to minimize contamination shall include draping the sides of the haulage unit with polyethylene sheeting. After loading, remove the polyethylene sheeting from the sides of the haulage unit and place within the haulage unit.

E. Perform excavation in such a manner that only the excavation bucket and boom contact contaminated materials.

F. Upon completion of the Excavation Plan, WCAA will obtain confirmatory soil samples from the base and sidewalls of the excavation.

G. Keep limits of excavation undisturbed and free of loose, soft, or organic matter.

H. Maintain excavation depth tolerances. Unless directed by WCAA, excavation in excess of specified limits shall be considered over-excavation.

I. Where directed by WCAA, stage moist or wet material in a temporary stockpile and allow to drain prior to loading for off-Site disposal. Contain drained water and store in designated storage tank. Dispose of water off-Site in accordance with Section 02120 - Waste Management.

J. Keep excavations open until directed to be backfilled by WCAA pending receipt and review of analytical results of samples collected from the excavated surface. Following receipt of analytical results, WCAA may direct CONTRACTOR to horizontally extend the limits of the excavation, excavate an additional depth of soil, or commence backfilling. For the duration of

an open excavation, maintain the excavation free from water and adequately mark the open excavation with temporary fencing to restrict access until the excavation is properly backfilled.

K. Schedule excavation activities in such a manner that access is available to any excavation area for additional excavation as directed by WCAA. In returning to an area for additional excavation, comply with previously specified access route restrictions. Make due allowance in scheduling excavation activities for time required for sample collection and analysis and for analytical results to be forwarded to WCAA. Allow for a laboratory turnaround time of 7 working days (not including weekends or holidays) commencing on the day following sample collection.

END OF SECTION

SECTION 16010

GENERAL ELECTRICAL REQUIREMENTS

PART ONE - GENERAL

RELATED DOCUMENTS

The work under this specification is subject to all of the Contract Documents and WCAA General Terms and Conditions that apply to the entire Work.

SUMMARY

Extent of Work by this Section of Specifications is applicable to all subsequent Sections of Division 16. Provide all labor, material, equipment and services and perform all operations required for the complete electrical installation and all related Work as required by the Contract Documents.

QUALITY ASSURANCE

Codes

Install all materials and equipment in strict accordance with the latest edition of the National Electrical Code, the National Safety Code, the National Fire Protection Association, and all governing national and local codes and authorities. When Contract Documents indicate higher quality materials or method than the minimum required by the regulatory agencies, comply with the required Contract Documents. Additionally, the installation shall be in accordance with the governing rules and regulations of the Federal Aviation Administration, the Federal Communications Commission, Wayne County, and the City of Ypsilanti and all local governing boards having jurisdiction and shall meet all the standards and requirements of the WCAA.

Materials

Provide all materials in the Electrical Work herein specified unless others specified, and suited to the use intended; listed by the Underwriters' Laboratories, Inc., meeting their requirements, and bearing their label whenever standards have been established and label service is regularly furnished by that agency.

Rules of Wayne County Airport Authority (WCAA): Comply with the required construction standards of the WCAA. Before submitting a bid, check with each authority having jurisdiction over the Project, and determine from them all standards and other methods of constructions which they will require to be incorporated in this installation, and figure the cost of the same in the bid. No extra payments will be made for the installation of such items, except in cases where the requirements of the governing codes may change after the bid has been submitted.

SUBMITTALS

All submittals shall be in accordance with the general provisions of these specifications. Shop Drawings, Product Data, Wiring Diagrams, Riser Diagrams, Manuals, Instructions, and Spare Parts List: Refer to appropriate Division 16 Sections for specific submittals. All submittals shall be in accordance with the general provisions of these specifications.

PROJECT RECORD DOCUMENTS

Using the installation drawings, keep an accurate record during construction of all underground and concealed conduit and all deviations and/or construction changes in the Electrical Work. Refer to the general provisions of these specifications for requirements regarding form and submittal of Project Record Documents.

In addition, the record documents shall include but not be limited to the following:

The location of all equipment, outlets, fixtures, junction boxes, etc., as installed.

Conduit runs shown in their relative locations with size and number of wires within.

Complete detailed riser diagrams for power, aircraft warning lights and any special system.

Miscellaneous wiring diagrams for all special systems and equipment.

CERTIFICATION

Where indicated in Division 16, provide required certification statements or labels in triplicate, from the manufacturers and/or installers, prior to product delivery to the Site, attesting that the materials, fixtures, and equipment meet the Specification requirements.

Certified equipment shall have been regularly manufactured by the manufacturer for a minimum period of two (2) years prior to the date of issuance of the Bidding Documents for the Project.

RECEIPTS AND MISCELLANEOUS ITEMS

Refer to general provisions of these specifications, regarding receipts for portable and detachable parts, and operation and maintenance information.

Retain until the completion of the Work, all portable and detachable portions of the installation such as tool kits, instruction books, wiring diagram, service annuals, switch operating handles, keys, etc.

Transfer all items to the WCAA when the Work has been approved and accepted, and obtain an itemized receipt.

Identify wiring diagrams, instruction books, and service manuals clearly as to which piece of equipment they apply and the equipment location.

Return to the WCAA, in good condition, all tools and tool kits supplied by manufacturers for installation or adjustment of their equipment. Replace any missing parts; clearly identify special tools supplied for pieces of equipment with that equipment.

Attach copies of all receipts obtained for the return or delivery of articles to the request for final adjustment and payments.

SCOPE OF WORK

The following brief description under this heading generally outlines the principal items of Work, material and equipment and is not intended to limit the amount of Work. Perform all Work as shown on Design Documents and as specified in the Specifications. Items include:

Replace primary fuses at the 15kV switchgear to protect the new distribution transformer.

Splice underground medium voltage cable in existing manhole to feed new distribution transformer.

Furnishing and installation of the 112.5kVA, 13.2kV:480/277V distribution transformer to serve oil water separator and retention pond electrical equipment.

Splice new 3-#3/0 UF & 1-#2 Bare conductors to the existing oil water separator circuit from the load side of new distribution transformer. Install metallic tape one foot below grade above underground cable installations.

Underground raceways, excavation, backfilling, etc.

Furnishing and installation of 200A safety switch fused at 125A.
Install handholes at either end of Hangar 2 to intercept the fiber optic and gate power cable/conduit system. Splice to new cable and conduit to be routed outside the hangar parallel to the southern wall.

Branch aircraft warning light circuits in a temporary fashion on top of Hangar 2.

Complete testing of all systems and equipment.

Conduit, conduit fittings, supports, fuses, wire, cables, connectors insulating bushings, solder, tape, etc. required for a complete electrical installation.

Work, equipment and materials as shown on the Design Documents, mentioned in the Specifications, and as required to make a complete satisfactory job, complete with all code requirements.

ELECTRICAL CHARACTERISTICS

Sub 3AI: 13.2kVΔ, alternating current, three-phase, from the Utility.

EQUIPMENT APPROVAL

All equipment to be furnished shall fit in the space allocated, with sufficient access space to allow proper operation, service of the equipment and to meet all code requirements. Include all costs of modification and adaptation required by any equipment proposed for a substitution.

PROTECTION AND HANDLING OF EQUIPMENT AND MATERIALS

Protect all materials and equipment provided under this portion of the Work after delivery, and before and after installation. Protect against pilferage, dampness and damage from all causes until the Work is accepted by the WCAA.

EXAMINATION OF PREMISES

Examine the premises before submitting a quotation in order to determine the conditions under which the Work is to be performed. Ascertain and check all conditions which may affect the Work, such as location and depth of existing services, existing ditches, poles, ground elevations, conditions in existing building where work is to be performed, including utilities, structural and physical clearances, and the like. No allowance will subsequently be made for extra expense due to failure or neglect to make such examination.

Check existing equipment which must be connected to verify voltage and other items which may affect the Work; check type of existing control system so that new system components will be compatible with existing system, and verify that space provided for new equipment is adequate for equipment to be provided under the Contract.

COOPERATION WITH OTHER TRADES

Prior to proceeding with installation of the Work, check with other trades and the Design Documents to avoid interference. In case of interference, consult with the WCAA who will decide which trades may occupy each space.

PERMITS

Take out all required in connection with the Work of Division 16, arrange for all necessary inspections by

local or state laws, and pay all fees and expenses in connection therewith.

PART TWO - PRODUCTS

FUSES

Fuses and Fuse Holders in General

See the Design Documents for the type and size of the medium and low voltage fuses to be used in this project.

PART THREE - EXECUTION

GENERAL

Consult Design Documents, field layouts of other trades as appropriate and all related shop drawings and install the electrical system complete so that its component parts function together as a workable system with all accessories necessary for its operation.

EQUIPMENT CONNECTIONS

Make connections to equipment, fixtures, etc., in accordance with the shop drawings and rough-in measurements furnished by the manufacturers of particular equipment provided. Total number of services required may vary slightly above or below number shown on Design Documents, but install such services as part of the project at no additional cost.

CUTTING AND PATCHING

Engage workmen skilled in the trade involved for all cutting and patching in connection with the Electrical Work. Patch and restore areas to the satisfaction of the DESIGNER, consistent with the conditions of the surfaces prior to the cutting and patching.

DAMAGE TO ADJACENT WORK

Repair all damage to adjacent surfaces caused by Work or workmen of Division 16, using and paying for workmen skilled in each trade involved.

CLEANING

Thoroughly brush galvanized surfaces and wipe with clean rags and solvent to remove all dirt, oil and grease.

Clean and polish factory finished equipment. Clean and polish lighting fixtures including lens, reflectors and trim. Upon completion, thoroughly clean the entire installation and remove all rubbish.

WORKMANSHIP

Where exact locations and arrangements of installation are not shown in full detail on the Design Documents, obtain such information from the DESIGNER. Replace or repair, at no additional cost to the WCAA, any Work installed in error, or any equipment damaged, due to failure to comply with this requirement, or any Work installed contrary to the advice or approval given. Repair or replace damaged equipment in such a manner to match existing Work. Immediately notify DESIGNER in writing all interferences occurring during the construction period that were unforeseeable in correlation and coordination meetings.

CONCRETE WORK FOR ELECTRICAL WORK

Provide concrete work including concrete, forming, pouring and reinforcing for underground duct banks, equipment foundations at grade as specified elsewhere.

Where foundation or pad is not shown, for equipment to be provided as part of the Electrical Work, provide foundation dimensions, size of foundation bolts, methods of setting, aligning and anchoring of equipment as approved by the DESIGNER. Make minimum height of four (4) inches above finished grade elevation and extend outer edges six (6) inches minimum beyond equipment outer dimensions. Submit shop drawings for each pad for approval.

Provide foundation bolts, sleeves, washers, nuts, and templates to locate position of bolts. Make sleeves of steel pipe, finish flush with top of rough concrete for anchorage and make embedded ends of bolts hooked.

EQUIPMENT IDENTIFICATION

Identify all panels, etc., as approved in accordance with the identification markings shown on the Design Documents and/or as directed. Identify equipment with suitably sized engraved plastic laminate phenolic tags/labels; black background with white lettering.

For each component of equipment, unless otherwise specified, securely attach a plate with manufacturer's name and catalog number on it or stamp or cast into the body of the of the items the name and catalog number of the equipment.

INSPECTION

Refer again to the Conditions of the Contract regarding DESIGNER's Project site visits, observations and inspections of the Work and Project Representative. Materials used and Work done shall, at all stages, be subject to observation by the DESIGNER, who shall observe quality, fitness and acceptability of the Work and materials, but such observation shall not relieve the contractor of any obligations to furnish materials and equipment and perform Work in accordance with the Contract Documents. Replace or repair defective material, equipment, or Work regardless of previous inspections, before final acceptance.

STRUCTURAL INTERFERENCES

Should any structural interferences or location and arrangement of WCAA's equipment prevent the installation of outlets, setting of cabinets, running conduit, etc., at points shown on Design Documents, the necessary deviations therefrom, as determined, must be made without additional cost.

INTERRUPTION OF SERVICE AND ADDITIONAL REQUIREMENTS

Perform any interruption of service at a time approved in advance by the WCAA's DESIGNER so as not to interfere with the present building operations.

FINAL OCCUPANCY INSPECTION

Final electrical inspection is required by the local inspection authority. Secure all final inspection permits on completion of Work. Attach such permits to request for final payment.

FINAL CLEANING AND ADJUSTMENTS

Perform final cleaning of electrical and similar work and leave the equipment in proper adjustment and operating condition.

END OF SECTION

SECTION 16115

PRIMARY CABLE AND ACCESSORIES

PART ONE - GENERAL

RELATED DOCUMENTS

Design Documents and general provisions of the Contract including the WCAA's General Terms and Conditions that apply to work specified in this section.

SUMMARY

Extent of primary cable and accessories work is indicated by Design Documents and by requirements of this section. Provide primary cable and accessories as required, and all materials and equipment, including wire and cable, connectors and lugs, splicing and terminating kits and identification, as indicated or specified.

QUALITY ASSURANCE

Source of Quality Control

Furnish wire and cable on which standard factory tests established by ASTM, ANSI, AEIC, ICEA and NEMA have been performed and which will meet the requirements of governing utility specifications.

UL Compliance

Provide primary cable and accessories which are UL listed and labeled.

SUBMITTALS

Product Data

Submit product data for each type and size of wire and cable. Identify material, construction data, insulation thickness, jacket thickness, suitability for application intended, factory impulse test value and manufacturer's recommendations for items specified.

Test Data

Submit test data for wire and cable as specified under "Quality Assurance" upon request of DESIGNER. Do not install wire and cable for which test data has been requested until test data is approved.

DELIVERY, STORAGE AND HANDLING

Wire and Cable

Deliver all wire and cable to the Site on reels, plainly marked for complete identification, including wire or cable size, number of conductors, type of wire or cable, length, weight, thickness and character of insulation and the name of the manufacturer.

PART TWO - PRODUCTS

MANUFACTURERS

Wire and Cable:

Anaconda
Okonite
Phelps Dodge
Pirelli

WIRE AND CABLE

15 kV Rated Cables Insulated with Ethylene Propylene Rubber for Power Distribution in Conduit and Underground Ducts

Single conductor cable, rated 15 kV, consisting of soft annealed bare copper Class B stranded conductors, extruded semi-conducting ethylene propylene rubber (EPR) screen over the conductors, EPR insulation, extruded semi-conducting EPR insulation screen over the insulation, outer conductor wires (1/3, full concentric neutral) over semi-conducting EPR and PVC overall jacket. The cable shall be rated 90°C, with 100 percent, 133 percent insulation level. Cable assembly method, insulation, electrical characteristics, conductor operating temperature and test voltages shall comply with ICEA Standard S-68-516. Jacket thickness and electrical characteristics shall comply with ICEA Standard S-61-402.

CONNECTORS FOR SPLICING COPPER CONDUCTORS

Connectors for Straight Splicing Conductors

Solderless compression 2-way type.

Thomas & Betts 54500 Series
Burndy Type YS-L

LUGS FOR TERMINATING COPPER CONDUCTORS

Solderless compression type, one hole for sizes through No. 4/0 AWG, and two hole for larger sizes.

Burndy YA-L
Thomas & Betts Series 54000

STRESS CONES

Preformed, indoor type, rated 15 kV complete with manufacturers kit.

Joslyn
3M

MISCELLANEOUS

Banding Tape:

3M Company "Scotch Brand 27"

Lubricating Compound:

Ideal 77 Yellow or Wire Lube

Aluminum Joint Compound:

Burndy "Penetrox A"
Thomas & Betts No. 21059

PART THREE - EXECUTION

INSTALLATION

General

Determine and procure correct length of cable from field measurements. Do not determine the length of cable from dimensional Design Documents. Install wiring in raceway systems, as indicated and as specified

except where exposed wiring is indicated or specified. Install wiring only in completed raceway systems and when systems are protected from the weather. Install conductors continuous, without splices, between equipment, where possible. Continuously lubricate all non-armored cables of the larger sizes at the pull-in point of conduit systems with a lubricating compound compatible with conductor insulation or jacket.

Install conductors in such a manner that the bending radius of any wire or cable is not less than the minimum recommended by ICEA, AEIC, or the manufacturer. In pulling cables, do not exceed the manufacturer's recommended values for maximum pulling tension using woven wire grips or pulling eyes. Provide sufficient slack for expansion and contraction of the cables.

In Underground Duct Systems

Brush and swab the duct line before pulling cables. Use flexible cable feeders of an appropriate size to lead the cable from the reel into the duct mouth. Fireproof each cable at exposed locations in handhole as follows:

Install not less than 4 layers of arc-proofing tape, two layers half-lapped, in one direction. Terminate fireproofing approximately 1/2 inch from the duct face to permit inspection of the cable at the duct entrance and to prevent the fireproofing from interfering with the expansion and contraction of the cable.

In applying tape snug the tape by twisting the tape with the hand. Where steep inclines are caused by changes in cable diameters, such as at splices, apply tape in a stairstep manner by increasing the lapping of the tape as required to maintain a minimum thickness of 4 layers. Increase lapping around cable bends to avoid decreasing the thickness below minimum on the outside of the cable bend.

Band the arc-proofing tape with 1/2 inch wide pressure-sensitive fiber glass cloth banding tape, at intervals not exceeding 12 inches on centers. Construct bands of not less than six turns of banding tape so applied that not more than three turns are in contact with the elastomer backing of the arc-proofing tape.

Splices and Terminations

Splice and terminate conductors with connectors and lugs as specified for the specific size and type of conductor. Terminate shielded cables with stress cones. Continue shields through splices and ground shields at splices and at terminations. Do not splice cables except where cable lengths are limited by maximum reel capacity or anticipated pulling tension. Do not splice direct burial cable underground. Indent all compression type connectors and lugs with tools as recommended by the connector or lug manufacturer.

Do not open cable prior to splicing or terminating unless unavoidable, and do not make splices or terminations if exposed to damp or inclement weather, except when prior approval has been obtained from the WCAA and a cable splicer's tent or other approved means of protection is employed. Pull the cables and overlap sufficiently at cable ends to provide undamaged cable for splicing and/or termination. Pull the cables to be spliced so that the ends overlap at least 5 feet. Pull the cables to be terminated in a pothead so that its end overlaps the pothead arm by at least 2 feet. Train or rack cables into their final positions as shown on Design Documents before cutting any cable. Cut cables to be spliced so that they butt squarely at the centerline of the splice. Once a cable is opened, proceed with the Work immediately and continue uninterrupted until the splice or termination is completed, including any sealing or resealing required.

Thoroughly clean wire ends before connectors or lugs are applied. Whenever copper lugs are terminated on aluminum bus, use a Belleville washer and two tin or cadmium plated washers, one on each side, in combination with aluminum joint compound on all contacting surfaces. Tighten bolts until Belleville washer is flat.

END OF SECTION

SECTION 16455

UNDERGROUND ELECTRICAL SERVICE

PART ONE - GENERAL

RELATED DOCUMENTS

Design Documents and general provisions of the Contract including the WCAA's General Terms and Conditions that apply to work specified in this section.

SUMMARY

Extent of underground work is indicated by Design Documents and by requirements of this Section. Provide all materials and equipment for below grade work as required, and furnish and install all equipment and material, including underground duct banks, direct burial conduit, handholes and concrete work for electrical work, as indicated or specified.

QUALITY ASSURANCE

ANSI Compliance: Comply with requirements of ANSI C2, "National Electrical Safety Code", pertaining to construction and installation of manholes and handholes.

SUBMITTALS

Shop Drawings

Submit shop drawings for approval and include complete data on each item. Coordinate the items, as they relate to the Work, prior to submittal. Include the following in Shop Drawings:

Underground duct
Frames and lids for handholes.

PART TWO – PRODUCTS

UNDERGROUND DUCT-CONCRETE ENCASED

Plastic Conduit

Rigid PVC conduit, Type EB-35 in standard lengths with tapered ends and matching solvent-weld type couplings.

Carlon
Olin
Orangeburg Standard
Triangle

DIRECT BURIAL CONDUIT

Plastic Conduit

Rigid PVC conduit, Type EB-35, in standard lengths with tapered ends and matching solvent-weld type couplings.

Carlon
Olin
Orangeburg Standard
Triangle

Concrete

Not less than 3000# compressive strength, dyed red.

FRAMES AND LIDS FOR ELECTRICAL AND TELEPHONE CAST-IN-PLACE HANDHOLES

Frame and Lid

Close grained gray cast iron meeting the requirements of the current standard specifications for Gray Iron Castings (Class 30) ASTM A48. Provide 30 inches diameter minimum opening in the frame with approximately 10 inches high frame and with a flange of outside diameter not less than 49 inches. Provide lid designed for heavy traffic with two (2) pentagon head special monel security bolts. Provide two (2) wrenches for installation and removal of security bolts. Inscribe the word "ELECTRIC" on electric manhole covers and "TELEPHONE" on telephone manhole covers.

Neenah No. R-1640-C

CABLE RACKS, HOOKS, AND INSULATORS FOR CAST-IN-PLACE PRIMARY DISTRIBUTION MAN-HOLES AND HANDHOLES

Cable Racks

Heavy duty underground type.

Hubbard No. 2225

Hooks

Heavy duty, to fit racks furnished.

Hubbard No. 2231, No. 2232, or No. 2233
Line Material DU1S1 through DU124

Insulators

White glaze porcelain, to fit hooks furnished.

Hubbard No. 2117, No. 2118, No. 2121, No. 2122, or No. 2123

MISCELLANEOUS MATERIALS

Duct Spacers

Preformed interlocking plastic.

Carlon
CertainTeed

PVC Solvent Cement

Carlon
CertainTeed

Backfill Materials

Under Pavement, Slabs, and Structures: Granular material, MDOT Section 8.02.06, Table 8.03-3, Class II or better.

Under Open Areas: Satisfactory soil material, ASTM D2487 soil classification groups GW, GP, GM, SM, and SW.

PART THREE - EXECUTION

INSTALLATION

Excavation

Perform all excavation by the open cut method necessary to permit installation of conduit, cables and other underground electrical Work. Excavate trenches and pits to minimum dimensions that will permit placing conduit and other Work and in accordance with the requirements of the most stringent governing authority. Where underground utilities or tree roots are encountered, do the trenching by hand. Where necessary, provide shoring and bracing to prevent caving of banks. Provide and maintain required railings, barricades, covers, warning signs and lights, and other safety devices, while excavations are open.

Backfilling

Backfill and compact with material and method as specified in Section 02200 - Site Restoration for immediately surrounding or otherwise similar subgrade conditions. Legally dispose of off the WCAA's property all excavated material not required for backfill.

Restoring Surfaces

Restore, without extra cost to WCAA, street pavements, curbs, and sidewalks that may be opened in performance of the Work, in a manner prescribed by authorities having jurisdiction.

Cast-In-Place Handholes

Construct handholes using concrete with reinforced roofs, walls and floors as shown on the Design Documents and in accordance with applicable requirements specified for cast-in-place manholes.

END OF SECTION

SECTION 16460

DISTRIBUTION TRANSFORMER

PART ONE - GENERAL

RELATED DOCUMENTS

Design Documents and general provisions of the Contract including the WCAA's General Terms and Conditions that apply to Work specified in this section.

SUMMARY

Extent of transformer work is indicated by Design Documents and by requirements of this section. Provide oil filled pad mounted distribution transformers with all accessories as indicated or specified.

QUALITY ASSURANCE

NEC Compliance: Comply with applicable portions of NEMA Std. Pub/No.'s TR 1 and TR 27 pertaining to power/distribution transformers.

UL Compliance: Comply with applicable requirements of ANSI/UL 506; "Safety standard for Specialty Transformers". Provide distribution transformers and components which are UL-listed and labeled.

SUBMITTALS

Product Data: Submit manufacturer's technical product data including rated KVA, frequency, primary and secondary voltages, percent taps, polarity, impedance and certification of transformer efficiency at indicated loads, percentage regulation at 100 percent and 80 percent power factor, no-load and full-load losses in watts, percent impedance, hot spot and average temperature rise above 40° C ambient temperature, sound level in decibels, and standard published data.

Shop Drawings: Submit manufacturer's certified drawings indicating dimensions, and weight loadings for transformer installations, showing layouts, mountings and supports.

PART TWO - PRODUCTS

OIL-FILLED PAD MOUNTED DISTRIBUTION TRANSFORMER

Provide one (1) compartmental type, self-cooled, weatherproof, high fire-point fluid filled, outdoor type, tamper-resistant, pad-mounted distribution transformers where shown, rated for 112.5kVA [ONAN], 3-phase, 60 hertz, 4.5 percent impedance, with 13.200Δ volt, 60 KV BIL primary and 480Y/277 volt, 30 KV BIL secondary with grounded neutral. Provide an externally operable tap changing mechanism for de-energized operation with two (2) 2-1/2 percent taps above and two (2) 2-1/2 percent taps below normal rated primary voltage. Equip sealed transformer tank with drain and sampling valves, filter-press connections, magnetic oil gage with alarm contacts, automatic pressure relief device, ANSI tank grounding provisions, and top-oil dial-type thermometer. Provide steel enclosure with side-hinged, removable weather-resistant cover; with hinged lift-off cabinet doors capable of locking. Provide interlock arrangement so that the high voltage fastenings are not accessible until the low voltage door has been opened. Equip with lightning arrestor, mounting pads, and high voltage/low voltage compartment barrier. Apply manufacturer's standard blue-green outdoor enamel over cleaned and phosphatized steel enclosure.

Provide dead front type medium voltage terminations and include universal walls or one piece integrated type dead front bushings for use with elbow terminators and clamp externally.

Arrange low voltage compartment for cabling from below and equip with three line bushings and one insu-

lated neutral bushing with an externally removable ground strap, all with blade type spade terminals with NEMA standard hole spacing.

Manufacturers

General Electric
Square-D Company
Eaton/Cutler-Hammer

PART THREE - EXECUTION

INSTALLATION

Install transformer as indicated, on a new concrete pad, complying with manufacturer's written instructions, applicable requirements of NEC, NEMA, ANSI and IEEE standards, and in accordance with recognized industry practices to ensure that products fulfill requirements.

END OF SECTION

16762

FIBER-OPTIC CABLE RELOCATION

PART ONE - GENERAL

RELATED DOCUMENTS

The Work under this specification is subject to all of the Contract Documents and WCAA General Terms and Conditions that apply to the entire Work.

SUMMARY

Extent of the fiber-optic system work is indicated by requirements of this section. The testing to be performed is noted in this section and shall provide the basis of performance of this Contract. These test results shall be evaluated by the DESIGNER. The CONTRACTOR shall be responsible for the adjustment of any equipment failing the tests described herein as specified by the DESIGNER. Safety and other such precautions shall be the responsibility of this CONTRACTOR during the installation of this equipment and execution of the tests.

The Work covered under this section of the specifications consists of furnishing project management, all labor, equipment, supplies and materials, and in performing all operations necessary to reroute the cabling system in accordance with the specifications and the accompanying documentation and drawings, except as specifically noted otherwise. The Work shall include, but not be limited to, the following:

Optical fiber cable, hardware, terminals, connectors, splice enclosures, fittings, innerduct, etc.

QUALITY ASSURANCE

The CONTRACTOR shall guarantee all Work against all defects for a period of 15 years from completion date, as accepted and established by Bid Specifications and shall make any necessary corrections and adjustments within this period.

The following shall be used as standards for this installation: National Electric Safety Code (NESC), National Electric Code (NEC), local building and fire codes, Underwriters laboratories (UL), IEEE Specifications, ANSI/EIA/TIA-526-14A, ANSI/EIA/TIA-526-7, BICSI TDMM & OSP, TIA/EIA 568-A and TIA/EIA 569-A.

SYSTEM DESCRIPTION

The CONTRACTOR or their subcontractor shall provide, install, test, and document the relocation of the optical fiber cabling. The following items are to be installed to provide a turnkey infrastructure installation: optical fiber cabling; optical fiber connecting hardware; optical fiber splicing hardware; all hangers and mounting material; all tie wraps, bushings, and miscellaneous parts; all installation tools and equipment necessary to complete the installation.

PART TWO - PRODUCTS

ACCEPTABLE MANUFACTURERS

SIECOR (optical fiber and hardware)

MATERIALS

Fiber Optic Connectors

All fiber connectors shall be SC. Fanout kits will be required on all loose tube cables.

Single Mode Cable

The dispersion unshifted, 12 strand, single-mode fiber utilized in the cable specified herein shall conform to the following specifications:

Cladding Diameter: 125.0 ± 1.0 μm.

Core-to-Cladding Offset: ≤ 0.8 μm.

Cladding Non-Circularity: ≤ 1.0%.

Defined as: $\left(1 - \frac{\text{Minimum Cladding Diameter}}{\text{Maximum Cladding Diameter}}\right) \times 100$

Coating Diameter: 245 ± 10 μm.

Colored Fiber Diameter: nominal 250 μm.

Attenuation Uniformity: No point discontinuity greater than 0.10 dB at either 1310 nm or 1550 nm.

Attenuation at the Water Peak: The attenuation at 1383 ± 3 nm shall not exceed 2.1 dB/km.

Cutoff Wavelength: The cabled fiber cutoff wavelength (λ_{ccf}) shall be < 1260 nm.

Mode-Field Diameter: 9.30 ± 0.50 μm at 1310 nm
10.50 ± 1.00 μm at 1550 nm.

Zero Dispersion Wavelength (λ_0): 1301.5 nm ≤ λ_0 ≤ 1321.5 nm.

Zero Dispersion Slope (S_0): ≤ 0.092 ps/(nm²•km).

Fiber Polarization Mode Dispersion (PMD): ≤ 0.5 $\text{ps}/\sqrt{\text{km}}$.

The coating shall be a dual layered, UV-cured acrylate applied by the fiber manufacturer.

The coating shall be mechanically strippable.

Fiber Specification Parameters

Required Fiber Grade - Maximum Individual Fiber Attenuation

(Single-mode) The maximum dispersion shall be ≤ 3.2 ps/(nm•km) from 1285 nm to 1330 nm and shall be < 18 ps/(nm•km) at 1550 nm.

All optical fibers shall be proof tested by the fiber manufacturer to a minimum load of 0.7 GN/m^2 (100 kpsi).

Specifications for Outdoor Cable Construction

Optical fibers shall be placed inside a loose buffer tube. The nominal outer diameter of the buffer tube shall be 3.0 mm.

Each buffer tube shall contain 12 fibers.

The fibers shall not adhere to the inside of the buffer tube.

Each fiber shall be distinguishable by means of color coding in accordance with TIA/EIA-598-A, "Optical Fiber Cable Color Coding."

The fibers shall be colored with ultraviolet (UV) curable inks.

Buffer tubes containing fibers shall be color coded with distinct and recognizable colors in accordance with TIA/EIA-598-A, "Optical Fiber Cable Color Coding."

Buffer tube colored stripes shall be inlaid in the tube by means of co-extrusion when required. The nominal stripe width shall be 1 mm.

For dual layer buffer tube construction cables, standard colors are used for tubes 1 through 12 and stripes are used to denote tubes 13 through 24. The color sequence applies to tubes containing fibers only, and shall begin with the first tube. If fillers are required, they shall be placed in the inner layer of the cable. The tube color sequence shall start from the inside layer and progress outward.

In buffer tubes containing multiple fibers, the colors shall be stable across the specified storage and operating temperature range and not subject to fading or smearing onto each other or into the gel filling material. Colors shall not cause fibers to stick together.

The buffer tubes shall be resistant to external forces and shall meet the buffer tube cold bend and shrinkback requirements of 7 CFR 1755.900.

Fillers may be included in the cable core to lend symmetry to the cable cross-section where needed. Fillers shall be placed so that they do not interrupt the consecutive positioning of the buffer tubes. In dual layer cables, any fillers shall be placed in the inner layer. Fillers shall be nominally 3.0 mm in outer diameter.

The central anti-buckling member shall consist of a dielectric, glass reinforced plastic (GRP) rod. The purpose of the central member is to prevent buckling of the cable. The GRP rod shall be overcoated with a black colored thermoplastic when required to achieve dimensional sizing to accommodate buffer tubes/fillers.

Each buffer tube shall be filled with a non-hygroscopic, non-nutritive to fungus, electrically non-conductive, homogenous gel. The gel shall be free from dirt and foreign matter. The gel shall be readily removable with conventional nontoxic solvents.

Buffer tubes shall be stranded around the dielectric central member using the reverse oscillation, or "S-Z", stranding process. Water blocking yarn(s) shall be applied longitudinally along the central member during stranding.

Two polyester yarn binders shall be applied contrahelically with sufficient tension to secure each buffer tube layer to the dielectric central member without crushing the buffer tubes. The binders shall be non-hygroscopic, non-wicking and dielectric with low shrinkage.

For single layer cables, a water blocking tape shall be applied longitudinally around the outside of the stranded tubes/fillers. The tape shall be held in place by a single polyester binder yarn. The water blocking tape shall be non-nutritive to fungus, electrically non-conductive and homogenous. It shall also be free from dirt and foreign matter.

For dual layer cables, a second (outer) layer of buffer tubes shall be stranded over the original core to form a two layer core. A water blocking tape shall be applied longitudinally over both the inner and outer layer with each being held in place with a single polyester binder yarn. The water blocking tape shall be non-nutritive to fungus, electrically non-conductive and homogenous. It shall also be free from dirt and foreign matter.

The cable shall contain at least one ripcord under the sheath for easy sheath removal of all-dielectric cable. The cable shall contain at least one ripcord under the inner sheath and under the steel armor for armored cable. The ripcord color shall be orange for non-armored sheaths and red for armored sheaths.

Tensile strength shall be provided by dielectric yarns. The high tensile strength dielectric yarns shall be helically stranded evenly around the cable core.

Armored cables shall have an inner sheath of MDPE. The minimum nominal jacket thickness of the inner sheath shall be 1.0 mm. The inner jacket shall be applied directly over the tensile strength members and water blocking tape. A water blocking tape shall be applied longitudinally around the outside of the inner jacket. The tape shall be held in place by a single polyester binder yarn. The armor shall be a corrugated steel tape, plastic-coated on both sides for corrosion resistance, and shall be applied around the outside of the water blocking tape with an overlapping seam with the corrugations in register. The outer jacket shall be applied over the corrugated steel tape armor. The outer jacket shall be a MDPE with a minimum nominal jacket thickness of 1.4 mm. The polyethylene shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus. See Figure 1.

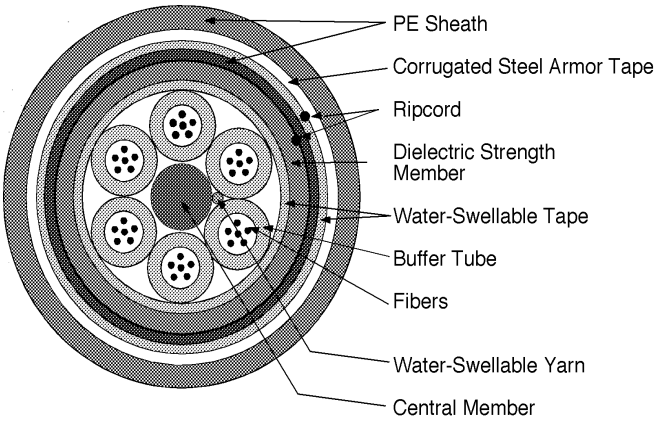


Figure 1

The MDPE jacket material shall be as defined by ASTM D1248, Type II, Class C and Grades J4, E7 and E8. The jacket or sheath shall be free of holes, splits, and blisters. The cable jacket shall contain no metal elements and shall be of a consistent thickness.

Cable jackets shall be marked with manufacturer's name, sequential meter or foot markings, month and year, or quarter and year of manufacture, and a telecommunication handset symbol, as required by Section 350G of the National Electrical Safety Code (NESC). The actual length of the cable shall be within -0/+1% of the length markings. The print color shall be white, with the exception that cable jackets containing one or more coextruded white stripes shall be printed in light blue. The height of the marking shall be approximately 2.5 mm.

The maximum pulling tension shall be 2700 N (608 lbf) during installation (short term) and 890 N (200 lbf) long term installed.

The shipping, storage, and operating temperature range of the cable shall be –40°C to +70°C. The installation temperature range of the cable shall be –30°C to +70°C.

General Cable Performance Specifications

When tested in accordance with FOTP-3, "Procedure to Measure Temperature Cycling Effects on Optical Fibers, Optical Cable, and Other Passive Fiber Optic Components," the change in attenuation at extreme operational temperatures (-40°C and +70°C) shall not exceed 0.2 dB/km at 1550 nm for single-mode fiber and 0.5 dB/km at 1300 nm for multimode fiber.

When tested in accordance with FOTP-82, "Fluid Penetration Test for Fluid-Blocked Fiber Optic Cable." a one meter length of unaged cable shall withstand a one meter static head or equivalent continuous pressure of water for one hour without leakage through the open cable end.

When tested in accordance with FOTP-81, "Compound Flow (Drip) Test for Filled Fiber Optic Cable", the cable shall exhibit no flow (drip or leak) of filling and/or flooding material at 65°C.

When tested in accordance with FOTP-41, "Compressive Loading Resistance of Fiber Optic Cables," the cable shall withstand a minimum compressive load of 440 N/cm (250 lbf/in) for armored cables and 220 N/cm (125 lbf/in) for non-armored cables applied uniformly over the length of the sample. The load shall be applied at the rate of 3 mm to 20 mm per minute and maintained for ten minutes. The change in attenuation shall not exceed 0.4 dB during loading and 0.2 dB after loading at 1550 nm for single-mode fiber and 1.0 dB during loading and 0.4 dB after loading at 1300 nm for multimode fiber.

When tested in accordance with FOTP-104, "Fiber Optic Cable Cyclic Flexing Test," the cable shall withstand 25 mechanical flexing cycles around a sheave diameter not greater than 20 times the cable diameter. The change in attenuation shall not exceed 0.1 dB at 1550 nm for single-mode fiber and 0.3 dB at 1300 nm for multimode fiber.

When tested in accordance with FOTP-25, "Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies," the cable shall withstand 25 impact cycles. The change in attenuation shall not exceed 0.2 dB at 1550 nm for single-mode fiber and 0.3 dB at 1300 nm for multimode fiber.

When tested in accordance with FOTP-33, "Fiber Optic Cable Tensile Loading and Bending Test," using a maximum mandrel and sheave diameter of 560 mm, the cable shall withstand a tensile load of 2700 N (608 lbf). The change in attenuation shall not exceed 0.2 dB during loading and 0.1 dB after loading at 1550 nm for single-mode fiber and 0.5 dB during loading.

When tested in accordance with FOTP-85, "Fiber Optic Cable Twist Test," a length of cable no greater than 4 meters shall withstand 10 cycles of mechanical twisting. The change in attenuation shall not exceed 0.1 dB at 1550 nm for single-mode fiber and 0.2 dB at 1300 nm for multimode fiber.

When tested in accordance with FOTP-181, "Lightning Damage Susceptibility Test for Optic Cables with Metallic Components," the cable shall withstand a simulated lightning strike with a peak value of the current pulse equal to 105 kA without loss of fiber continuity. A damped oscillatory test current shall be used with a maximum time-to-peak value of 15 μs (which corresponds to a minimum frequency of 16.7 kHz) and a maximum frequency of 30 kHz. The time to half-value of the waveform envelope shall be from 40 - 70 μs.

When tested in accordance with FOTP-37, "Low or High Temperature Bend Test for Fiber Optic Cable", the cable shall withstand four full turns around a mandrel of ≤ 10 times the cable diameter for non-armored cables and ≤ 20 times the cable diameter for armored cables after conditioning for four hours at test temperatures of -30°C and +60°C. Neither the inner or outer surfaces of the jacket shall exhibit visible cracks, splits, tears or other openings. Optical continuity shall be maintained throughout the test."

Quality Assurance Provision

All cabled optical fibers > 1000 meters in length shall be 100 percent attenuation tested. The attenuation of each fiber shall be provided with each cable reel. The cable manufacturer shall be ISO 9001 registered.

Packaging

The completed cable shall be packaged for shipment on non-returnable wooden reels. Required cable lengths shall be stated in the purchase order. Top and bottom ends of the cable shall be available for testing. Both ends of the cable shall be sealed to prevent the ingress of moisture. Each reel shall have a weather resistant reel tag attached identifying the reel and cable. The reel tag shall include the following information:

Cable number
Shipped cable length in meters
Siecor product number
Date cable was tested
Cable length markings
Top (inside end of cable)
Bottom (outside end of cable)
Gross weight
Job order number
Customer order number
Siecor order number
Item number

The reel (one flange) marking shall include:

"Siecor"
Country of origin (i.e. USA)
An arrow indicating proper direction of roll when handling
Ship to address
Ship to "attention of" notice (when available)
Siecor cable number
Cable length in meters and/or feet
Gross package weight inclusive of cable, reel and protective covering
Customer purchase order (when available)
Fork lift handling illustration
"DO NOT SHIP REEL ON SIDE"

Each cable shall be accompanied by a cable data sheet. The cable data sheet shall include the following information:

Siecor Cable Number
Siecor Factory Order Number
Alternate Customer
Customer Purchase Order Number
Mark for Information
Maximum Billable Length
Measured Attenuation of Each Fiber (for lengths > 1000 m)
Siecor Product Number
Customer Name
Customer Cable Number
Alternate Code
Ordered Length
Actual Shipped Length
Bandwidth Specification (where applicable)

Miscellaneous

At the request of the customer, the cable manufacturer shall provide installation procedures and technical support concerning the items contained in this specification.

Optical Fiber Connectors

General Considerations

This document covers the specifications and performance for field-installable single-mode ST compatible, SC and FC connectors.

References

The following documents may be used as references:

EIA/TIA-4750000B Generic Specifications for Fiber Optic Connectors.

EIA/TIA-455-A Standard Test Procedures for Optical Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices, and Other Fiber Optic Components (FOTPs).

TIA/EIA-604-2 Fiber Optic Connector Intermateability Standard, FOCIS-2 (ST Compatible).

TIA/EIA-604-3 Fiber Optic Connector Intermateability Standard, FOCIS-3 (Type SC).

TIA/EIA-604-4 Fiber Optic Connector Intermateability Standard, FOCIS-4 (Type FC).

Connector Characteristics

Installation: *Installation on field fiber: The connector shall contain a mechanical splice and require one (1) tool kit to assemble all three (3) connector types.*

Installation rate: The connector shall be installable on 900 µm buffered fiber in one (1) minute or less and on 3 mm jacketed cable in three (3) minutes or less.

Installation polishing: The connector shall not require polishing of the endface in the field. Connectors shall have a factory-polished fiber stub in the connector ferrule.

Installation type: The connector installation shall not require the use of epoxies.

Comment: Epoxies add to the consumable cost of each connector and to the overall installation time. Epoxies also have a limited shelf life.

Fiber protection: The connector's factory stub fiber shall be secured with epoxy to protect the bare fiber from the ingress of air or waterborne contaminants and shall secure the fiber in the ferrule micro-hole.

Design Features

Strain relief: The connector shall provide a strain relief mechanism for installation on a single fiber cable that contains strength elements. The fiber within the body of the connector shall be isolated mechanically from cable tension, bending and twisting.

Index matching material: The connector shall require index matching material within the splice components of the connector.

Intermateability: The connector shall be designed in compliance with the appropriate TIA FOCIS document.

Packaging Requirements

The connector shall be individually packaged in a manner to adequately protect the connector. Each connector shall be equipped with a protective dust cap that does not contaminate the connector endface. The packaging shall indicate the supplier part number, connector type, and date of manufacture.

Performance Requirements

Insertion Loss: When tested in accordance with FOTP-171, connectors shall be consistently capable of insertion losses £ 0.5 dB (typical) and £ 0.70 dB (maximum) when installed in accordance with the manufacturer's recommended procedure.

Comment: Individual maximum insertion loss requirements are based on the link loss budget required by the transmitter-receiver pair, however an insertion loss of 0.70 dB is typically adequate for most systems

and should be achievable with very low scrap rates and/or rework when procedures are followed.

Reflectance: When tested in accordance with FOTP-107, connectors shall be consistently capable of reflectance values of £ -50 dB (typical) and £ -40 dB (maximum) when installed in accordance with the manufacturer's recommended procedure.

PART THREE - EXECUTION

All installation work shall be done in a neat, high quality manner, and in conformity to federal, state, and local building codes. Cables shall be placed with sufficient bending radius so as not to kink, shear, or violate manufacturer bend radius on each optical fiber strand. Cable routes must be field engineered to avoid obstruction by ducts, other material in the ceiling plenum space. Each fiber optic cable will be labeled with its own specific cable identifier number and securely marked at each end of the cable.

Fiber Optic Testing and Documentation Procedure

Two (2) basic types of field testing must be completed for the system to be accepted which include: Optical Fiber Link Performance Testing and Optical Time Domain Reflectometer (OTDR) testing.

Procedure end to end attenuation testing: Measure optical link performance (including all optical fiber, splices and connectors). Testing must be completed on all strands. Testing is to be performed in two (2) directions, main equipment room to the individual building telecommunication closets and from the individual building telecommunication closets to the main equipment room. Perform optical link performance testing at 850 and 1300nm wavelengths specified for multimode fiber. ANSI/TIA/EIA - 526 - 14A. Perform optical link performance link performance testing at 1310nm wavelength specified for singlemode fiber. ANSI/TIA/EIA - 526 - 7. Optical link performance testing compares the optical power at the input of the fiber to the optical power at the output of the fiber. Attenuation is measured in dB. Follow recommended procedures performed in TIA/EIA 568A standards (Annex H - Optical fiber link performance testing).

Calculate the attenuation of the fiber in dB unit type comparison of the reference power and the output power. Record the output power of the remaining fibers in the same manner. Installer will provide an attenuation logging form. Any runs failing to meet standards must be removed and replaced with runs which prove in testing to meet the standards. The installation will not be accepted until testing reports indicate that all runs meet all standards.

OTDR Testing: OTDR testing is required for all strands. The OTDR can be used to evaluate loss per unit distance (dB/km) if its wavelength is adjusted to match the fiber specification. The minimum testing required is at 850 nm for multimode fiber and 1310nm for singlemode fiber. Distance can be approximately measured to: connectors, fiber ends, localized attenuation, localized losses caused by cable damage are readily apparent, as is fiber uniformity. The OTDR provides documentation to determine if splices have been performed, if the cable has been damaged and the length of the cable strand under test end-to-end. Hard copies of the OTDR trace must be provided. Cable length values from the OTDR tests will be used with the end-to-end attenuation provided in the Insertion Loss Test to insure the cable strand end-to-end is acceptable.

Consistency of the light launch and receive conditions is critical to performing acceptable measurements. Any runs failing to meet standards must be removed and replaced with runs which prove in testing to meet the standards. The installation will not be accepted until testing reports indicate that all runs meet all standards.

Documentation

Both ends of each cable must bear a secure label which clearly identifies its cable number. The number

format must be approved by the WCAA prior to the installation. The CONTRACTOR must provide cable records and fiber cable test results in a hard copy. The records must include at least the following information about each cable: cable identifier, room and floor, use identification, fiber optic OTDR test results as specified, fiber optic light source and power meter results as specified.

Warranty

All Work shall be warranted to be free from defects. Any defective materials or workmanship, as well as, damage to the Work of all trades resulting from same, shall be replaced or repaired as directed for the duration of stipulated warranty periods. Upon receipt of notification of repair or replacement of defective materials, the CONTRACTOR must comply within seven (7) business days.

The duration of warranty periods following the date of acceptance of the Work shall be one year unless otherwise specified. The cabling infrastructure and all associated equipment included as part of the Bidder's proposal must be warranted by the Bidder and by the manufacturer to be free of defects in equipment, software and workmanship for a period of at least one year from the system acceptance. During the warranty period, any defective components shall be repaired or replaced at no cost to the WCAA.

END OF SECTION