

**LAUNCH COMPLEX 34, SWMU CC054
PEDESTAL HAZARD ABATEMENT AND SOIL REMOVAL
CONSTRUCTION COMPLETION REPORT
CAPE CANAVERAL SPACE FORCE STATION, FLORIDA**

Prepared for:



**National Aeronautics and Space Administration
Kennedy Space Center, Florida**

**February 2021
Revision 0**

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FOR
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Prepared for:
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National Aeronautics and Space Administration
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February 2021

PROFESSIONAL ENGINEER CERTIFICATION

This Construction Completion Report for Pedestal Hazard Abatement and Soil Removal at Launch Complex 34, Solid Waste Management Unit CC054, at Cape Canaveral Space Force Station, Florida, dated February 2021, has been prepared by or under the responsible supervision, direction, or control of the Florida-licensed professional engineer whose signature and seal appear below. This document and the work described herein complies with standard professional practices and the requirements of Chapter 62-780, Florida Administrative Code (F.A.C.) and other rules of the Florida Department of Environmental Protection according to Rule 62-780.400(1), F.A.C.



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ABBREVIATIONS AND ACRONYMS

CCAFS	Cape Canaveral Air Force Station
CCR	Construction Completion Report
CCSFS	Cape Canaveral Space Force Station
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
HEPA	High Efficiency Particulate Air
IDW	investigative-derived waste
IM	interim measure
IWP	Implementation Work Plan
KSC	Kennedy Space Center
LC34	Launch Complex 34
mg/kg	milligrams per kilogram
MOA	Memorandum of Agreement
NASA	National Aeronautics and Space Administration
NPS	National Park Service
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
RFI	RCRA Facility Investigation
SCTL	Soil Cleanup Target Level
SHPO	State Historic Preservation Office
SWMU	Solid Waste Management Unit
T&D	transportation and disposal
Tetra Tech	Tetra Tech, Inc.

EXECUTIVE SUMMARY

This Construction Completion Report summarizes the activities associated with implementation of an interim measure (IM) for hazard abatement of the Launch Pedestal and soil removal at Launch Complex 34 (LC34), Cape Canaveral Space Force Station, Florida. LC34 has been designated as Solid Waste Management Unit CC054 under Kennedy Space Center's (KSC) Resource Conservation and Recovery Act Corrective Action Program.

Since abandonment of the LC34 site in the late 1960s, the steel liner plating and piping on the Launch Pedestal have rusted and deteriorated over time with fragments of metal periodically falling from the structure. The plating and piping were originally coated with a protective paint assumed to contain polychlorinated biphenyls (PCBs). In 2018-2019, sampling was conducted to determine whether PCBs were present on the steel elements remaining on the Launch Pedestal. Samples of metal fragments collected from the top-side of the Pedestal confirmed the presence of PCBs above regulatory cleanup criteria, while samples collected from the underside of the Pedestal did not identify PCBs above regulatory cleanup criteria. Based on sampling results, a limited hazard abatement IM plan was developed for the top-side steel elements only, while the rest of the Pedestal would remain unchanged and in-place.

The purpose of the hazard abatement IM was to mitigate any continuing source of contamination associated with residual PCB-containing paint on the Launch Pedestal. Sampling determined that residual PCB concerns were limited to the steel elements on the top-side of the Pedestal, which included the torus ring, feed pipe, down pipes, pipe straps and shields, remaining steel cover plates and bolts, and railing support steel. The IM would also mitigate the potential spread of contamination to surrounding areas by removing fallen metal fragments from the concrete launch pad, as well as soil from trenches on the launch pad where PCB-containing paint chips may have accumulated prior to or during Pedestal hazard abatement activities.

Following notifications and receipt of approvals from stakeholders, IM activities were completed between September and November 2020. An anchor system was installed to ensure safe working conditions throughout the duration of the IM and was completed in two phases. The "Phase 1" portion included 26 anchors and was installed from September 9 through 14, 2020 to

ensure safe working conditions during Pedestal hazard abatement activities. After these anchors were installed, deconstruction of top-side steel elements (torus ring, feed and down pipes) was completed on September 15 and 16, 2020. The remaining steel elements on the top-side of the Pedestal (cover plates, bolts, and railing support steel) were removed between September 18 and October 1, 2020. The steel elements removed from the Pedestal were classified as PCB bulk-product waste and were disposed of at the KSC Schwartz Road Landfill. Following Pedestal hazard abatement activities, the “Phase 2” portion of the anchor system was installed between November 11 and 20, 2020, which included an additional 51 anchors to remove potential falling hazards of the underside steel plates for up to one year, per Structural Engineer design calculations.

For the soil removal portion of the IM, approximately six inches of soil from all of the trenches located within and around the launch pad was removed due to potential contamination from fallen metal fragments that may have had residual PCB-containing paint. Approximately 233 tons of soil were excavated and transported off site for disposal at the Waste Connections of Osceola County – JED Landfill in St. Cloud, Florida between September 14 and October 8, 2020. The excavation area was backfilled with ¾-inch granite stone. Following Pedestal hazard abatement and soil removal activities, the launch pad and top-side of the Pedestal were cleared of any metal fragments using a High Efficiency Particulate Air vacuum to further remove any additional potential sources of PCB contamination and prevent release to the surrounding area.

Based on completed IM activities and previous sampling results from the underside of the Pedestal, there is no known source of PCBs remaining on the Launch Pedestal that are acting as a continuing source of environmental contamination. The soil removal from trenches and cleanup of fallen metal fragments from around the launch pad has also mitigated potential sources of PCB contamination to the surrounding area.

SECTION I

INTRODUCTION

This Construction Completion Report (CCR) summarizes activities associated with implementation of an IM for hazard abatement of the Launch Pedestal and soil removal at Launch Complex 34 (LC34), Cape Canaveral Space Force Station (CCSFS), formerly known as Cape Canaveral Air Force Station (CCAFS), Florida. Hazard abatement consisted of removing steel elements from the Pedestal that were identified to be a source of polychlorinated biphenyls (PCBs), and thereby a continuing source of environmental contamination. Based on sampling results, hazard abatement was limited to steel elements on the top-side of the Pedestal; the rest of the Pedestal remained unchanged and in-place. Soil removal was conducted from trenches on the launch pad to remove soils potentially impacted by PCBs from the Launch Pedestal.

This CCR was prepared by Tetra Tech, Inc. (Tetra Tech) for the National Aeronautics and Space Administration (NASA) under Indefinite Delivery Indefinite Quantity Contract 80KSC019D0011, Task Order Contract Number 80KSC019F0067. LC34 has been designated as Solid Waste Management Unit (SWMU) CC054 under the Kennedy Space Center (KSC) Resource Conservation and Recovery Act (RCRA) Corrective Action Program. The Pedestal IM activities at LC34 were conducted in accordance with the Pedestal Hazard Abatement Implementation Work Plan (IWP) dated August 2019 (NASA, 2019).

1.1 SITE SETTING

The LC34 site is located in Section 6, Township 23 South, and Range 38 in the False Cape Quadrangle. The facility is located on CCSFS and is bordered by Launch Complex 37 to the north, by Launch Complex 20 to the south, by ICBM Road (Samuel Phillips Parkway) to the west, and by the Atlantic Ocean to the east. Figure A-1 in Appendix A shows the location of LC34 within CCSFS. Prior to development, LC34 consisted of relict sand dunes and interdunal swales typical of barrier island depositional environments. A detailed description of site buildings and structures is presented in the LC34 RCRA Facility Investigation (RFI) Report (NASA, 1999).

1.2 BACKGROUND

The Launch Pad and associated facilities at LC34 were built in the late 1950s and used by NASA's Apollo Space Program for the launching of Saturn rockets from 1960 to 1968. On 27 January 1967, a capsule fire claimed the lives of Apollo 1 astronauts, Roger B. Chaffee, Virgil I. "Gus" Grissom, and Edward H. White II. A total of seven launches occurred from LC34, to include the first U.S. 3-manned mission, Apollo 7, on 11 October 1968. LC34 was declared part of the "Man In Space National Historic Landmark" in 1984.

Following shutdown of the launch pad in 1968, LC34 has remained largely inactive, although several site features (e.g., Blockhouse, camera pad, etc.) are still present. Most operational equipment (service towers, fuel storage tanks, piping, etc.) has been dismantled, and the majority of the on-site buildings and structures were abandoned-in-place. The Launch Pedestal, located in the center of the Launch Pad, was one of the structures that was abandoned-in-place.

NASA is currently the facility manager of the LC34 site under Permit Number SPCCAN 2-07-0041 issued by the Secretary of the Air Force granting use of real property and facilities at LC34. The permit allows NASA to investigate environmental conditions onsite, implement appropriate remedies, and conduct long term monitoring at this facility to comply with the RCRA Corrective Action Permit administered by the State of Florida.

The main structure of the Pedestal stands at a height of 27 feet, 42 feet by 42 feet in area and is constructed of reinforced concrete that is encased with 3/8" coated steel liner plate along the flame-contact faces. Most of the auxiliary steel structures associated with the Pedestal, such as the launch tower and access stairs, have been previously dismantled and removed. Since abandonment of the site, the steel liner plating and piping on the Pedestal have rusted over time. Fragments of metal from the top, inner ring, and ceiling plating and piping have fallen periodically over time, creating a safety hazard and resulting in barriers being installed to prevent anyone from walking beneath the Pedestal.

The plating and piping on the Pedestal were originally coated with a protective paint assumed to contain PCBs since many similar CCSFS structures of the same age had PCB-containing coatings. As documented in the IWP, sampling conducted in 2018-2019 of metal fragments

from the top-side of the Pedestal confirmed the presence of PCBs, with the highest concentration detected at 6,200 milligrams per kilogram (mg/kg). The State of Florida residential Soil Cleanup Target Level (SCTL) of 0.5 mg/kg was used as cleanup guidance since PCBs from the Pedestal have the potential to contaminate surrounding soil and pose a potential human health risk. Paint samples collected from the steel liner plates on the underside of the Pedestal did not exceed the FDEP SCTL and were therefore determined not to be a source of PCB contamination.

Additional information about the sampling process can be found in the Pedestal Hazard Abatement IWP (NASA, 2019).

1.3 INTERIM MEASURE OBJECTIVE

The objective of this IM was to mitigate any continuing source of contamination associated with residual PCB-containing paint on the Launch Pedestal. Based on sampling results, this was limited to the steel elements on the top-side of the Pedestal, which included the torus ring, feed pipe, down pipes, pipe straps and shields, remaining steel cover plates and bolts, and railing support steel. The IM was also intended to prevent the potential spread of additional contamination to surrounding areas by cleaning up fallen metal fragments from the concrete launch pad, as well as removing soil from trenches on the launch pad that was potentially affected by PCB-containing paint chips from the Pedestal. The technical approach for the Pedestal portion of the IM was developed based on a series of visual and physical inspections by licensed Structural and Civil Engineers, as well as material sampling and testing, as detailed in the August 2019 IWP. A site plan of the launch pad area where the Pedestal is located is shown on Figure A-2.

1.4 INTERIM MEASURE TEAM

Tetra Tech self-performed the IM and employed several local and national subcontractors. Table 1-1 lists the project support entities and their functions during IM activities.

Table 1-1. Project Support Companies

COMPANY	FUNCTION
<p>American Waste Management Services 1 American Way Warren, OH 44484</p>	<p>Transportation and disposal broker</p>
<p>Cypress Mulch and Sod, Inc. 7300 US 1 South Titusville, FL 32780</p>	<p>Backfill supplier</p>
<p>Eurofins TestAmerica, Tampa 6712 Benjamin Road, Suite 100 Tampa, FL 33634</p>	<p>Waste characterization and monitoring well sample laboratory analyses</p>
<p>Soil Tech 7611 East Broadway Avenue Tampa, FL 33619</p>	<p>Transportation for PCB remediation waste less than 50 mg/kg disposal</p>
<p>Synergy Equipment 8151 North Orange Blossom Trail Orlando, FL 32810</p>	<p>Heavy equipment rental</p>
<p>Waste Connections of Osceola County, LLC – JED Landfill 1501 Omni Way St Cloud, FL 34773</p>	<p>Landfill for PCB remediation waste less than 50 mg/kg disposal</p>

1.5 DOCUMENT ORGANIZATION

The remainder of this document is organized as follows:

Section II: Interim Measure Implementation – summarizes pre-mobilization/mobilization, site preparation, Pedestal hazard abatement activities, soil removal activities, site restoration, and demobilization activities performed as a part of the IM.

Section III: Interim Measure Summary – summarizes the IM.

Section IV: References – lists the documents referenced in this CCR.

SECTION II

INTERIM MEASURE IMPLEMENTATION

The Pedestal hazard abatement portion of the IM was conducted in general accordance with the August 2019 IWP. Soil on the launch pad that was potentially affected by PCB-containing paint chips, which may have flaked off naturally or during Pedestal hazard abatement activities, was also removed as part of the IM. IM implementation consisted of pre-mobilization/mobilization, site preparation, Pedestal hazard abatement activities, soil removal activities, site restoration, and demobilization. Permitting and planning documentation required to conduct the IM activities are provided in Appendix B. A photographic log (digital image documentation) of IM field activities is presented in Appendix C, and an activity log summarizing day-to-day activities associated with field implementation is provided in Appendix D.

2.1 PRE-MOBILIZATION/MOBILIZATION

Pre-mobilization activities included securing site access for the field crew and subcontractors, collecting waste characterization samples, procuring supplies and equipment for the Pedestal hazard abatement and soil removal, and obtaining the necessary permits and documentation to conduct IM activities.

In addition to the pre-mobilization field activities, several coordination and permitting actions were required prior to commencing fieldwork, which included:

- KSC Record of Environmental Consideration (REC) – A KSC Environmental Checklist was submitted to receive a KSC REC. The REC was received on June 25, 2020 and outlined the non-permit and permit requirements to be followed for the project.
- Wildlife Survey – Based on previous observations of an owl in one of the down pipes on the Launch Pedestal, Tetra Tech coordinated with the KSC Wildlife Ecologist to evaluate the potential for wildlife inhabiting the Pedestal. No inhabiting wildlife was identified and the KSC Wildlife Ecologist installed a blocking material to ensure that no wildlife would enter the down pipes, which were planned to be removed as part of the IM.

- AF Form 332 – Because LC34 is located at CCSFS, formerly CCAFS, a Base Civil Engineer Work Request (AF Form 332) to the Air Force was required to identify any requirements (i.e., dig permit, environmental impact analysis, etc.) necessary to complete the project. The approved AF Form 332 was received on July 1, 2020.
- AF Form 103 – Based on the AF Form 332, a Utility Locate/Dig Permit (Base Civil Engineering Work Clearance Request, AF Form 103) was required and obtained from the Air Force prior to any excavation activity. The approved AF Form 103 was received on July 28, 2020.
- Memorandum of Agreement (MOA) – Since LC34 is a part of the National Historic Landmark District, a consultation between KSC and the Florida State Historic Preservation Office (SHPO) and National Park Service (NPS) was conducted under Section 106 of the National Historic Preservation Act. The Air Force was involved with all aspects of the Section 106 consultation; however, NASA was the lead agency since the project was environmental remediation related. A MOA between KSC and Florida SHPO, with NPS as a concurring party, was prepared to detail the extent of the work to be conducted and to minimize adverse effects of the historic landmark. The MOA was signed by all parties in March 2020.
- Hot Work Permit – A hot work permit was required for the use of a reciprocating saw and angle grinder to cut the Torus Ring (including the pipe straps and shields) into sections and to grind bolts that could not be removed with an impact wrench. No torches were used. The Hot Work Permit was obtained during the IM on September 17, 2020 once it was determined hot work was necessary.

Copies of all permits and the MOA were kept on site during the IM and are provided in Appendix B of this report.

Construction equipment and materials were mobilized on September 8, 2020. Upon mobilization to the site, a Nuts and Bolts Safety Kick-off Meeting was held with the Tetra Tech Construction Manager and field personnel, NASA Safety, and the NASA Remediation Project Manager prior to beginning work.

2.2 SITE PREPARATION

Site preparation consisted of setting up a project support area. The project support area consisted of a construction fence to keep unauthorized personnel and visitors out of the launch pad area. Project sign boards were set up outside of the fenced area to inform visitors of the activities occurring. Copies of the project sign boards can be found in Appendix B. NASA also contacted tour groups that regularly visit LC34 to inform them of the IM work that would be taking place at the site. Additionally, as a part of the MOA stipulations agreed upon, KSC personnel photographed the Pedestal to document pre-abatement conditions for SHPO and NPS archival purposes.

2.3 PEDESTAL HAZARD ABATEMENT

This section discusses the activities conducted to install an anchor system on the underside steel panels of the Pedestal, as well as deconstruct and remove the top-side steel elements of the Pedestal, which included the torus ring, feed pipe, down pipes, pipe straps and shields, remaining steel cover plates and bolts, and railing support steel. The layout of the anchor system is shown on Figure A-3, and the elements removed from the Pedestal are shown on Figure A-4. Photographs of the Pedestal hazard abatement activities are provided in Appendix C, and details of daily construction activities are included in Appendix D.

2.3.1 Installation of Anchors. Based on the extent of corrosion around existing anchors holding up the steel panels on the underside of the Pedestal, additional anchors were installed on the underside steel panels to ensure a safe working environment. The anchor system installed was implemented in two phases. “Phase 1” of the anchor system was installed in accordance with the design drawings, the Structural Engineer’s recommendations and proposed layout, and the manufacturer’s requirements, as outlined in the IWP (NASA, 2019), to ensure safe working conditions for the duration of deconstruction activities. “Phase 2” of the anchor system was installed after the deconstruction activities were complete. The “Phase 2” anchors were installed to stabilize steel plates not included in “Phase 1” and eliminate the safety hazard of falling steel panels for up to one year, per Structural Engineer design calculations.

Anchor installation activities were conducted from September 9, 2020 to September 14, 2020 for “Phase 1” and November 13, 2020 to November 20, 2020 for “Phase 2”. A Tetra Tech Field Engineer was responsible for overseeing the work to ensure that the anchor system was installed in accordance with the requirements. The anchor system was installed working from a scissor lift. A telehandler was used to provide temporary bracing to each individual panel undergoing anchor installation. A total of 77 anchors were installed (26 anchors in “Phase 1” and 51 anchors in “Phase 2”). The layout of the anchor system is included on Figure A-3, and the design packages with details of anchor system installation is included in Appendix E.

2.3.2 Torus Ring, Feed, and Down Pipe Deconstruction. Torus ring (including pipe straps and shields), feed, and down pipe deconstruction activities were conducted on September 15 and 16, 2020. The deconstruction activities were completed after installation of the Phase 1 anchor system. Based on field assessment, it was determined that the safest and most efficient deconstruction method was to cut the pipes into sections and lower the sections down with a telehandler. A reciprocating saw and angle grinder was used to cut the pipes into sections, which were then carefully lowered and placed into a roll-off box. The cutting of the pipe bracing and pipe sections was completed from a manlift. Per Air Force request, a section of the torus ring was salvaged and turned over to the Air Force for cleaning and museum display. Figure A-4 shows the torus ring, feed, and down pipe locations on the Pedestal.

2.3.3 Top-Side Steel Deconstruction. The remaining steel on the top-side of the Pedestal (cover plates, bolts and railing support steel) was removed from the structure as shown on Figure A-4. Top-side steel deconstruction activities were conducted from September 18, 2020 to October 1, 2020. The steel elements were removed methodically using various means, as appropriate. Most elements were removed by unscrewing the steel bolts using an impact wrench. Bolts that could not be removed were grinded down using an angle grinder. The work was conducted from the manlift. All deconstructed material was securely attached to the telehandler and lowered down and placed in a roll-off box for removal from site.

2.3.4 Pedestal Bulk Waste Transportation and Disposal. Steel plates, pipe sections, and bolts removed from the Pedestal with the paint coating intact were classified as PCB bulk product waste. All PCB bulk product waste was placed directly into roll-off boxes until

transported for disposal. All PCB bulk product waste was disposed of at the KSC Schwartz Road Landfill, which is a permitted non-hazardous waste landfill, in accordance with Code of Federal Regulations 761.62 (b), “Disposal in solid waste landfills.” Approximately ten tons of material was disposed of at KSC Schwartz Road Landfill. The waste tickets for the roll-off boxes of PCB bulk product waste are provided in Appendix F.

2.4 SOIL REMOVAL

In conjunction with Pedestal hazard abatement activities, soil located in encased utility trenches within and around the perimeter of the launch pad were excavated. No soil samples were collected to confirm the presence or absence of PCBs; however, small fragments of metal, which presumably fell from deteriorating portions of the Pedestal, were visible in the surface of the soil. Since the metal fragments potentially still had PCB-containing paint on them, soil from all of the trenches was removed as a precaution. The trench locations are shown on Figure A-5.

2.4.1 Waste Characterization. Tetra Tech contracted American Waste Management Services to coordinate Waste Connections of Osceola County, LLC – JED Landfill in St. Cloud, Florida for soil disposal. One composite sample for waste characterization was collected on July 27, 2020, and analyzed for volatile organic compounds, semi-volatile organic compounds, PCBs, dioxins/furans, eight RCRA metals, and Toxicity Characteristic Leaching Procedure extraction for metals. The locations of sample aliquots collected for waste characterization are shown on Figure A-5. The sample results, which included PCBs detected at 1.8 mg/kg, indicated disposal of soil at a RCRA Subtitle D Landfill was appropriate (i.e., Waste Connections of Osceola County, LLC – JED Landfill). The laboratory analytical data package for the waste characterization sample is included in Appendix G, and the waste profile is included in Appendix F.

2.4.2 Excavation. Excavation activities began on September 14, 2020 and were completed on October 5, 2020. Approximately 133 cubic yards (223 tons) of soil were excavated from the trenches on the LC34 launch pad. Soil in the trenches was excavated to 0.5 feet below land surface. An overview of areas excavated is shown on Figure A-5. Excavations were completed using a small excavator and hand digging. Excavated soils were temporarily stockpiled on

visqueen and subsequently loaded into transportation and disposal (T&D) trucks (see Figure A-2 for stockpile location). With the trenches still open, magnets were used to pick up any loose metal fragments still remaining, which were then disposed of with the steel components removed from the top-side of the Pedestal.

Following excavation of these areas, a decontamination pad was set up. Water used for decontamination of excavation equipment was supplied by a fire hydrant through a backflow preventer. The decontamination water was transferred from the decontamination pad to a 55-gallon drum via a sump pump. The drum of decontamination water was managed as investigative derived waste (IDW) in accordance with the KSC's IDW Management Plan.

Additional details of daily construction activities are provided in Appendix D.

2.4.3 Transportation and Disposal. Tetra Tech contracted American Waste Management Services to coordinate trucking procurement. Transportation of soil was provided by Soil Tech (see Table 1-1). A total of seven truckloads containing a total of 233 tons of soil were sent to Waste Connections of Osceola County, LLC – JED Landfill in St. Cloud, Florida on October 7 and 8, 2020. Ingress and egress to the site for trucks hauling the soil were through the CCSFS gate along Samuel C. Phillips Parkway (see Figure A-1). T&D trucks used the on-site traffic route depicted on Figure A-2. Prior to leaving the site, each T&D truck was inspected by Tetra Tech personnel to ensure that the tailgate was latched, automatic tarps were in place, and no residual soil remained on the siderails or tailgate. The off-site transportation vehicles were weighed both loaded and empty at the disposal facilities. The weight tickets and manifests for off-site disposal are provided in Appendix F.

2.4.4 Backfilling. Backfilling began after excavation activities were completed. Backfilling activities were conducted on October 2 and 5, 2020. A total of seven truckloads of ¾-inch granite stone (approximately 194 tons) were supplied by Cypress Mulch and Sod (see Table 1-1).

The granite stone was placed directly into the excavated trenches and evenly spread until level with the existing concrete pad.

2.5 SITE RESTORATION

Final site restoration consisted of vacuuming the top-side of the Pedestal and the entire concrete launch pad area using a High Efficiency Particulate Air (HEPA) vacuum to remove any metal fragments that had fallen before or during Pedestal hazard abatement activities. Vacuuming took place throughout the duration of the project as the metal fragments fell off of the deteriorating elements removed from the Pedestal. A final round of vacuuming was conducted following completion of all Pedestal hazard abatement and soil removal activities. Additionally, the metal barriers that typically surround the Pedestal were positioned back in place to prevent visitors from walking beneath the structure. Metal fragments were disposed of with the steel components removed from the top-side of the Pedestal.

2.6 DEMOBILIZATION

Demobilization from LC34 occurred in two phases; on October 9, 2020 and on November 20, 2020. The first demobilization consisted of removing equipment and materials needed for the Pedestal hazard abatement and soil removal activities, as well as the project support area. The second demobilization consisted of removing equipment needed for the “Phase 2” anchor installation and any other miscellaneous material remaining in the IM area.

SECTION III

INTERIM MEASURE SUMMARY

This IM was completed to mitigate any continuing source of contamination associated with residual PCB-containing paint on the Launch Pedestal. Based on sampling results, this was limited to the steel elements on the top-side of the Pedestal, which included the torus ring, feed pipe, down pipes, pipe straps and shields, remaining steel cover plates and bolts, and railing support steel. The rest of the Pedestal remained unchanged and in-place. The IM also mitigated the potential spread of additional contamination to surrounding areas by removing fallen metal fragments from the concrete launch pad, as well as soil from trenches on the launch pad where PCB-containing paint chips may have accumulated prior to or during Pedestal hazard abatement activities.

IM activities were completed between September and November 2020. The first step of the IM included installing an anchor system, which was completed in two phases as detailed on Figure A-3 and in Appendix E. The “Phase 1” portion included 26 anchors, which were installed to ensure safe working conditions during Pedestal hazard abatement activities. After the Phase 1 anchor system was installed, deconstruction of the top-side steel elements was completed, as shown on Figure A-4. The steel elements removed from the Pedestal were classified as PCB bulk product waste and were disposed of at the KSC Schwartz Road Landfill. Following deconstruction activities, the “Phase 2” portion of the anchor system was installed, which included an additional 51 anchors to remove potential falling hazards of the underside steel plates for up to one year, per Structural Engineer design calculations.

For the soil removal portion of the IM, soil from all of the trenches located within and around the launch pad was removed due to potential contamination from fallen metal fragments that may have had residual PCB-containing paint (see Figure A-5). Approximately 233 tons of soil were excavated and transported off site for disposal at the Waste Connection of Osceola County, LLC – JED Landfill in St. Cloud, Florida. The excavation area was backfilled with $\frac{3}{4}$ -inch granite stone. Final site restoration activities included clearing any metal fragments from the concrete launch pad and top-side of the Pedestal using a HEPA vacuum to further remove any potential sources of PCB contamination to the surrounding area.

Based on completed IM activities and previous sampling results from the underside of the Pedestal, there is no known source of PCBs remaining on the Launch Pedestal that are acting as a continuing source of environmental contamination. The soil removal from trenches and cleanup of fallen metal fragments from around the launch pad has also mitigated potential sources of PCB contamination to the surrounding area.

SECTION IV

REFERENCES

NASA (National Aeronautics and Space Administration), 1999. Resource Conservation and Recovery Act Facility Investigation Report of Launch Complex 34, SWMU No. 54. Cape Canaveral Air Force Station, Florida. July.

NASA, 2019. Pedestal Hazard Abatement Implementation Work Plan, Launch Complex 34, SWMU CC054. Cape Canaveral Air Force Station, Florida. August.

APPENDIX A

FIGURES

FIGURE A-1 LOCATION OF CAPE CANAVERAL SPACE FORCE STATION AND LAUNCH COMPLEX 34
SWMU CC054, LAUNCH COMPLEX 34, CAPE CANAVERAL SPACE FORCE STATION, FLORIDA

LC34 CCR
Revision: 0
February 2021

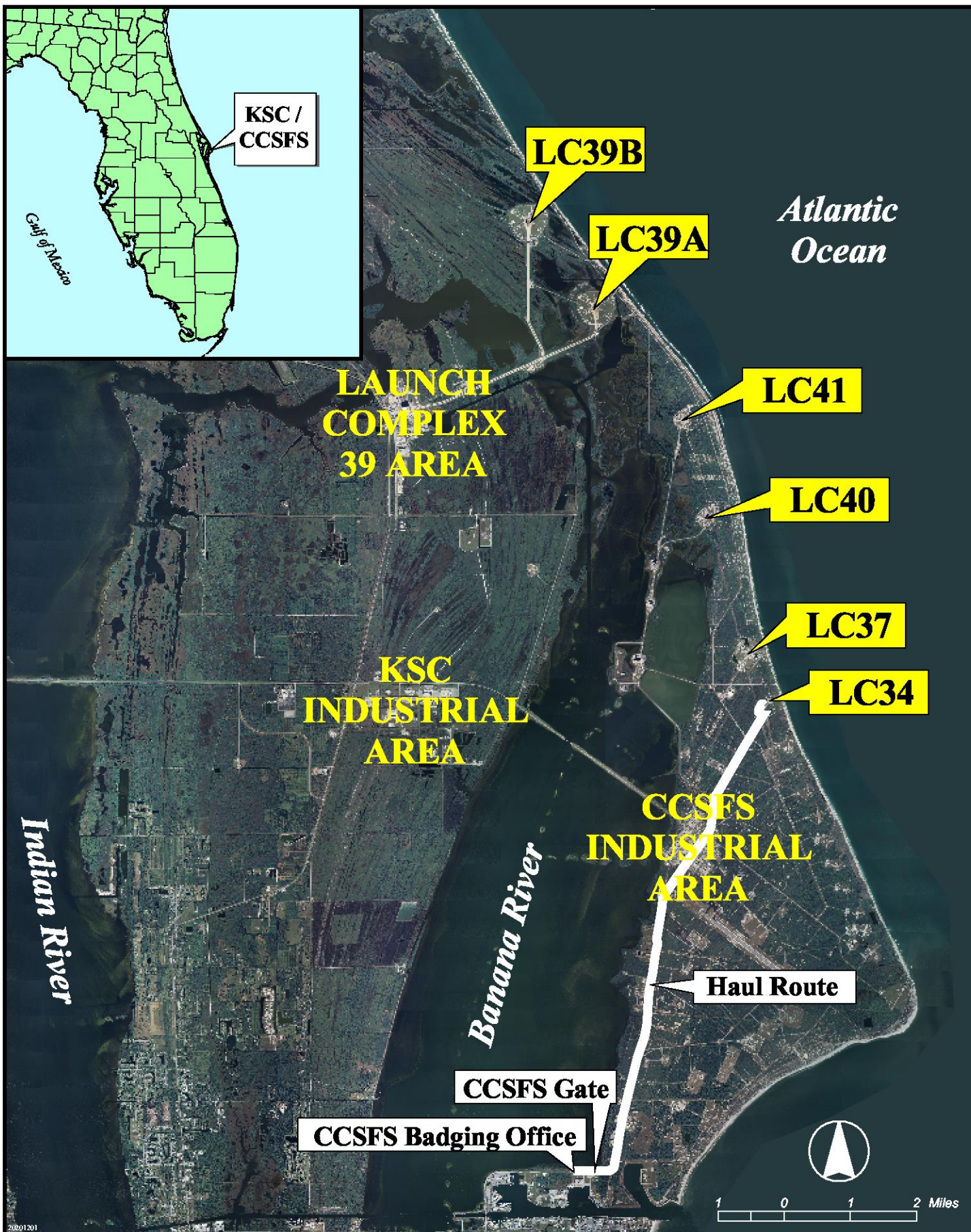
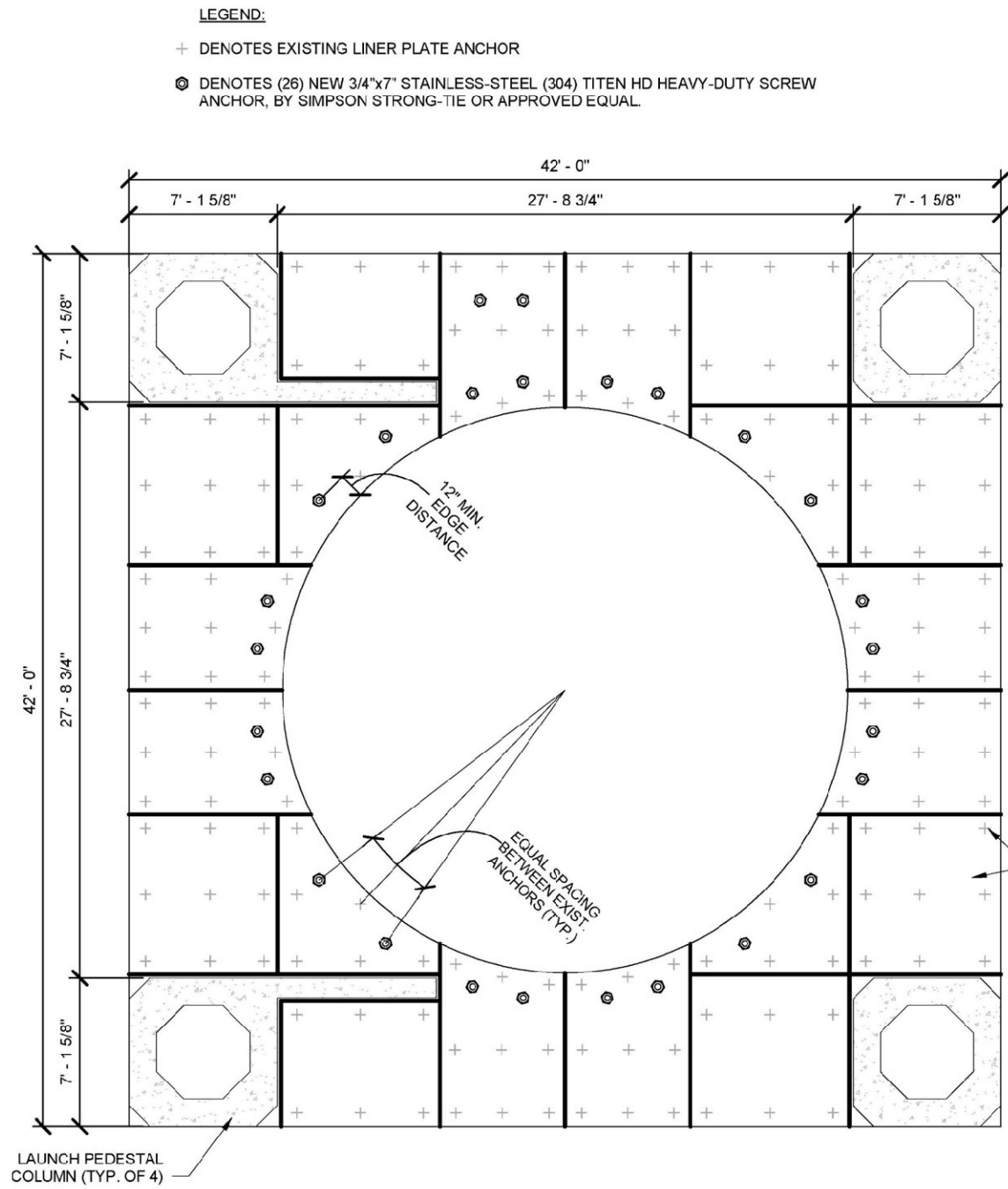
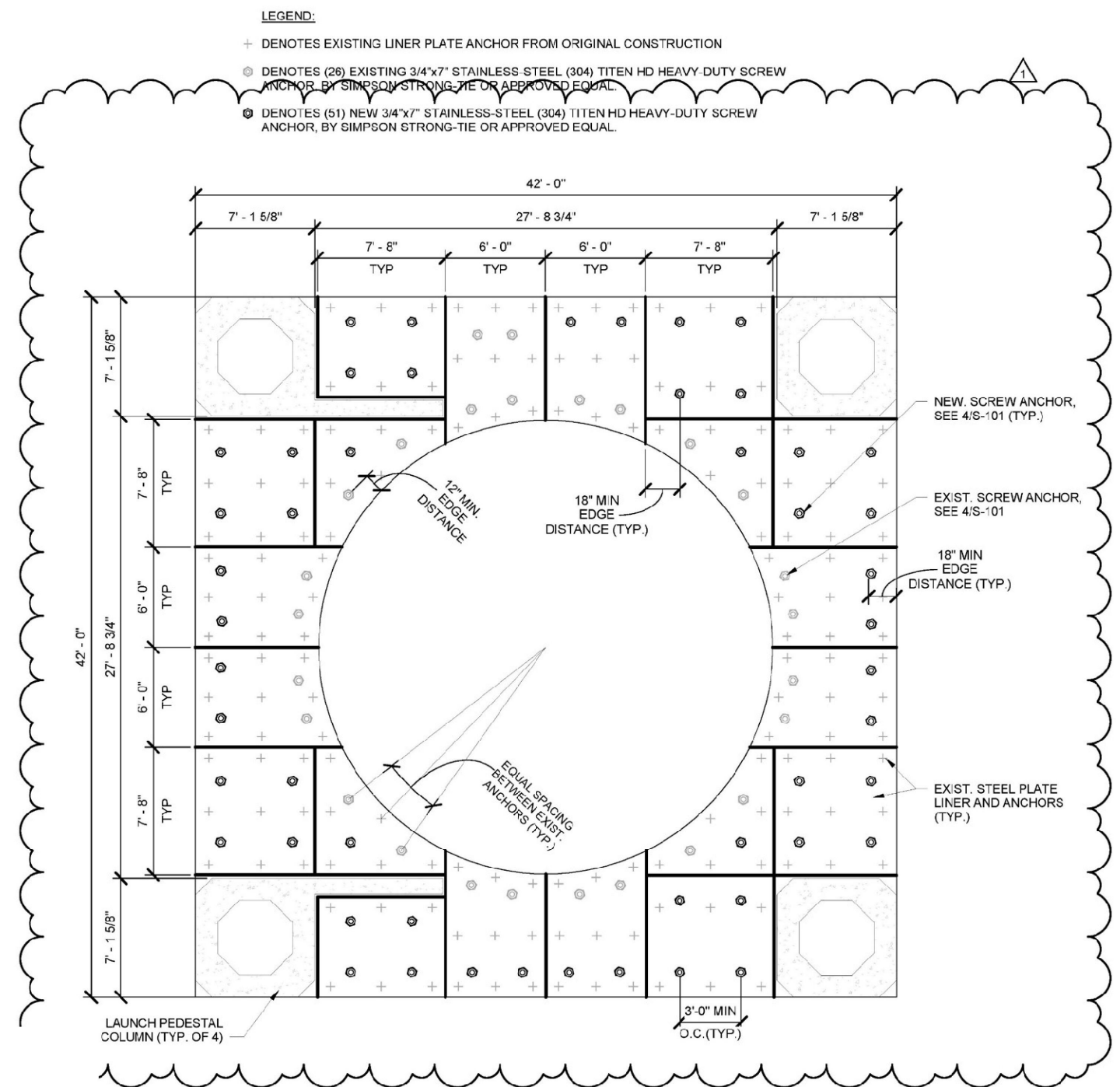


FIGURE A-2 SITE PLAN
SWMU CC054, LAUNCH COMPLEX 34, CAPE CANAVERAL SPACE FORCE STATION, FLORIDA

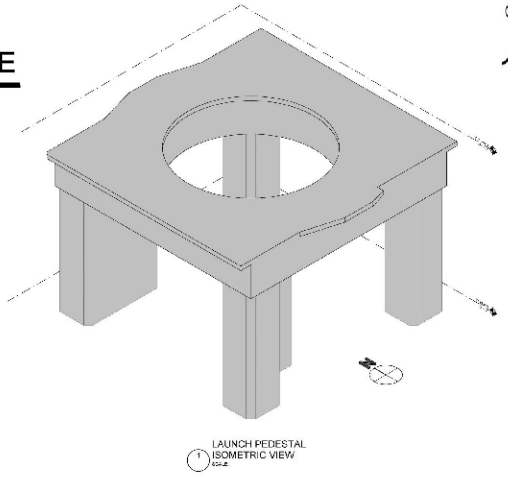


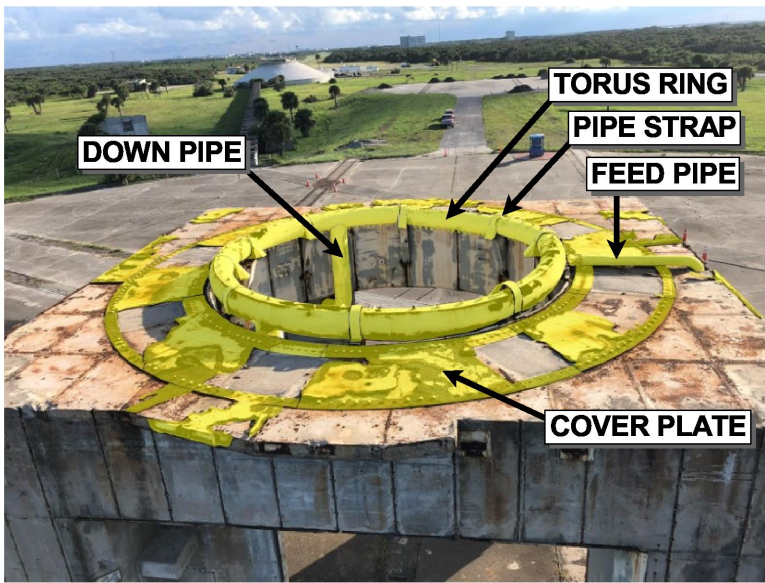


2 BOTTOM LINER ANCHOR LOCATIONS - PHASE ONE
 NOT TO SCALE



2 BOTTOM LINER ANCHOR LOCATIONS - PHASE TWO
 NOT TO SCALE

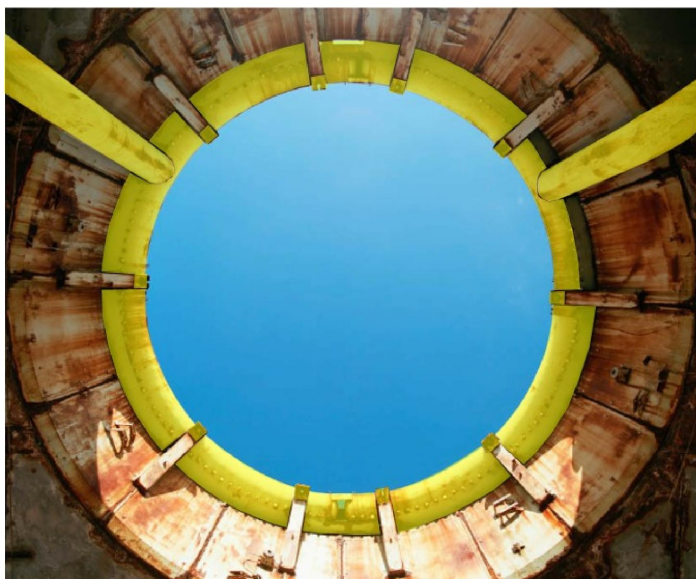




← TOP-SIDE VIEW OF PEDESTAL



← UNDERSIDE VIEW OF PEDESTAL

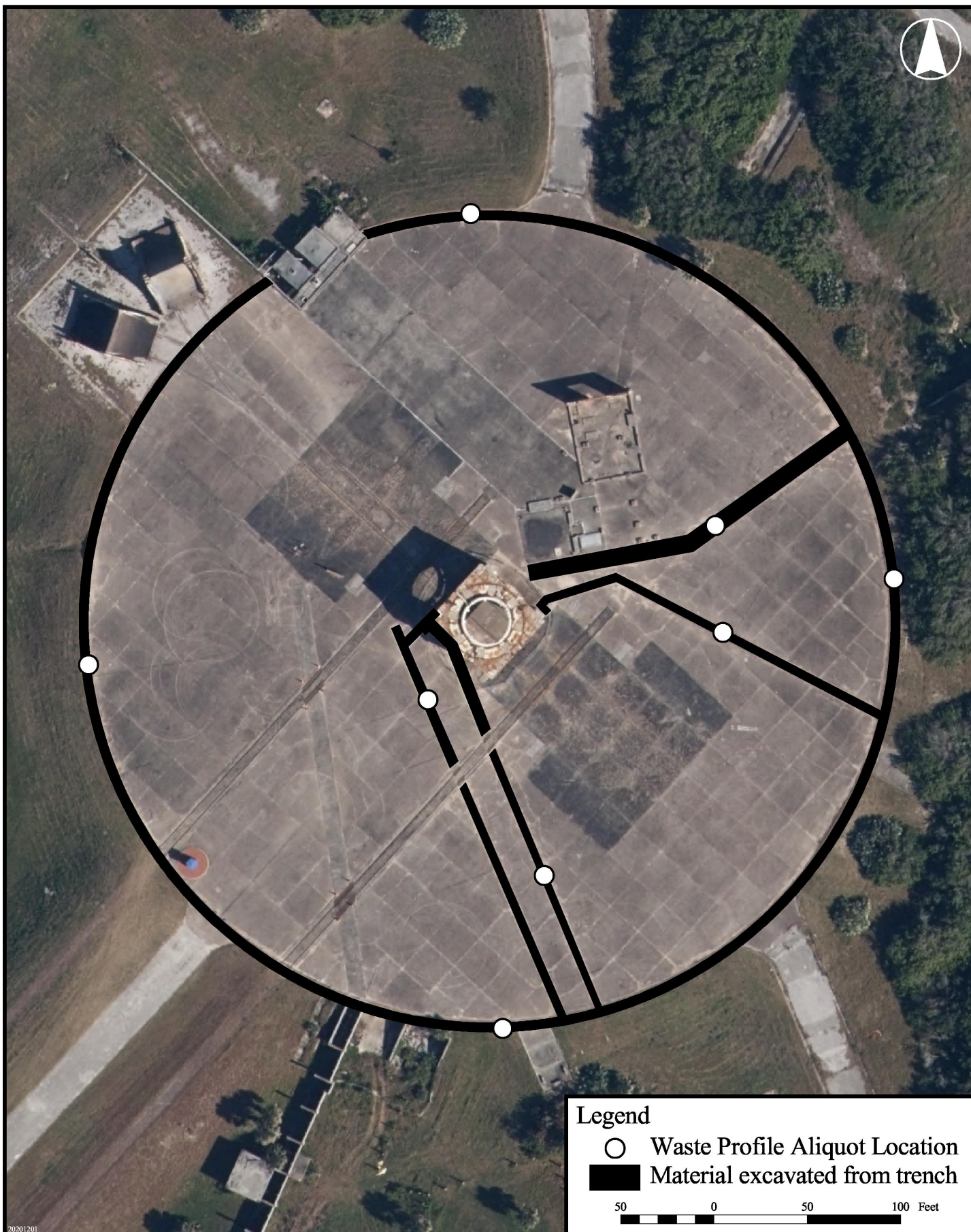


← UNDERSIDE VIEW OF PEDESTAL

ITEMS HIGHLIGHTED IN YELLOW WERE REMOVED DURING THE ABATEMENT PROJECT. THESE ITEMS INCLUDED TORUS RING, FEED/DOWN PIPES, PIPE STRAPS, COVER PLATES, AND STEEL RAILING.

FIGURE A-5 WASTE COMPOSITE SAMPLE LOCATIONS AND EXCAVATED AREAS
SWMU CC054, LAUNCH COMPLEX 34, CAPE CANAVERAL SPACE FORCE STATION, FLORIDA

LC34 CCR
Revision: 0
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APPENDIX B

PERMITTING AND PLANNING DOCUMENTATION

- B.1 KENNEDY SPACE CENTER RECORD OF ENVIRONMENTAL CONSIDERATION**
- B.2 BASE CIVIL ENGINEER WORK REQUEST – AF FORM 332**
- B.3 BASE CIVIL ENGINEERING WORK CLEARANCE REQUEST – AF FORM 103**
- B.4 LAUNCH PEDESTAL HAZARD ABATEMENT MEMORANDUM OF AGREEMENT**
- B.5 HOT WORK PERMIT**
- B.6 PROJECT SIGN BOARDS**

**B.1 KENNEDY SPACE CENTER RECORD OF ENVIRONMENTAL
CONSIDERATION**

Avoid Verbal Orders

TO: SI-E2/Mike Deliz

DATE: 06/25/2020

FROM: SI-E3/Environmental Management Branch

SUBJECT: KSC Record of Environmental Consideration (REC)

REC #: 11132

1. PROJECT INFORMATION

Project Title: Launch Pedestal Hazard Abatement at Launch Complex 34 (LC34)

Project Lead: Mike Deliz, SI-E2, 321-867-6971

Project No.: ENV 1634A(2)

Project Description:

The purpose of this hazard abatement project is to remove steel elements from the Launch Pedestal at Launch Complex 34 that are a continuing source of polychlorinated biphenyl (PCB) contamination. Based on sample results, only the steel elements from the top-side of the Launch Pedestal will be removed and will include the torus ring, feed pipe, down pipes, pipe straps and shields, cover plates, railing support steel, and bearing ring plates and bolts (see Figures 1 and 2 attached to environmental checklist). The rest of the Launch Pedestal will remain unchanged and in-place. For safety purposes, an anchor system (screw anchors) will be installed in the underside steel ceiling plates prior to removing the steel elements from the top-side of the Pedestal. The steel elements removed from the Pedestal will be disposed of at the KSC Landfill. Fallen debris (rust) will also be cleaned up from the concrete and earthen trenches on the launch pad and disposed of accordingly.

This project has been coordinated with the State Historic Preservation Officer (SHPO) and National Park Service (NPS) through the Section 106 consultation process, and a Memorandum of Agreement was executed between these agencies and NASA on 23 March 2020. NASA has also communicated this project with the 45th Space Wing.

EPB Reviewer:

LPH

Facility No.: LC34, SWMU CC054

2. NEPA DETERMINATIONS

- | | |
|---|--|
| <input checked="" type="checkbox"/> a. Categorical Exclusions per 14 CFR Part 1216.304(d) | <input type="checkbox"/> e. Centerwide EIS |
| <input type="checkbox"/> b. Environmental Assessment (EA) Required | <input type="checkbox"/> f. AF Project on KSC/813 |
| <input type="checkbox"/> c. Environmental Impact Statement (EIS) Required | <input checked="" type="checkbox"/> g. NASA Project on CCAFS/813 |
| <input type="checkbox"/> d. Existing FONSI or ROD | |

3. ENVIRONMENTAL REQUIREMENTS

- | | | |
|----------------------------|---|-----------------------------|
| a. Non-Permit Requirements | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| b. Permit Requirements | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |

2.a.1. CATEGORICAL EXCLUSION (CATEX): This project is categorically excluded (CATEX) from further NEPA review as defined in 14 CFR 1216.304(d)(2)(i) Routine maintenance, minor construction or rehabilitation, minor demolition, minor modification, minor repair, and continuing or altered operations at, or of, existing NASA or NASA-funded or -approved facilities and equipment, such as buildings, roads, grounds, utilities, communication systems, and ground support systems, such as space tracking and data systems. For additional information, please contact Don Dankert of the NASA Environmental Management Branch (SI-E3, 321-861-1196).

2.g.1. NASA PROJECT ON AF PROPERTY: This project is located on CCAFS property. Coordination with the 45th CES/CEIE is required prior to any construction activity at this facility. AF Form 813 must be completed for project review by the Air Force. Contact Eva Long (853-0910, 45 CES/CEIE) if clarification is required.

NOTE: NASA has coordinated with the 45th Space Wing on proposed action.

3.a.1. SOLID WASTE MANAGEMENT UNIT (SWMU): This project includes work within the boundary of SWMU #C054, "Launch Complex 34". A SWMU designation means a site has had historical operations with the potential to impact the environment. This area is being investigated by the NASA Remediation Group under Remediation Project Manager (RPM) Mike Deliz (SI-E2, 867-6971) of the Environmental Assurance Branch. A Land Use Control Implementation Plan (LUCIP) has been prepared for the SWMU. These controls are necessary to prohibit residential exposure to soil and groundwater present at the site.

Avoid Verbal Orders

TO: SI-E2/Mike Deliz

DATE: 06/25/2020

FROM: SI-E3/Environmental Management Branch

SUBJECT: KSC Record of Environmental Consideration (REC)

REC #: 11132

All workers involved in subsurface/dewatering work must be notified (HAZCOM) of the potential for contamination present and it is recommended that an Industrial Hygienist be consulted for determination of required personal protective equipment (PPE). Handle potentially contaminated soils or groundwater in accordance with site work plan. Utilize PPE as required by Health and Safety Plan.

3.a.2. HAZARDOUS/NON-HAZARDOUS WASTE: All hazardous and non-hazardous wastes generated during the interim measure must be properly containerized, stored, labeled, manifested, shipped, and disposed of in full regulatory compliance. Hazardous wastes generated by this activity must be manifested, shipped, and disposed of under either the remediation contractor's or NASA's Environmental Protection Agency (EPA) identification number. The contractor shall maintain copies of waste management records and manifests onsite and make them available for review by NASA upon request.

If wastes are managed, controlled and disposed of using the NASA EPA identification number, the KSC Waste Management requirements outlined in KNPR 8500.1 must be followed. A Process Waste Questionnaire (PWQ), KSC Form 26-551 along with any supporting documentation (MSDS, product formulation, lab analyses) must be submitted to the KEMCON/IMSS Waste Management Office for each waste stream generated. That office will then generate a Technical Response Package (TRP) which will give direction on proper handling, storage, and disposal of the waste stream. Please contact KEMCON/IMSS Waste Management Services at 867-8642 if assistance is required.

The remediation contractor is responsible for any spills, releases, or other environmental contamination that occurs as a result of the proposed activities. A KSC Pollution Incident Report (PIR) Form (KSC Form 21-555) must be completed and submitted to the NASA Environmental Assurance Branch within three (3) calendar days of the incident.

3.a.3. HAZARDOUS AND CONTROLLED WASTE - POLYCHLORINATED BIPHENYLS (PCBs): Non-oil filled equipment with greater than 50 ppm PCBs on the painted surfaces may go to the KSC landfill for disposal. PCBs have been regularly detected in various building materials (such as paints, coatings, caulk, mastic, window glazing, etc.) across KSC and CCAFS. Construction and demolition debris that has not been tested for PCBs or has been found to contain PCBs greater than 50 ppm will be accepted at the KSC landfill but must be managed according to PCB bulk product waste storage regulations until disposal in the landfill. This includes covering the materials and storing them on an impermeable surface for protection against precipitation and prevention of soil contamination. In addition to window caulking, paint coatings, and electrical equipment, transformer concrete pads and other surrounding materials may contain PCB contamination. To determine if surrounding media and/or surfaces to be disturbed/disposed of have been contaminated by past actions with oils containing PCBs, contact KEMCON Waste Management. They will determine the applicable regulatory requirements and guidance for the proper management of the waste PCB materials. Please follow the PWQ/TRP process for waste disposal. All concrete associated with oil-containing electrical equipment must be disposed through KEMCON Waste Management as regulated PCB waste.

3.a.4. PAINT DISTURBANCE/REMOVAL: This project will involve disturbance of paint coatings. Unless known to be non-hazardous, the coatings must be sampled and analyzed for the 8 RCRA hazardous metals (Ag, As, Ba, Cd, Cr, Hg, Pb, and Se) and PCBs. If the coatings contain heavy metals or PCBs, OSHA standards must be followed. It is recommended that the control zone and personal protective equipment requirements established in the lead standard be complied with to prevent exposure to workers and adjacent unprotected areas. The sampling analysis will dictate the level of PPE required and the handling/disposal requirements. Contact your company's Safety and Health Office or KEMCON Industrial Hygiene (IH) for recommendations on personal protective equipment (PPE). IMSS IH can be contacted at 867-2400 or at KSC-DL-EnvHealth/(KSC-DL-EnvHealth@mail.nasa.gov). Paint chips, rust, debris, blast media, etc. generated during preparation of metal, fiberglass, or concrete surfaces and/or deconstruction will be contained and disposed of according to waste management guidelines given above in Item 3.a.2.

Avoid Verbal Orders

TO: SI-E2/Mike Deliz

DATE: 06/25/2020

FROM: SI-E3/Environmental Management Branch

SUBJECT: KSC Record of Environmental Consideration (REC)

REC #: 11132

Recycling of painted materials: Painted non oil-filled electrical equipment and other painted materials may go to the KSC Reutilization, Recycling, and Marketing Facility (RRMF) or taken off KSC for salvage by a contractor if PCBs are less than 50 ppm. Oil-filled and grease or oil-contacted equipment with PCB concentrations less than 50 ppm in the oil and in the paint on the equipment may go to the contractor or the RRMF for reuse. There is no requirement for TCLP analysis on items to be reused.

Disposal of painted materials: Painted construction and demolition waste items will be accepted at the KSC Class III Landfill without PCB or TCLP analysis. Construction and demolition debris that has not been tested for PCBs or has been found to contain PCBs greater than 50 ppm will be accepted at the KSC landfill but must be managed according to PCB bulk product waste storage regulations until disposal in the landfill. This includes covering the materials and storing them on an impermeable surface for protection against precipitation, and prevention of soil contamination.

Oil-filled and grease or oil contacted equipment with PCB concentrations greater than or equal to 50 ppm in the oil or in the paint on the equipment must be managed as regulated PCB waste.

Welding/torch cutting: Organizations shall not directly torch cut or use heat on any materials that contain PCBs as burning of PCBs can create toxic byproducts (such as dioxins). Paint samples shall be collected and analyzed for PCBs prior to using heat or torch cutting of materials that could potentially contain PCBs. Heating or torch cutting of materials with PCBs is a regulatory violation and is prohibited without a permit issued by the EPA. See KNPR 8500.1 for details.

3.a.5. HISTORIC PROPERTY: LC 34 is part of the Cape Canaveral National Historic Landmark District (8Br216). A Section 106 consultation with the State Historic Preservation Officer (SHPO) and National Park Service (NPS) has been completed. A Memorandum of Agreement was executed between these agencies and NASA on March 23, 2020. The project may proceed as planned. Contact Jeanne Ryba (SI-E3, 867-7824) with questions.

3.a.6. THREATENED AND ENDANGERED SPECIES: This project has the potential to affect the protected gopher tortoises. Measures must be taken to minimize impacts to their habitat. If gopher tortoise burrows are identified within 25 feet of excavation, laydown, or equipment staging areas, contact Becky Bolt (IMSS-200, 867-7330) for a biological survey prior to beginning work.

3.b.1. EXCAVATION PERMIT: A KSC Excavation Permit will be required for any digging proposed by this project. Please contact the Utility Locate/Excavation Permit Request Customer Helpline at 867-2406 or go to website at <http://epr.ksc.nasa.gov/Home/> for an underground utility scan and dig permit. NOTE: If a trench or pit is to be left open all day or overnight, the trench/pit must be checked for trapped animals at the beginning and end of each work shift. If an animal is observed trapped, contact Becky Bolt (IMSS-200, 867-7330) or the Duty Office (861-5050, email KSC-BOSS-DutyOffice@mail.nasa.gov) to arrange removal/release. Do not handle the animal(s).

No other environmental issues were identified based upon the information provided in the KSC Environmental Checklist. This Record of Environmental Consideration (REC) does not relinquish the project lead from obtaining and complying with any other internal NASA permits or directives necessary to ensure all organizations potentially impacted by this project are notified and concur with the proposed project.

Due to potential changes in regulations, permit requirements and environmental conditions, statements in this REC are valid for 6 months, and subject to review after this period. It is the responsibility of the project lead to submit current project information for a REC update prior to project commencement if REC is older than 6 months; and also to notify the Environmental Management Branch (SI-E3) if the scope of the project changes at any time after the REC is issued.

Avoid Verbal Orders

TO: SI-E2/Mike Deliz

DATE: 06/25/2020

FROM: SI-E3/Environmental Management Branch

SUBJECT: KSC Record of Environmental Consideration (REC)

REC #: 11132

M. Deliz/SI-E2

cc:

M. Jonnet/Tetra Tech

B. Bolt/IMSS-200

J. Ryba/SI-E3

E. Long/45 CES/CEIE

4. Upon evaluation of the subject project, the above determinations have been made and identified. Contact the Environmental Management Branch (SI-E3) at 861-1196 for re-evaluation should there be any modifications to the scope of work.



James Brooks

06/25/2020 00:00

Date

B.2 BASE CIVIL ENGINEER WORK REQUEST – AF FORM 332

SLO

06/23/2020

BASE CIVIL ENGINEER WORK REQUEST <i>(See Reverse for Instructions)</i>	Form Approved OMB No. 0704-0188
--	------------------------------------

Public reporting burden for this collection of information is estimated to average .3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project 0704-0188, Washington DC 20503. Please DO NOT RETURN your form to either of these addresses. Send your completed form to HQ AFESC/DEMG.

SECTION I - TO BE COMPLETED BY REQUESTER

1. FROM (Organization) Tetra Tech (Contractor)	2. OFFICE SYMBOL	3. DATE OF REQUEST 6/23/2020	4. WORK REQUEST NO. (For BCE Use) 30251109
--	------------------	--	--

5. NAME AND PHONE NO. OF REQUESTER Mark Jonnet (Tetra Tech), 412-921-8622	6. REQUIRED COMPLETION DATE 9/30/2020	7. BUILDING, FACILITY OR STREET ADDRESS WHERE WORK IS TO BE ACCOMPLISHED Launch Complex 34
---	---	--

8. DESCRIPTION OF WORK TO BE ACCOMPLISHED *(Include Sketch or Plan, when appropriate)*

Remove steel elements from the Launch Pedestal at Launch Complex 34 that are a continuing source of polychlorinated biphenyl (PCB) contamination. Based on sample results, only the steel elements from the top-side of the Launch Pedestal will be removed and will include the torus ring, feed pipe, down pipes, pipe straps and shields, cover plates, railing support steel, and bearing ring plates and bolts (see Figures 1 and 2). The rest of the Launch Pedestal will remain unchanged and in-place. For safety purposes, an anchor system (screw anchors) will be installed in the underside steel ceiling plates prior to removing the steel elements from the top-side of the Pedestal. The steel elements removed from the Pedestal will be disposed of at the KSC Landfill. Fallen debris (rust) will also be cleaned up from the concrete and earthen trenches on the launch pad and disposed of accordingly.

This project has been coordinated with the State Historic Preservation Officer (SHPO) and National Park Service (NPS) through the Section 106 consultation process, and a Memorandum of Agreement was executed between these agencies and NASA on 23 March 2020. NASA has communicated this project with 45 CES/CEAN and 45 CES/CEZ, and will NASA will notify tour bus companies of project work. A safety exclusion zone will be set up to prevent unauthorized personnel from entering the project area (see Figure 3), and access roads leading up to the launch pad will be closed except for the main access road where tour buses park.

9. BRIEF JUSTIFICATION FOR WORK TO BE ACCOMPLISHED *(Not required for maintenance and repair)*

Regulatory commitment for corrective action at Solid Waste Management Unit, which is being performed under the Kennedy Space Center (KSC) Resource Conservation and Recovery Act (RCRA) permit.

103

10. DONATED RESOURCES
KREMPJ00

<input checked="" type="checkbox"/> FUNDS	<input type="checkbox"/> LABOR	<input type="checkbox"/> MATERIAL	<input type="checkbox"/> CONTRACT BY REQUESTER	<input type="checkbox"/> NONE
---	--------------------------------	-----------------------------------	--	-------------------------------

11. NAME OF REQUESTER Michael Deliz, SI-E2	12. GRADE OF REQUESTER GS-14	13. SIGNATURE OF REQUESTER <i>(See Reverse of Form)</i> MICHAEL DELIZ Digitally signed by MICHAEL DELIZ Date: 2020.06.23 10:55:54 -04'00'
--	--	--

14. COORDINATION
[Signature]
24 June 2020

SECTION II - FOR BASE CIVIL ENGINEER USE

15. WORK ORDER *(Place an "X" in the appropriate box.)*

<input type="checkbox"/> IN-SERVICE	<input type="checkbox"/> SELF-HELP	<input type="checkbox"/> CONTRACT	<input type="checkbox"/> SABER
-------------------------------------	------------------------------------	-----------------------------------	--------------------------------

16. DIRECT SCHEDULED WORK *(Place an "X" in the appropriate box.)*

<input type="checkbox"/> EMERGENCY	<input type="checkbox"/> URGENT	<input type="checkbox"/> ROUTINE	<input type="checkbox"/> SELF-HELP	<input type="checkbox"/> M/C
------------------------------------	---------------------------------	----------------------------------	------------------------------------	------------------------------

17. SELF-HELP *(Place an "X" in the appropriate box.)*

<input type="checkbox"/> BRIEFING REQUIRED	<input type="checkbox"/> ADEQUATE COORDINATION	<input type="checkbox"/> INSPECTION REQUIRED
--	--	--

SECTION III - COMPLETE ONLY IF WORK IS TO BE ACCOMPLISHED BY WORK ORDER

18. WORK CLASS	19. PRIORITY	20. ESTIMATED HOURS	21. ESTIMATED FUNDED COST	22. ESTIMATED TOTAL COST
<input type="checkbox"/> 23. THERE IS NO NEED FOR AN ENVIRONMENTAL ASSESSMENT (AFR 19-2)	<input type="checkbox"/> 24. A WRITTEN ASSESSMENT IS BEING/HAS BEEN PROCESSED	<input type="checkbox"/> 25. APPROVED	<input type="checkbox"/> 26. DISAPPROVED	

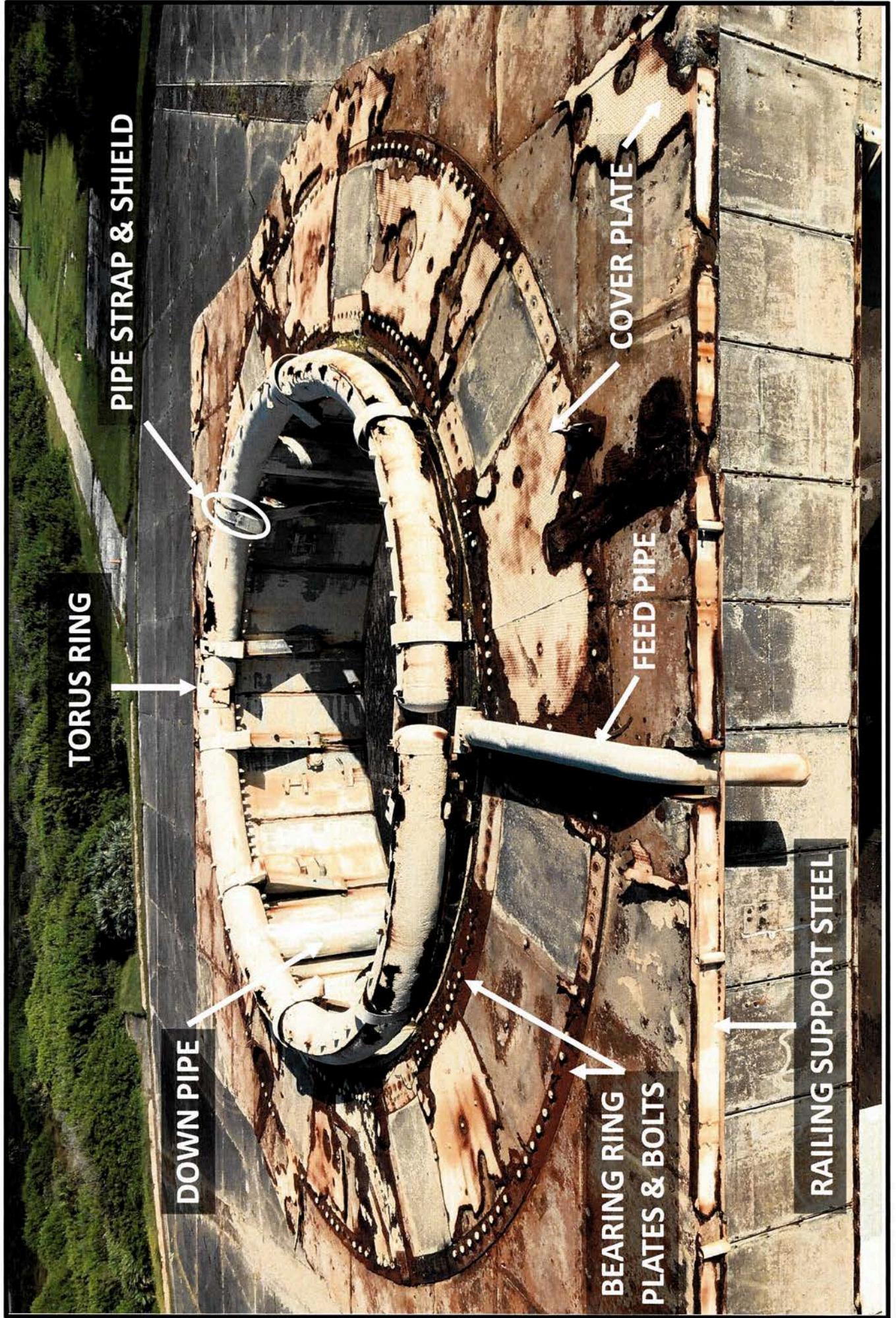
27. REMARKS

SECTION IV - APPROVING AUTHORITY

28. NAME AND GRADE <i>(Please Type or Print)</i>	29. SIGNATURE	30. DATE
--	---------------	----------

FIGURE 1 - TOP-SIDE REMOVAL ELEMENTS

SWMU CC054, LAUNCH PAD 34, CAPE CANAVERAL AIR FORCE STATION, FLORIDA

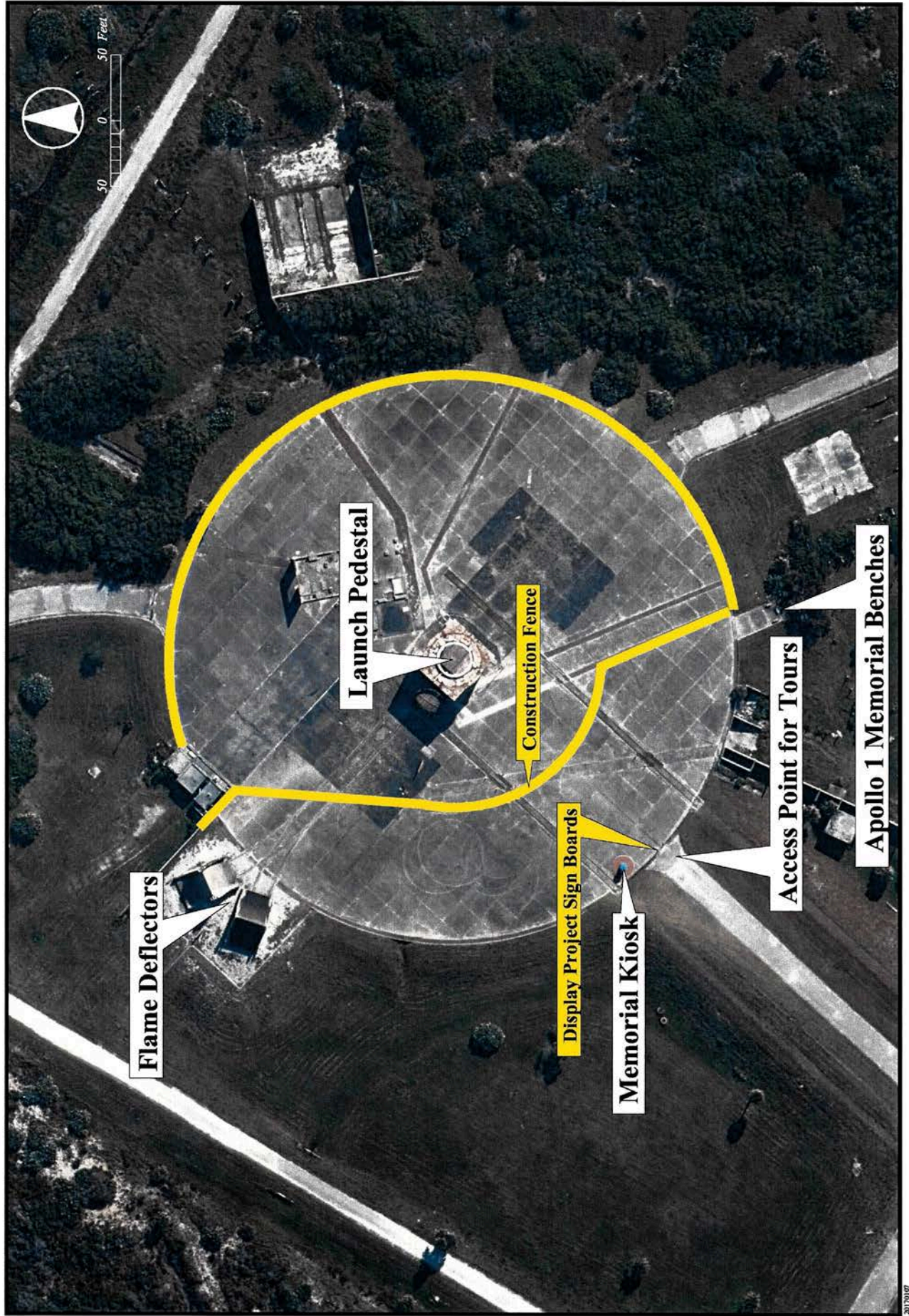


**FIGURE 2 – STEEL ELEMENTS TO BE REMOVED FROM PEDESTAL
SWMU CC054, LAUNCH PAD 34, CAPE CANAVERAL AIR FORCE STATION, FLORIDA**

**Yellow highlighted items
will be removed from
Launch Pedestal. Rest of
Pedestal will remain
unchanged and in-place.**



FIGURE 3 - PEDESTAL WORK AREA
LAUNCH COMPLEX 34, CAPE CANAVERAL AIR FORCE STATION, FLORIDA



JENKINS, THOMAS L CTR USSF AFSPC CLOIS/ASRCC

From: Jonnet, Mark <Mark.Jonnet@tetrattech.com>
Sent: Tuesday, June 23, 2020 12:57 PM
To: Cape Canaveral CLOIS Work Management
Subject: [Non-DoD Source] LC34 Pedestal AF 332
Attachments: AF 332_20200623_LC34_Pedestal m.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Attached is the signed AF 332 for the work that is planned on the pedestal at LC34, please let me know if you need any additional information for the weekly review meeting. Thank you.

Mark J Jonnet | Project Manager
Direct +1 (412) 921-8622 | Business +1 (412) 921-7090 | Mark.Jonnet@tetrattech.com

Tetra Tech | Complex World, Clear Solutions™
Foster Plaza VII, Pittsburgh, PA 15220 | tetrattech.com

Please consider the environment before printing. [Read More.](#)

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2	<p>REMOVE STEEL ELEMENTS FROM LAUNCH PEDESTAL</p> <p>SWO 30251109, 103 required.</p> <p>*Please read and comply to all remarks made by reviewers written on 332, within this section and email direction attached to this package. 103 submissions and reviewer contact request can be sent to workmgt@us.af.mil Real Property, facility, Space Allocation requirements, 1354's etc., will need to be sent to 45CES.CLOIS.AssetManagement@us.af.mil</p>	CX 34	MARK JONNET	412-921-8662	6/23/2020	CE	SWO	
							FIRE	If welding or cutting is required, a hot work permit is required. Request must be made 24 hours prior to the beginning of any work.
							SAFETY	No Issues.
							SITING	No Issues. T Leech
							IRP	No issues.
							ENVIRO	CATEX A2.3.29. Appears all Environmental concerns have been adequately addressed. Understood that all waste materials will be disposed of at KSC Landfill.
							SECURITY	No Issues
							CLOIS REAL PROP	Permit SPCCAN 2-07-0041 Expires 8/31/2027
							CLOIS ENV	No Issues

**B.3 BASE CIVIL ENGINEERING WORK CLEARANCE REQUEST –
AF FORM 103**

RECEIVED JUL 02 2020

BASE CIVIL ENGINEERING WORK CLEARANCE REQUEST <i>(See Instructions on Reverse)</i>		DATE PREPARED 20200702		
1. Clearance is requested to proceed with work at <u>Launch Complex 34 - Remove Steel Elements from Launch Pedestal</u>				
on Work Order No. <u>30251109</u> , Contract No. <u>80KSC019F0067</u> , involving excavation or utility disturbance per attached sketch. This area <input type="checkbox"/> has <input checked="" type="checkbox"/> has not been staked or clearly marked.				
2. TYPE OF FACILITY/WORK INVOLVED				
<input type="checkbox"/> A. PAVEMENTS <input type="checkbox"/> D. FIRE DETECTION & PROTECTION SYSTEMS <input type="checkbox"/> G. AIRCRAFT OR VEHICULAR TRAFFIC FLOW <input type="checkbox"/> B. DRAINAGE SYSTEMS <input type="checkbox"/> E. UTILITY <input type="checkbox"/> OVERHEAD <input type="checkbox"/> UNDERGROUND <input type="checkbox"/> H. SECURITY <input type="checkbox"/> C. RAILROAD TRACKS <input type="checkbox"/> F. COMM <input type="checkbox"/> OVERHEAD <input type="checkbox"/> UNDERGROUND <input type="checkbox"/> I. OTHER				
3. DATE CLEARANCE REQUIRED 20200713		4. DATE OF CLEARANCE		
5. SIGNATURE OF REQUESTING OFFICIAL Mark Jonnet <small>Digitally signed by Mark Jonnet Date: 2020.07.02 08:05:37 -0400</small>		6. TELEPHONE NO. (412) 921-8622		
7. ORGANIZATION Tetra Tech (Contractor)				
	ORGANIZATION	REMARKS <i>(Use Reverse for additional comments)</i>	REVIEWER'S NAME AND INITIALS	
B B A S E C I V I L E N G I N E R I N G	A. ELECTRICAL DISTRIBUTION	<i>Line locate B4 dig</i>	Click to sign	
	B. STEAM DISTRIBUTION		Click to sign	
	C. WATER DISTRIBUTION		Click to sign	
	D. POL DISTRIBUTION		Click to sign	
	E. SEWER DISTRIBUTION		Click to sign	
	F. ENVIRONMENTAL		<i>See Attached Email</i>	Click to sign
	G. PAVEMENTS/ GROUNDS		<i>No Issue</i>	Click to sign
	H. FIRE PROTECTION		<i>See Attached 103</i>	Click to sign
	I. ZONE <u>TRP</u>		<i>No Comment, see Attached Email</i>	Click to sign
	J. OTHER (Specify) <i>Real Property Programming</i>		<i>No Issue</i>	Click to sign
9. SECURITY POLICE	<i>No Comment, see Attached Email</i>	Click to sign		
10. SAFETY	<i>No Comment, see Attached 103</i>	Click to sign		
11. COMMUNICATIONS	<i>No Comment See Attached 103</i>	Click to sign		
12. BASE OPERATIONS <i>Siting</i>	<i>No Comment, see Attached Email</i>	Click to sign		
13. CABLE TV		Click to sign		
14. COMMERCIAL UTILITY COMPANY		Click to sign		
<input type="checkbox"/> TELEPHONE <input type="checkbox"/> GAS <input type="checkbox"/> ELECTRIC				
15. OTHER (Specify) <u>30259656</u>				
16. REQUESTED CLEARANCE <input checked="" type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED				
17. TYPED NAME AND SIGNATURE OF APPROVING OFFICER <i>(Chief of Operations Flight or Chief of Engineering Flight)</i>		17a. DATE SIGNED		
<i>[Signature]</i> Click to sign		<i>28 July 2020</i>		

INSTRUCTIONS

The BCE work clearance request is used for any work (contract or in-house) that may disrupt aircraft or vehicular traffic flow, base utility services, protection provided by fire and intrusion alarm system, or routine activities of the installation. This form is used to coordinate the required work with key base activities and keep customer inconvenience to a minimum. It is also used to identify potentially hazardous work conditions in an attempt to prevent accidents. The work clearance request is processed just prior to the start of work. If delays are encountered and the conditions at the job site change (or may have changed) this work clearance request must be reprocessed.

18. REMARKS. *(This section must describe specific precautionary measure to be taken before and during work accomplishment. Specific comments concerning the approved method of excavation, hand or powered equipment, should be included.)*

Remove steel elements from the top-side of the Launch Pedestal at Launch Complex 34 that are a continuing source of polychlorinated biphenyl (PCB) contamination (see Figures 1 and 2 in approved AF 332). The rest of the Launch Pedestal will remain unchanged and in-place. For safety purposes, an anchor system (screw anchors) will be installed in the underside steel ceiling plates prior to removing the steel elements from the top-side of the Pedestal. Ground support equipment will be used to carefully lower the top-side steel elements to the ground, which will then be disposed of at the KSC Landfill.

Fallen debris (rust) will also be cleaned up from the surface of the launch pad. The majority of the launch pad is concrete, but there are some earthen trenches within the launch pad where a surface scrape will be required using hand tools or mini-excavator. Clean fill will be used to backfill the earthen trenches to match existing grade.

A safety exclusion zone will be set up to prevent unauthorized personnel from entering the project area (see Figure 3 in approved AF 332), and access roads leading up to the launch pad will be closed except for the main access road where tour buses park. NASA will notify tour bus companies of project work.

AF FORM 103 ATTACHMENT

WORK ORDER NUMBER: _____

HAND DIG ONLY: YES NO

LOCATORS INITIALS: _____

Sean O'Brien

OPERATIONAL RESTRICTIONS:

Hand dig within 24 inches in all directions of locator markings. Contact Utility Locator if marks have faded or are disturbed in any manner. Customer shall mark or coordinate with the locator, a white paint border around the area to excavate. Do not excavate outside of the area marked with this border.

CUSTOMER MUST COORDINATE WITH:

COMM. LOCATES

(CALL 321.853.2141)

GAS LINE LOCATES CONTACT:

Sunshine State One Call @ 811 or 1-800-432-4770

Locate Ticket Number

NATURAL RESOURCES SURVEY:

Customer must coordinate with the Air Force Natural Resources (45 CES/CEIE-C) office at least 3 weeks prior to mobilization unless as emergency. Contact numbers: 321.853.6822, 321.794.5268 or 321.853.0964 (to determine if any wildlife or habitat needs to be protected. 45th CES/CEIE-C

APPROVED: _____

*See Attached Email
850-348-6742*

Notify CLOIS Locator for remarking of utilities if required.

SEAN O'BRIEN (CLOIS LOCATOR SERVICES)

321-853-5525 (Office)

321-449-6460 (Cell)

321-853-5211 (Cape Support)

REPORT ALL UTILITY BREAKS TO CAPE SUPPORT IMMEDIATELY.

CRITICAL DAY NOTICE

Contractor SHALL contact Cape Support, 321.853.5211, each day prior to commencing any digging or excavation work.

Work Order/Dig Permit number will be required for permission to proceed.

Request locator service only within 45 days of the estimated start of the excavation operation.

Maintain marks per locator instructions or request remarking by the locator. (Locator response may require a 72 hour notice)

Notify the Duty Office or permit administrator when excavation operations have been completed.

CUSTOMER PRINTED NAME

CUSTOMER SIGNATURE

DATE

SLO

06/23/2020

BASE CIVIL ENGINEER WORK REQUEST

Form Approved OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average .3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project 0704-0188, Washington DC 20503 Please DO NOT RETURN your form to either of these addresses. Send your completed form to HQ AFESC/DEMG.

SECTION I - TO BE COMPLETED BY REQUESTER

1. FROM (Organization) Tetra Tech (Contractor)
2. OFFICE SYMBOL
3. DATE OF REQUEST 6/23/2020
4. WORK REQUEST NO. (For BCE Use) 30251109

5. NAME AND PHONE NO. OF REQUESTER Mark Jonnet (Tetra Tech), 412-921-8622
6. REQUIRED COMPLETION DATE 9/30/2020
7. BUILDING, FACILITY OR STREET ADDRESS WHERE WORK IS TO BE ACCOMPLISHED Launch Complex 34

8. DESCRIPTION OF WORK TO BE ACCOMPLISHED (Include Sketch or Plan, when appropriate)
Remove steel elements from the Launch Pedestal at Launch Complex 34 that are a continuing source of polychlorinated biphenyl (PCB) contamination. Based on sample results, only the steel elements from the top-side of the Launch Pedestal will be removed and will include the torus ring, feed pipe, down pipes, pipe straps and shields, cover plates, railing support steel, and bearing ring plates and bolts (see Figures 1 and 2). The rest of the Launch Pedestal will remain unchanged and in-place. For safety purposes, an anchor system (screw anchors) will be installed in the underside steel ceiling plates prior to removing the steel elements from the top-side of the Pedestal. The steel elements removed from the Pedestal will be disposed of at the KSC Landfill. Fallen debris (rust) will also be cleaned up from the concrete and earthen trenches on the launch pad and disposed of accordingly.
This project has been coordinated with the State Historic Preservation Officer (SHPO) and National Park Service (NPS) through the Section 106 consultation process, and a Memorandum of Agreement was executed between these agencies and NASA on 23 March 2020. NASA has communicated this project with 45 CES/CEAN and 45 CES/CEZ, and will NASA will notify four bus companies of project work. A safety exclusion zone will be set up to prevent unauthorized personnel from entering the project area (see Figure 3), and access roads leading up to the launch pad will be closed except for the main access road where four buses park.

9. BRIEF JUSTIFICATION FOR WORK TO BE ACCOMPLISHED (Not required for maintenance and repair)
Regulatory commitment for corrective action at Solid Waste Management Unit, which is being performed under the Kennedy Space Center (KSC) Resource Conservation and Recovery Act (RCRA) permit.
103

10. DONATED RESOURCES
KREMPJ00

Checkboxes for FUNDS, LABOR, MATERIAL, CONTRACT BY REQUESTER, NONE

11. NAME OF REQUESTER Michael Deliz, SI-E2
12. GRADE OF REQUESTER GS-14
13. SIGNATURE OF REQUESTER (See Reverse of Form) MICHAEL DELIZ Digitally signed by MICHAEL DELIZ Date: 2020.06.23 10:55:54 -04'00'

14. COORDINATION
Handwritten signature and date: 24 June 2020

SECTION II - FOR BASE CIVIL ENGINEER USE

15. WORK ORDER (Place an "X" in the appropriate box)
IN-SERVICE, SELF-HELP, CONTRACT, SABER

16. DIRECT SCHEDULED WORK (Place an "X" in the appropriate box)
EMERGENCY, URGENT, ROUTINE, SELF-HELP, M/C

17. SELF-HELP (Place an "X" in the appropriate box.)
BRIEFING REQUIRED, ADEQUATE COORDINATION, INSPECTION REQUIRED

SECTION III - COMPLETE ONLY IF WORK IS TO BE ACCOMPLISHED BY WORK ORDER

18. WORK CLASS, 19. PRIORITY, 20. ESTIMATED HOURS, 21. ESTIMATED FUNDED COST, 22. ESTIMATED TOTAL COST

23. THERE IS NO NEED FOR AN ENVIRONMENTAL ASSESSMENT (AFR 19-2), 24. A WRITTEN ASSESSMENT IS BEING/HAS BEEN PROCESSED, 25. APPROVED, 26. DISAPPROVED

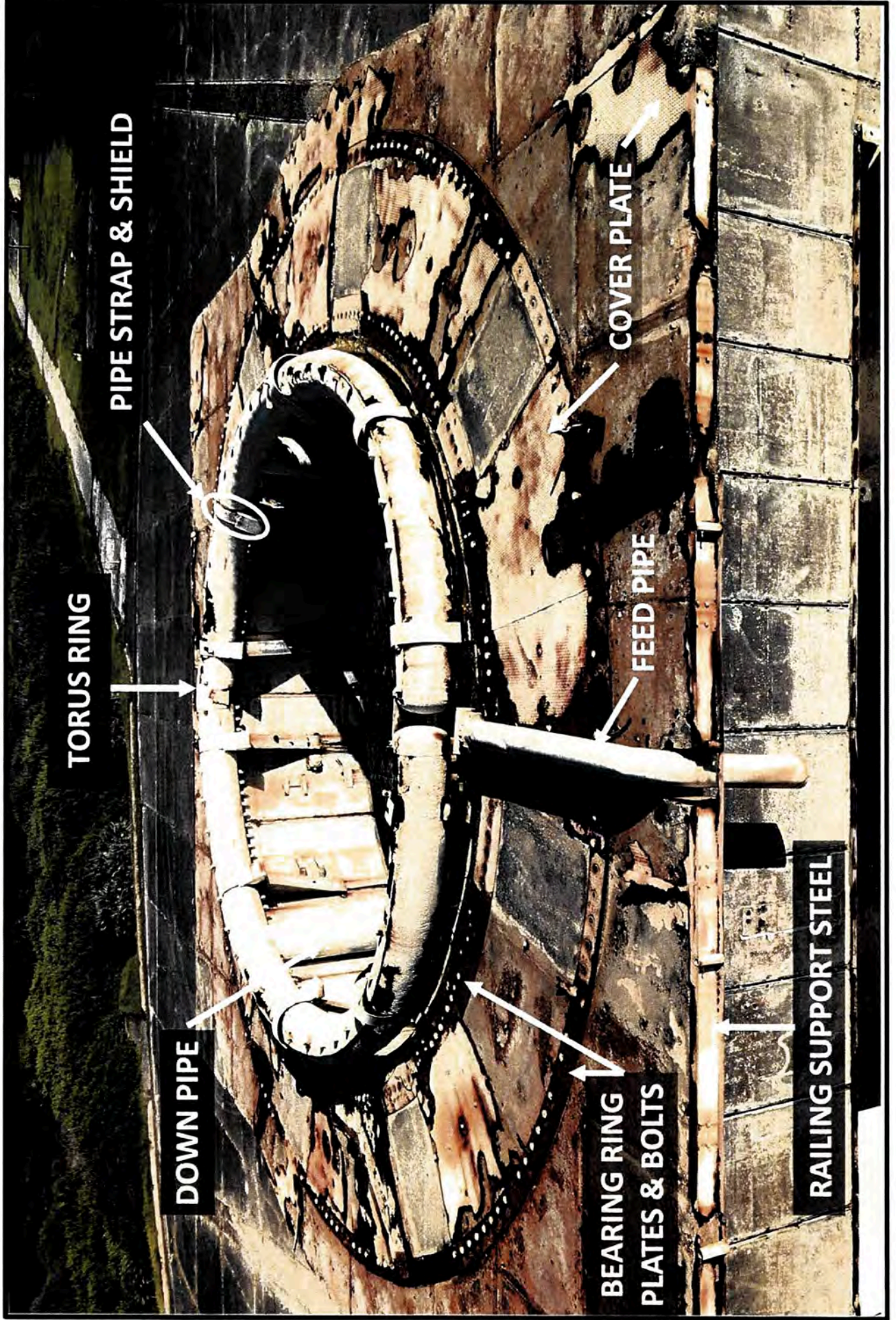
27. REMARKS

SECTION IV - APPROVING AUTHORITY

28. NAME AND GRADE (Please Type or Print), 29. SIGNATURE, 30. DATE

FIGURE 1 - TOP-SIDE REMOVAL ELEMENTS

SWMU CC054, LAUNCH PAD 34, CAPE CANAVERAL AIR FORCE STATION, FLORIDA

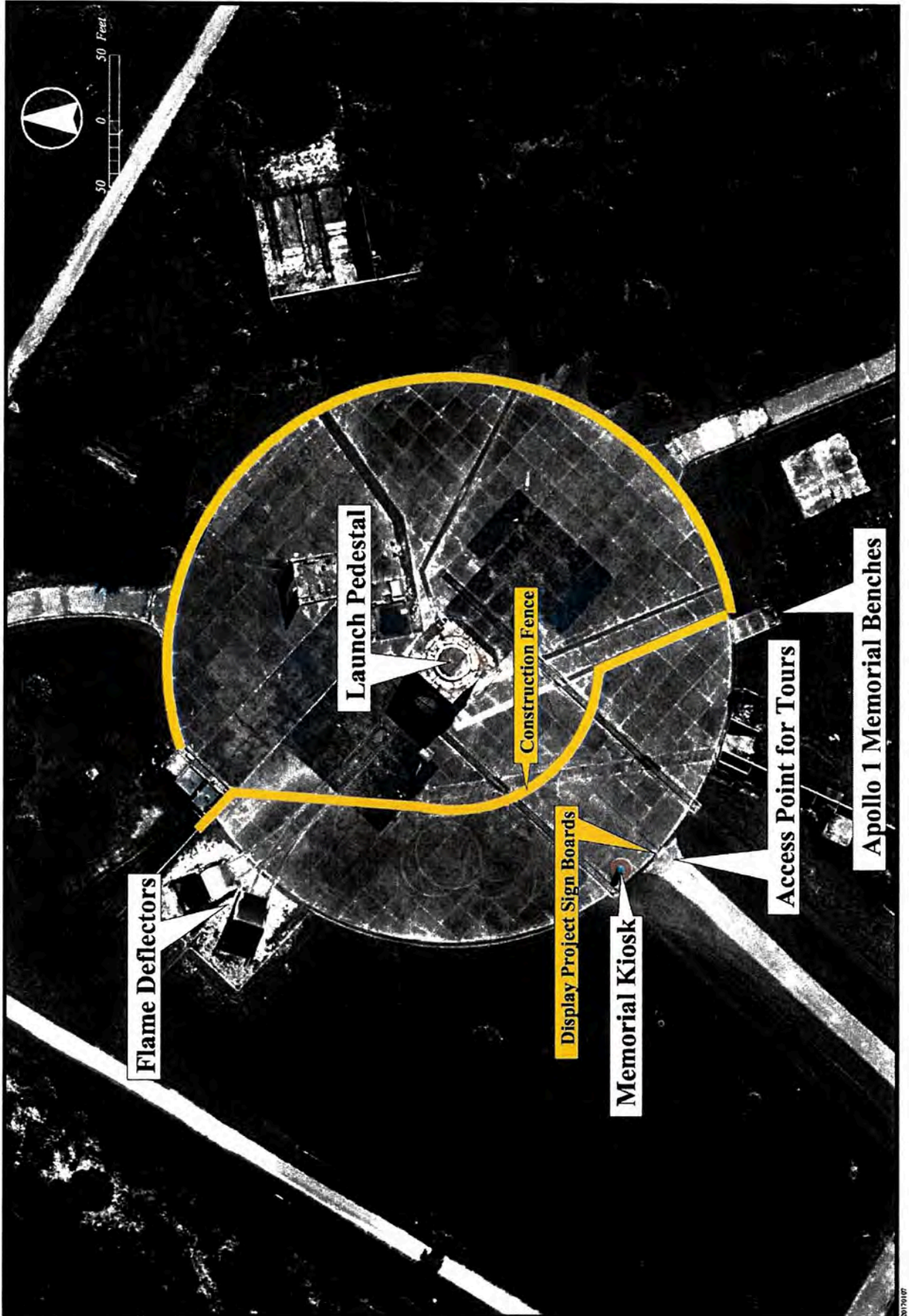


**FIGURE 2 – STEEL ELEMENTS TO BE REMOVED FROM PEDESTAL
SWMU CC054, LAUNCH PAD 34, CAPE CANAVERAL AIR FORCE STATION, FLORIDA**

Yellow highlighted items will be removed from Launch Pedestal. Rest of Pedestal will remain unchanged and in-place.



FIGURE 3 - PEDESTAL WORK AREA
LAUNCH COMPLEX 34, CAPE CANAVERAL AIR FORCE STATION, FLORIDA



JENKINS, THOMAS L CTR USSF AFSPC CLOIS/ASRCC

From: Jonnet, Mark <Mark.Jonnet@tetrattech.com>
Sent: Tuesday, June 23, 2020 12:57 PM
To: Cape Canaveral CLOIS Work Management
Subject: [Non-DoD Source] LC34 Pedestal AF 332
Attachments: AF 332_20200623_LC34_Pedestal m.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Attached is the signed AF 332 for the work that is planned on the pedestal at LC34, please let me know if you need any additional information for the weekly review meeting. Thank you.

Mark J Jonnet | Project Manager
Direct +1 (412) 921-8622 | Business +1 (412) 921-7090 | Mark.Jonnet@tetrattech.com

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Foster Plaza VII, Pittsburgh, PA 15220 | tetrattech.com

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<p>2 REMOVE STEEL ELEMENTS FROM LAUNCH PEDESTAL SWO 30251109, 103 required. *Please read and comply to all remarks made by reviewers written on 332, within this section and email direction attached to this package. 103 submissions and reviewer contact request can be sent to workmgt@us.af.mil Real Property, facility, Space Allocation requirements, 1354's etc., will need to be sent to 45CES.CLOIS.AssetManagement@us.af.mil</p>	CX 34	MARK JONNET	412-921-8662	6/23/2020	CE	<table border="1"> <tr> <td>SWO</td> <td>If welding or cutting is required, a hot work permit is required. Request must be made 24 hours prior to the beginning of any work.</td> </tr> <tr> <td>FIRE</td> <td>No Issues.</td> </tr> <tr> <td>SAFETY</td> <td>No Issues. T Leech</td> </tr> <tr> <td>SITING</td> <td>No Issues.</td> </tr> <tr> <td>IRP</td> <td>CATEX A2.3.29. Appears all Environmental concerns have been adequately addressed. Understood that all waste materials will be disposed of at KSC Landfill.</td> </tr> <tr> <td>ENVIRO</td> <td>No Issues</td> </tr> <tr> <td>SECURITY</td> <td>Permit SPCCAN 2-07-0041 Expires 8/31/2027</td> </tr> <tr> <td>CLOIS REAL PROP</td> <td>No Issues</td> </tr> <tr> <td>CLOIS ENV</td> <td></td> </tr> </table>	SWO	If welding or cutting is required, a hot work permit is required. Request must be made 24 hours prior to the beginning of any work.	FIRE	No Issues.	SAFETY	No Issues. T Leech	SITING	No Issues.	IRP	CATEX A2.3.29. Appears all Environmental concerns have been adequately addressed. Understood that all waste materials will be disposed of at KSC Landfill.	ENVIRO	No Issues	SECURITY	Permit SPCCAN 2-07-0041 Expires 8/31/2027	CLOIS REAL PROP	No Issues	CLOIS ENV	
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FIRE	No Issues.																							
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ENVIRO	No Issues																							
SECURITY	Permit SPCCAN 2-07-0041 Expires 8/31/2027																							
CLOIS REAL PROP	No Issues																							
CLOIS ENV																								

HERMANSON, SCOTT D CTR USSF AFSPC CLOIS/ASRCC

From: Jonnet, Mark <Mark.Jonnet@tetrattech.com>
Sent: Thursday, July 2, 2020 8:09 AM
To: Cape Canaveral CLOIS Work Management
Subject: [Non-DoD Source] FW: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL RE: LC34 Pedestal AF 332, AF103 SUBMISSION
Attachments: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL.pdf; af103_rev_20200702_LC34_Pedestal.pdf

Attached is the AF103 requested below along with the approved AF332. Please let me know if any additional info is needed. Thank you.

From: Cape Canaveral CLOIS Work Management <workmgt@us.af.mil>
Sent: Wednesday, July 1, 2020 12:53 PM
To: Jonnet, Mark <Mark.Jonnet@tetrattech.com>; Cape Canaveral CLOIS Work Management <workmgt@us.af.mil>
Subject: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL RE: LC34 Pedestal AF 332

Mark,
The attached 332 has been approved for coordination, 103 required.

*Please read and comply to all remarks made by reviewers written on 332, within the comment section and email direction attached to this package. 103 submissions and reviewer contact request can be sent to workmgt@us.af.mil Real Property, facility, Space Allocation requirements, 1354's etc., will need to be sent to 45CES.CLOIS.AssetManagement@us.af.mil

Thank you,

Tom Jenkins
CLOIS EDC/WM
R&D, Rm 120A
321-476-4358

From: Jonnet, Mark <Mark.Jonnet@tetrattech.com>
Sent: Tuesday, June 23, 2020 12:57 PM
To: Cape Canaveral CLOIS Work Management <workmgt@us.af.mil>
Subject: [Non-DoD Source] LC34 Pedestal AF 332

Attached is the signed AF 332 for the work that is planned on the pedestal at LC34, please let me know if you need any additional information for the weekly review meeting. Thank you.

Mark J Jonnet | Project Manager
Direct +1 (412) 921-8622 | Business +1 (412) 921-7090 | Mark.Jonnet@tetrattech.com

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Foster Plaza VII, Pittsburgh, PA 15220 | tetrattech.com

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HERMANSON, SCOTT D CTR USSF AFSPC CLOIS/ASRCC

From: LORENZ, LOREN M GS-12 USSF AFSPC AFCEC/CZO
Sent: Thursday, July 2, 2020 8:35 AM
To: Cape Canaveral CLOIS Work Management
Cc: LANGETT, JOHN M GS-13 USAF AFCEC AFCEC/CZOE
Subject: RE: 103 REQUEST FW: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL
RE: LC34 Pedestal AF 332, AF103 SUBMISSION
Signed By: loren.lorenz.1@us.af.mil

Hi Scott,

This is a NASA Environmental remediation project and there are no known IRP concerns.

Thanks,

Loren

//SIGNED//

Loren M. Lorenz, DAF
Project Manager
Patrick Installation Support Section
Air Force Civil Engineer Center (AFCEC/CZOE)
(321) 494-5221 (Desk) (DSN 854)
(321) 536-4759 (Mobile)
Loren.Lorenz.1@us.af.mil

From: Cape Canaveral CLOIS Work Management <workmgt@us.af.mil>
Sent: Thursday, July 2, 2020 8:26 AM
To: LONG, EVA M CIV USSF SPOC 45 CES/CEIE <eva.long@us.af.mil>; STAHL, PATRICK W GS-12 USSF SPOC 45 CES/CEIE <patrick.stahl.1@us.af.mil>; AMOS, GARRY J JR CTR USSF SPOC 45 CES/PatrickF2F <garry.amos.ctr@us.af.mil>; MAY, DARREN C CTR USSF SPOC 45 CES/PatrickF2F <darren.may.ctr@us.af.mil>; BLAYLOCK, MICHAEL A GS-13 USSF SPOC 45 CES/CEIE <michael.blaylock.4@us.af.mil>; PATEN, JONTA L CTR USSF AFSPC WSI 001/FEMS <jonta.paten.1.ctr@us.af.mil>; LORENZ, LOREN M GS-12 USSF AFSPC AFCEC/CZO <loren.lorenz.1@us.af.mil>; LANGETT, JOHN M GS-13 USAF AFCEC AFCEC/CZOE <john.langett.1@us.af.mil>; RUSCITTI, ROBERT V GS-11 USSF SPOC 45 SFS/S5SE <robert.ruscitti.1@us.af.mil>; COX, JAMES A GS-12 USSF SPOC 45 SW/SEG <james.cox.47@us.af.mil>; LEECH, TIMOTHY C GS-12 USSF SPOC 45 CES/CENPL <timothy.leech@us.af.mil>; CREIGHTON, EDWARD W III CTR USSF AFSPC E-LTRS/COMM <edward.creighton.ctr@us.af.mil>; WILLIAMS, REUBEN E CTR USSF AFSPC E-LTRS/RGN/COMM <reuben.williams.ctr@us.af.mil>; MANDEL, RACHEL N CTR USSF SPOC 45 CES/CEI <rachel.mandel.1.ctr@us.af.mil>
Subject: 103 REQUEST FW: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL RE: LC34 Pedestal AF 332, AF103 SUBMISSION

103 request requires approval

Scott Hermanson
CLOIS EDC / Work Management
RD120A
476-4357

HERMANSON, SCOTT D CTR USSF AFSPC CLOIS/ASRCC

From: RUSCITTI, ROBERT V GS-11 USSF SPOC 45 SFS/S5SE
Sent: Thursday, July 2, 2020 8:39 AM
To: Cape Canaveral CLOIS Work Management
Subject: RE: 103 REQUEST FW: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL
RE: LC34 Pedestal AF 332, AF103 SUBMISSION
Signed By: RUSCITTI.ROBERT.V.1080409660

Security is good with this

From: Cape Canaveral CLOIS Work Management <workmgt@us.af.mil>
Sent: Thursday, July 2, 2020 8:26 AM
To: LONG, EVA M CIV USSF SPOC 45 CES/CEIE <eva.long@us.af.mil>; STAHL, PATRICK W GS-12 USSF SPOC 45 CES/CEIE <patrick.stahl.1@us.af.mil>; AMOS, GARRY J JR CTR USSF SPOC 45 CES/PatrickF2F <garry.amos.ctr@us.af.mil>; MAY, DARREN C CTR USSF SPOC 45 CES/PatrickF2F <darren.may.ctr@us.af.mil>; BLAYLOCK, MICHAEL A GS-13 USSF SPOC 45 CES/CEIE <michael.blaylock.4@us.af.mil>; PATEN, JONTA L CTR USSF AFSPC WSI 001/FEMS <jonta.paten.1.ctr@us.af.mil>; LORENZ, LOREN M GS-12 USSF AFSPC AFCEC/CZO <loren.lorenz.1@us.af.mil>; LANGETT, JOHN M GS-13 USAF AFCEC AFCEC/CZOE <john.langett.1@us.af.mil>; RUSCITTI, ROBERT V GS-11 USSF SPOC 45 SFS/S5SE <robert.ruscitti.1@us.af.mil>; COX, JAMES A GS-12 USSF SPOC 45 SW/SEG <james.cox.47@us.af.mil>; LEECH, TIMOTHY C GS-12 USSF SPOC 45 CES/CENPL <timothy.leech@us.af.mil>; CREIGHTON, EDWARD W III CTR USSF AFSPC E-LTRS/COMM <edward.creighton.ctr@us.af.mil>; WILLIAMS, REUBEN E CTR USSF AFSPC E-LTRS/RGN/COMM <reuben.williams.ctr@us.af.mil>; MANDEL, RACHEL N CTR USSF SPOC 45 CES/CEI <rachel.mandel.1.ctr@us.af.mil>
Subject: 103 REQUEST FW: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL RE: LC34 Pedestal AF 332, AF103 SUBMISSION

103 request requires approval

Scott Hermanson
CLOIS EDC / Work Management
RD120A
476-4357

From: Jonnet, Mark <Mark.Jonnet@tetrattech.com>
Sent: Thursday, July 2, 2020 8:09 AM
To: Cape Canaveral CLOIS Work Management <workmgt@us.af.mil>
Subject: [Non-DoD Source] FW: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL RE: LC34 Pedestal AF 332, AF103 SUBMISSION

Attached is the AF103 requested below along with the approved AF332. Please let me know if any additional info is needed. Thank you.

From: Cape Canaveral CLOIS Work Management <workmgt@us.af.mil>
Sent: Wednesday, July 1, 2020 12:53 PM
To: Jonnet, Mark <Mark.Jonnet@tetrattech.com>; Cape Canaveral CLOIS Work Management <workmgt@us.af.mil>
Subject: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL RE: LC34 Pedestal AF 332

Mark,
The attached 332 has been approved for coordination, 103 required.

BASE CIVIL ENGINEERING WORK CLEARANCE REQUEST <i>(See Instructions on Reverse)</i>		DATE PREPARED 20200702	
1. Clearance is requested to proceed with work at <u>Launch Complex 34 - Remove Steel Elements from Launch Pedestal</u>			
on Work Order No. <u>30251109</u> , Contract No. <u>80KSC019F0067</u> , involving excavation or utility disturbance per attached sketch. This area <input type="checkbox"/> has <input checked="" type="checkbox"/> has not been staked or clearly marked.			
2. TYPE OF FACILITY/WORK INVOLVED			
<input type="checkbox"/> A. PAVEMENTS <input type="checkbox"/> D. FIRE DETECTION & PROTECTION SYSTEMS <input type="checkbox"/> G. AIRCRAFT OR VEHICULAR TRAFFIC FLOW <input type="checkbox"/> B. DRAINAGE SYSTEMS <input type="checkbox"/> E. UTILITY <input type="checkbox"/> OVERHEAD <input type="checkbox"/> UNDERGROUND <input type="checkbox"/> H. SECURITY <input type="checkbox"/> C. RAILROAD TRACKS <input type="checkbox"/> F. COMM <input type="checkbox"/> OVERHEAD <input type="checkbox"/> UNDERGROUND <input type="checkbox"/> I. OTHER			
3. DATE CLEARANCE REQUIRED 20200713		4. DATE OF CLEARANCE	
5. SIGNATURE OF REQUESTING OFFICIAL Mark Jonnet <small>Digitally signed by Mark Jonnet Date: 2020.07.02 08:05:37 -0400'</small>		6. TELEPHONE NO. (412) 921-8622	
7. ORGANIZATION Tetra Tech (Contractor)			
ORGANIZATION	REMARKS <i>(Use Reverse for additional comments)</i>	REVIEWER'S NAME AND INITIALS	
B B A S E C I V I L E N G I N E R I N G	A. ELECTRICAL DISTRIBUTION	Click to sign	
	B. STEAM DISTRIBUTION	Click to sign	
	C. WATER DISTRIBUTION	Click to sign	
	D. POL DISTRIBUTION	Click to sign	
	E. SEWER DISTRIBUTION	Click to sign	
	F. ENVIRONMENTAL	Click to sign	
	G. PAVEMENTS/ GROUNDS	Click to sign	
	H. FIRE PROTECTION	If welding is required, send request to Cape Support 24 hours prior to the desired start date. Fire inspection required.	PATEN JONTA L1102856258 <small>Digitally signed by PATEN JONTA L1102856258 Date: 2020.07.02 09:05:19 -0400'</small>
	I. ZONE _____	Click to sign	
	J. OTHER <i>(Specify)</i>	Click to sign	
9. SECURITY POLICE		Click to sign	
10. SAFETY		Click to sign	
11. COMMUNICATIONS		Click to sign	
12. BASE OPERATIONS		Click to sign	
13. CABLE TV		Click to sign	
14. COMMERCIAL UTILITY COMPANY <input type="checkbox"/> TELEPHONE <input type="checkbox"/> GAS <input type="checkbox"/> ELECTRIC		Click to sign	
15. OTHER <i>(Specify)</i>			
16. REQUESTED CLEARANCE <input type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED			
17. TYPED NAME AND SIGNATURE OF APPROVING OFFICER <i>(Chief of Operations Flight or Chief of Engineering Flight)</i> Click to sign		17a. DATE SIGNED	

BASE CIVIL ENGINEERING WORK CLEARANCE REQUEST <i>(See Instructions on Reverse)</i>		DATE PREPARED 20200702	
1. Clearance is requested to proceed with work at <u>Launch Complex 34 - Remove Steel Elements from Launch Pedestal</u>			
on Work Order No. <u>30251109</u> , Contract No. <u>80KSC019F0067</u> , involving excavation or utility disturbance per attached sketch. This area <input type="checkbox"/> has <input checked="" type="checkbox"/> has not been staked or clearly marked.			
2. TYPE OF FACILITY/WORK INVOLVED			
<input type="checkbox"/> A. PAVEMENTS <input type="checkbox"/> D. FIRE DETECTION & PROTECTION SYSTEMS <input type="checkbox"/> G. AIRCRAFT OR VEHICULAR TRAFFIC FLOW <input type="checkbox"/> B. DRAINAGE SYSTEMS <input type="checkbox"/> E. UTILITY <input type="checkbox"/> OVERHEAD <input type="checkbox"/> UNDERGROUND <input type="checkbox"/> H. SECURITY <input type="checkbox"/> C. RAILROAD TRACKS <input type="checkbox"/> F. COMM <input type="checkbox"/> OVERHEAD <input type="checkbox"/> UNDERGROUND <input type="checkbox"/> I. OTHER			
3. DATE CLEARANCE REQUIRED 20200713		4. DATE OF CLEARANCE	
5. SIGNATURE OF REQUESTING OFFICIAL Mark Jonnet <small>Digitally signed by Mark Jonnet Date: 2020.07.02 08:05:37 -0400'</small>		6. TELEPHONE NO. (412) 921-8622	
		7. ORGANIZATION Tetra Tech (Contractor)	
ORGANIZATION REMARKS (Use Reverse for additional comments) REVIEWER'S NAME AND INITIALS			
B A S E C I V I L E N G I N E E R I N G	A. ELECTRICAL DISTRIBUTION		Click to sign
	B. STEAM DISTRIBUTION		Click to sign
	C. WATER DISTRIBUTION		Click to sign
	D. POL DISTRIBUTION		Click to sign
	E. SEWER DISTRIBUTION		Click to sign
	F. ENVIRONMENTAL		Click to sign
	G. PAVEMENTS/ GROUNDS		Click to sign
	H. FIRE PROTECTION		Click to sign
	I. ZONE _____		Click to sign
	J. OTHER (Specify)		Click to sign
9. SECURITY POLICE			Click to sign
10. SAFETY			Click to sign
11. COMMUNICATIONS		CALL FOR COMM, LOCATES 853-2141	<small>CREIGHTON EDWARD W III 1192223167 <small>Digitally signed by CREIGHTON EDWARD W III Date: 2020.07.02 13:21:08 -0400'</small></small>
12. BASE OPERATIONS			Click to sign
13. CABLE TV			Click to sign
14. COMMERCIAL UTILITY COMPANY			Click to sign
<input type="checkbox"/> TELEPHONE <input type="checkbox"/> GAS <input type="checkbox"/> ELECTRIC			Click to sign
15. OTHER (Specify)			
16. REQUESTED CLEARANCE		<input type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED	
17. TYPED NAME AND SIGNATURE OF APPROVING OFFICER (Chief of Operations Flight or Chief of Engineering Flight)		17a. DATE SIGNED	
Click to sign			

HERMANSON, SCOTT D CTR USSF AFSPC CLOIS/ASRCC

From: MANDEL, RACHEL N CTR USSF SPOC 45 CES/CEI
Sent: Thursday, July 2, 2020 1:31 PM
To: Cape Canaveral CLOIS Work Management
Subject: RE: 103 REQUEST FW: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL
RE: LC34 Pedestal AF 332, AF103 SUBMISSION
Signed By: rachel.mandel.1.ctr@us.af.mil

Natural resources survey required to look at area fence will be installed.

Rachel Mandel
Fish & Wildlife Biologist
US Fish & Wildlife Service
Environmental Conservation
45 CES/CEIE
(321) 853-6642 (desk)
(850) 348-6742 (mobile)
Rachel.mandel.1.ctr@us.af.mil
Rachel_mandel@fws.gov

From: Cape Canaveral CLOIS Work Management <workmgt@us.af.mil>
Sent: Thursday, July 2, 2020 8:26 AM
To: LONG, EVA M CIV USSF SPOC 45 CES/CEIE <eva.long@us.af.mil>; STAHL, PATRICK W GS-12 USSF SPOC 45 CES/CEIE <patrick.stahl.1@us.af.mil>; AMOS, GARRY J JR CTR USSF SPOC 45 CES/PatrickF2F <garry.amos.ctr@us.af.mil>; MAY, DARREN C CTR USSF SPOC 45 CES/PatrickF2F <darren.may.ctr@us.af.mil>; BLAYLOCK, MICHAEL A GS-13 USSF SPOC 45 CES/CEIE <michael.blaylock.4@us.af.mil>; PATEN, JONTA L CTR USSF AFSPC WSI 001/FEMS <jonta.paten.1.ctr@us.af.mil>; LORENZ, LOREN M GS-12 USSF AFSPC AFCEC/CZO <loren.lorenz.1@us.af.mil>; LANGETT, JOHN M GS-13 USAF AFCEC AFCEC/CZOE <john.langett.1@us.af.mil>; RUSCITTI, ROBERT V GS-11 USSF SPOC 45 SFS/S5SE <robert.ruscitti.1@us.af.mil>; COX, JAMES A GS-12 USSF SPOC 45 SW/SEG <james.cox.47@us.af.mil>; LEECH, TIMOTHY C GS-12 USSF SPOC 45 CES/CENPL <timothy.leech@us.af.mil>; CREIGHTON, EDWARD W III CTR USSF AFSPC E-LTRS/COMM <edward.creighton.ctr@us.af.mil>; WILLIAMS, REUBEN E CTR USSF AFSPC E-LTRS/RGN/COMM <reuben.williams.ctr@us.af.mil>; MANDEL, RACHEL N CTR USSF SPOC 45 CES/CEI <rachel.mandel.1.ctr@us.af.mil>
Subject: 103 REQUEST FW: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL RE: LC34 Pedestal AF 332, AF103 SUBMISSION

103 request requires approval

Scott Hermanson
CLOIS EDC / Work Management
RD120A
476-4357

From: Jonnet, Mark <Mark.Jonnet@tetrattech.com>
Sent: Thursday, July 2, 2020 8:09 AM
To: Cape Canaveral CLOIS Work Management <workmgt@us.af.mil>

BASE CIVIL ENGINEERING WORK CLEARANCE REQUEST <i>(See Instructions on Reverse)</i>		DATE PREPARED 20200702
1. Clearance is requested to proceed with work at <u>Launch Complex 34 - Remove Steel Elements from Launch Pedestal</u>		
on Work Order No. <u>30251109</u> , Contract No. <u>80KSC019F0067</u> , involving excavation or utility disturbance per attached sketch. This area <input type="checkbox"/> has <input checked="" type="checkbox"/> has not been staked or clearly marked.		
2. TYPE OF FACILITY/WORK INVOLVED		
<input type="checkbox"/> A. PAVEMENTS <input type="checkbox"/> D. FIRE DETECTION & PROTECTION SYSTEMS <input type="checkbox"/> G. AIRCRAFT OR VEHICULAR TRAFFIC FLOW <input type="checkbox"/> B. DRAINAGE SYSTEMS <input type="checkbox"/> E. UTILITY <input type="checkbox"/> OVERHEAD <input type="checkbox"/> UNDERGROUND <input type="checkbox"/> H. SECURITY <input type="checkbox"/> C. RAILROAD TRACKS <input type="checkbox"/> F. COMM <input type="checkbox"/> OVERHEAD <input type="checkbox"/> UNDERGROUND <input type="checkbox"/> I. OTHER		
3. DATE CLEARANCE REQUIRED 20200713		4. DATE OF CLEARANCE
5. SIGNATURE OF REQUESTING OFFICIAL Mark Jonnet <small>Digitally signed by Mark Jonnet Date: 2020.07.02 08:05:37 -0400'</small>		6. TELEPHONE NO. (412) 921-8622
7. ORGANIZATION Tetra Tech (Contractor)		
ORGANIZATION	REMARKS <i>(Use Reverse for additional comments)</i>	REVIEWER'S NAME AND INITIALS
B B A S E C I V I L E N G I N E E R I N G	A. ELECTRICAL DISTRIBUTION	Click to sign
	B. STEAM DISTRIBUTION	Click to sign
	C. WATER DISTRIBUTION	Click to sign
	D. POL DISTRIBUTION	Click to sign
	E. SEWER DISTRIBUTION	Click to sign
	F. ENVIRONMENTAL	Click to sign
	G. PAVEMENTS/ GROUNDS	Click to sign
	H. FIRE PROTECTION	Click to sign
	I. ZONE _____	Click to sign
	J. OTHER <i>(Specify)</i>	Click to sign
9. SECURITY POLICE		Click to sign
10. SAFETY	No Issues.	COX, JAMES A. 1053248124 <small>Digitally signed by COX, JAMES A. 1053248124 Date: 2020.07.02 13:40:48 -0400'</small>
11. COMMUNICATIONS		Click to sign
12. BASE OPERATIONS		Click to sign
13. CABLE TV		Click to sign
14. COMMERCIAL UTILITY COMPANY <input type="checkbox"/> TELEPHONE <input type="checkbox"/> GAS <input type="checkbox"/> ELECTRIC		Click to sign
15. OTHER <i>(Specify)</i>		
16. REQUESTED CLEARANCE <input type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED		
17. TYPED NAME AND SIGNATURE OF APPROVING OFFICER <i>(Chief of Operations Flight or Chief of Engineering Flight)</i> Click to sign		17a. DATE SIGNED

HERMANSON, SCOTT D CTR USSF AFSPC CLOIS/ASRCC

From: LEECH, TIMOTHY C GS-12 USSF SPOC 45 CES/CENPL
Sent: Monday, July 13, 2020 4:43 PM
To: Cape Canaveral CLOIS Work Management
Subject: RE: 103 REQUEST FW: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL
RE: LC34 Pedestal AF 332, AF103 SUBMISSION
Signed By: timothy.leech@us.af.mil

Scott,

No site plan required.

Tim Leech
45 CES/CENPL
Community Planner
Cape Canaveral Air Force Station
321 853-0963
DSN 467-0963

From: Cape Canaveral CLOIS Work Management <workmgt@us.af.mil>
Sent: Thursday, July 2, 2020 8:26 AM
To: LONG, EVA M CIV USSF SPOC 45 CES/CEIE <eva.long@us.af.mil>; STAHL, PATRICK W GS-12 USSF SPOC 45 CES/CEIE <patrick.stahl.1@us.af.mil>; AMOS, GARRY J JR CTR USSF SPOC 45 CES/PatrickF2F <garry.amos.ctr@us.af.mil>; MAY, DARREN C CTR USSF SPOC 45 CES/PatrickF2F <darren.may.ctr@us.af.mil>; BLAYLOCK, MICHAEL A GS-13 USSF SPOC 45 CES/CEIE <michael.blaylock.4@us.af.mil>; PATEN, JONTA L CTR USSF AFSPC WSI 001/FEMS <jonta.paten.1.ctr@us.af.mil>; LORENZ, LOREN M GS-12 USSF AFSPC AFCEC/CZO <loren.lorenz.1@us.af.mil>; LANGETT, JOHN M GS-13 USAF AFCEC AFCEC/CZOE <john.langett.1@us.af.mil>; RUSCITTI, ROBERT V GS-11 USSF SPOC 45 SFS/S5SE <robert.ruscitti.1@us.af.mil>; COX, JAMES A GS-12 USSF SPOC 45 SW/SEG <james.cox.47@us.af.mil>; LEECH, TIMOTHY C GS-12 USSF SPOC 45 CES/CENPL <timothy.leech@us.af.mil>; CREIGHTON, EDWARD W III CTR USSF AFSPC E-LTRS/COMM <edward.creighton.ctr@us.af.mil>; WILLIAMS, REUBEN E CTR USSF AFSPC E-LTRS/RGN/COMM <reuben.williams.ctr@us.af.mil>; MANDEL, RACHEL N CTR USSF SPOC 45 CES/CEI <rachel.mandel.1.ctr@us.af.mil>
Subject: 103 REQUEST FW: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL RE: LC34 Pedestal AF 332, AF103 SUBMISSION

103 request requires approval

Scott Hermanson
CLOIS EDC / Work Management
RD120A
476-4357

From: Jonnet, Mark <Mark.Jonnet@tetrattech.com>
Sent: Thursday, July 2, 2020 8:09 AM
To: Cape Canaveral CLOIS Work Management <workmgt@us.af.mil>
Subject: [Non-DoD Source] FW: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL RE: LC34 Pedestal AF 332, AF103 SUBMISSION

Attached is the AF103 requested below along with the approved AF332. Please let me know if any additional info is needed. Thank you.

HERMANSON, SCOTT D CTR USSF AFSPC CLOIS/ASRCC

From: BLAYLOCK, MICHAEL A GS-13 USSF SPOC 45 CES/CEIE
Sent: Friday, July 24, 2020 10:26 AM
To: HERMANSON, SCOTT D CTR USSF AFSPC CLOIS/ASRCC
Cc: LONG, EVA M CIV USSF SPOC 45 CES/CEIE; OBRYAN, CECIL D JR GS-14 USSF SPOC 45 CES/CEZ; Mark.Jonnet@tetrattech.com; Deliz, Michael J. (KSC-SIE20)
Subject: FW: 103 REQUEST FW: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL RE: LC34 Pedestal AF 332, AF103 SUBMISSION
Signed By: michael.blaylock.4@us.af.mil

Hi Scott,

Environmental approves this 103 to move forward. Cecil is arranging for CLOIS to be able to accept two small approximately 2ft x 2ft pieces of the torus ring to be cleaned and turn over to the museum.

Mark,

Once Cecil has the CLOIS POC that will accept the two pieces, we'll send the contact info to you.

Thanks

v/r

Mike

Michael Blaylock

Chief, Environmental Conservation

45 CES/CEIE-Cape

WP 321-853-0964 DSN 467-0964

CP 321-292-1503

From: LONG, EVA M CIV USSF SPOC 45 CES/CEIE <eva.long@us.af.mil>
Sent: Wednesday, July 22, 2020 4:47 PM
To: BLAYLOCK, MICHAEL A GS-13 USSF SPOC 45 CES/CEIE <michael.blaylock.4@us.af.mil>
Subject: FW: 103 REQUEST FW: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL RE: LC34 Pedestal AF 332, AF103 SUBMISSION

Mike, if you get an answer to this tomorrow while I'm out, can you send an email to Scott Hermanson and Mark Jonnet and tell them what you want to say about the artifact and approve the AF103?

There are no other env conditions – compliance understands that NASA is handling the transport and disposal of the waste and are fine with it.

Thank you. -- e

From: Jonnet, Mark <Mark.Jonnet@tetrattech.com>
Sent: Wednesday, July 22, 2020 12:09 PM
To: LONG, EVA M CIV USSF SPOC 45 CES/CEIE <eva.long@us.af.mil>
Cc: HERMANSON, SCOTT D CTR USSF AFSPC CLOIS/ASRCC <scott.hermanson.ctr@us.af.mil>
Subject: [Non-DoD Source] RE: 103 REQUEST FW: 30251109 332 RMV STEEL ELEMENTS FROM LAUNCH PEDESTAL RE: LC34 Pedestal AF 332, AF103 SUBMISSION

Excellent, thank you and stay safe during these crazy times we find ourselves in...

**B.4 LAUNCH PEDESTAL HAZARD ABATEMENT MEMORANDUM OF
AGREEMENT**

**MEMORANDUM OF AGREEMENT (MOA)
BETWEEN THE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AND THE
FLORIDA STATE HISTORIC PRESERVATION OFFICER
REGARDING THE
LAUNCH PEDESTAL HAZARD ABATEMENT
AT LAUNCH COMPLEX 34,
AT THE
CAPE CANAVERAL AIR FORCE STATION**

WHEREAS, the National Aeronautics and Space Administration (NASA) John F. Kennedy Space Center (KSC) plans to carry out the proposed hazard abatement undertaking (See Attachment 1) pursuant to Section 800.14 of the regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act (NHPA), as amended; and

WHEREAS, NASA KSC will support contract activities for removal of steel elements that are contaminated with polychlorinated biphenyls (PCBs) from atop the Launch Complex 34 (LC-34) Launch Pedestal, a contributing structure located in the Cape Canaveral Air Force Station (CCAFS) National Historic Landmark (NHL) District. The structure has been abandoned for operations since 1973, and in accordance with the United States Air Force (USAF) Use Permit number SPCCAN 02-07-0041, the demolition of steel elements will reduce safety and environmental hazards present at the Launch Pedestal site; and

WHEREAS, NASA KSC has defined the undertaking's area of potential effects (APE) as the LC-34 Launch Pad area, in which currently only the Launch Pedestal, historical site kiosk, and wall from the support building for the former umbilical tower remain; and

WHEREAS, NASA KSC has determined that the undertaking may have an adverse effect on the CCAFS NHL District, which is listed in the National Register of Historic Places, and has consulted with the United States Air Force 45th Space Wing (45 SW), State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation (ACHP) (Attachment 2, ACHP Letter), and the Department of Interior, National Park Service (NPS) (Attachment 3, NPS Letter) pursuant to 36 CFR Part 800; and

WHEREAS, NASA KSC has contacted the North Brevard Historical Society, Spacewalk Hall of Fame, Brevard County Historical Commission, North Brevard Heritage Foundation, Air Force Space and Missile Museum, and the Apollo One Memorial Foundation regarding the effects of the undertaking on historic properties and received no comments regarding this MOA; and

WHEREAS, in accordance with 36 CFR § 800.6(a)(1), NASA KSC notified the ACHP of its adverse effect determination, and the ACHP has chosen *not to* participate in the consultation; and

NOW, THEREFORE, NASA KSC and the SHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

I. STIPULATIONS

NASA KSC and the SHPO stipulate that taken together the following measures will mitigate the adverse effect to the CCAFS NHL District:

- A. Previous surveys documenting the historical context of LC-34 were submitted to the SHPO for review and those surveys have been entered into and are on file in the Florida Master Site File (FMSF).
- B. A FMSF Historic Structure Forms for LC-34 is on file at the FMSF.
- C. The 45 SW has submitted to the SHPO, in electronic form, historic photographs for all the cultural resources within the APE acquired from the Brevard County Historic Commission archives, Florida Historical Society archives, National Archives and Records Administration, and/or the 45 SW History Office. These historic photographs are on file at the FMSF.
- D. A Historic American Engineering Record (HAER No. FL-8-6) has been completed for LC-34 and is on file with the FMSF and NPS.
- E. The 45 SW has submitted to the SHPO electronic copies of original construction drawings (as-builts drawings) for LC-34, which are on file at the FMSF.
- F. The Air Force Space and Missile Museum maintains an archive of hard copies of all as-built drawings for facilities on CCAFS, including LC-34.
- G. Both NASA KSC and the 45 SW have created electronic databases that include the historical data mentioned above. Historic photographs are also archived at NASA KSC and the 45 SW History Office.
- H. A high-definition laser scanning project was recently completed by the University of South Florida (USF) for several launch complexes at CCAFS, including LC-34. The images are accessible on a public website hosted by the Digital Heritage and Humanities Collections at USF (<https://dhhc.lib.usf.edu/project/cape-canaverall/>).
- I. NASA KSC will ensure that the following mitigation measure is completed: Digital photographs, following NPS Digital standards (https://www.nps.gov/subjects/nationalregister/upload/Photo_Policy_update_2013_05_15_508.pdf), will be taken of the LC-34 Launch Pedestal before commencing the hazard abatement project and after completion of this project, in order to document the physical changes that were made to the LC-34 Launch Pedestal. NASA KSC will provide electronic copies of these photographs to the SHPO and NPS for archival purposes.

II. TERM

This MOA becomes effective upon the date of the last signature below ("Commencement Date") and, unless sooner terminated as hereinafter provided, shall be effective until August 31, 2027. Prior to such time, NASA KSC may consult with the other signatories to reconsider the terms of the MOA and amend it in accordance with Section V, below.

III. MONITORING AND REPORTING

Each year following the execution of this MOA until it expires or is terminated, NASA KSC shall provide all parties to this MOA a summary report detailing work undertaken pursuant to its terms. Such report shall include any scheduling changes proposed, any problems encountered, and any disputes and objections received in NASA KSC's efforts to carry out the terms of this MOA.

IV. DISPUTE RESOLUTION

Should any signatory or concurring party to this MOA object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, NASA KSC shall consult with such party to resolve the objection. If NASA KSC determines that such objection cannot be resolved, NASA KSC will:

- A. Forward all documentation relevant to the dispute, including NASA KSC's proposed resolution, to the ACHP. Prior to reaching a final decision on the dispute, NASA KSC shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of the written response. NASA KSC will then proceed according to its final decision.
- B. If the ACHP does not provide its advice regarding the dispute within thirty (30) days, NASA KSC may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, NASA KSC shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to this MOA, and provide them and the ACHP with a copy of such written response.
- C. NASA KSC's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

V. AMENDMENTS

This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date signed by all of the signatories.

VI. TERMINATION

If any signatory to this MOA determines that it will not or cannot carry out any terms of the agreement, that party shall immediately consult with the other signatories to attempt to develop an amendment per Section V, above. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate this MOA upon written notification to the other signatories.

Once the MOA is terminated, and prior to work continuing on the undertaking, NASA KSC must either (a) execute an MOA pursuant to 36 CFR § 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. NASA KSC must notify the signatories as to the course of action it will pursue.

Execution of this MOA by NASA KSC and SHPO and implementation of its terms evidence that NASA KSC has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

SIGNATORIES:

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JOHN F. KENNEDY SPACE CENTER

By: **ROBERT CABANA** Digitally signed by ROBERT CABANA
Date: 2020.03.23 15:02:19 -04'00'

Robert D. Cabana
Director

DATE

FLORIDA STATE HISTORIC PRESERVATION OFFICE

By:  3/18/2020

Timothy Parsons
Florida State Historic Preservation Officer

DATE

CONCURRING PARTY:

NATIONAL PARK SERVICE

By: See Next Page for Concurrence

Robert Vogel
National Park Service Regional Director

DATE

ATTACHMENT 1

National Aeronautics and Space Administration, Kennedy Space Center Letter

National Aeronautics and Space Administration
Kennedy Space Center
Kennedy Space Center, FL 32899



November 26, 2019

Reply to: AM-10
SI-F-3

Jason Aldridge
Florida Division of Historical Resources
& State Historic Preservation Officer
500 S. Bronough Street
R. A. Gray Building
Tallahassee, Florida 32399-0250

Subject: Launch Pedestal Hazard Abatement at Launch Complex 34 (LC-34), Kennedy Space Center, Florida

The National Aeronautics and Space Administration's Kennedy Space Center (NASA KSC) sent a National Historic Preservation Act (NHPA) Section 106 Consultation letter to your office on October 28, 2019, (dated October 25, 2019) concerning a hazard abatement project at LC-34. Following additional conversations with the Advisory Council on Historic Preservation (ACHP), Florida State Historic Preservation Officer (FL SHPO), and National Park Service (NPS), NASA KSC wishes to revise and resubmit the Section 106 Consultation letter to better meet requirements in 36 CFR Part 800, "Protection of Historic Properties."

NASA KSC has determined that Area of Potential Effect (APE) for this project is the LC-34 Launch Pad area, in which currently only the Launch Pedestal, historical site kiosk, and wall from the support building for the former umbilical tower remain (see Figure 1). The LC-34 flame deflectors and memorial benches for the Apollo 1 astronauts are located on separate concrete platforms adjacent to the Launch Pad.

LC-34 is currently owned by the United States Air Force (USAF) 45th Space Wing (45 SW). The LC-34 Land Use Permit, which was issued and signed by the USAF for environmental remediation purposes, states that "the Grantee [NASA KSC] shall be responsible for adhering to all Federal agency requirements mandated in Sections 106 and 110 of the NHPA" and "[i]f the Grantee propose to take any action that would be considered an adverse effect to the historic property, the Grantee will notify the Grantor [45 SW] and conduct formal consultation with the Florida State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP) and the National Park Service (NPS)." Therefore, NASA KSC has assumed responsibility as the lead Federal agency for all Section 106 and 110 reviews prompted by environmental remediation projects at LC-34.

ATTACHMENT 1 (Continued)

National Aeronautics and Space Administration, Kennedy Space Center Letter

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Identification of Historic Properties

LC-34 was identified as a historic property in The National Park Service's Man in Space reconnaissance survey of 1981 and is a contributing element to the Cape Canaveral Air Force Station (CCAFS) National Historic Landmark (NHL) District designated in 1984. It is currently listed in the Florida Master Site File (FMSF) as site number 8BR216. A Historic American Engineering Record was conducted in 2003 by Archaeological Consultants, Inc. (Reference *JIAER No. FL-8-6*). The FL SHPO concurred in 2009 that the LC-34 Resource Group (8BR2279) and 21 individual structures associated with it (8BR2280-2300) appear to meet the criteria for listing in the National Register under Criteria A for Military and Criteria C for Engineering (Reference *DHR Project File Number: 2008-6613*).

The LC-34 Launch Pad and associated facilities were constructed between 1959 and 1961 and were used by NASA's Apollo Program to launch Saturn rockets from 1961 to 1968 (see Figures 2 and 3). LC-34 was deactivated in 1969 and mothballed in 1971. Most of the operational equipment, including the service structure, fuel storage tanks, piping, was dismantled and removed in 1972. The majority of buildings and structures remaining on-site were abandoned-in-place in 1973. LC-34 has remained largely inactive throughout the years, although several site features that were abandoned-in-place are still present (e.g., Blockhouse, camera pad, etc.). The Launch Pedestal, located in the center of the launch pad, was one of the structures that was abandoned-in-place. LC-34 remains significant because of its role in the early American space program, and also because it serves as a memorial for the three Apollo 1 astronauts, Roger B. Chaffee, Virgil I. "Gus" Grissom, and Edward H. White II, who lost their lives in a capsule fire on the LC-34 launch pad during a launch rehearsal test on January 27, 1967.

Affected Historic Properties

As stated above, the APE consists of the LC-34 Launch Pad area. The Launch Pedestal is the only contributing resource located within the APE. The main structure of the Launch Pedestal stands at 42 feet by 42 feet in area with a height of 27 feet and is constructed of reinforced concrete encased with 3/8" coated steel liner plates along the flame-contact faces. Most of the auxiliary steel structures associated with the Launch Pedestal, such as the launch tower and access stairs, were previously dismantled and removed. The steel liner plates, torus ring and supports, deluge piping, and miscellaneous embedded steel items still remain on the structure and are in various stages of degradation.

Description of the Undertaking

The NASA KSC Remediation Projects team proposes to conduct limited hazard abatement on the Launch Pedestal at LC-34. This hazard abatement will consist of removing from the Pedestal the source of polychlorinated biphenyls (PCBs), which is a human health risk and a continuing source of environmental contamination. The steel elements proposed to be removed are located atop the Launch Pedestal and consist of a torus ring; feed pipe; down pipes; pipe straps and shields; cover plates; railing support steel; and bearing ring plates and bolts (see Figure 4). The rest of the Launch Pedestal will remain unchanged and in place (see Figures 5 and 6). No corrosion control measures (e.g., painting) or other modifications are proposed for the rest of the Pedestal.

ATTACHMENT 1 (Continued)

National Aeronautics and Space Administration, Kennedy Space Center Letter

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In the 1990s, a restoration project was conducted in an effort to protect steel components from weathering (see Figure 7). However, the highly corrosive nature of LC-34's marine coastal environment has continued to rapidly degrade the remaining steel components on the Launch Pedestal. In addition to the environmental setting, the typical design service life for stainless steel pipe ranges from 20-50 years depending on the service environment, which in this case has also included extreme heat from Saturn rocket launches.

Recent environmental sampling in the local vicinity of the Launch Pedestal identified soils contaminated with PCBs at concentrations greater than the Florida Department of Environmental Protection (FDEP) Residential Soil Cleanup Target Level (RSCTL) of 0.5 milligrams per kilogram (mg/kg). Historically, paints used on launch complex structures contained PCBs due to their heat resistant properties. Based on the suspected presence of residual PCB-laden paint on the Launch Pedestal, samples were collected from the Launch Pedestal on two separate occasions. In March 2018, samples were collected from debris on the top of the Launch Pedestal (e.g., steel plates and torus ring), then in February 2019, paint samples were collected from each of the 56 steel liner panels on the underside (ceiling and inner ring) and from legs of the Launch Pedestal. All samples were tested for PCBs, and the results are shown in the table below:

Sample Location	Sample Date	Number of Samples	PCB Concentrations (mg/kg)		FDEP Cleanup Level (mg/kg)
			Minimum	Maximum	
Ceiling	Feb-19	20	Non-detect	0.08	0.5
Inner Ring	Feb-19	20	0.04	0.51	0.5
Legs	Feb-19	16	Non-detect	0.34	0.5
Top (Debris)	Mar-18	14	5.6	6,200	0.5

Sample results show that paint from the steel liner plates on the underside (ceiling and inner ring) and the legs of the Launch Pedestal met the FDEP's cleanup level of 0.5 mg/kg. However, debris recovered from the topside of the Launch Pedestal had PCB results well above FDEP's cleanup level of 0.5 mg/kg, with a maximum result of 6,200 mg/kg (see last line in the table above). This shows that the residual paint on the steel components on the topside of the pedestal is a human health risk and a continuing source of environmental contamination.

Following the March 2018 sampling event, the debris from the topside of the Launch Pedestal was collected, placed in a drum, and properly disposed of off-site. However, the steel and paint continue to degrade and create debris that poses a human health risk from PCBs above regulatory cleanup criteria.

A photo showing the debris accumulated on the topside of the Launch Pedestal before cleanup in March 2018 is shown as Figure 8. The photo in Figure 4 shows the condition of the topside of the Launch Pedestal after cleanup was complete.

In accordance with Section 110(f) of the NHPA and Standard 4 within the National Park Service's Section 110 guidelines, NASA KSC explored several different alternatives to address the PCB-laden paint on the Launch Pedestal. The following alternatives were considered:

1. Alternative #1: No action.

ATTACHMENT 1 (Continued)

National Aeronautics and Space Administration, Kennedy Space Center Letter

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This alternative presents significant human and environmental health risks since the hazardous debris on the Launch Pedestal will remain and continue to release PCBs, thereby exacerbating the contamination already present at the site. In addition, this alternative also poses a safety hazard in the vicinity of the Pedestal due to falling fragments from the degrading steel. LC-34 is an active and long-term environmental remediation site, with personnel working continually in the area, and in addition is a tour stop on KSC Visitor Complex and Cape Canaveral special tours. A crowd-control barrier currently surrounds it to prevent anyone from walking underneath because of the safety and human health hazards. If the steel elements are left in place, it is possible that the entire Launch Pedestal area will need to be barricaded. And a no-action alternative might cause further damage to the structural integrity of the Pedestal due to the level of degradation of these steel elements. Furthermore, this alternative is not consistent with the NASA KSC Remediation cleanup plan; NASA KSC is required by environmental regulations to conduct a cleanup action to remove PCB impacts to the surrounding environment.

2. Alternative #2: Corrosion control/painting

While this alternative can slow steel and paint degradation in the short term, in the long term it will not be sufficient to abate the structural damage to the Pedestal as well as the human and environmental health risks posed by this hazardous debris. Additionally, the falling fragments of degrading steel would continue to pose a safety hazard to visitors and employees, and would call for the continued use of the crowd-control barrier currently surrounding the Launch Pedestal. It is possible that the entire Launch Pad area would need to be barricaded due to potential safety risks. Furthermore, this alternative is not consistent with the NASA KSC Remediation cleanup plan and its associated environmental regulations.

3. Alternative #3: Removal of Launch Pedestal steel elements with PCB-laden paint.

This alternative poses the best long-term option to minimize human and environmental health risks associated with PCBs above regulatory cleanup criteria. Due to the significant state of degradation on the topside of the Pedestal, it is not possible to only remove the PCB-laden paint from the surfaces, and therefore the steel elements themselves need to be removed.

NASA KSC believes the unique nature of this projects calls for Alternative #3, Removal of launch pedestal steel elements with PCB-laden paint, as the most desirable alternative. While this alternative does not avoid the short-term adverse effect to the NHL, the risks posed by leaving the PCB-contaminated elements in place call for placing worker and visitor health and safety first and foremost above all other considerations. Additionally, this alternative will be the most prudent and beneficial alternative for the NHL in the long term, as it will prevent further damage to the overall structure (thereby strengthening its integrity) and will allow the area around the pedestal to remain freely-accessible for tours and special events, including annual Apollo 1 remembrance ceremonies for family members.

The overall approach is to remove all elements on the Launch Pedestal that have been identified as containing PCBs at concentrations that exceed FDEP's cleanup level of 0.5 mg/kg. This comprises all the steel elements from the topside of the Pedestal, including the torus ring, feed pipe, down pipes, railing support steel, and all remaining steel plating/bolts (see Figure 4). Because paint results from the steel liner plates on the underside (ceiling and inner ring) and legs

ATTACHMENT 1 (Continued)

National Aeronautics and Space Administration, Kennedy Space Center Letter

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of the pedestal do not exceed regulatory cleanup criteria, these are not included in the proposed hazard abatement project.

The technical approach for hazard abatement was developed based on a series of visual and physical inspections by licensed structural and civil engineers, as well as material sampling and testing. The sampling approach performed was used to minimize harm to the NHL, as results were used to only remove the steel elements from the Launch Pedestal that are necessary to mitigate risk to human health and the environment.

The following is a summary of proposed hazard abatement measures:

a. Anchor System

Due to the extent of corrosion on the steel liner panels on the underside of the Launch Pedestal, a structural analysis was performed to determine if the steel panels posed a risk to construction personnel that would be performing hazard abatement activities. The analysis determined that there was enough material loss in the ceiling plates and existing anchor system to validate structural integrity concerns. It was recommended that a supplemental anchor system be installed to protect construction personnel during hazard abatement activities. The design calls for a total of 26 (¼" x 8 ½") stainless steel, heavy duty screw anchors (Titan HD by Simpson Strong-tie), which will be installed in the 12 ceiling plates that surround the circular opening of the Launch Pedestal. Each anchor will have a ¼" thick by 2 ½" diameter stainless steel washer plate to increase the bearing surface, which will prevent additional damage to the existing plates due to point-loading from the anchors. Figure 9 shows the anchor system design.

The anchor system will be installed working from a scissor lift. A telehandler will be used to provide temporary bracing to each individual panel undergoing anchor installation. The installation steps for each anchor are as follows: (1) brace panel with telehandler tines; (2) install rotary hammer drill equipped with dust extraction system into overhead drill press; (3) measure and mark anchor installation location, 12" from the interior edge of the panel and equally spaced between the existing anchors; (4) pre-drill 5/16" diameter holes in the 1/4" liner plate using rotary hammer drill with metal cutting drill bit; (5) drill 3/4" diameter hole through the refractory concrete and into the structural concrete to a depth of 8 3/4" from the face of the liner plate using the rotary hammer drill with a carbide tipped drill bit, in accordance with the manufacturer's requirements; (6) install the 1/4" thick by 2 1/2" diameter stainless steel washer onto the screw anchor prior to insertion into the pre-drilled hole; (7) insert the anchor into the pre-drilled hole; (8) tighten the anchor into the structural concrete using a 1 1/4" impact wrench until the hex washer head and stainless-steel anchor plate make firm contact with the existing ceiling plate.

b. Torus Ring, Feed, and Down Pipes Deconstruction

Following installation of the anchor system, deconstruction activities will occur to remove the torus ring, and associated feed and down pipes (see Figure 4). The cutting of the pipe bracing and pipe sections will be completed from a manlift.

The deconstruction steps for each section are as follows: (1) wrap telehandler tynes in pearl-weave or similar debris netting to create a sleeve to prevent debris from falling to the ground during deconstruction; (2) position telehandler tynes underneath the pipe section to be removed;

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National Aeronautics and Space Administration, Kennedy Space Center Letter

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(3) secure the pipe section to be removed to the telehandler tynes; (4) cut the pipe bracing with a reciprocating saw or angle grinder with diamond cut-off blade while dust and fine debris are captured by a High Efficiency Particulate Air (HEPA) vacuum; (5) cut pipe into sections with a reciprocating saw or angle grinder with diamond cut-off blade while using HEPA vacuum; (6) lower the cut section to the ground with the telehandler.

c. Top-Side Steel Plate and Railing Support Steel Deconstruction

Deconstruction and removal of the remaining steel liner plates and railing support steel from the topside of the Launch Pedestal will be conducted methodically using various means, as appropriate. The work will be conducted from a manlift. Bolts will be unfastened with an impact wrench (backed out or snapped off) and attached steel will be removed by hand or with a prying tool such as a crowbar. For any bolts that are not able to be removed with the impact wrench, bolt heads will be cut with a reciprocating saw or angle grinder with diamond cut-off blade. The attached steel will then be removed by hand or with a prying tool such as a crowbar. If any sections are difficult to remove, steel plating will be cut into smaller sections, as needed, with a reciprocating saw or angle grinder with diamond cut-off blade, and then removed by hand or with a prying tool such as a crowbar.

Assessment of Effects on Historic Properties

NASA KSC has determined that in accordance with 36 CFR § 800.5, the project's outcome (i.e., removal of historic components from atop the Pedestal) will cause an "adverse effect" to the LC-34 NHL due to its potential to diminish the integrity of the property's materials, feeling, or association. NASA KSC consulted with the 45 SW Cultural Resource Manager on the proposed undertaking and the 45 SW concurred with the adverse effect finding.

Public Participation

As of this date, no comments from consulting parties or from the public have been received. The letter is available for public comment at:
<https://environmental.ksc.nasa.gov/EnvironmentalPlanning/CulturalResources/section106>.

A teleconference was held on November 21, 2019, between NASA KSC, NPS, the ACHP, the FL SHPO, and the 45 SW to discuss the project at LC-34. Based on feedback from the discussion, NASA KSC decided to resubmit this Section 106 consultation letter clarifying the undertaking, the adverse effect determination (in accordance with 36 CFR § 800.5), and a resolution to this adverse effect.

Conclusions

NASA KSC has determined that a finding of "adverse effect" is appropriate for this project and is seeking your office's concurrence with this determination. NASA KSC intends to resolve this adverse effect by entering into a memorandum of agreement (MOA) with the SHPO in accordance with 36 CFR § 800.6. The MOA would set forth provisions to mitigate the adverse effects.

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National Aeronautics and Space Administration, Kennedy Space Center Letter

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If you have any questions or require further assistance, please contact Jeanne Ryba, Cultural Resources Specialist, at 321-867-7824.

Natasha Darre
KSC Cultural Resources Manager

Enclosure(s)
Photographs and drawings

cc:
HQs FPO/R. Klein
KSC/AID/S. Gilmore
KSC/CC/A. Vinson
KSC/SI-C2/R. Griffin
FWS/L. Hamilton
NPS/C. Walton
NPS/J. Grass
NPS/K. Kneiff

Interested Parties:
CCA/MS-9125/T. Penders
Spacewalk Hall of Fame
North Brevard Historical Society
Air Force Space and Missile Museum
Brevard County Historic Commission
Apollo One Memorial Foundation
North Brevard Heritage Foundation
Veterans Memorial Foundation

ATTACHMENT 1 (Continued)

National Aeronautics and Space Administration, Kennedy Space Center Letter



Figure 1. View of the LC-34 APE (i.e., the LC-34 Launch Pad area) comprising the Launch Pedestal (right), historical site kiosk (center), and remaining wall of a support building (left)



Figure 2. Historical aerial photograph of LC-34 under construction (1960)

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National Aeronautics and Space Administration, Kennedy Space Center Letter

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Figure 3. Historical photograph of a Saturn I rocket on LC-34 Launch Pedestal (1961)



Figure 4. Steel elements of the Launch Pedestal being proposed for removal

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National Aeronautics and Space Administration, Kennedy Space Center Letter

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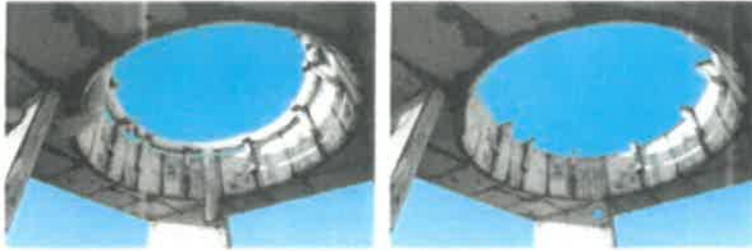


Figure 5. Current underside view of the torus ring and downpipes on the Launch Pedestal (left), and post-project view of the Pedestal (digitally altered) with these steel elements removed (right)

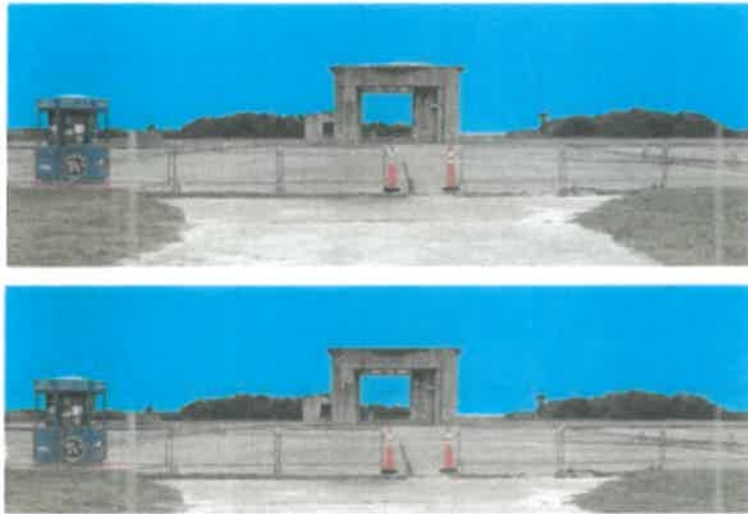


Figure 6. Current view of the torus ring atop the Launch Pedestal (top), and post project view of the Pedestal (digitally altered) with this steel element removed (bottom)

ATTACHMENT 1 (Continued)

National Aeronautics and Space Administration, Kennedy Space Center Letter

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Figure 7. The Launch Pedestal following restoration activities in the 1990s



Figure 8. View of the top side of the Launch Pedestal before debris cleanup (2018)

ATTACHMENT 1 (Continued)

National Aeronautics and Space Administration, Kennedy Space Center Letter

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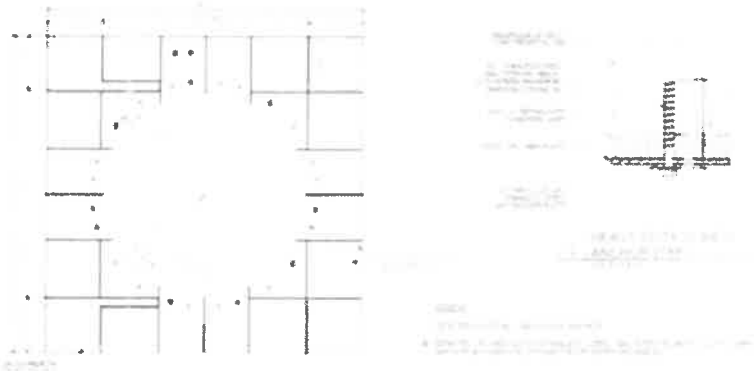


Figure 9. Anchor System Design.

ATTACHMENT 2

Advisory Council on Historic Preservation

Letter of Receipt

Dated: January 14, 2020



January 14, 2020

Jeanne M. Ryba
Cultural Resources Specialist
Kennedy Space Center
National Aeronautics and Space Administration
Kennedy Space Center, FL 32899

Ref: *Proposed Hazard Abatement at Launch Complex 34 at Kennedy Space Center
Florida*

Dear Ms. Ryba:

The Advisory Council on Historic Preservation (ACHP) has received your notification and supporting documentation regarding the adverse effects of the referenced undertaking on a property or properties listed or eligible for listing in the National Register of Historic Places. Based upon the information provided, we have concluded that Appendix A, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, of our regulations, "Protection of Historic Properties" (36 CFR Part 800), does not apply to this undertaking. Accordingly, we do not believe that our participation in the consultation to resolve adverse effects is needed. However, if we receive a request for participation from the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), affected Indian tribe, a consulting party, or other party, we may reconsider this decision. Additionally, should circumstances change, and it is determined that our participation is needed to conclude the consultation process, please notify us.

Pursuant to 36 CFR §800.6(b)(1)(iv), you will need to file the final Memorandum of Agreement (MOA), developed in consultation with the Florida State Historic Preservation Office (SHPO), and any other consulting parties, and related documentation with the ACHP at the conclusion of the consultation process. The filing of the MOA, and supporting documentation with the ACHP is required in order to complete the requirements of Section 106 of the National Historic Preservation Act.

Thank you for providing us with the notification of adverse effect. If you have any questions or require further assistance, please contact Mr. Christopher Daniel at 202-517-0223 or via e-mail at cdaniel@achp.gov.

Sincerely,


Artisha Thompson
Historic Preservation Technician
Office of Federal Agency Programs

ADVISORY COUNCIL ON HISTORIC PRESERVATION
401 F Street NW Suite 308 • Washington, DC 20540 • 1-2637
Phone 202-517-0200 • Fax 202-517-8381 • achp@achp.gov • www.achp.gov

ATTACHMENT 3

United States Department of the Interior – NATIONAL PARK SERVICE

Letter of Receipt

Dated: December 16, 2019



IN REPLY REFER TO

1 A 2

United States Department of the Interior

NATIONAL PARK SERVICE
Atlanta Federal Center
1924 Building
100 Alabama St., SW.
Atlanta, Georgia 30303



National Aeronautics and Space Administration
Kennedy Space Center
Ms. Natasha Dare
Kennedy Space Center, FL 32899

Dear Ms. Dare:

Thank you for your letter of October 25, 2019, and subsequent letter of November 26, 2019, notifying the National Park Service (NPS) of the National Aeronautics and Space Administration's (NASA) proposed project to conduct hazard abatement upon Launch Complex 34 at the Kennedy Space Center in Florida. This structure is a contributing resource to the Cape Canaveral Air Force Station National Historic Landmark (NHL) District. Upon review of the materials submitted, as well as the presentation on November 21, 2019, we agree with your agency's assessment that the proposed activity, specifically the removal of the materials from atop the pedestal, will constitute an adverse effect.

The NPS wishes to participate in any further consultation concerning this property and/or in the development of a Memorandum of Agreement to address the adverse effects associated with this undertaking. Please direct all correspondence for this project to Ellen Rankin at (404) 507-5791. Ellen_Rankin@nps.gov.

Sincerely,

Mary Troy
Acting Chief, Cultural Resources

cc: Chris Daniels, Advisory Council on Historic Preservation, Office of Federal Agency Program, NASA Program Analyst (via email)
Jay Girass, National Park Service, Superintendent, Canaveral National Seashore (via email)
Jeanne Ryba, National Aeronautics and Space Administration, Cultural Resource Specialist (via email)
Jason Aldridge, Florida Division of Historic Resources, State Compliance and Review and Deputy SHPO (via email)
Tom Penders, 45th Space Wing, US Air Force, Cultural Resources Program Manager (via email)

B.5 HOT WORK PERMIT

USAF HOT WORK PERMIT

1. CONTROL NUMBER

2020-336

THIS PERMIT IS GOOD FOR 24 HOURS ONLY

2. Date / Time Issued

17-Sep-2020 1311

3. Date / Time Expires

16-Oct-2020 1800

4. Organization/Contractor/Company (Name and Contact Information)

TETRA TECH
304-780-1426

5. Location Facility # 21934

Floor

Aircraft Tail

Inside Hanger

Outside Hanger

Munitions present (Requires approval from Installation Weapons Safety [SEW] Office)

SEW Signature / Date (If required)

Other:

6. Description of Work

CUTTING AND WELDING CX 34 CUTTING/GRINDING BOLTS

7. Is Fire Watch Required? See requirements on back of form

MARI QUIROGA

Yes No

If yes, Name of Individual qualified to make determination:

8. Before approving any Hot Work Permit, the Permit Authorizing Individual (PAI) shall inspect the work area and confirm precautions have been taken to prevent fire IAW AFI 91-203 and NFPA 51B. (PAI will be certified and trained by the Installation FES flight)

Sprinklers in service

Adequate ventilation

Hot work equipment in good

Pressure cylinders are secured

Portable fire extinguisher(s) are in immediate work area (Minimum rated 2A:10B:C, consult with Installation CEF Flight for additional guidance [i.e. aircraft])

Explosive atmosphere eliminated and flammable liquids, vapors and gases moved 50ft (16m) away from operation

Remove combustibles, sweep floors clean of combustibles, and cover wall and floor openings within 35 feet of hot work where possible. Otherwise protect with fire-resistant tarpaulins or metal

Appropriate shields are used

Combustible floors wet down, covered with damp sand, or fire-resistant shields if work is to be performed in a confined space, coordinate with SEG/BE/CEF & attach to the AF Form 1024, Confined Space Entry Permit

If work is to be performed in a confined space, coordinate with SEG/BE/CEF and attach to the AF FORM 1024, Confined Space Entry Permit

SEG Signature / Date (If required)

BE Signature / Date (If required)

FES Signature / Date (If required)

Any special precautions needed:

9. The location where the work is to be performed has been examined, necessary precautions taken and permission is granted for stated work.

PAI Name

MARI E. QUIROGA

Contact

321-684-1222

Signature / Date (If required)

17-Sep-2020

Mari Quiroga

10. I am fully qualified to perform this operation, understand my responsibilities and my equipment meets all requirements as outlined in AFI 91-203 and NFPA-51B

Operator or On-scene

DAN FORESTER

Contact

304-780-1426

Signature / Date (If required)

17-Sep-2020

Dan Forester

11. Has this process been evaluated by installation BE? (As required: confined space, survey reports, PPE, ect.) If "Yes", attach documentation (BE Survey Report, PPE List, ets.) If "No", obtain BE coordination below.

BE Name & Duty Title

Contact

Signature / Date (If required)

N/A

[Signature]

12. FINAL CHECK (FIRE WATCH) Work area and all adjacent areas to which sparks and heat might spread, including floors above and below and opposite side of walls, were inspected at least 30 minutes after the work was completed but no later than 60 minutes after work was completed and determined to be fire safe.

Operator or On-scene Supervisor & Duty Title

Contact

Signature / Date / Time

B.6 PROJECT SIGN BOARDS



Saturn Rocket, 1961

Launch Complex 34

Launch Pedestal Environmental Restoration Project

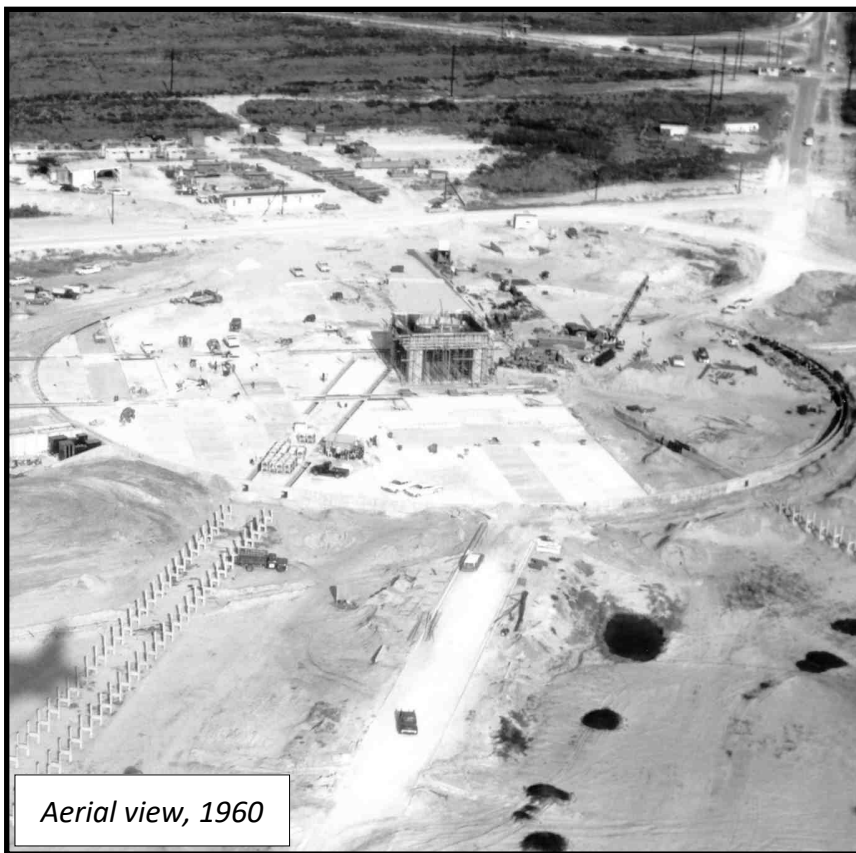
An Environmental Restoration Project is underway to deconstruct and remove degraded pieces of metal that are causing flakes of rust debris to fall off the Launch Pedestal. The project is intended to prevent the potential spread of metal rust debris to the surrounding environment, to ensure the safety of site visitors, and to preserve the history and integrity of the Pedestal structure.

Launch Pedestal Facts

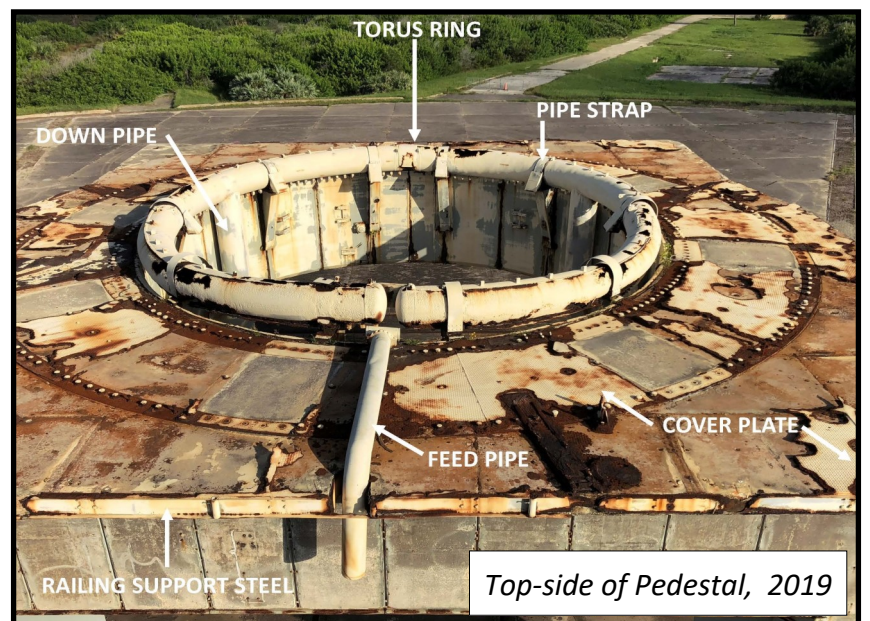
- The Pedestal stands 27 feet tall and is 42 by 42 feet in area
- It was built in the late 1950s and used by NASA's Apollo Space Program for launching Saturn rockets from 1961 to 1968
- The Pedestal is constructed of reinforced concrete that is encased with 3/8" coated steel liner plates along the flame-contact faces
- The steel liner plates, Torus ring and supports, deluge piping, and miscellaneous embedded steel items currently remain on the structure in various stages of degradation.

Project Tasks

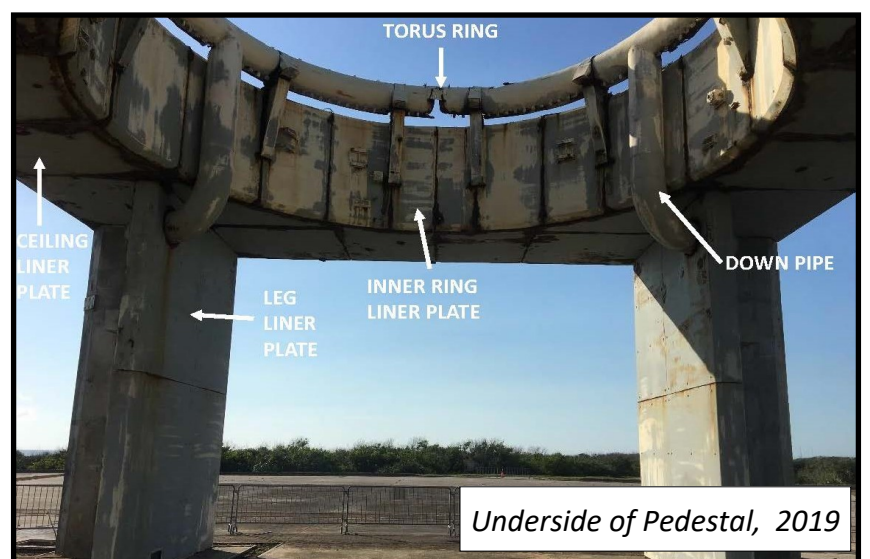
- Installation of an anchor system to protect construction workers during deconstruction activities.
- Deconstruction and removal of the torus ring, associated feed pipe and down pipes.
- Deconstruction and removal of the remaining liner plates and railing support steel from the top-side of the Pedestal.
- Collection and disposal of large and small debris generated during deconstruction activities.



Aerial view, 1960



Top-side of Pedestal, 2019



Underside of Pedestal, 2019

Agency Collaboration

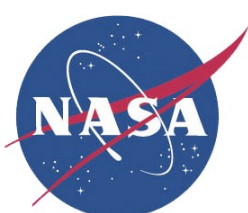
The project is being conducted by NASA in cooperation with the U.S. Air Force, Florida Department of Environmental Protection, and National Historic Landmark (NHL) agencies including the Florida State Historic Preservation Office (SHPO), the National Park Service (NPS), and the Advisory Council on Historic Preservation (ACHP).

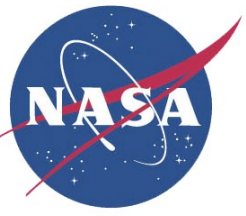
Contact Information

NASA Mail Code SI-E2 Building K-1547
Kennedy Space Center, FL 32899-0001

Michael Deliz Phone: 321.867.6971
Email: Michael.j.deliz@nasa.gov

Lindsay Morgan Phone: 321.867.5352
Email: Lindsay.a.morgan@nasa.gov





Launch Complex 34

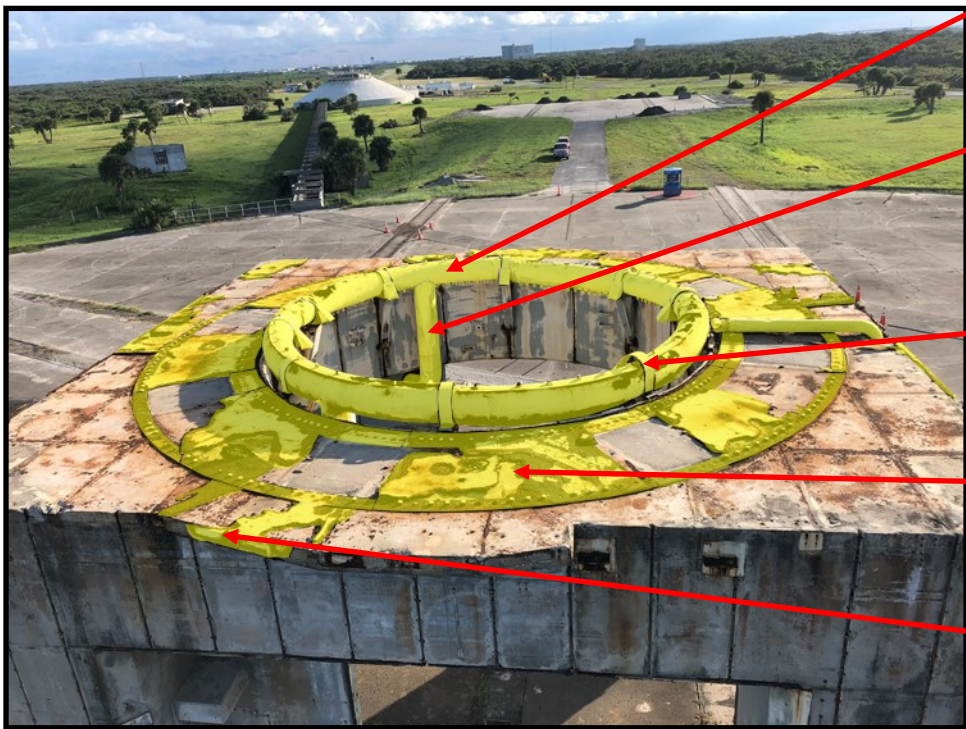
Launch Pedestal Environmental Restoration Project

An Environmental Restoration Project is underway to deconstruct and remove degraded pieces of metal that are causing flakes of rust debris to fall off the Launch Pedestal. The project is intended to prevent the potential spread of metal rust debris to the surrounding environment, to ensure the safety of site visitors, and to preserve the history and integrity of the Pedestal structure.

Q: What is NASA removing from the Launch Pedestal?

A: Only the metal pieces highlighted yellow in the photos below. The rest of the Pedestal will remain unchanged.

Top-side view of Pedestal



Torus Ring

Feed Pipe /
Down Pipes

Pipe Straps

Cover Plates

Railing Steel

Underside View of Pedestal



Contact Information

Michael Deliz Phone: 321.867.6971
Email: Michael.j.deliz@nasa.gov

NASA Mail Code SI-E2 Building K-1547
Kennedy Space Center, FL 32899-0001

Lindsay Morgan Phone: 321.867.5352
Email: Lindsay.a.morgan@nasa.gov

APPENDIX C
PHOTOGRAPHIC LOG



Figure 1: 9/9/2020 9:58:08 AM; Bracing underside steel plate for anchor installation



Figure 2: 9/9/2020 10:05:40 AM; drilling hole for anchor installation



Figure 3: 9/9/2020 10:19:06 AM; drilling hole for anchor installation



Figure 4: 9/9/2020 10:25:28 AM; drilling hole for anchor installation



Figure 5: 9/9/2020 1:07:50 PM; drilling hole for anchor installation



Figure 6: 9/9/2020 1:12:34 PM; anchor installation



Figure 7: 9/9/2020 1:14:05 PM; newly installed anchor on underside steel plate



Figure 8: 9/10/2020 8:50:29 AM; looking at underside steel plates with newly installed anchors



Figure 9: 9/10/2020 10:32:18 AM; vacuuming steel fragments from launch pad



Figure 10: 9/10/2020 11:55:30 AM; drilling hole for anchor installation



Figure 11: 9/11/2020 10:11:15 AM; drilling hole for anchor installation



Figure 12: 9/11/2020 10:11:41 AM; vacuuming trench on launch pad near Pedestal



Figure 13: 9/11/2020 10:14:20 AM; looking at underside steel plates with newly installed anchors



Figure 14: 9/11/2020 10:14:39 AM; looking at underside steel plates with newly installed anchors



Figure 15: 9/14/2020 9:27:00 AM; looking at underside steel plates with newly installed anchors



Figure 16: 9/14/2020 10:16:35 AM; drilling hole for anchor installation



Figure 17: 9/14/2020 2:26:17 PM; looking at underside steel plates with newly installed anchors



Figure 18: 9/15/2020 9:35:05 AM; facing NE, excavated trenches of NW side of launch pad



Figure 19: 9/15/2020 9:36:18 AM; facing SW, excavated trenches on NW side of launch pad



Figure 20: 9/15/2020 9:36:34 AM; facing SW, excavated trenches on NW side of launch pad



Figure 21: 9/15/2020 9:36:57 AM; facing S, excavated trenches on W side of launch pad



Figure 22: 9/15/2020 10:48:11 AM; securing section of Torus Ring to telehandler



Figure 23: 9/15/2020 11:08:19 AM; lowering section of Torus Ring into roll-off box



Figure 24: 9/15/2020 11:57:01 AM; lowering section of Torus Ring into roll-off box



Figure 25: 9/15/2020 11:57:18 AM; lowering section of Torus Ring into roll-off box



Figure 26: 9/15/2020 12:03:52 PM; looking into section of Torus Ring



Figure 27: 9/15/2020 2:00:40 PM; lowering section of Torus Ring



Figure 28: 9/15/2020 2:00:46 PM; top of Pedestal with multiple sections of Torus Ring removed



Figure 29: 9/15/2020 2:30:05 PM; lowering section of Torus Ring into roll-off box

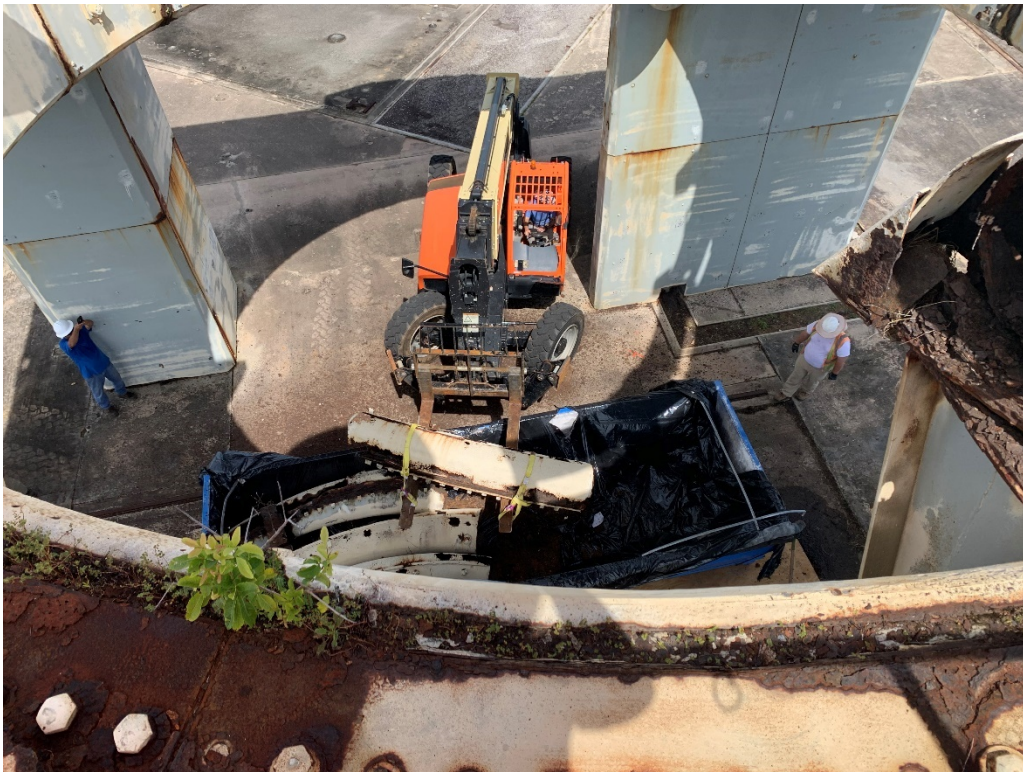


Figure 30: 9/15/2020 2:30:30 PM; lowering section of Torus Ring into roll-off box



Figure 31: 9/15/2020 2:59:09 PM; lowering Torus Ring support brace into roll-off box



Figure 32: 9/15/2020 3:57:30 PM; looking from underneath Pedestal with sections of Torus Ring removed



Figure 33: 9/15/2020 3:57:46 PM; looking from underneath Pedestal with sections of Torus Ring removed



Figure 34: 9/15/2020 4:26:54 PM; looking from underneath Pedestal with sections of Torus Ring removed



Figure 35: 9/15/2020 4:27:52 PM; looking from underneath Pedestal at Torus Ring sections to be removed



Figure 36: 9/15/2020 4:28:10 PM; looking from underneath Pedestal with sections of Torus Ring removed



Figure 37: 9/15/2020 4:28:48 PM; looking from underneath Pedestal with sections of Torus Ring removed



Figure 38: 9/16/2020 9:46:14 AM; looking from underneath Pedestal with sections of Torus Ring removed



Figure 39: 9/16/2020 10:16:59 AM; removing Torus Ring section and down pipe



Figure 40: 9/16/2020 10:19:29 AM; lowering Torus Ring section and down pipe



Figure 41: 9/16/2020 10:19:40 AM; lowering Torus Ring section and down pipe



Figure 42: 9/16/2020 10:19:45 AM; lowering Torus Ring section and down pipe



Figure 43: 9/16/2020 10:35:11 AM; Torus Ring section and down pipe to be removed



Figure 44: 9/16/2020 1:06:03 PM; removing Torus Ring section



Figure 45: 9/16/2020 1:26:13 PM; removing Torus Ring section into roll-off box



Figure 46: 9/16/2020 1:47:50 PM; removing Torus Ring section and down pipe



Figure 47: 9/16/2020 1:48:05 PM; removing Torus Ring section and down pipe



Figure 48: 9/16/2020 1:48:20 PM; removing Torus Ring section and down pipe



Figure 49: 9/16/2020 1:48:27 PM; lowering Torus Ring section and down pipe



Figure 50: 9/16/2020 1:52:26 PM; looking from underneath Pedestal with Torus Ring removed



Figure 51: 9/16/2020 2:17:54 PM; looking from underneath Pedestal with Torus Ring removed



Figure 52: 9/18/2020 10:09:57 AM; Torus Ring section being placed in roll-off box



Figure 53: 9/18/2020 11:10:44 AM; preparing to remove remaining steel plates from top side of Pedestal



Figure 54: 9/18/2020 11:14:53 AM; removing steel plates from top side of Pedestal



Figure 55: 9/21/2020 9:09:12 AM; facing SW, excavated trench on SE side of launch pad



Figure 56: 9/21/2020 9:09:23 AM; facing NW, excavated trench on SE side of launch pad



Figure 57: 9/22/2020 8:13:47 AM; facing N, excavating trench on NW side of launch pad



Figure 58: 9/22/2020 1:39:03 PM; facing NW, vacuuming launch pad



Figure 59: 9/24/2020 8:24:03 AM; portions of Torus Ring saved for museum



Figure 60: 9/24/2020 11:29:26 AM; removing top side steel plates



Figure 61: 9/24/2020 11:30:55 AM; top side steel plate removed from Pedestal



Figure 62: 9/24/2020 2:02:30 PM; removing top side steel plates



Figure 63: 9/24/2020 2:46:51 PM; removing top side steel plates



Figure 64: 9/24/2020 3:18:23 PM; removed feed pipe being transfer to roll-off box



Figure 65: 9/25/2020 10:48:20 AM; top side of Pedestal with steel plates removed



Figure 66: 9/25/2020 3:59:32 PM; project information boards

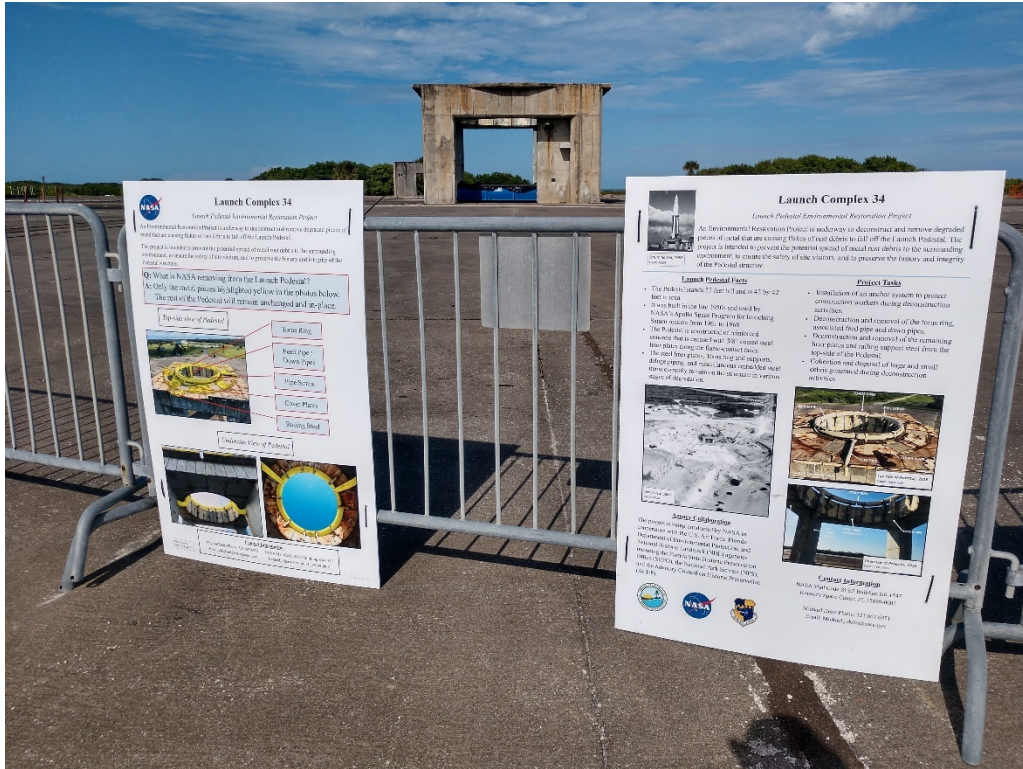


Figure 67: 9/25/2020 4:00:56 PM; project information boards at SW entrance to launch pad



Figure 68: 9/28/2020 3:40:04 PM; top side of Pedestal with steel plates removed



Figure 69: 9/28/2020 3:40:06 PM; top side of Pedestal with steel plates removed



Figure 70: 9/29/2020 10:21:39 AM; lower top side/side edge steel panel



Figure 71: 9/29/2020 10:21:42 AM; top side of Pedestal with steel plates removed



Figure 72: 9/29/2020 11:06:23 AM; removing side edge panels from top of Pedestal



Figure 73: 9/29/2020 11:06:41 AM; removing side edge panels from top of Pedestal



Figure 74: 9/29/2020 11:36:34 AM; granite stone stockpile



Figure 75: 9/29/2020 1:45:09 PM; vacuuming debris from down pipe opening



Figure 76: 9/29/2020 3:12:29 PM; sweeping debris off of top of the Pedestal



Figure 77: 9/29/2020 3:12:32 PM; vacuuming top of the Pedestal



Figure 78: 9/29/2020 3:12:35 PM; top of the Pedestal following sweeping and vacuuming



Figure 79: 9/29/2020 3:12:37 PM; top of the Pedestal after sweeping and vacuuming



Figure 80: 9/29/2020 3:12:39 PM; vacuuming top of the Pedestal



Figure 81: 9/29/2020 3:19:45 PM; facing W, excavated trench on NW side of launch pad



Figure 82: 9/29/2020 3:20:34 PM; facing N, excavated trench on NW side of launch pad



Figure 83: 9/29/2020 3:20:49 PM; facing NE, excavated trench on N side of launch pad



Figure 84: 9/29/2020 3:21:03 PM; facing E, excavated trench on N side of launch pad



Figure 85: 9/29/2020 3:21:17 PM; facing E, excavated trench on N side of launch pad



Figure 86: 9/29/2020 3:21:32 PM; facing SE, excavated trench on NE side of launch pad



Figure 87: 9/29/2020 3:21:46 PM; facing SE, excavated trench on NE side of launch pad



Figure 88: 9/29/2020 3:22:12 PM; facing SW, excavated trench on NE side of launch pad



Figure 89: 9/29/2020 3:23:07 PM; facing S, excavated trench on E side of launch pad



Figure 90: 9/29/2020 3:23:20 PM; facing S, excavated trench on E side of launch pad



Figure 91: 9/29/2020 3:23:36 PM; facing S, excavated trench on E side of launch pad



Figure 92: 9/29/2020 3:25:23 PM; facing NW, excavated trench on E side of launch pad



Figure 93: 9/29/2020 3:25:40 PM; facing S, excavated trench on SE side of launch pad



Figure 94: 9/29/2020 3:25:58 PM; facing S, excavated trench on SE side of launch pad



Figure 95: 9/29/2020 3:26:17 PM; facing SW, excavated trench on S side of launch pad



Figure 96: 9/29/2020 3:27:00 PM; facing SW, excavated trench on S side of launch pad



Figure 97: 9/29/2020 3:27:15 PM; facing NW, excavated trench on S side of launch pad



Figure 98: 9/29/2020 3:27:32 PM; facing NW, excavated trench on S side of launch pad



Figure 99: 9/29/2020 3:29:59 PM; facing S, excavated trench on W side of launch pad



Figure 100: 9/29/2020 3:30:30 PM; facing S, excavated trench on SW side of launch pad



Figure 101: 9/29/2020 3:30:44 PM; facing S, excavated trench on SW side of launch pad



Figure 102: 9/30/2020 10:02:52 AM; backfilling on N side of launch pad



Figure 103: 9/30/2020 10:04:58 AM; facing SW, hand digging trench on NE side of launch pad



Figure 104: 9/30/2020 1:48:56 PM; facing E, backfilling trench on E side of launch pad



Figure 105: 9/30/2020 3:32:07 PM; top of the Pedestal after sweeping and vacuuming



Figure 106: 9/30/2020 3:32:13 PM; top of the Pedestal after sweeping and vacuuming



Figure 107: 9/30/2020 3:32:14 PM; top of the Pedestal after sweeping and vacuuming



Figure 108: 9/30/2020 3:32:16 PM; top of the Pedestal after sweeping and vacuuming



Figure 109: 9/30/2020 4:07:57 PM; facing NW, backfilled trench on S side of launch pad



Figure 110: 10/1/2020 3:09:12 PM; facing W, excavated trench of SW side of launch pad



Figure 111: 10/1/2020 3:09:21 PM; facing SE, excavated trench on S side of launch pad



Figure 112: 10/1/2020 3:09:40 PM; facing SE, excavated trench on S side of launch pad



Figure 113: 10/1/2020 3:09:58 PM; facing E, excavated trench on S side of launch pad



Figure 114: 10/1/2020 3:10:27 PM; facing N, vacuuming trench on W side of launch pad



Figure 115: 10/1/2020 3:32:20 PM; facing W, backfilled trench on SW side of launch pad



Figure 116: 10/2/2020 11:01:24 AM; facing E, backfilling trench on S side of launch pad



Figure 117: 10/2/2020 11:01:45 AM; facing E, backfilling trench on S side of launch pad



Figure 118: 10/2/2020 11:02:02 AM; facing NE, excavated trench on SE side of launch pad



Figure 119: 10/5/2020 10:59:57 AM; facing S; excavating trenches near base of Pedestal



Figure 120: 10/5/2020 3:10:28 PM; facing SE, excavated trench on S side of Pedestal



Figure 121: 10/5/2020 3:10:30 PM; removing metal debris from excavated trench with magnet



Figure 122: 10/5/2020 3:10:33 PM; facing SW, excavated trenches on SW side of Pedestal



Figure 123: 10/5/2020 3:12:18 PM; removing metal fragments from excavated trench with magnet



Figure 124: 10/5/2020 3:12:32 PM; removing metal fragments from excavated trench with magnet



Figure 125: 10/5/2020 3:31:39 PM; facing SE, vacuuming trench S of Pedestal



Figure 126: 10/5/2020 3:31:48 PM facing N, vacuumed trench E of Pedestal



Figure 127: 10/5/2020 3:33:06 PM; backfilling trenches



Figure 128: 10/5/2020 3:41:10 PM; facing SE, vacuuming trench S of Pedestal



Figure 129: 10/5/2020 3:41:23 PM; vacuuming trenches



Figure 130: 10/7/2020 7:45:32 AM; excavated soil stockpile being loaded into T&D truck



Figure 131: 10/8/2020 3:34:45 PM; facing NW; launch pad and Pedestal following restoration activities



Figure 132: 10/8/2020 3:35:20 PM; facing N, launch pad and Pedestal following restoration activities



Figure 133: 10/8/2020 3:35:54 PM; facing SE, launch pad following restoration activities



Figure 134: 10/8/2020 3:36:55 PM; facing SE, Pedestal following restoration activities



Figure 135: 10/9/2020 1:19:49 PM; restoring excavated soil stockpile to original conditions

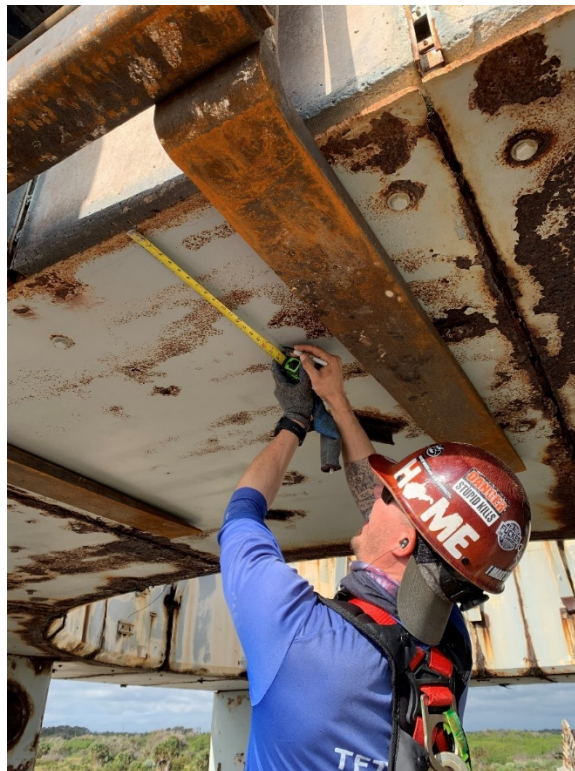


Figure 136: 11/13/2020 9:57:43 AM; marking anchor locations for "phase 2" of anchor installation







Figure 137: 11/16/2020 3:37:57 PM; marked anchor locations of "phase 2"







Figure 138: 11/16/2020 3:39:12 PM; preparing to drill anchor hole during "phase 2" of anchor installation



APPENDIX D
DAILY ACTIVITY LOG



DAILY ACTIVITY REPORT							Date:	8
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:	September	
8985						Year:	2020	
6300						Day:	Monday	
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA	x				
	Project Support:							
	Project Support:							
Subcontractor:								
							Onsite	
Visitors:								
							Onsite	
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
5:45	DF at Home Depot for supplies							
7:30	DF arrive onsite LC 34.							
8:00	All onsite have a Site Safety Brief Nuts and Bolts.							
8:30								
9:00	Mobilize equipment; operators preform equipment inspections.							
9:30	CN, RL, KH set up site signage and barracades							
10:00								
10:30								
11:00								
11:30								
12:00	All to Lunch. WC depart, DF offsite to HMFN							
12:30								
13:00	DF onsite, All resume							
13:30								
14:00	DF layout and organize equipment and inspect safety devices.							
14:30								
15:00								
15:30								
16:00	KH, RL depart site.							
16:30	DF, CN depart site. DF other sites							
17:00								
17:30								
18:30	End Day Site Secure							
Comments:								
--								
--								
--								
--								
Temperature Range:	80		--	84		°	F	
Weather Conditions:	partly cloudy							
				 Field Operations Supervisor Signature				



DAILY ACTIVITY REPORT							Date:	9
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:	September	
8985						Year:	2020	
6300						Day:	Wednesday	
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN		Wayne Crisafulli	WC		
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA	x	Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor:								
Visitors:								
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC	x	Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	DF, RL arrive onsite LC 34. Operators preform equipment inspections.							
8:00	KH, CA onsite, All have a Site Safety Brief.							
8:30								
9:00								
9:30	DF, KH start installing Anchor bolts on the NE corner working west.							
10:00								
10:30	DF on phone with MJ about rebar and drilling through.							
11:15	GC onsite 5 minutes							
11:30	DF to Home Depot for long steel drill bits to go through rebar. KH, RL, CA lunch							
12:00								
12:30	DF onsite resume anchor install							
13:00								
13:30								
14:00								
14:30								
15:00								
15:30								
16:00	All pack up equipment							
16:30	All depart site. DF to Home Depot							
17:00								
17:30	End Day Site Secure							
18:00								
Comments:								
-- 5 anchors installed					PPE Level D+ Fall Protection			
--								
--								
--								
Temperature Range: 80 -- 88 ° F								
Weather Conditions: Cloudy								
					Field Operations Supervisor Signature			



DAILY ACTIVITY REPORT							Date:	10	
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:		September	
8985						Year:		2020	
6300						Day:		Thursday	
Personnel Summary									
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite		
	Field Operations Supervisor:	Christopher Neumann	CN		Wayne Crisafulli	WC			
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x		
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x		
	Project Support:	Chris Adkison	CA	x	Rob Segiel	RS			
	Project Support:								
	Project Support:								
Subcontractor: Onsite Onsite									
Visitors: Onsite Onsite									
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO			
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ			
Sean Nichols	NASA Safety	SN							
Description of Work Performed, Problems Encountered and Resolutions:									
Time									
7:00									
7:30	All arrive onsite LC 34. All have a Site Safety Brief. Operators preform equipment inspections.								
8:00	DF, KH start anchor install. RL vacuum cracks on pad								
8:30									
9:00									
9:30									
10:00									
10:30									
11:00									
11:30									
12:00	All to Lunch								
12:30	Resume								
13:00									
13:30									
14:00									
14:30									
15:00									
15:30									
16:00	All depart site. DF to other sites								
16:30									
17:00									
17:30									
18:30	DF depart site. End Day Site Secure								
Comments:									
-- Transmition on cart goes out call for new cart				PPE Level D+ Fall Protection					
-- 8 anchors installed									
--									
--									
Temperature Range: 83 -- 87 ° F				 Field Operations Supervisor Signature					
Weather Conditions: Partly Cloudy									



DAILY ACTIVITY REPORT							Date:	11
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:		September
8985						Year:		2020
6300						Day:		Friday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN		Wayne Crisafulli	WC		
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA	x	Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor: Onsite Onsite								
Visitors: Onsite Onsite								
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ	x	
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	DF, RL arrive onsite LC 34. All have a Site Safety Brief. Operators perform equipment inspections.							
8:00	KH onsite, DF, KH start anchor install. RL vacuum cracks on pad							
8:30								
9:00								
9:30								
10:00								
10:30								
11:00								
11:30								
12:00	All to Lunch							
12:30	Resume							
13:00								
13:30								
14:15	DJ onsite 15 minutes							
14:30								
15:00	DF, KH WD-40 top side bolts							
15:30								
16:00	All depart site. End Day Site Secure							
16:30								
17:00								
17:30								
18:30								
Comments:								
-- 7 anchors installed				PPE Level D+ Fall Protection				
--								
--								
--								
Temperature Range: 84 -- 87 ° F								
Weather Conditions: Mostly cloudy								
				Field Operations Supervisor Signature				



DAILY ACTIVITY REPORT							Date:	14
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:	September	
8985						Year:	2020	
6300						Day:	Monday	
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA	x	Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor: Onsite Onsite								
Visitors: Onsite Onsite								
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	All arrive onsite LC 34. All have a Site Safety Brief. Operators preform equipment inspections.							
8:00	DF, KH start anchor install. CN, WC (mini) RL (spot) start 6" scrap.							
8:30								
9:00								
9:30								
10:00								
10:30								
11:00								
11:30								
12:00	All to Lunch							
12:30	Resume							
13:00								
13:30								
14:15								
14:30								
15:00	DF, KH WD-40 top side bolts							
15:30								
16:00	All depart site. Df to other sites.							
16:30								
17:00								
17:30								
18:00	DF off site. End Day Site Secure							
Comments:								
-- 5 anchors installed					PPE Level D+ Fall Protection			
--								
--								
--								
Temperature Range: 81 -- 86 ° F								
Weather Conditions: Cloudy								
					Field Operations Supervisor Signature			



DAILY ACTIVITY REPORT							Date:	15
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration					Month:	September
8985							Year:	2020
6300							Day:	Tuesday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA	x	Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor: Onsite Onsite								
Visitors: Onsite Onsite								
Mike Deliz	NASA RPM	MD	x	Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	All arrive onsite LC 34. All have a Site Safety Brief. Operators perform equipment inspections.							
8:00	DF(manlift), CN (ground spot), CA (ground spot), KH (telehandler) start Torus Ring removal. WC (mini) RL (spot) start 6" scrap.							
8:30								
9:00								
9:30								
10:00								
10:30								
11:00								
11:30								
12:00	All to Lunch							
12:30								
13:00	Resume							
13:30								
14:15								
14:30								
15:00	DF, KH Stop pipe removal and shovel debris.							
15:30	KH help RL and WC							
16:00	All depart site. Df to other sites.							
16:30								
17:00								
17:30								
18:00	DF off site. End Day Site Secure							
Comments:								
--								
--								
--								
--								
Temperature Range:	84	--	86	°	F			
Weather Conditions:	Cloudy							
					PPE Level	D+ Fall Protection		
								
					Field Operations Supervisor Signature			



DAILY ACTIVITY REPORT							Date:	16
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:	September	
8985						Year:	2020	
6300						Day:	Wednesday	
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN		Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA	x	Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor: Onsite Onsite								
Visitors: Onsite Onsite								
Mike Deliz	NASA RPM	MD	x	Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	All arrive onsite LC 34. All have a Site Safety Brief. Operators perform equipment inspections.							
8:00	DF, KH(manlift), CA (ground spot), RL (telehandler) start Ring removal WC (Ground direction).							
8:30								
9:00	MD onsite							
9:30								
10:00								
10:30								
11:00	DF on Phone with MAE2.							
11:30	All to Lunch, MD to lunch							
12:00								
12:30	Resume							
13:00								
13:30								
14:00	Last section of pipe down all shovel debris							
14:30	WC (mini), RL, KH (spot) work on 6" scrape							
15:00								
15:30								
16:00	All depart site. DF await equipment delivery of compressor and impact.							
16:30	equipment onsite in good condition							
17:00	DF off site. End Day Site Secure							
17:30								
18:00								
Comments:								
--								
--								
--								
--								
Temperature Range:	80	--	86	°	F			
Weather Conditions:	Cloudy					 Field Operations Supervisor Signature		
PPE Level								



DAILY ACTIVITY REPORT							Date:	17
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration					Month:	September
8985							Year:	2020
6300							Day:	Thursday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor:	Onsite						Onsite	
Visitors:	Onsite						Onsite	
Mike Deliz	NASA RPM	MD	x	Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	All arrive onsite LC 34. All have a Site Safety Brief. Operators preform equipment inspections.							
8:00	WC (mini) RL, KH (spot) start 6" scrap. Roll-off driver onsite to take roll-off to Schwartz Road Landfill							
8:30								
9:00	MD onsite							
9:30	DF call Cape Support for Hot work permit.							
10:00	Becky Bolt onsite to walk area for DPTs. DF take around on cart. 10:15 roll off back							
10:30								
11:00	Becky Bolt depart. DF expenses							
11:30								
12:00	All to Lunch							
12:30								
13:00	Resume							
13:30	DF meet with fire inspector Mari Quiroga.							
13:45	DF to KSC badging to meet courier							
14:30	DF onsite vacuum pad cracks							
15:00								
15:30								
16:00	All depart site. Df to Home depot.							
16:30								
17:00								
17:30	DF off site. End Day Site Secure							
18:00								
Comments:								
-- 1 roll-off box taken to Schwartz Road Landfill				PPE Level				D+ Fall Protection
--								
--								
--								
Temperature Range: 79 -- 87 ° F								
Weather Conditions: Mostly cloudy								
				Field Operations Supervisor Signature				



DAILY ACTIVITY REPORT							Date:	18
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:	September	
8985						Year:	2020	
6300						Day:	Friday	
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA	x	Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor:								
								Onsite
								Onsite
								Onsite
Visitors:								
								Onsite
Mike Deliz	NASA RPM	MD	x	Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	All arrive onsite LC 34. All have a Site Safety Brief. Operators preform equipment inspections.							
8:00	WC (mini) RL (spot) start 6" scrap. DF, KH set up to remove top bolts.							
8:30								
9:00	Impact wrench not working as expected call for service. KH help spot. DF cut pipe for muesum							
9:30								
10:00								
10:30								
11:00								
11:30	Technician onsite say compressor is too small; looking for a larger one.							
12:00	All to lunch							
12:30	Resume							
13:00								
13:30								
14:00								
14:30								
15:00								
15:30								
16:00	Depart site.							
16:30	DF depart site. End Day Site Secure							
17:00								
17:30								
18:00								
Comments:								
--					PPE Level D			
--								
--								
--								
Temperature Range: 80 -- 87 ° F								
Weather Conditions: mostly cloudy								
					Field Operations Supervisor Signature			



DAILY ACTIVITY REPORT							Date:	21
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:	September	
8985						Year:	2020	
6300						Day:	Monday	
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL		
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor: Onsite Onsite								
Visitors: Onsite Onsite								
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC	x	Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	DF arrive onsite LC 34. DF start cut pipe for muesum							
8:00	KH onsite. All have a Site Safety Brief. Operators preform equipment inspections. KH vacuum pad							
8:30								
9:00	CN onsite							
9:30								
10:00	GC onsite, Questions cord on tool and DF repair on the spot.							
10:30	WC (mini) KH (spot) start 6" scrap.							
11:00								
11:30								
12:00	All to lunch							
12:30								
13:00	Resume							
13:30								
14:00								
14:30								
15:00								
15:30								
16:00	KH, WC depart site. DF, CN await compressor replacement.							
16:30								
17:00	Compressor onsite in good shape.							
17:30								
18:00	DF, CN depart site. End Day Site Secure							
Comments:								
--				PPE Level D				
--								
--								
--								
Temperature Range: 78 -- 82 ° F								
Weather Conditions: mostly cloudy								
				Field Operations Supervisor Signature				



DAILY ACTIVITY REPORT							Date:	22
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration					Month:	September
8985							Year:	2020
6300							Day:	Tuesday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor:								
Visitors:								
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	DF, KH arrive onsite LC 34.							
8:00	RL, WC, CN onsite. All have a Site Safety Brief. Operators preform equipment inspections. KH vacuum pad WC (mini) RL (spot) start 6" scrap.							
8:30								
9:00								
9:30								
10:00								
10:30								
11:00	DF offsite							
11:30								
12:00	All to lunch,							
12:30	DF onsite in manlift test impact and compressor							
13:00	Resume							
13:30								
14:00	High winds stop aerial work. DF, CN talk about CHP							
14:30								
15:00								
15:30								
16:00	KH, WC, RL depart site.							
16:30	DF, CN depart site. End Day Site Secure							
17:00								
17:30								
18:00								
Comments:								
--								
--								
--								
--								
Temperature Range:	77	--	81	°	F			
Weather Conditions:	cloudy						 Field Operations Supervisor Signature	



DAILY ACTIVITY REPORT							Date:	23	
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:		September	
8985						Year:		2020	
6300						Day:		Wednesday	
Personnel Summary									
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite		
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x		
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x		
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x		
	Project Support:	Chris Adkison	CA		Rob Segiel	RS			
	Project Support:								
	Project Support:								
Subcontractor: Onsite Onsite									
Visitors: Onsite Onsite									
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO			
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ			
Sean Nichols	NASA Safety	SN							
Description of Work Performed, Problems Encountered and Resolutions:									
Time									
7:00									
7:30	All arrive onsite LC 34.								
8:00	All have a Site Safety Brief. Operators preform equipment inspections. DF, KH remove bolts, WC (mini) RL (spot) start 6" scrap.								
8:30									
9:00									
9:30									
10:00									
10:30									
11:00									
11:30									
12:00	All to lunch,								
12:30									
13:00	Resume								
13:30									
14:00									
14:30									
15:00									
15:30									
16:00	DF, CN, KH, WC, RL depart site. End day site secure								
16:30									
17:00									
17:30									
18:00									
Comments:									
-- See CN notes				PPE Level D+ Fall Protection					
--									
--									
--									
Temperature Range: 80 -- 82 ° F									
Weather Conditions: cloudy									
				Field Operations Supervisor Signature					



DAILY ACTIVITY REPORT							Date:	24	
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:		September	
8985						Year:		2020	
6300						Day:		Thursday	
Personnel Summary									
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite		
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x		
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x		
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x		
	Project Support:	Chris Adkison	CA		Rob Segiel	RS			
	Project Support:								
	Project Support:								
Subcontractor: Onsite Onsite									
Visitors: Onsite Onsite									
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO			
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ			
Sean Nichols	NASA Safety	SN							
Description of Work Performed, Problems Encountered and Resolutions:									
Time									
7:00									
7:30	All arrive onsite LC 34.								
8:00	All have a Site Safety Brief. Operators preform equipment inspections. DF, KH (manlift), WC (ground direction) RL (telehandler) remove blates.								
8:30									
9:00									
9:30									
10:00									
10:30									
11:00									
11:30									
12:00	All to lunch,								
12:30									
13:00	Resume								
13:30									
14:00									
14:30									
15:00									
15:30									
16:00	DF, CN, KH, WC, RL depart site. End day site secure								
16:30									
17:00									
17:30									
18:00									
Comments:									
--				PPE Level D+ Fall Protection					
--									
--									
--									
Temperature Range: 82 -- 86 ° F									
Weather Conditions: mostly cloudy									
				Field Operations Supervisor Signature					



DAILY ACTIVITY REPORT							Date:	25
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month: September		
8985						Year: 2020		
6300						Day: Friday		
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor: Onsite Onsite								
Visitors: Onsite Onsite								
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	All arrive onsite LC 34.							
8:00	All have a Site Safety Brief. Operators preform equipment inspections. DF, KH (manlift), WC (ground direction) RL (telehandler) remove blates.							
8:30								
9:00								
9:30								
10:00								
10:30								
11:00								
11:30								
12:00	All to lunch,							
12:30								
13:00	Resume							
13:30								
14:00	Phase 2 weather; stop work							
14:30								
15:00								
15:30								
16:00	DF, CN, KH, WC, RL depart site. End day site secure							
16:30								
17:00								
17:30								
18:00								
Comments:								
--				PPE Level D+ Fall Protection				
--								
--								
--								
Temperature Range: 79 -- 86 ° F								
Weather Conditions: partly cloudy								
				Field Operations Supervisor Signature				



DAILY ACTIVITY REPORT							Date:	28
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration					Month:	September
8985							Year:	2020
6300							Day:	Monday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor: _____ Onsite _____ Onsite _____								
Visitors: _____ Onsite _____ Onsite _____								
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	All arrive onsite LC 34.							
8:00	All have a Site Safety Brief. Operators preform equipment inspections. DF, KH (manlift), WC (telehandler) remove plates. RL work at system to install ice machine							
8:30								
9:00	DF offsite							
9:30								
10:00	DF on site							
10:30								
11:00								
11:30								
12:00	All to lunch,							
12:30								
13:00	Resume							
13:30								
14:00								
14:30								
15:00								
15:30	All plates removed from top of pedestal							
16:00	KH, WC, depart site. DF, CN help RL							
16:30								
17:00	CN depart site.							
18:00	RL depart site							
19:30	End day site secure							
Comments:								
--								
--								
--								
--								
Temperature Range:	80	--	84	°	F			
Weather Conditions:	cloudy						 Field Operations Supervisor Signature	



DAILY ACTIVITY REPORT							Date:	29
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration					Month:	September
8985							Year:	2020
6300							Day:	Tuesday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor:	Onsite						Onsite	
Visitors:	Onsite						Onsite	
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	All arrive onsite LC 34.							
8:00	All have a Site Safety Brief. Operators preform equipment inspections. DF, KH (manlift), WC (telehandler) remove side plates. RL, CN vacuum pad.							
8:30	CN depart for for AOSB electrical meeting.							
9:00								
9:30								
10:00	CN back onsite							
10:30								
11:00								
11:30								
12:00	All to lunch,							
12:30								
13:00	Resume							
13:30								
14:00	All side panels removed. DF, KH start cleaning top of pedestal.							
14:30								
15:00								
15:30								
16:00	DF, CN, KH, WC, RL depart site. End day site secure							
16:30								
17:00								
17:30								
18:00								
Comments:								
-- 7 truckloads of gravel delivered throughout day (194 tons)				PPE Level				D+ Fall Protection
--								
--								
--								
Temperature Range: 77 -- 85 ° F								
Weather Conditions: partly cloudy								Field Operations Supervisor Signature



DAILY ACTIVITY REPORT							Date:	30
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration					Month:	September
8985							Year:	2020
6300							Day:	Wednesday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN		Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor:	Onsite						Onsite	
Visitors:	Onsite						Onsite	
Mike Deliz	NASA RPM	MD	x	Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC	x	Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	All arrive onsite LC 34. All have a Site Safety Brief. Operators perform equipment inspections.							
8:00	WC (mini), RL (loader), KH (skid) spread gravel, DF walk trenches with magnet							
8:30								
9:00	DF phone with MJ and JL							
9:30	GC onsite 5 minute							
10:00	DF rake gravel							
10:30								
11:00								
11:30								
12:00	All to lunch,							
12:30	Resume RL, WC walk trenches with magnet and fill with gravel, DF, KH vacuum top pedestal.							
13:00								
13:30								
14:00	MD onsite							
14:30								
15:00								
15:30								
16:00	KH, WC, RL depart site.							
16:30	DF depart site. End day site secure							
17:00								
17:30								
18:00								
Comments:								
--								
--	PPE Level D+ Fall Protection							
--								
--								
Temperature Range:	60 -- 80 ° F							
Weather Conditions:	clear, sunny, occasional shower							
				 Field Operations Supervisor Signature				



DAILY ACTIVITY REPORT							Date:	2
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:	October	
8985						Year:	2020	
6300						Day:	Friday	
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC		
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH		
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor: Onsite Onsite								
Visitors: Onsite Onsite								
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ	x	
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	All arrive onsite LC 34. All have a Site Safety Brief. Operators perform equipment inspections.							
8:00	RL (mini), DF (spot) finish dig,							
8:30								
9:00								
9:30								
10:00	RL (loader) backfill all areas. DF, CN Vacuum pad							
10:30								
11:00								
11:30								
12:00	All to lunch,							
12:30	Resume							
13:00	DJ onsite 15 min							
13:30								
14:00								
14:30								
15:00								
15:30								
16:00	All depart site. End day site secure							
16:30								
17:00								
17:30								
18:00								
Comments:								
--					PPE Level D			
--								
--								
--								
Temperature Range: 72 -- 80 ° F								
Weather Conditions: partly cloudy								
					Field Operations Supervisor Signature			



DAILY ACTIVITY REPORT							Date:	5
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:	October	
8985						Year:	2020	
6300						Day:	Monday	
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Project Support:								
Subcontractor: Onsite Onsite								
Visitors: Onsite Onsite								
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	DF arrive onsite LC 34.							
8:00	CN, KH, WC, RL onsite. All have a Site Safety Brief. Operators preform equipment inspections. WC (mini), RL (spot) DF, KH (hand dig) final 2 trenches infront of pedestal							
8:30								
9:00								
9:30								
10:00								
10:30								
11:00								
11:30								
12:00	All to lunch, Heavy Rain							
12:30								
13:00	Resume No Rain KH (skid) grade DF vacuum pad							
13:30								
14:00								
14:30	All 6" scrape complete							
15:00	RL depart, WC, DF, KH move roll off out from under Pedestal							
15:30								
16:00	All depart site. End day site secure							
16:30								
17:00								
17:30								
18:00								
Comments:								
--				PPE Level D				
--								
--								
--								
Temperature Range: 77 -- 82 ° F								
Weather Conditions: cloudy, rain								
				Field Operations Supervisor Signature				



DAILY ACTIVITY REPORT							Date:	6
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration					Month:	October
8985							Year:	2020
6300							Day:	Tuesday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor: Onsite Onsite								
Visitors: Onsite Onsite								
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	All arrive onsite LC 34.							
8:00	All have a Site Safety Brief. Operators preform equipment inspections. WC (clear DPT), RL (Loader), KH (skid) grade, DF vacuum pad							
8:30	30 minutes heavy rain							
9:00								
9:30								
10:00	Mike of NASA HS onsite 1 hour							
10:30								
11:00								
11:30								
12:00	All to lunch,							
12:30								
13:00	Resume							
13:30								
14:00								
14:30								
15:00	WC pop track on skid DF, KH help reset							
15:30								
16:00	All depart site. End day site secure							
16:30								
17:00								
17:30								
18:00								
Comments:								
-- See CN notes				PPE Level D				
--								
--								
--								
Temperature Range: 84 -- 88 ° F				 Field Operations Supervisor Signature				
Weather Conditions: cloudy, rain								



DAILY ACTIVITY REPORT							Date:	7
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:	October	
8985						Year:	2020	
6300						Day:	Wednesday	
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN	x	Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA	x	Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor:	Onsite						Onsite	
Visitors:	Onsite						Onsite	
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
7:00								
7:30	All arrive onsite LC 34. Loading 2 T&D truck							
8:00	All have a Site Safety Brief. Operators preform equipment inspections. WC (clear DPT), RL, KH, DF vacuum pad							
8:30								
9:00								
9:30								
10:00	CN depart							
10:30								
11:00								
11:30								
12:00	All to lunch, Loading 2 T&D trucks							
12:30								
13:00	Resume							
13:30								
14:00	CA onsite aid vacuum							
14:30								
15:00								
15:30	WC, KH depart							
16:00	Loading last T&D truck for day							
16:30	CA depart							
17:00	RL depart							
17:30								
18:00	DF depart site. End day site secure							
Comments:								
-- 5 truck loads of soil to JED Landfill				PPE Level D				
--								
--								
--								
Temperature Range: 82 -- 85 ° F				 Field Operations Supervisor Signature				
Weather Conditions: partly cloudy								



DAILY ACTIVITY REPORT							Date:	8
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration					Month:	October
8985							Year:	2020
6300							Day:	Thursday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN		Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor:	Onsite						Onsite	
Visitors:	Onsite						Onsite	
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
6:00	DF onsite notes, RL onsite 0700 load T&D truck							
7:30	WC, KH arrive onsite LC 34. KH escort Alpha Omega to Schwartz Road Landfill							
8:00	All have a Site Safety Brief. Operators preform equipment inspections. WC (clear DPT), RL (loader), KH (skid), grade							
8:30								
9:00								
9:30								
10:00								
10:30								
11:00								
11:30								
12:00	All to lunch							
12:30								
13:00	Resume, DF placing metal racks around pedestal							
13:30								
14:00								
14:30								
15:00								
15:30								
16:00	All depart site. End day site secure							
16:30								
17:00								
17:30								
18:00								
Comments:								
-- 1 roll off box to Schwartz Road Landfill				PPE Level				D
-- 2 truck loads of soil to JED landfill								
--								
--								
Temperature Range: 82 -- 87 ° F								
Weather Conditions: mostly cloudy								Field Operations Supervisor Signature



DAILY ACTIVITY REPORT							Date:	9
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration					Month:	October
8985							Year:	2020
6300							Day:	Friday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN		Wayne Crisafulli	WC	x	
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor:	Onsite						Onsite	
Visitors:	Onsite						Onsite	
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
6:00								
7:30	All arrive onsite LC 34.							
8:00	All have a Site Safety Brief. Operators preform equipment inspections. WC (clear DPT), RL, DF MOB equipment offsite							
8:30								
9:00								
9:30								
10:00								
10:30	KH arrive onsite help MOB equipment off site							
11:00								
11:30								
12:00	All to lunch							
12:30								
13:00	DF, KH, RL offsite for other sites							
13:30								
14:00								
14:30								
15:00								
15:30								
16:00	All depart site. End day site secure							
16:30								
17:00								
17:30								
18:00								
Comments:								
--								
--	PPE Level D							
--								
--								
Temperature Range:	79	--	86	°	F			
Weather Conditions:	partly cloudy							
						 Field Operations Supervisor Signature		



DAILY ACTIVITY REPORT							Date:	10
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration					Month:	November
8985							Year:	2020
6300							Day:	Tuesday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN		Wayne Crisafulli	WC		
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor: Onsite Onsite								
Visitors: Onsite Onsite								
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC	x	Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
6:00								
7:30	DF, RL arrive onsite CHP load site trailer.							
8:00	DF, RL MOB site trailer to LC 34. KH call say on his way in.							
8:30	All onsite LC 34. All have a Site Safety Brief. Operators preform equipment inspections. Organize supplies and tools.							
9:00								
9:30								
10:00	GC onsite 5 minutes.							
10:30								
11:00	DF, KH (manlift) RL (ground/telehandler) start anchor install.							
11:30								
12:00	All to lunch, heavy rain							
12:30	DF call work due to rain and wind and all offsite to other sites.							
13:00								
13:30								
14:00								
14:30								
15:00								
15:30								
16:00	All depart site. End day site secure							
16:30								
17:00								
17:30								
18:00								
Comments:								
--								
--								
--								
--								
Temperature Range:	77	--	80	°	F			
Weather Conditions:	Scattered showers					 Field Operations Supervisor Signature		
						PPE Level	D+ Fall Protection	



DAILY ACTIVITY REPORT							Date:	13
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration					Month:	November
8985							Year:	2020
6300							Day:	Friday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN		Wayne Crisafulli	WC		
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor:	Onsite						Onsite	
Visitors:	Onsite						Onsite	
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
6:00								
7:30	All onsite LC 34. All have a Site Safety Brief. Operators preform equipment inspections. Organize supplies and tools.							
8:00	KH add air to manlift tires. Tires 5-7 LBs lower than Tuesday. DF call Pat Davis to have manlift switched out due to bad tires. All determine manlift safe to work in there are no holes or plugs, just monitor tires throughout day.							
8:30	DF, KH (manlift) RL (ground/telehandler) start anchor install							
9:00								
9:30								
10:00	Pat Davis call back say will have issue resolved by Monday.							
10:30								
11:00								
11:30								
12:00	All to lunch							
12:30	KH check tire pressure in manlift- pressure is good 0-2 LBs lower than morning. All resume work							
13:00								
13:30								
14:00								
14:30								
15:00								
15:30	All pack equipment for weekend.							
16:00	All depart site. End day site secure							
16:30								
17:00								
17:30								
18:00								
Comments:								
-- 13 anchors installed				PPE Level				D+ Fall Protection
--								
--								
--								
Temperature Range: 71 -- 82 ° F								
Weather Conditions: cloudy								Field Operations Supervisor Signature

DAILY ACTIVITY REPORT							Date:	16
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration					Month:	November
8985							Year:	2020
6300							Day:	Monday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN		Wayne Crisafulli	WC		
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor:	Onsite						Onsite	
Visitors:	Onsite						Onsite	
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
6:00								
7:30	All onsite LC 34. All have a Site Safety Brief. Operators perform equipment inspections. Organize supplies and tools.							
8:00	KH add air to manlift tires. Tires 5-7 LBs lower than Friday. All determine manlift safe to work in there are no holes or plugs, just monitor tires throughout day.							
8:30	DF, KH (manlift) RL (ground/telehandler) start anchor install							
9:00								
9:30								
10:00								
10:30	Pat Davis (PD) onsite with mechanic to check manlift tires and indicated that Boulevard tire has to say what wrong with tires instead of swap out.							
11:00	P.D. offsite							
11:30								
12:00	All to lunch, DF on phone individually with CN, MJ.							
12:30	KH check tire pressure in manlift- pressure is good 0-2 LBs lower than morning.							
13:00	All resume work							
13:30								
14:00	Boulevard tire onsite. Check 2 steering tires, say the beads are bad and air is leaking through sidewall. Can patch for now and safe to use but tires need replace will order and be back later in week.							
14:30								
15:00								
15:30	Boulevard tire offsite, DF, KH photograph area with no access for anchor. DF email structural engineer for new location.							
16:00	All depart site. End day site secure							
16:30								
17:00								
17:30								
18:00								
Comments:								
-- 8 anchors installed				PPE Level				D+ Fall Protection
--								
--								
--								
Temperature Range: 70 -- 81 ° F								
Weather Conditions: Mostly sunny								Field Operations Supervisor Signature

DAILY ACTIVITY REPORT							Date:	17
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration					Month:	November
8985							Year:	2020
6300							Day:	Tuesday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN		Wayne Crisafulli	WC		
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor:	Onsite						Onsite	
Visitors:	Onsite						Onsite	
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC	x	Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
6:00								
7:30	All onsite LC 34. All have a Site Safety Brief. Operators preform equipment inspections. Organize supplies and tools.							
8:00	DF, KH (manlift) RL (ground/telehandler) start anchor install.							
8:30								
9:00								
9:30	GC onsite 5 minutes.							
10:00								
10:30								
11:00								
11:30								
12:00	All to lunch, DF on phone with CN							
12:30	All resume							
13:00								
13:30								
14:00								
14:30								
15:00								
15:30	All pack equipment for night							
16:00	All depart site. End day site secure							
16:30								
17:00								
17:30								
18:00								
Comments:								
-- 10 anchors installed				PPE Level				D+ Fall Protection
--								
--								
--								
Temperature Range: 57 -- 77 ° F								
Weather Conditions: mostly sunny								Field Operations Supervisor Signature

DAILY ACTIVITY REPORT							Date:	18
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:		November
8985						Year:		2020
6300						Day:		Wednesday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN		Wayne Crisafulli	WC		
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor:								
							Onsite	
Visitors:								
							Onsite	
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
6:00								
7:30	All onsite LC 34. All have a Site Safety Brief. Operators preform equipment inspections. Organize supplies and tools.							
8:00	DF, KH (manlift) RL (ground/telehandler) start anchor install.							
8:30								
9:00								
9:30								
10:00								
10:30								
11:00								
11:30								
12:00	All to lunch, DF offsite to HBF							
12:30	DF back onsite, All resume							
13:00								
13:30								
14:00								
14:30								
15:00	All pack equipment for night, KH, RL depart							
15:30	DF offsite to HBF							
16:00								
16:30								
17:00								
17:30	DF depart site. End day site secure							
18:00								
Comments:								
-- 9 anchors installed				PPE Level D+ Fall Protection				
--								
--								
--								
Temperature Range: 56 -- 76 ° F				 Field Operations Supervisor Signature				
Weather Conditions: mostly cloudy								

DAILY ACTIVITY REPORT							Date:	19
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration				Month:		November
8985						Year:		2020
6300						Day:		Thursday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN		Wayne Crisafulli	WC		
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor: Onsite Onsite								
Visitors: Onsite Onsite								
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
6:30								
7:00	DF onsite WC's meet HDPE delivery							
7:30	DF, RL, WC onsite WC offload truck.							
8:30								
9:00	RL to POL. DF, WC load WC trailer to bring HDPE to LC34							
9:30	KH onsite WC. DF, WC, KH to LC34							
10:00	All onsite LC34 offload HDPE							
10:30	All onsite LC 34. All have a Site Safety Brief. Operators preform equipment inspections. Organize supplies and tools.							
11:00	DF, KH (manlift) RL (ground/telehandler) start anchor install. WC back with another load of HDPE							
11:30	All to lunch							
12:00	All resume, WC back onsite with last load of HDPE.							
12:30								
13:00								
13:30								
14:00								
14:30								
15:00								
15:30	All pack equipment for night							
16:00	DF, RL, KH depart site. DF to HBF							
16:30								
17:00								
17:30	DF End day site secure							
18:00								
Comments:								
-- 6 anchors installed				PPE Level D+ Fall Protection				
--								
--								
--								
Temperature Range: 68 -- 77 ° F				 Field Operations Supervisor Signature				
Weather Conditions: cloudy								

DAILY ACTIVITY REPORT							Date:	20
Project No.:	Project Title:	Launch Complex 34, SWMU CC054 Pedestal Restoration					Month:	November
8985							Year:	2020
6300							Day:	Friday
Personnel Summary								
	Tetra Tech, Inc.			Onsite Support Personnel:			Onsite	
	Field Operations Supervisor:	Christopher Neumann	CN		Wayne Crisafulli	WC		
	Field Operations Lead:	Dan Forester	DF	x	Kyle Hoard	KH	x	
	Project Manager:	Mark Jonnet	MJ		Ron Linton	RL	x	
	Project Support:	Chris Adkison	CA		Rob Segiel	RS		
	Project Support:							
	Project Support:							
Subcontractor:	Onsite						Onsite	
Visitors:	Onsite						Onsite	
Mike Deliz	NASA RPM	MD		Ryan O'Mera	NASA RPM	RO		
Geoff Card	NASA Safety	GC		Deda Johansen	NASA RPM	DJ		
Sean Nichols	NASA Safety	SN						
Description of Work Performed, Problems Encountered and Resolutions:								
Time								
6:30								
7:30	All onsite LC 34. All have a Site Safety Brief. Operators preform equipment inspections. Organize supplies and tools.							
8:00	DF, KH (manlift) RL (ground/telehandler) start anchor install.							
8:30								
9:00								
9:30	Boulevard tire onsite DF ask to wait about an hour until work complete before replace tires.							
10:00								
10:30	Last anchor installed. Clean and store equipmnet. B.T. replace 2 tires.							
11:00	RL to lunch, DF notes, KH to CHP							
11:30	Boulevard Tire offsite DF, RL repair Blemishes and MOB equipment offsite.							
12:00								
12:30								
13:00	DF, RL offsite. DF to CHP, RL to all sites							
13:30								
14:00								
14:30								
15:00								
15:30								
16:00								
16:30								
17:00								
17:30								
18:00								
Comments:								
-- 4 anchors installed				PPE Level				D+ Fall Protection
-- All anchors installed								
--								
--								
Temperature Range: 69 -- 78 ° F								
Weather Conditions: cloudy								
				Field Operations Supervisor Signature				

APPENDIX E

ANCHOR SYSTEM DESIGN PACKAGE



Findings Report:
Concrete Launch Pedestal Plate Inspection
Launch Complex 34, Cape Canaveral, FL

Date: December 12, 2018

Prepared by:

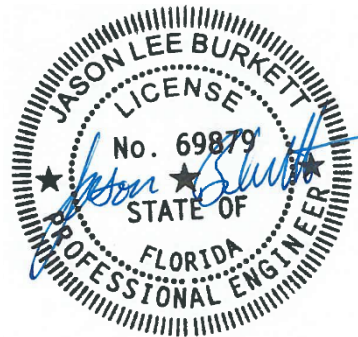
Tetra Tech

2000 Warrington Way, Suite 245

Louisville, KY 40222

A handwritten signature in black ink that reads "Christopher D. Coleman".

Christopher D. Coleman, PE
Structural Engineer



Jason Burkett, PE, SE
Structural Engineer

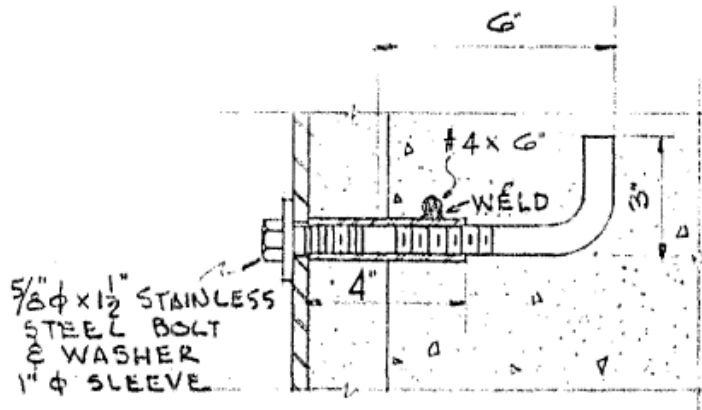
Executive Summary

On November 29th, 2018, a field visit to Launch Complex 34, Cape Canaveral, Florida was conducted by Chris Coleman, PE of Tetra Tech. The intent of the field visit was to provide an assessment of the structural integrity of the 3/8" steel plates that are attached to an abandoned concrete launch pedestal. The visible corrosion of the plates is causing concerns that they are in jeopardy of falling off the pedestal, thus posing a risk to personnel that will be performing environmental remediation work on the structure. After a visual inspection of the plates, it is Tetra Tech's opinion that there is enough material loss in the plates and supporting anchors to validate the integrity concerns. As a result, Tetra Tech recommends either removing the plates in their entirety or providing supplemental anchors prior to any planned work within the vicinity of the structure. A more thorough analysis and investigation will be required if the pedestal becomes a tourist attraction whereby allowing people access to underneath the launch deck.

Background

Based on the record drawings provided to Tetra Tech, the launch pedestal was constructed in 1961. The launch pedestal is a square structure (~45 feet x 45 feet) constructed out of reinforced concrete that stands 27 feet tall. The top deck is approximately seven feet thick with a 27 feet diameter opening, supported by four corner columns with dimensions of 7 feet x 7 feet. Three-eighths inch thick, steel plate lines the inside of the columns, the bottom of the launch deck, and the inside of the pedestal opening. According to the as-built drawings provided, a two-inch thick, lightweight precast refractory concrete layer exists between the plate and concrete. The plate is anchored to the concrete with 5/8 inch diameter stainless steel bolts and washers that are screwed into a one inch diameter sleeve that's welded to a J-bolt with six inches embedment into structural concrete (See Figure 1). The bolts are spaced no more than four feet apart.

Future remediation work is planned for the pedestal which involves removal of the 20-inch diameter torus ring that lines the inside opening of the deck and removal of the paint that exists on the structure and plates. Because the mechanical methods required in the remediation tasks involve vibration and impact forces, there is a concern that these forces will cause the deteriorated plates and/or anchors to fail. The plates, weighing between 800 and 1000 pounds each and pose a serious safety risk to personnel if they become separated from their anchorage points and fall.



ANCHOR BOLT - TYPICAL

DETAIL $\frac{D}{29}$

3" = 1' - 0"

Figure 1

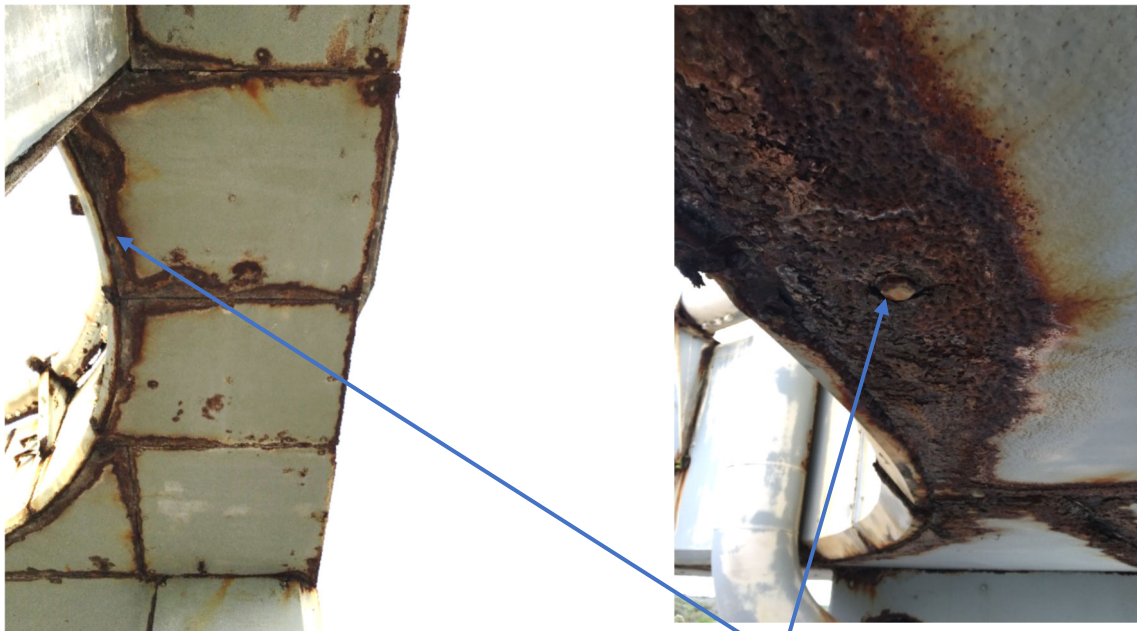
Findings

The field visit was conducted on the morning of November 29th. Weather conditions were mostly cloudy and dry with temperatures in the 50's. A manlift was utilized to access the plates under the top deck and upper sections of the columns. Safety concerns associated with the torus ring's anchorage, prevented a close inspection inside the opening of the deck. However, a detailed close inspection was possible for the remainder of the plates.

Overall, the concrete structure of the launch pedestal is in good condition. Minor spalls and cracking were evident in random areas of the structure. The presence of efflorescence was visible on the soffit that extends off the south side of the top deck. It can be generally stated that the visible areas of concrete showed no signs of damage that would put doubt into the integrity of the concrete; thus, providing evidence that the concrete surrounding the expansion sleeves used to anchor the plates is likely not compromised. However, this conclusion cannot be definitive since the concrete under the plates could not be observed.

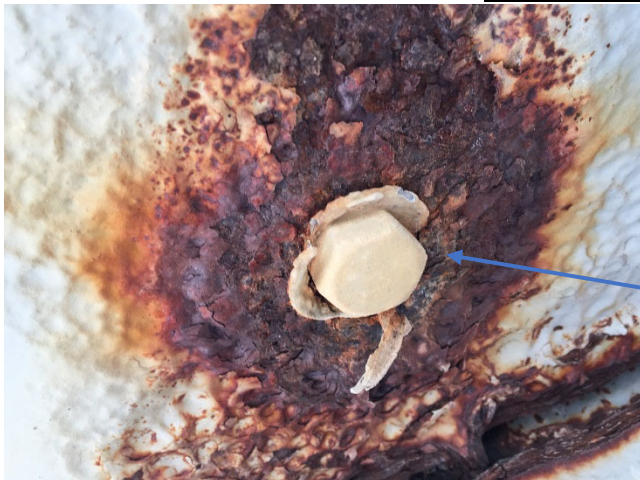
The plates are at various stages of corrosion, ranging from flash and minor surface rust to significant laminar separation that is causing deformation and warping of the plates. The most significant corrosion exists on the plates that are attached to the bottom side of the launch deck. Within these plates the corrosion is prevalent along the outer edges which coincides with the location of some of the anchorage bolts. This is concerning since the weight of the plate is transferred along the lines of corrosion to the bolts through the washer and bolt head assembly. The condition of the bolts and washers for the underside plates appear undamaged

in the north and east quadrants of the pedestal. Damage to the washer was discovered in five bolts within the south and west quadrants. There are numerous locations where the steel around the bolts in all quadrants is heavily damaged but appears to not be corroded all the way through to the concrete. The damage in the plates ranges from pitting to severe delamination. Bolts also exist within the middle of the plate where the corrosion and damage are not as severe. A few locations show where the plates are warping outward from the concrete. This outward deflection signifies expansive corrosive forces of either the concrete or steel plate are occurring between the plate and concrete.



Anchorage bolts contained within corrosion path

Typical Corrosion Pattern



Damaged washer and pitting example at plate anchorage

Edge condition at top deck revealing laminar delamination



Displaced plate along west edge at top deck due to corrosion behind plate

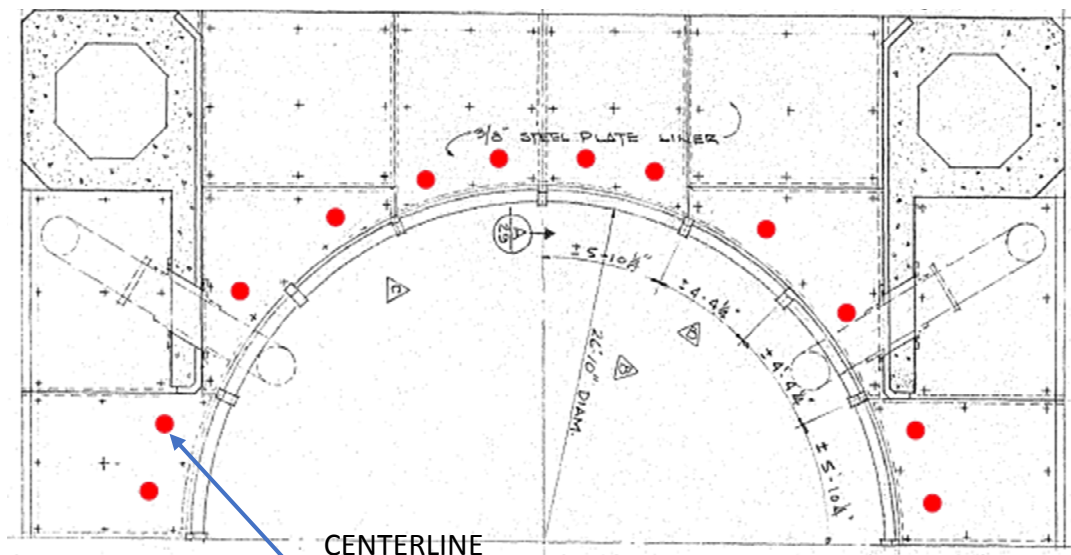
Recommendations

The visual inspection discovered enough evidence that indicates the anchorage of the plate system is compromised. The exact level of strength reduction is not possible to calculate without doing a sandblast and removal of all loose steel to properly measure the undamaged thickness of steel. Furthermore, it's not possible to determine the capacity of the anchor that is secured within the concrete surface unless a prescribed pull test program is instituted on a select number of bolts.

Because of these uncertainties, it is recommended that the plates are either removed in their entirety or retrofitted to eliminate the risk of anchor failure. If the plates must remain in place

during the environmental remediation activities, then it is recommended that supplemental post-installed anchors are installed within the plates. The supplemental anchors will offset the strength deficiencies associated with the corrosion damage. Tetra Tech recommends installing additional expansion anchors in a pattern as indicated by the red dots in the original construction plan excerpt below. The expansion anchors and washers should be made of hot-dipped galvanized steel, have a diameter of 5/8" and have at least six inches embedment into structural concrete. Hilti's Kwik Bolt 3 is one example of a suitable anchor. All installation should strictly follow the manufacturer's recommendations for installation. Although shoring of the plates is not anticipated during the anchor installation, the contractor shall be mindful of plate vibration during drilling and installation of the anchors. If the plates begin to vibrate or begin to sag, post shores and additional anchorage may be required - consult Tetra Tech's structural engineer in the event this occurs.

The previously described methods for securing the plates are only applicable to safeguarding construction personnel during the environmental remediation activities. If the pedestal becomes a tourist attraction allowing people unrestricted access to underneath the launch deck, a more comprehensive investigation will need to be performed. All corrosion will need to be removed from the plates so that the remaining steel thickness can be properly measured. The result of the measurements and subsequent analysis may require additional anchorage beyond what was specified for the remediation efforts. Furthermore, State Historic Preservation Office (SHPO) requirements may dictate an alternate approach to securing the plates. These additional considerations will need to be followed before the pedestal is considered safe for public access.



Post-installed anchor locations
Typical 2 per plate about centerline

TECHNICAL MEMORANDUM

DATE: October 16, 2020

SUBJECT: Launch Pedestal Plate Stabilization for Launch Complex 34 – Cape Canaveral, FL

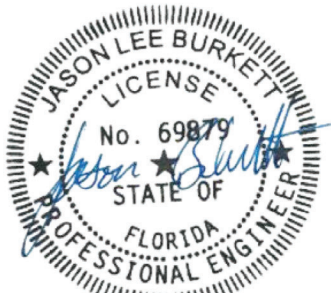
Representatives from Tetra Tech visited the Launch Complex C34 site on November 28, 2018 to visually inspect external cladding on the launch pedestal and provide a structural assessment for the deteriorating members. This evaluation resulted in a repair plan to add post-installed concrete anchors to stabilize potentially weakened areas on the underside due to advanced corrosion. The originally proposed repairs were installed this year in 2020. The purpose of this final assessment is to provide additional anchors necessary to fully support cladding plate and provide a design that guarantees a safe condition for at least one year. Conservatively, this design assumes existing/original anchors are no longer engaged and do not provide support since there is significant corrosion around them and no material testing has been performed.

The existing cladding plates are 3/8" thick carbon steel and were originally supported by stainless steel bolts anchored into concrete. From our visual observation, much of the advanced deterioration in the plate and anchors is concentrated to the underside of the launch pedestal. This area is subjected to water collection and slower rates of evaporation from limited sunlight. The new anchors have been designed for the self-weight of the cladding plate plus any suction loading from a code level hurricane. Locations for the new anchors are no less than 12" from plate edges and to be located away from high corrosion zones.

Our calculation determined fifty-one (51) additional anchors are required to safely support the cladding plate on the underside of the launch pedestal. The design checked the capacity of new anchors with anchor design software by Simpson Strong Tie. Stresses in the plate were confirmed to be safe by finite element analysis. The new anchors are comprised of 3/4" dia. x 7" Simpson Strong Tie Titan HD, stainless-steel (304). The additional anchors match the size and material previously used for the initial plate stabilization.

Thank you for the opportunity to provide support to this project. Please do not hesitate to call with questions or for further assistance.

Sincerely,



Jason Burkett, FL P.E. #69879
Structural Engineer

Enclosed (2):

Drawing S101 – Steel Liner Plate Stabilization, Rev 1
Design Calculations for Plate Stabilization

Tetra Tech
2000 Warrington Way, Suite 245
Louisville, KY
502-584-5555

JOB TITLE NASA PAD

JOB NO. <u>200-16040-19002</u>	SHEET NO. _____
CALCULATED BY <u>SPS</u>	DATE <u>10/14/20</u>
CHECKED BY <u>JLB</u>	DATE <u>10/14/20</u>

CS2018 Ver 2019.05.15

www.struware.com



STRUCTURAL CALCULATIONS

FOR

NASA - LC34 LAUNCH PAD

Cape Canaveral, FL



TETRA TECH

PROJECT NASA PAD ANCHOR DESIGN
 PROJECT NO 200-01278-19003
 SUBJECT SIMPSON HD SCREW DESIGN CHECK
 BY SPS/ JLB DATE 10/15/2020 SHEET 1 OF 1

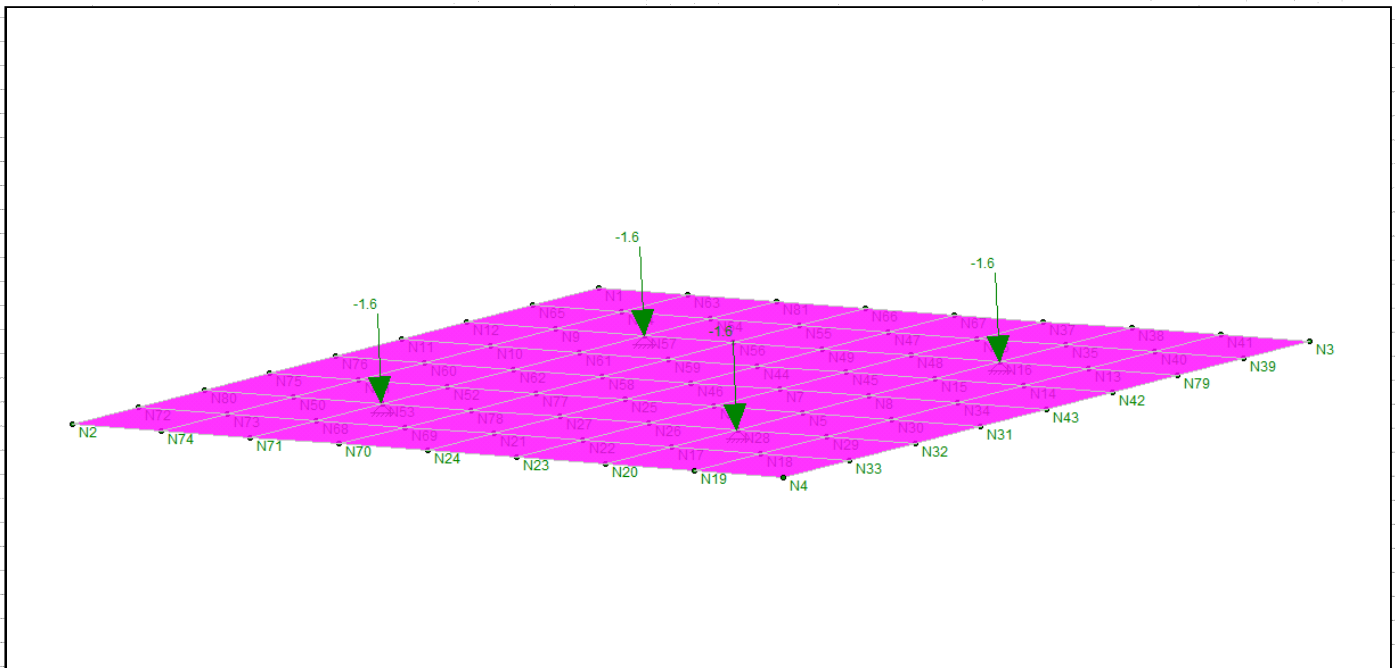
CONTROLLING PLATE SIZE = 8' x 8'

WIND LOAD ON 64SF AREA = 83 PSF , SEE ATTACHED SHEET.

FACTORED REACTION FROM RISA ON EACH ANCHOR FROM DEAD LOAD AND WINDLOAD = -1.638 KIPS PER ANCHOR

SELECTED SCREW ANCHOR = 3/4" x 7" LONG

SEE ATTACHED ANCHOR CALCULATIONS.



MAX BENDING STRESS IN PLATE FROM RISA = 0.618 k-ft = 618#-FT < 1139 #-FT, SEE ATTACHED SHEET FOR CALCULATION

VON MISES STRESS FROM RISA = 25.9 KSI < 0.9*36= 32.4KSI

PUNCHING SHEAR IN PLATE:

WINCH SIZE FOR 3/4" BOLT = 1 1/8"

CONSIDERING CRITICAL SECTION AT d= 3/8" DISTANCE FROM FACE OF SCREW HEAD.

$$b_o = 3.14*(1.125+2*3/8)= 5.89"$$

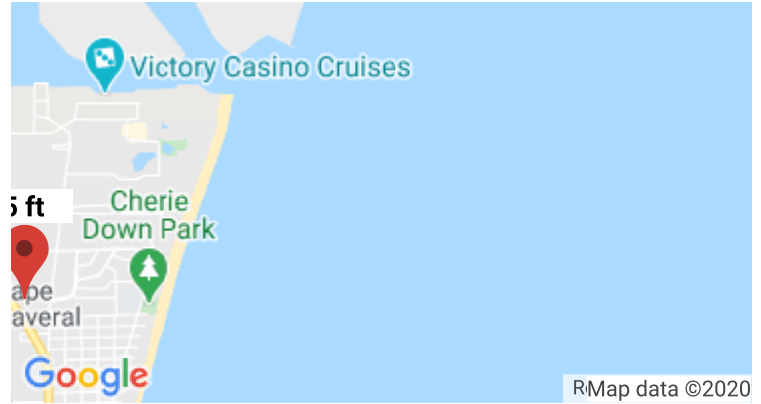
$$d = 3/8"$$

$$\text{Shear strength of steel plate} = 0.75*36*5.89*0.375 = 59.64 \text{ kips} > 1.638 \text{ kips}$$

ATC Hazards by Location

Search Information

Address: Cape Canaveral, FL 32920, USA
Coordinates: 28.3922182, -80.60771319999999
Elevation: 5 ft
Timestamp: 2020-10-14T21:21:08.091Z
Hazard Type: Wind



ASCE 7-16

MRI 10-Year 83 mph
 MRI 25-Year 99 mph
 MRI 50-Year 110 mph
 MRI 100-Year 121 mph
 Risk Category I ⚠️ 136 mph

You are in a wind-borne debris region if you are also within 1 mile of the coastal mean high water line.

Risk Category II ⚠️ 148 mph
 You are in a wind-borne debris region.

Risk Category III ⚠️ 159 mph

If the structure under consideration is a healthcare facility and you are also within 1 mile of the coastal mean high water line, you are in a wind-borne debris region. If other occupancy, use the Risk Category II basic wind speed contours to determine if you are in a wind-borne debris region.

Risk Category IV ⚠️ 168 mph
 You are in a wind-borne debris region.

ASCE 7-10

MRI 10-Year 83 mph
 MRI 25-Year 99 mph
 MRI 50-Year 110 mph
 MRI 100-Year 121 mph
 Risk Category I ⚠️ 136 mph

You are in a wind-borne debris region if you are also within 1 mile of the coastal mean high water line.

Risk Category II ⚠️ 148 mph
 You are in a wind-borne debris region.

Risk Category III-IV ... ⚠️ 159 mph

If the structure under consideration is a healthcare facility and you are also within 1 mile of the coastal mean high water line, you are in a wind-borne debris region. If other occupancy, use the Risk Category II basic wind speed contours to determine if you are in a wind-borne debris region.

ASCE 7-05

ASCE 7-05 Wind Speed - ⚠️ 127 mph
 You are in a wind-borne debris region.

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Tetra Tech

Address
City, State
Phone

JOB TITLE NASA PAD

JOB NO. 200-16040-19002
CALCULATED BY SPS
CHECKED BY JLB

SHEET NO.
DATE 10/14/20
DATE 10/14/20

Wind Loads - Open Buildings: $0.25 \leq h/L \leq 1.0$

Ultimate Wind Pressures

Type of roof = Monoslope Free Roofs
Wind Flow = Clear

G = 0.85
Roof Angle = 0.0 deg

Main Wind Force Resisting System

$K_z = K_h$ (case 2) = 0.98

Base pressure (qh) = **54.0 psf**

NOTE: The code requires the MWFRS be designed for a minimum pressure of 16 psf.

Roof pressures - Wind Normal to Ridge

Wind Flow	Load Case		Wind Direction $\gamma = 0 \text{ \& } 180 \text{ deg}$	
			Cnw	Cnl
Clear Wind Flow	A	Cn =	1.20	0.30
		p =	55.1 psf	13.8 psf
	B	Cn =	-1.10	-0.10
		p =	-50.5 psf	-4.6 psf

- NOTE: 1). Cnw and Cnl denote combined pressures from top and bottom roof surfaces.
2). Cnw is pressure on windward half of roof. Cnl is pressure on leeward half of roof.
3). Positive pressures act toward the roof. Negative pressures act away from the roof.

Roof pressures - Wind Parallel to Ridge, $\gamma = 90 \text{ deg}$

Wind Flow	Load Case		Horizontal Distance from Windward Edge		
			$\leq h$	$>h \leq 2h$	$> 2h$
Clear Wind Flow	A	Cn =	-0.80	-0.60	-0.30
		p =	-36.7 psf	-27.6 psf	-13.8 psf
	B	Cn =	0.80	0.50	0.30
		p =	36.7 psf	23.0 psf	13.8 psf

h = 30.0 ft
2h = 60.0 ft

Fascia Panels -Horizontal pressures

qp = 54.0 psf

Windward fascia: 81.1 psf (GCpn = +1.5)
Leeward fascia: -54.0 psf (GCpn = -1.0)

Components & Cladding - roof pressures

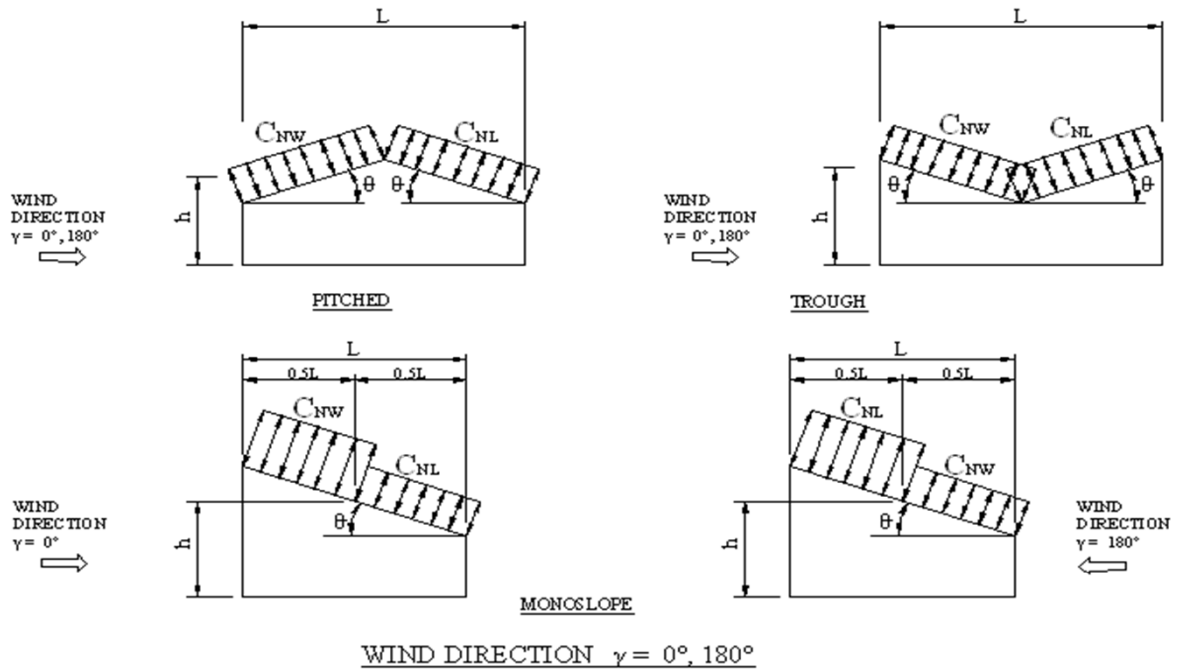
$K_z = K_h$ (case 1) = 0.98
Base pressure (qh) = **54.0 psf**
G = 0.85

a = 4.2 ft

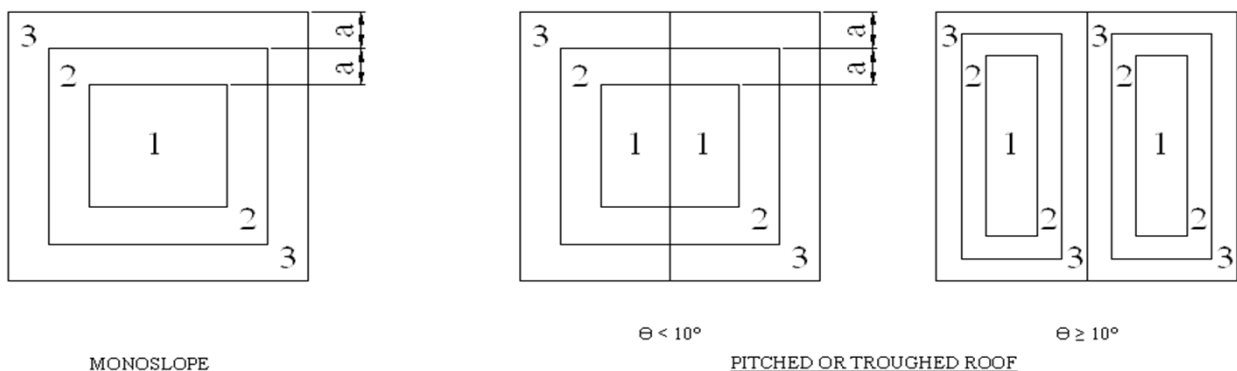
$a^2 = 17.6 \text{ sf}$
 $4a^2 = 70.6 \text{ sf}$

	Effective Wind Area	Clear Wind Flow					
		zone 3		zone 2		zone 1	
		positive	negative	positive	negative	positive	negative
C _N	$\leq 17.6 \text{ sf}$	2.40	-3.30	1.80	-1.70	1.20	-1.10
	$>17.6, \leq 70.6 \text{ sf}$	1.80	-1.70	1.80	-1.70	1.20	-1.10
	$> 70.6 \text{ sf}$	1.20	-1.10	1.20	-1.10	1.20	-1.10
Wind pressure	$\leq 17.6 \text{ sf}$	110.2 psf	-151.6 psf	82.7 psf	-78.1 psf	55.1 psf	-50.5 psf
	$>17.6, \leq 70.6 \text{ sf}$	82.7 psf	-78.1 psf	82.7 psf	-78.1 psf	55.1 psf	-50.5 psf
	$> 70.6 \text{ sf}$	55.1 psf	-50.5 psf	55.1 psf	-50.5 psf	55.1 psf	-50.5 psf

Location of Wind Pressure Zones



MAIN WIND FORCE RESISTING SYSTEM



COMPONENTS AND CLADDING



Company:	Tetra Tech	Date:	10/16/2020
Engineer:	SPS	Page:	1/5
Project:	NASA pad anchors		
Address:			
Phone:			
E-mail:			

1. Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General

Design method: ACI 318-14
Units: Imperial units

Anchor Information:

Anchor type: Concrete screw
Material: Stainless Steel
Diameter (inch): 0.750
Nominal Embedment depth (inch): 6.250
Effective Embedment depth, h_{ef} (inch): 4.130
Anchor category: 1
Anchor ductility: Yes
 h_{min} (inch): 10.00
 c_{ac} (inch): 7.38
 c_{min} (inch): 1.75
 s_{min} (inch): 3.00

Base Material

Concrete: Normal-weight
Concrete thickness, h (inch): 60.00
State: Cracked
Compressive strength, f'_c (psi): 4000
 $\Psi_{c,v}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Ignore 6do requirement: Not applicable
Build-up grout pad: No

Base Plate

Length x Width x Thickness (inch): 36.00 x 36.00 x 0.33

Recommended Anchor

Anchor Name: Titen HD® Stainless Steel - 3/4"Ø SS Titen HD, h_{nom} : 6.25" (159mm)





Company:	Tetra Tech	Date:	10/16/2020
Engineer:	SPS	Page:	2/5
Project:	NASA pad anchors		
Address:			
Phone:			
E-mail:			

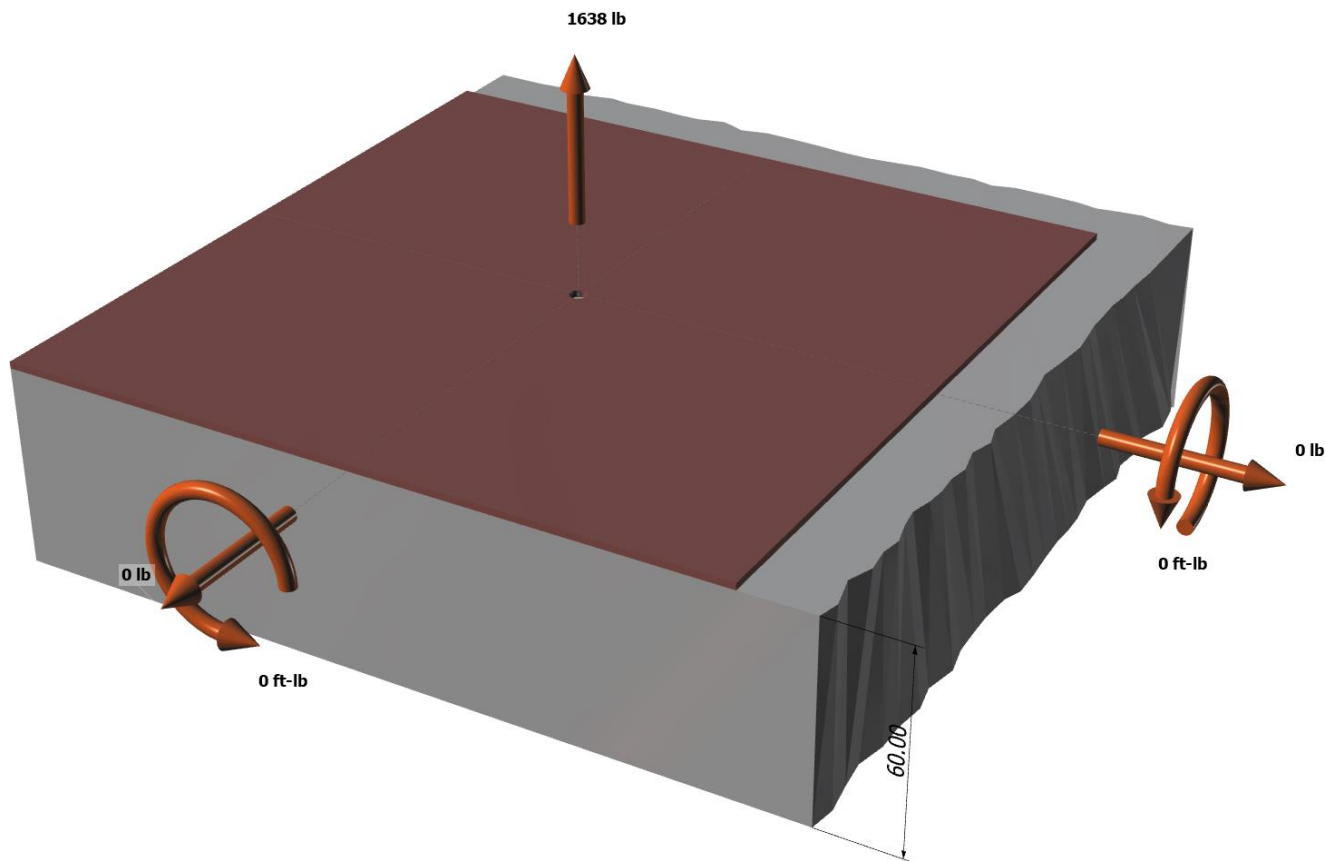
Load and Geometry

Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: Not applicable
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: No

Strength level loads:

N_{ua} [lb]: 1638
 V_{uax} [lb]: 0
 V_{uay} [lb]: 0
 M_{ux} [ft-lb]: 0
 M_{uy} [ft-lb]: 0

<Figure 1>

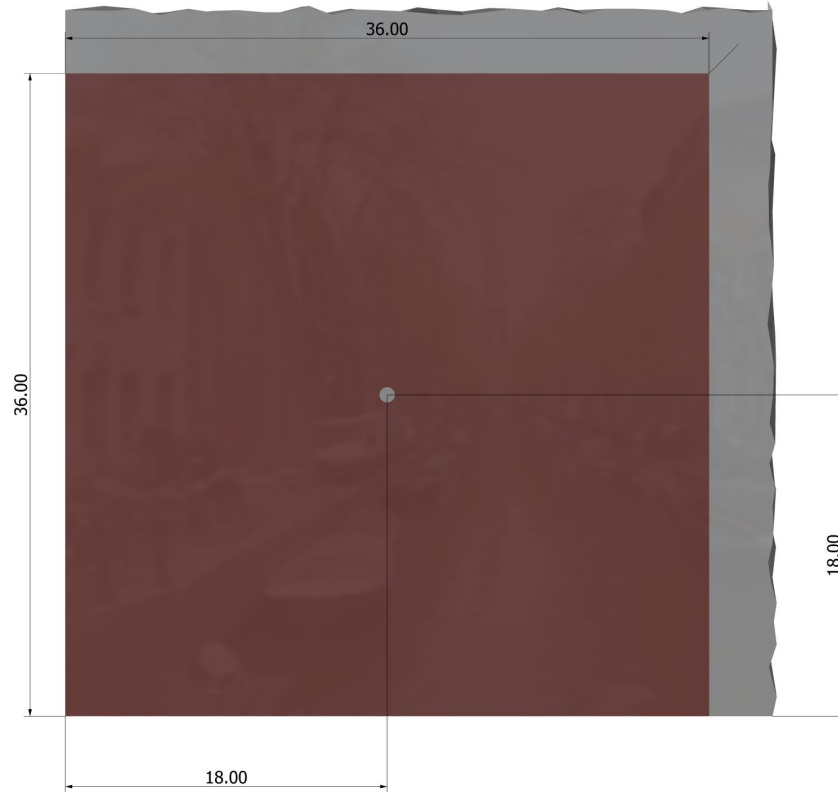


Input data and results must be checked for agreement with the existing circumstances, the standards and guidelines must be checked for plausibility.



Company:	Tetra Tech	Date:	10/16/2020
Engineer:	SPS	Page:	3/5
Project:	NASA pad anchors		
Address:			
Phone:			
E-mail:			

<Figure 2>





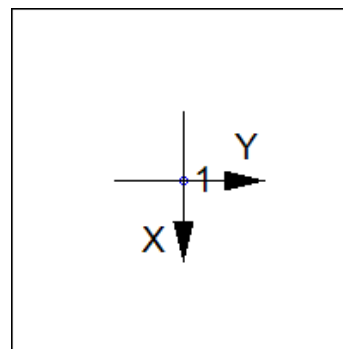
Company:	Tetra Tech	Date:	10/16/2020
Engineer:	SPS	Page:	4/5
Project:	NASA pad anchors		
Address:			
Phone:			
E-mail:			

3. Resulting Anchor Forces

Anchor	Tension load, N _{ua} (lb)	Shear load x, V _{uax} (lb)	Shear load y, V _{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2 + (V_{uay})^2}$ (lb)
1	1638.0	0.0	0.0	0.0
Sum	1638.0	0.0	0.0	0.0

Maximum concrete compression strain (%): 0.00
 Maximum concrete compression stress (psi): 0
 Resultant tension force (lb): 1638
 Resultant compression force (lb): 0
 Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
 Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00

<Figure 3>



4. Steel Strength of Anchor in Tension (Sec. 17.4.1)

N _{sa} (lb)	φ	φN _{sa} (lb)
47606	0.75	35705

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.4.2)

$$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5} \text{ (Eq. 17.4.2.2a)}$$

k _c	λ _a	f' _c (psi)	h _{ef} (in)	N _b (lb)
21.0	1.00	4000	4.130	11147

$$\phi N_{cb} = \phi (A_{Nc} / A_{Nco}) \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b \text{ (Sec. 17.3.1 \& Eq. 17.4.2.1a)}$$

A _{Nc} (in ²)	A _{Nco} (in ²)	c _{a,min} (in)	Ψ _{ed,N}	Ψ _{c,N}	Ψ _{cp,N}	N _b (lb)	φ	φN _{cb} (lb)
153.51	153.51	18.00	1.000	1.00	1.000	11147	0.65	7246

11. Results

11. Interaction of Tensile and Shear Forces (Sec. D.7)?

Tension	Factored Load, N _{ua} (lb)	Design Strength, φN _n (lb)	Ratio	Status
Steel	1638	35705	0.05	Pass
Concrete breakout	1638	7246	0.23	Pass (Governs)

3/4"Ø SS Titen HD, hnom:6.25" (159mm) meets the selected design criteria.



Anchor Designer™
Software
Version 2.9.7376.0

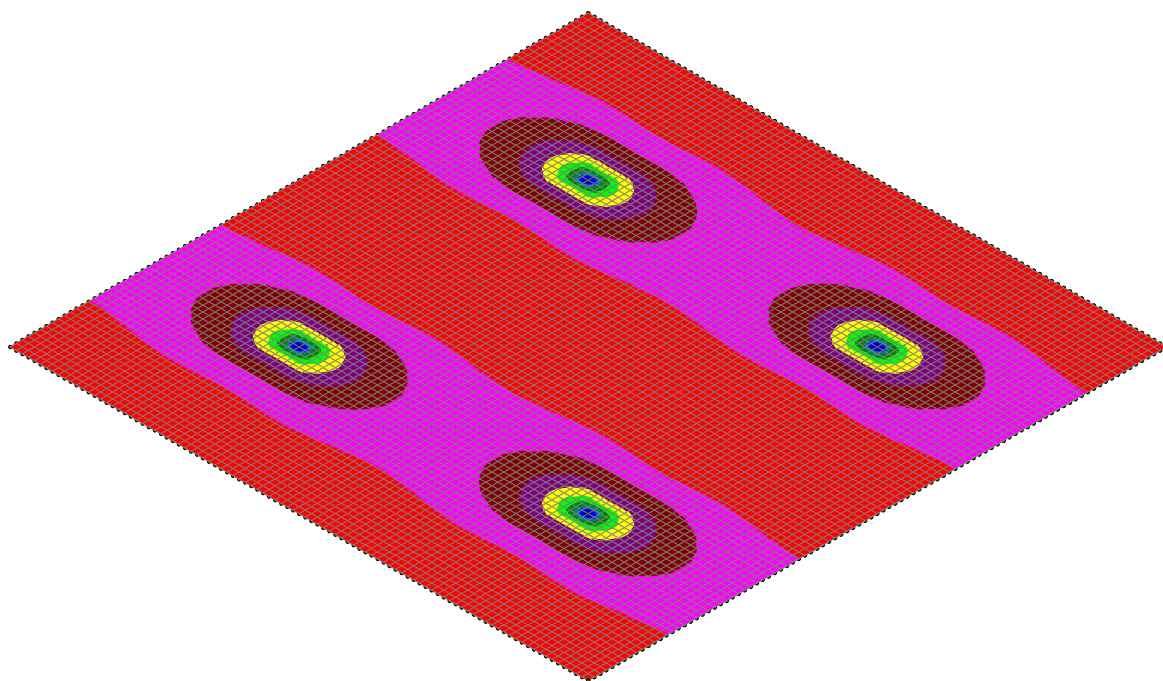
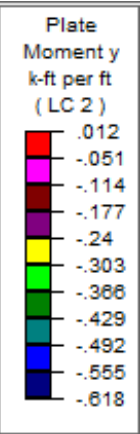
Company:	Tetra Tech	Date:	10/16/2020
Engineer:	SPS	Page:	5/5
Project:	NASA pad anchors		
Address:			
Phone:			
E-mail:			

12. Warnings

- Designer must exercise own judgement to determine if this design is suitable.
- Refer to manufacturer's product literature for hole cleaning and installation instructions.



WIND LOAD APPLIED ON PLATE = 83 PSF
LC 2 = 1.2 DEAD + 1.0 WIND (BOTH LOADS ACTING UP)



Results for LC 2, IBC 16-4 (a)

Tetra Tech	NASA pad anchors	Bending stress on plate
SPS		Oct 16, 2020 at 8:55 AM
200-01278-19003		Plate stresses.r3d

Steel Plate Bending Strength



Input:

$$f_y := 36 \text{ksi} \quad (\text{yield strength of steel})$$

$$\phi_b := 0.9 \quad (\text{resistance factor})$$

$$t_p := \frac{3}{8} \text{in} \quad (\text{plate thickness})$$

$$\Omega_b := 1.67 \quad (\text{safety factor})$$

$$B := 12 \text{in} \quad (\text{plate width})$$



$$I_x := \frac{B \cdot t_p^3}{12}$$

$$I_x = 0.05 \cdot \text{in}^4$$

$$Z_x := \frac{B \cdot t_p^2}{4}$$

$$Z_x = 0.42 \cdot \text{in}^3$$

$$S_x := \frac{2I_x}{t_p}$$

$$S_x = 0.28 \cdot \text{in}^3$$

$$M_p := Z_x \cdot f_y$$

$$M_p = 15.19 \cdot \text{kip} \cdot \text{in}$$

$$M_y := S_x \cdot f_y$$

$$M_y = 10.12 \cdot \text{kip} \cdot \text{in}$$

$$1.6 \cdot M_y = 16.2 \cdot \text{kip} \cdot \text{in}$$



$$M_n := \min(M_p, 1.6M_y)$$

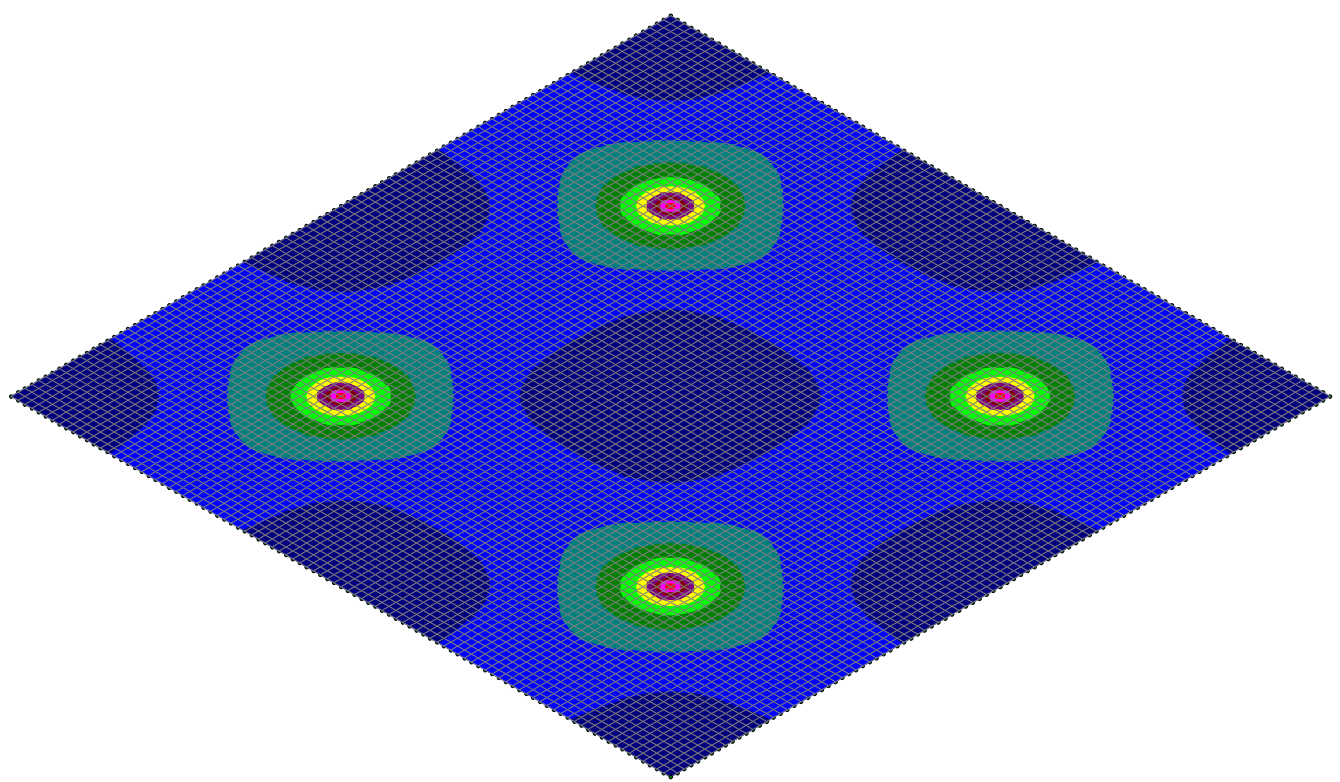
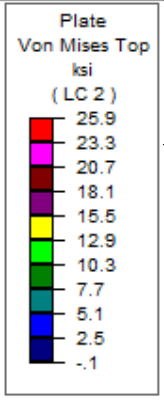
$$\phi_b \cdot M_n = 1139.06 \cdot \text{ft} \cdot \text{lb} \quad (\text{LRFD})$$

$$\frac{M_n}{\Omega_b} = 9.09 \cdot \text{kip} \cdot \text{in} \quad (\text{ASD})$$



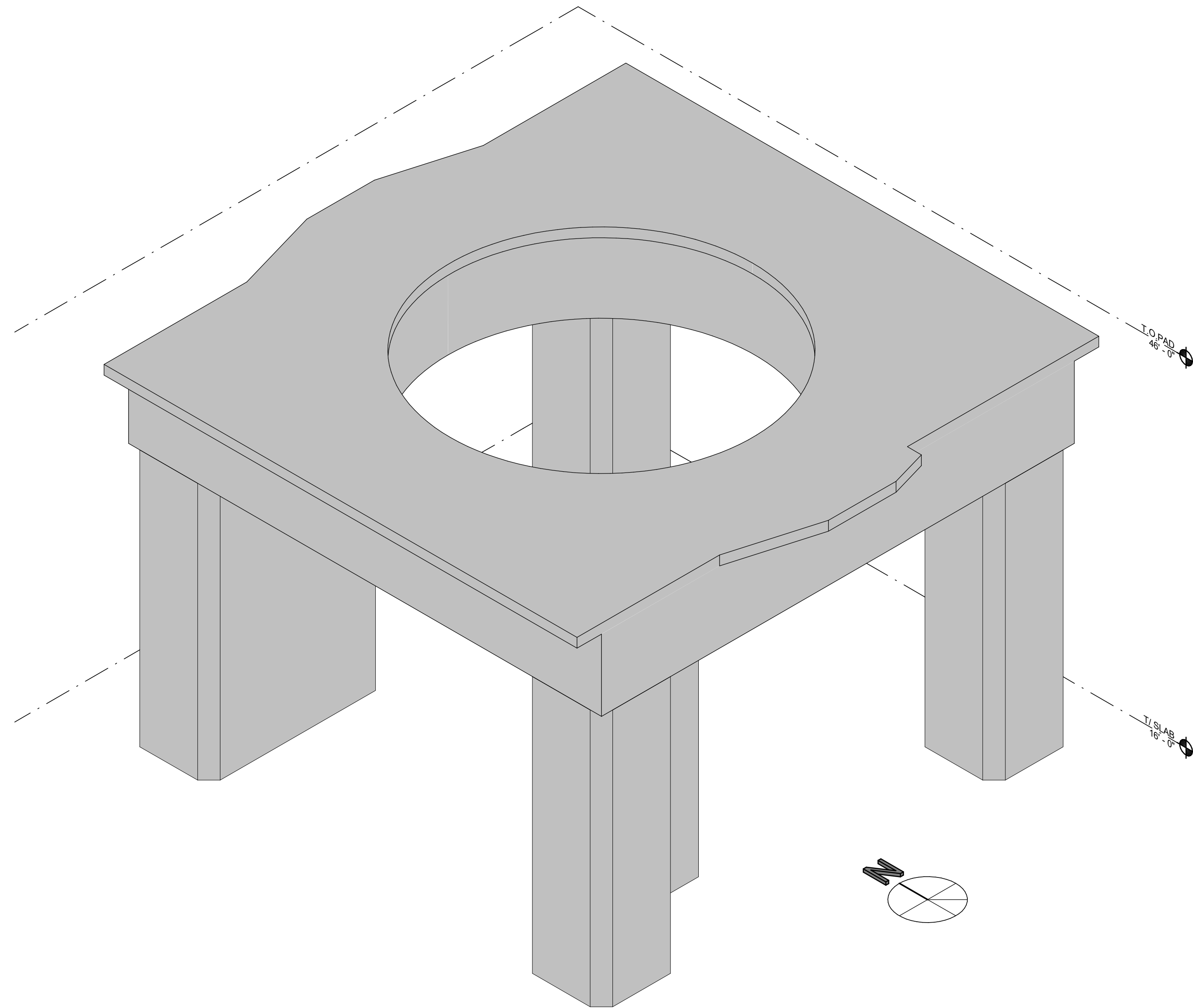


WIND LOAD APPLIED ON PLATE = 83 PSF
LC 2 = 1.2 DEAD + 1.0 WIND (BOTH LOADS ACTING UP)

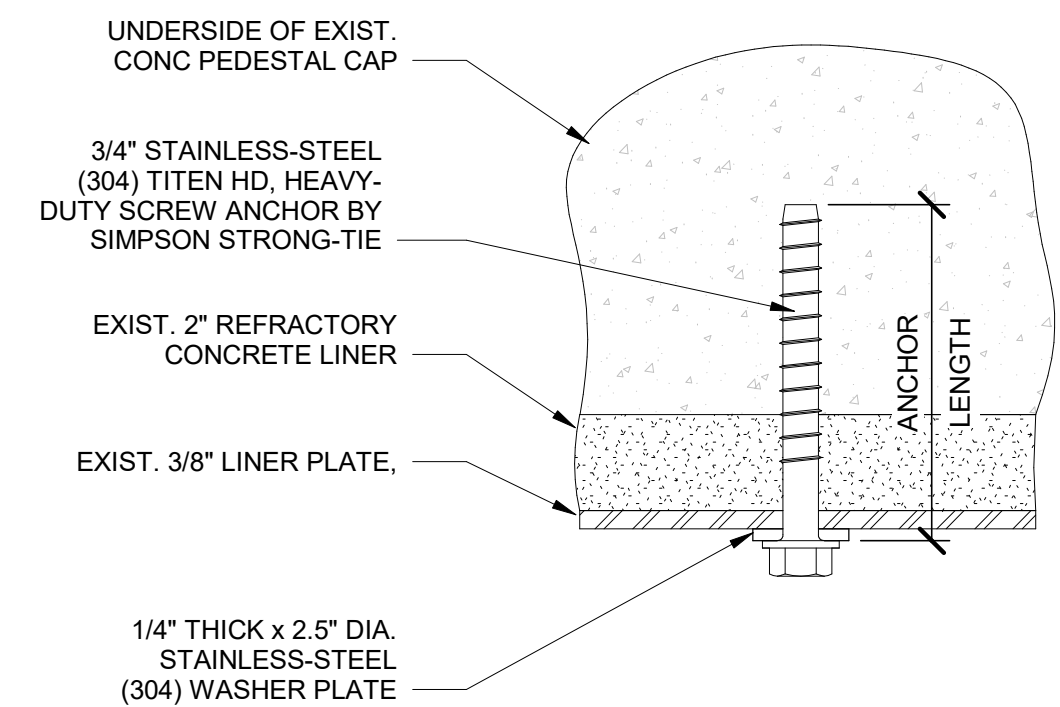
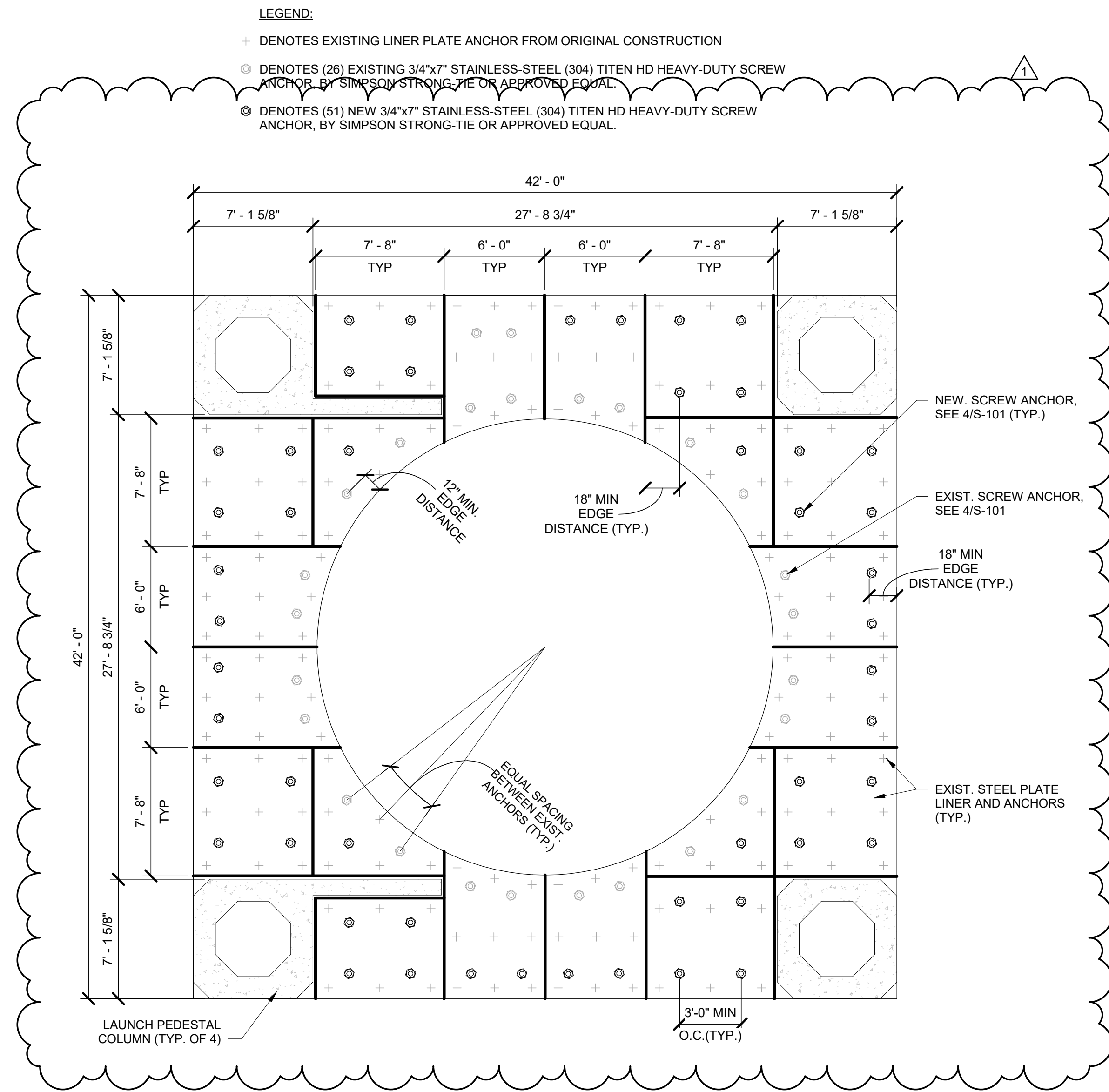


Results for LC 2, IBC 16-4 (a)

Tetra Tech	NASA pad anchors	Von mises stress
SPS		Oct 16, 2020 at 8:59 AM
200-01278-19003		Plate stresses.r3d



1 LAUNCH PEDESTAL ISOMETRIC VIEW
SCALE:



4 HEAVY-DUTY SCREW ANCHOR (TYP.)
SCALE: 3" = 1'-0"

NOTES:

- NEW SCREW ANCHORS ARE TO BE PLACED WHERE INDICATED ON PLAN. DO NOT INSTALL NEW ANCHORS WHERE EXCESSIVE PLATE CORROSION, EXPANSION, OR DELAMINATION EXISTS. MAINTAIN 2" CLEAR DISTANCE BETWEEN HEAVILY CORRODED PLATE STEEL AND NEW ANCHOR.
- PRE-DRILL EXIST. STEEL LINER PLATE AND WASHER WITH 15/16" DIA. HOLE.
- PRE-DRILL CONCRETE SUBSTRATE WITH 3/4" DIA. HOLES. DO NOT CLEAR DUST FOR OVERHEAD INSTALLATIONS.
- TIGHTEN THE ANCHOR INTO THE SUBSTRATE MATERIAL UNTIL WASHER MAKES SOLID CONTACT WITH LINER PLATE. DO NOT DAMAGE THREADS WHEN TIGHTENING ANCHOR.
- SCREW ANCHORS ARE FOR ONE TIME USE ONLY. DO NOT REUSE FOR LINER PLATE INSTALLATION.
- COREDILLING IS NOT ALLOWED FOR ANCHOR HOLE INSTALLATION. REBAR CUTTING DRILL BITS WILL BE USED AS REQUIRED. WHEN REBAR IS ENCOUNTERED, USE 3/4"x8 1/2" STAINLESS STEEL (304) TITEN HD SCREWS OR APPROVED EQUAL.
- NEW ANCHORS ARE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTION. DO NOT OVER TIGHTEN OR DAMAGE FINISHES. APPLY AN ANTI-SEIZE COMPOUND TO THE SHANK OF SCREWS WHERE CONTACTS BETWEEN CARBON STEEL AND STAINLESS CAN OCCUR.

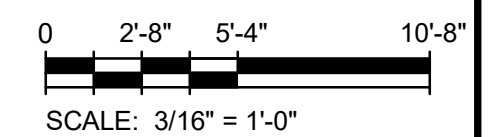


MARK	DATE	DESCRIPTION	BY
1	10/14/20	NEW ANCHORS	

NASA - CAPE CANAVERAL, FL
LC34 LAUNCH PEDESTAL
STEEL LINER PLATE STABILIZATION

PROJ: 200-01278-19003
DESN: JLB
DRWN: MSP
CHKD: CDC

S-101



Bar measures 1 inch, otherwise drawing is not to scale

APPENDIX F

WASTE DISPOSAL

- F.1 KSC SCHWARTZ ROAD LANDFILL WASTE WEIGHT TICKETS**
- F.2 JED LANDFILL WASTE PROFILE, MANIFESTS, AND WEIGHT TICKETS**

(PROVIDED IN ELECTRONIC VERSION ONLY)

F.1 KSC SCHWARTZ ROAD LANDFILL WASTE WEIGHT TICKETS

KSC Landfill
East Schwartz Road
Operated by BOSS
Supervisor- Derick Fowler

Transaction No. 60399
Date Time Scale
In: 09/17/2020 09:05 1
Out: 09/17/2020 09:29 1

Vehicle P69-64B Alpha Omega
Account TETRA TECH Wayne Crisuf
Material Working Fa Construction
User1 DAVID
User2D: ENV1635
Comments: LAUNCH COMPLEX 34
Regular Transaction
Charge by Weight

Gross: 40740 lb (M)
Tare: 32000 lb
Net: 8740 lb

Driver Signature:

KSC Landfill
East Schwartz Road
Operated by BOSS
Supervisor- Derick Fowler

Transaction No. 60526
Date Time Scale
In: 10/08/2020 08:06 1
Out: 10/08/2020 08:20 1

Vehicle P69-64B Alpha Omega
Account TETRA TECH Wayne Crisuf
Material Working Fa Construction
User1 DAVID
User2D: ENV1635
Comments: LAUNCH COMPLEX 34
Regular Transaction
Charge by Weight

Gross: 43440 lb (M)
Tare: 32020 lb
Net: 11420 lb

Driver Signature:

F.2 JED LANDFILL WASTE PROFILE, MANIFESTS, AND WEIGHT TICKETS



Waste Stream - LC34 Pad Soils

[Waste Profile](#)

[Track Waste \(Learn More\)](#)

Utilities ▼

Edit Profile

Submit Profile for Approval

Waste Profile

ID: a76f0f5a-aae5-4884-affd-08d29e37a943

DRAFT

GENERAL INFORMATION

Destination Country

United States of America ⓘ

Generator

[NASA Kennedy Space Center](#) ↗

NASA Causeway, Kennedy Space Center, FL 32953 , Brevard

▶ Contacts (0)

Waste Facility

[JED Landfill](#) ↗

1501 Omni Way, St Cloud, FL 34773 , Osceola

▶ Contacts (0)

Billing Company

[AMERICAN WASTE MNGT SVCS](#) ↗

One American Way, Warren, OH 44484

(330) 856-8800

▶ Contacts (0)

Transporter

Not specified

Material Origin

Origin Address

Launch Complex 34 (LC34)

Cape Canaveral Air Force Station, FL 32953

Brevard County

EPA ID

FL6800014585

Notes

Attachments

Activities

Resources

State ID	N/A
----------	-----

Material

Is this an Industrial Waste Stream?	<input checked="" type="radio"/> Yes <input type="radio"/> No
-------------------------------------	--

Common Name	LC34 Pad Soils
-------------	----------------

Generation Process	Excavation of Contaminated Soil
--------------------	---------------------------------

Preferred Disposal Methods	<i>Not specified</i>
----------------------------	----------------------

Contamination Source	<i>Not specified</i>
----------------------	----------------------

Material Composition

Constituents	Soil: 95% – 99% Aggregate: 1% – 5%
--------------	---------------------------------------

State Waste Codes	N/A
-------------------	-----

Color	Brown/Gray
-------	------------

Physical State at 70°F	<input checked="" type="radio"/> Solid <input type="radio"/> Liquid <input type="radio"/> Sludge <input type="radio"/> Dust <input type="radio"/> Other
------------------------	---

pH	N/A
----	-----

Strong Odor	<input type="radio"/> Yes <input checked="" type="radio"/> No
-------------	--

Reactivity	<input type="radio"/> Yes <input checked="" type="radio"/> No
------------	--

- Flash Point
- < 140°F
- 140°F - 199°F
- ≥ 200°F
- N/A

Regulatory

EPA Hazardous Waste? No

- Attached Non-Hazardous Determination Document(s) (Check all that apply)
- Process Knowledge
- SDS
- Certified Analytical Report
- Exempt Waste

Is the data derived from testing a representative sample according with 40 CFR 261 and/or other applicable laws? Yes

- Type of Analytical Sample
- Composite
- Grab

Sample ID # LC34-CP0005-000.5-20200727

State Hazardous Waste? No

Is this material non-hazardous due to treatment, delisting, or exclusion? No

From an industry regulated under Benzene NESHAP? No

Facility remediation subject to 40 CFR 63 GGGGG? No

CERCLA or State-Mandated clean-up? No

Regulated, Licensed or NORM Radioactive Waste? No

Contains PCBs? Yes

Regulated by 40 CFR 761? No

Remediation under 40 CFR 761.61 (a)? Yes

PCB imported into the US? No

Regulated and/or Untreated
Medical/Infectious Waste? No

Contains Asbestos? No

Subject to RCRA Subpart CC controls? No

Shipping & DOT

Event Frequency
 One Time
 On-Going

Estimated Annual Quantity 243

Unit of Measure
 Tons
 Yards
 Drums
 Gallons
 Other

Shipping Frequency
 Once
 Daily
 Weekly
 Monthly
 Other

Quantity Per Shipment 20 Tons

Container Type Dump Trailer

Container Size 40 CY

USDOT Shipping Name N/A

Profile Certification

UNCERTIFIED

I hereby certify that (1) all information submitted on this form and on supplemental materials is complete and accurate to the best of my knowledge and ability to determine; (2) the information provided herein, including any supplemental information, such as laboratory analytical, MSDS, etc., accurately describes the waste stream to be delivered to the facility and that all known or suspected hazards have been disclosed. I understand that, once the waste stream is approved by Destination Facility based on this information, any deviation in the source, composition, constituents or characteristics of the waste stream from the information described herein, may render the waste stream unacceptable for disposal, at the sole discretion of Destination Facility. I further understand that any deviation from the information contained herein will require immediate notification to the Destination Facility and cessation of disposal.



Certify Profile

AMERICAN WASTE MANAGEMENT SERVICES, INC.
 ONE AMERICAN WAY WARREN, OHIO 44484-5555
 (330) 856-8800 FAX (330) 856-8482

BILL TO: P-7720

INVOICE: 205251
 DATE: 10/31/2020
 TERMS: 30 DAYS

TETRA TECH NUS, INC.
 661 ANDERSON DRIVE
 FOSTER PLAZA 7
 PITTSBURGH PA 15220
 ATTENTION: ACCOUNTS PAYABLE

PO NO:

WASTE ID NO: 64230
 WASTE NAME: LC 34 PEDESTAL TRENCH SOIL,
 GENERATOR: NASA KENNEDY SPACE CENTER
 PLANT:

REFERENCE NO:	DATE	ACTUAL	MINIMUM	COST PER	COST PER	TAX PER	TOTAL	TOTAL	TOTAL
DESCRIPTION	DESCRIPTION	QUANTITY	QUANTITY	UNIT	UNIT	ITEM	TRANSPORTATION	DISPOSAL	ANALYTICAL
#:LC340001	10/07/2020	151935							
DISPOSAL		27.97		\$25.50	TON	\$713.24			
TRANSPORTATION		27.97	22.00	\$14.00	TON	\$391.58			\$713.24
							\$391.58		
#:LC340002	10/07/2020	151939							
DISPOSAL		32.43		\$25.50	TON	\$826.97			
TRANSPORTATION		32.43	22.00	\$14.00	TON	\$454.02			\$826.97
							\$454.02		
#:LC340003	10/07/2020	152020							
DISPOSAL		29.99		\$25.50	TON	\$764.75			
TRANSPORTATION		29.99	22.00	\$14.00	TON	\$419.86			\$764.75
							\$419.86		
#:LC340004	10/07/2020	152023							
DISPOSAL		31.44		\$25.50	TON	\$801.72			
TRANSPORTATION		31.44	22.00	\$14.00	TON	\$440.16			\$801.72
							\$440.16		
#:LC340005	10/08/2020	152043							
DISPOSAL		32.82		\$25.50	TON	\$836.91			
TRANSPORTATION		32.82	22.00	\$14.00	TON	\$459.48			\$836.91
							\$459.48		
#:LC340006	10/08/2020	152167							
DISPOSAL		33.12		\$25.50	TON	\$844.56			
TRANSPORTATION		33.12	22.00	\$14.00	TON	\$463.68			\$844.56
							\$463.68		
#:LC340007	10/08/2020	152259							
DISPOSAL		35.70		\$25.50	TON	\$910.35			
TRANSPORTATION		35.70	22.00	\$14.00	TON	\$499.80			\$910.35
							\$499.80		

AMERICAN WASTE MANAGEMENT SERVICES, INC.

BILL TO: TETRA TECH NUS, INC.
PAGE NO: 2

INVOICE: 205251
DATE: 10/31/2020

REFERENCE NO:	DATE	ACTUAL	MINIMUM	COST PER	COST PER	TAX PER	TOTAL	TOTAL	TOTAL	
DESCRIPTION:	DESCRIPTION	QUANTITY	QUANTITY	UNIT	UNIT	ITEM MIN*	ITEM	TRANSPORTATION	DISPOSAL	ANALYTICAL
							\$0.00	\$3,128.58	\$5,698.50	\$0.00

TOTAL TRANS. LOADS:	7.00	TOTAL DISPOSAL LOADS:	6.00
TOTAL MINI TRANS. UNITS:	0.00	TOTAL MINI DISPOSAL UNITS:	0.00
TOTAL ACTUAL TRANS. UNITS:	223.47	TOTAL ACTUAL DISPOSAL:	223.47 TON

TOTAL DISPOSAL:	\$5,698.50
TOTAL TRANSPORTATION:	\$3,128.58
SUBTOTAL:	\$8,827.08
TOTAL SALES TAX:	\$0.00
TOTAL INVOICE:	\$8,827.08

**PLEASE REMIT TO AMERICAN WASTE MANAGEMENT SERVICES, INC.
P.O. Box 1406 Youngstown, OHIO 44501-1406**

A service charge of 1 1/2% per month, which is an annual percentage rate of 18%, will be charged on all balances over 30 days.

NON-HAZARDOUS WASTE MANIFEST		1. Generator ID Number FL0000016599	2. Page 1 of 1	3. Emergency Response Phone 402-852-3756	4. Waste Tracking Number L0160001
5. Generator's Name and Mailing Address NASA KENNEDY SPACE CENTER NASA CRUISEWAY KENNEDY SPACE CENTER, FL 32899		Generator's Site Address (if different than mailing address) LAWSON COMPTON RR CRAB CREEK TPA AIR FORCE STATION KENNEDY SPACE CENTER FL			
Generator's Phone: 407-857-8150		U.S. EPA ID Number			
6. Transporter 1 Company Name BOUL TECH SERVICES, INC.		U.S. EPA ID Number			
7. Transporter 2 Company Name		U.S. EPA ID Number			
8. Designated Facility Name and Site Address WASTE CONCENTRATION AND REFINING 1801 HWY 191 SALVAGE YARD RD 34715		U.S. EPA ID Number			
Facility's Phone: 807-921-2500					
9. Waste Shipping Name and Description		10. Containers		11. Total Quantity	12. Unit Wt/Vol.
1. Non-HDRA (non-HDR) Regulated Material: 100% Gas Solvent		No.	Type	25	
2.					
3.					
4.					
13. Special Handling Instructions and Additional Information 2. 807-921-2500 FAX: 807-921-2500 <i>American Waste Management 5274</i>					
14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.					
Generator's/Offlor's Printed/Typed Name Edith Johansen					
Signature: <i>Edith Johansen</i> Month: 10 Day: 20 Year: 20					
15. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Part of entry/exit: Date leaving U.S.:					
16. Transporter Acknowledgment of Receipt of Materials					
Transporter 1 Printed/Typed Name: <i>Robb Francis</i> Signature: <i>[Signature]</i> Month: 10 Day: 7 Year: 20					
Transporter 2 Printed/Typed Name: Signature: Month: Day: Year:					
17. Discrepancy					
17a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection					
17b. Alternate Facility (or Generator) Manifest Reference Number: U.S. EPA ID Number:					
Facility's Phone:					
17c. Signature of Alternate Facility (or Generator) Month: Day: Year:					
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Resp. 17a Printed/Typed Name: Signature: Month: 10 Day: 20 Year: 20					



JED Landfill
A Waste Connections Company
 1501 Omni Way
 St Cloud, FL 34773

3110
 AMERICAN WASTE MANAGEMENT SVCS
 ONE AMERICAN WAY
 WARREN, OH 44484

** Electronic Ticket **

SITE	TICKET	GRID		WEIGHMASTER	
01	151939			CSANCHEZ	
DATE IN	DATE OUT	TIME IN	TIME OUT	VEHICLE	ROLL OFF
10/07/20	10/07/20	10:01	10:01	229-671DT	
REFERENCE			ORIGIN		
20-110			BREVARD		

Scale Gross Wt.	95660	
Stored Tare Wt.	30800	Charge Ticket
Net Weight	64860	

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	FEE	TOTAL
32.43	TON	Contaminated Soil				

Operating hours:

BILL TO: NASA KENNEDY SPACE CENTER LC34
 MANIFEST#: 229-LC340002
 PO#:
 PROFILE#: 20-110

SIGNATURE _____

NET AMOUNT
TENDERED
CHANGE
CHECK NO.



JED Landfill
A Waste Connections Company
 1501 Omni Way
 St Cloud, FL 34773

3110
 AMERICAN WASTE MANAGEMENT SVCS
 ONE AMERICAN WAY
 WARREN, OH 44484

** Electronic Ticket **

SITE	TICKET	GRID		WEIGHMASTER	
01	151935			CSANCHEZ	
DATE IN	DATE OUT	TIME IN	TIME OUT	VEHICLE	ROLL OFF
10/07/20	10/07/20	9:47	9:47	274-698 DT	
REFERENCE			ORIGIN		
20-110			BREVARD		

Scale Gross Wt.	86200	Charge Ticket
Stored Tare Wt.	30260	
Net Weight	55940	

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	FEE	TOTAL
27.97	TON	Contaminated Soil				
1.00		Processing Fee				

Operating hours:

BILL TO: NASA KENNEDY SPACE CENTER LC34
 MANIFEST#: 274-LC340001
 PO#:
 PROFILE#: 20-110

SIGNATURE _____

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number: ELA920013959

2. Page 1 of 3

3. Emergency Response Phone: 412-992-7755

4. Waste Tracking Number: L0540006

5. Generator's Name and Mailing Address: **NAASA KENNEDY SPACE CENTER**
NAASA KENNEDY SPACE CENTER, FL 32899
Generator's Phone: 321-897-1001

Generator's Site Address (if different than mailing address): **LAUNCH COMPLEX 14**
STATE UNIVERSITY AIR FORCE STATION
KENNEDY SPACE CENTER, FL

6. Transporter 1 Company Name: **ACOL TRON DISTRIBUTORS, INC.**
U.S. EPA ID Number: _____

7. Transporter 2 Company Name: _____
U.S. EPA ID Number: _____

8. Designated Facility Name and Site Address: **WASTE CONNECTIONS/JED LANSING**
1801 MAIN HWY SAINT CLOUD FL 34715
Facility's Phone: (807) 921-9201
U.S. EPA ID Number: _____

9. Waste Shipping Name and Description: **1. Non-PCRA/Non-DOT Regulated Material 40000 lbs Spills**

10. Containers	11. Total Quantity	12. Unit Wt./Vol.
1	25	7
2		
3		
4		

13. Special Handling Instructions and Additional Information: **A. FEU-30-110 UN 1542 20**
American Waste
S229

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Officer's Printed/Typed Name: **Edith Johansen**
Signature: *Edith Johansen*
Month Day Year: **10 | 28 | 20**

15. International Shipments: Import to U.S. Export from U.S. Port of Blanket: _____ Date leaving U.S.: _____

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: **ALBERTO BARRERA**
Signature: *AB*
Month Day Year: **10 | 7 | 20**

Transporter 2 Printed/Typed Name: _____
Signature: _____
Month Day Year: _____

17. Discrepancy

17a. Discrepancy Indication Space: Quantity Type Residue Partial Rejection Full Rejection

17b. Alternate Facility (or Generator): _____ Manifest Reference Number: _____ U.S. EPA ID Number: _____

Facility's Phone: _____

17c. Signature of Alternate Facility (or Generator): _____
Month Day Year: _____

18. Designated Facility Owner or Operator Certification of receipt of materials covered by the manifest except as noted in Item 17a.
Printed/Typed Name: _____
Signature: _____
Month Day Year: **10 | 7 | 20**

DESIGNATED FACILITY TO GENERATOR

NON-HAZARDOUS WASTE MANIFEST		1. Generator ID Number FL0000014923	2. Page 1 of 1	3. Emergency Response Phone 312-362-7199	4. Waste Tracking Number L0240000
5. Generator's Name and Mailing Address NASA KENNEDY SPACE CENTER 5900 CAUSEWAY KENNEDY SPACE CENTER, FL 32899		Generator's Site Address (if different than mailing address) LAUNCH COMPLEX 34 CASE CONTROL AIR FORCE STATION KENNEDY SPACE CENTER FL			
Generator's Phone: 407-750-5192		U.S. EPA ID Number			
6. Transporter 1 Company Name SOIL TECH ASSOCIATES, INC.		U.S. EPA ID Number			
7. Transporter 2 Company Name		U.S. EPA ID Number			
8. Designated Facility Name and Site Address WASTE CONNECTIONS/300 LANDFILL 1501 50TH WAY PAINT CREEK FL 32909		U.S. EPA ID Number			
Facility's Phone: 907-881-0280					
9. Waste Shipping Name and Description		10. Containers		11. Total Quantity	12. Unit Wt/Vol
1. Non-HCRF Non-RCRA Regulated Material - 1054 Pad Soils.		No.	Type	25	T
2.					
3.					
4.					
13. Special Handling Instructions and Additional Information S229					
14. GENERATOR/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.					
Generator's/Officer's Printed/Typed Name Edith Johanson		Signature <i>Edith Johanson</i>		Month Day Year 10/29/20	
15. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: Date leaving U.S.:					
15. Transporter Acknowledgment of Receipt of Materials					
Transporter 1 Printed/Typed Name ALBERTO BARRERA		Signature <i>AB</i>		Month Day Year 10/7/20	
Transporter 2 Printed/Typed Name		Signature		Month Day Year	
17. Discrepancy					
17a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection					
17b. Alternate Facility (or Generator)		Manifest Reference Number:		U.S. EPA ID Number	
Facility's Phone:					
17c. Signature of Alternate Facility (or Generator)		Month Day Year			
18. Designated Facility Owner or Operator, Certification of receipt of materials covered by the manifest, except as noted in item 17a					
Printed/Typed Name H. H. H.		Signature <i>H. H. H.</i>		Month Day Year 11/17/20	



JED Landfill
A Waste Connections Company
 1501 Omni Way
 St Cloud, FL 34773

** Electronic Ticket **

3110
 AMERICAN WASTE MANAGEMENT SVCS
 ONE AMERICAN WAY
 WARREN, OH 44484

SITE	TICKET	GRID		WEIGHMASTER	
01	152020			HUNTERH	
DATE IN	DATE OUT	TIME IN	TIME OUT	VEHICLE	ROLL OFF
10/07/20	10/07/20	14:27	14:27	229-671DT	
REFERENCE			ORIGIN		
20-110			BREVARD		

Scale Gross Wt.	90780	Charge Ticket
Stored Tare Wt.	30800	
Net Weight	59980	

QTY	UNIT	DESCRIPTION	RATE	EXTENSION	FEE	TOTAL
29.99	TON	Contaminated Soil				

Operating hours:

BILL TO: NASA KENNEDY SPACE CENTER LC34
 MANIFEST#: 229
 PO#: _____
 PROFILE#: 20-110

SIGNATURE _____

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

NON-HAZARDOUS WASTE MANIFEST		1. Generator ID Number FL000010000	2. Page 1 of 1	3. Emergency Response Phone 910-202-7000	4. Waste Tracking Number L0000000
5. Generator's Name and Mailing Address 3037 KENNEDY SPACE CENTER 143A CAULDRY KENNEDY SPACE CENTER, FL 32816 Generator's Phone: 351-367-3112			Generator's Site Address (if different than mailing address) LAUNCH COMPLEX 24 COST CANNONBALL AIR PLAZA STATION KENNEDY SPACE CENTER FL		
6. Transporter 1 Company Name SOLAR TECH DISTRIBUTORS, INC.				U.S. EPA ID Number	
7. Transporter 2 Company Name				U.S. EPA ID Number	
8. Designated Facility Name and Site Address WASTE CONVECTIONS/JED LANDFILL 1801 GORE WAY SAINT CLOUD FL 34709 Facility's Phone: 351-331-1111				U.S. EPA ID Number	
9. Waste Shipping Name and Description		10. Containers		11. Total Quantity	12. Unit Wt./Vol.
		No.	Type		
1. Non-RCRA Non-DOT Regulated Material (RCRA 609 End Bottle)		1	DT	25	7
2.					
3.					
4.					
13. Special Handling Instructions and Additional Information S 274					
14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.					
Generator's/Offor's Printed/Typed Name Beach Services				Signature Edith Hansen	
				Month Day Year 09 20 20	
15. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry: Date leaving U.S.					
16. Transporter Acknowledgment of Receipt of Materials					
Transporter 1 Printed/Typed Name CARLOS BARRERA				Signature	
Transporter 2 Printed/Typed Name				Signature	
				Month Day Year 10 7 20	
17. Discrepancy					
17a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection					
				Manifest Reference Number:	
17b. Alternate Facility (or Generator)				U.S. EPA ID Number	
Facility's Phone:					
17c. Signature of Alternate Facility (or Generator)				Month Day Year	
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in item 17a					
Printed/Typed Name Hou				Signature	
				Month Day Year 10 1 20	



JED Landfill
A Waste Connections Company
 1501 Omnl Way
 St Cloud, FL 34773

3110

AMERICAN WASTE MANAGEMENT SVCS
 ONE AMERICAN WAY
 WARREN, OH 44484

**** Electronic Ticket ****

SITE	TICKET	GRID		WEIGHMASTER	
01	152023			HUNTERH	
DATE IN	DATE OUT	TIME IN	TIME OUT	VEHICLE	ROLL OFF
10/07/20	10/07/20	14:36	14:36	274-698 DT	
REFERENCE			ORIGIN		
20-110			BREVARD		

Scale Gross Wt.	93140	Charge Ticket
Stored Tare Wt.	30260	
Net Weight	62880	

QTY	UNIT	DESCRIPTION	RATE	EXTENSION	FEE	TOTAL
31.44	TON	Contaminated Soil				

Operating hours:

BILL TO: NASA KENNEDY SPACE CENTER LC34
 MANIFEST#: 274
 PO#: _____
 PROFILE#: 20-110

SIGNATURE _____

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number FL880014525	2. Page 1 of 1	3. Emergency Response Phone 312-892-1759	4. Waste Tracking Number L0910006
	5. Generator's Name and Mailing Address NASA KENNEDY SPACE CENTER NASA CAUSEWAY KENNEDY SPACE CENTER, FL 32899		Generator's Site Address (if different than mailing address) LAUNCH COMPLEX 19 CARE CANAVERAL AIR FORCE STATION KENNEDY SPACE CENTER FL	
Generator's Phone: 352-1667-6000		U.S. EPA ID Number		
6. Transporter 1 Company Name ROEL TECH DISTRIBUTORS, INC.		U.S. EPA ID Number		
7. Transporter 2 Company Name		U.S. EPA ID Number		
8. Designated Facility Name and Site Address WASTE CONVERSION/RECYCLED LANDFILL 1801 INDIAN WAY SAINT CLOUD FL 34985		U.S. EPA ID Number		
Facility's Phone: 352-321-1200				
9. Waste Shipping Name and Description	10. Containers		11. Total Quantity	12. Unit Wt./Vol.
	No.	Type		
	1. Non-PCRA Non-ULC Regulated Material - L091 Gas Balls	25	BT	T
	2.			
	3.			
13. Special Handling Instructions and Additional Information AMERICAN WASTE \$229				
14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.				
Generator's/Offeror's Printed/Typed Name Edith Johansen		Signature <i>Edith Johansen</i>		Month Day Year 10 28 20
15. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: Date leaving U.S.:				
16. Transporter Acknowledgment of Receipt of Materials				
Transporter 1 Printed/Typed Name ALBERTO BARRERA		Signature <i>A/B</i>		Month Day Year 10 7 20
Transporter 2 Printed/Typed Name		Signature		Month Day Year
17. Discrepancy				
17a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection				
17b. Alternate Facility (or Generator)		Manifest Reference Number: U.S. EPA ID Number		
Facility's Phone:				
17c. Signature of Alternate Facility (or Generator)		Month Day Year		
18. Designated Facility Owner/Operator. Certification of receipt of materials covered by the manifest except as noted in item 17a				
Printed/Typed Name		Signature <i>[Signature]</i>		Month Day Year 10 8 20



JED Landfill
A Waste Connections Company
 1501 Omni Way
 St Cloud, FL 34773

3110

AMERICAN WASTE MANAGEMENT SVCS
 ONE AMERICAN WAY
 WARREN, OH 44484

** Electronic Ticket **

SITE	TICKET	GRID		WEIGHMASTER	
01	152043			CSANCHEZ	
DATE IN	DATE OUT	TIME IN	TIME OUT	VEHICLE	ROLL OFF
10/08/20	10/08/20	5:01	5:01	229-671DT	
REFERENCE			ORIGIN		
20-110			BREVARD		

Scale Gross Wt.	96440	Charge Ticket
Stored Tare Wt.	30800	
Net Weight	65640	

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	FEE	TOTAL
32.82	TON	Contaminated Soil				

Operating hours:

BILL TO: NASA KENNEDY SPACE CENTER LC34
 MANIFEST#: 229-LC340005
 PO#:
 PROFILE#: 20-110

SIGNATURE _____

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

NON-HAZARDOUS WASTE MANIFEST		1. Generator ID Number FL0000016599	2. Page 1 of 1	3. Emergency Response Phone 312-582-7316	4. Waste Tracking Number L0000008
5. Generator's Name and Mailing Address NASA KENNEDY SPACE CENTER NASA CAUSEWAY KENNEDY SPACE CENTER, FL 32819 Generator's Phone: 321-867-5352			Generator's Site Address (if different than mailing address) LAUNCH COMPLEX 34 3456 CROAVERAL AIR FORCE STATION KENNEDY SPACE CENTER FL		
6. Transporter 1 Company Name SOUL TECH DISTRIBUTORS, INC.			U.S. EPA ID Number		
7. Transporter 2 Company Name			U.S. EPA ID Number		
8. Designated Facility Name and Site Address WASTE CONNECTIONS/JET CENTER 1811 CANE WAY SAINT CLAUD FL 34701 Facility's Phone: 352-321-3000			U.S. EPA ID Number		
9. Waste Shipping Name and Description		10. Containers		11. Total Quantity	12. Unit Wt/Vol
		No.	Type		
1. Non-HAZARDOUS/Non-WOT Regulated Material - 1006 End Pails		1	INT	25	-
2.					
3.					
4.					
13. Special Handling Instructions and Additional Information § 229					
14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of the consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.					
Generator's/Offendor's Printed/Typed Name Edith Johanson			Signature <i>Edith Johanson</i>		Month Day Year 09/28/20
15. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: Date leaving U.S.:					
16. Transporter Acknowledgment of Receipt of Materials					
Transporter 1 Printed/Typed Name ALBERTO BARRERA			Signature <i>AB</i>		Month Day Year 10/8/20
Transporter 2 Printed/Typed Name			Signature		Month Day Year
17. Discrepancy					
17a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection					
17b. Alternate Facility (or Generator)			Manifest Reference Number:		U.S. EPA ID Number
Facility's Phone:					
17c. Signature of Alternate Facility (or Generator)			Month Day Year		
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a					
Printed/Typed Name Huan			Signature <i>Huan</i>		Month Day Year 10/8/20



JED Landfill
A Waste Connections Company
 1501 Omni Way
 St Cloud, FL 34773

3110
 AMERICAN WASTE MANAGEMENT SVCS
 ONE AMERICAN WAY
 WARREN, OH 44484

** Electronic Ticket **

SITE	TICKET	GRID		WEIGHMASTER	
01	152167			HUNTERH	
DATE IN	DATE OUT	TIME IN	TIME OUT	VEHICLE	ROLL OFF
10/08/20	10/08/20	9:20	9:20	229-671DT	
REFERENCE			ORIGIN		
20-110			BREVARD		

Scale Gross Wt.	97040	
Stored Tare Wt.	30800	Charge Ticket
Net Weight	66240	

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	FEE	TOTAL
33.12	TON	Contaminated Soil				

Operating hours:

BILL TO: NASA KENNEDY SPACE CENTER LC34
 MANIFEST#: 229-LC340006
 PO#:
 PROFILE#: 20-110

SIGNATURE _____

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

NON-HAZARDOUS WASTE MANIFEST		1. Generator ID Number PLE000014388	2. Page 1 of 1	3. Emergency Response Phone 813-282-7755	4. Waste Tracking Number L0140007
5. Generator's Name and Mailing Address NASA KENNEDY SPACE CENTER NASA CHRISTOPHER KENNEDY SPACE CENTER, FL 32819					
Generator's Site Address (if different than mailing address) LAUNCH COMPLEX 04 1325 COLONIAL BIP FORCE STATION KENNEDY SPACE CENTER FL					
Generator's Phone: 813-282-7755				U.S. EPA ID Number	
6. Transporter 1 Company Name 2222 TECH ENTERPRISES, INC.				U.S. EPA ID Number	
7. Transporter 2 Company Name				U.S. EPA ID Number	
8. Designated Facility Name and Site Address WASTE CONNECTIONS/IBO LANDFILL 1801 CHIVE WAY RAVENHURST FL 32753				U.S. EPA ID Number	
Facility's Phone: 904-200-8720					
9. Waste Shipping Name and Description		10. Containers		11. Total Quantity	12. Unit Wt./Vol.
		No.	Type		
1. Non-HCFL Non-ODT Regulated Material (RCRA Fed Swill)		1	55	25	T
2.					
3.					
4.					
13. Special Handling Instructions and Additional Information S229					
14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.					
Generator's/Offeror's Printed/Typed Name Edith Johanson				Signature Edith Johanson	
				Month Day Year 09/28/20	
15. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. <input type="checkbox"/> Port of Entry/Exit: Date leaving U.S.:					
16. Transporter Acknowledgment of Receipt of Materials					
Transporter 1 Printed/Typed Name ALBERTO BALLERA				Signature Alberto Ballera	
Transporter 2 Printed/Typed Name				Month Day Year 10/18/20	
17. Discrepancy					
17a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection					
Manifest Reference Number: U.S. EPA ID Number					
17b. Alternate Facility (or Generator) U.S. EPA ID Number					
Facility's Phone:					
17c. Signature of Alternate Facility (or Generator)				Month Day Year	
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in item 17a					
Printed/Typed Name H. H. H.				Signature H. H. H.	
				Month Day Year 10/28/20	



JED Landfill
 A Waste Connections Company
 1501 Omni Way
 St Cloud, FL 34773

** Electronic Ticket **

3110
 AMERICAN WASTE MANAGEMENT SVCS
 ONE AMERICAN WAY
 WARREN, OH 44484

SITE	TICKET	GRID		WEIGHMASTER	
01	152259			HUNTERH	
DATE IN	DATE OUT	TIME IN	TIME OUT	VEHICLE	ROLL OFF
10/08/20	10/08/20	14:25	14:25	229-671DT	
REFERENCE			ORIGIN		
20-110			BREVARD		

Scale Gross Wt.	102200					
Stored Tare Wt.	30800					Charge Ticket
Net Weight	71400					
QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	FEE	TOTAL
35.70	TON	Contaminated Soil				

Operating hours:

BILL TO: NASA KENNEDY SPACE CENTER LC34
 MANIFEST#: 229-LC340007
 PO#:
 PROFILE#: 20-110

SIGNATURE _____

NET AMOUNT
TENDERED
CHANGE
CHECK NO.

APPENDIX G

**WASTE CHARACTERIZATION LABORATORY RESULTS
(PROVIDED IN ELECTRONIC VERSION ONLY)**



National Aeronautics and
Space Administration

PERMISSION TO PUBLISH

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Signature _____

11-12-19
Date _____

TestAmerica Laboratories, Inc.
Brian Spann
Laboratory Director
6712 Benjamin Road, Suite 100, Tampa FL 32301
813.885.7427
Brian.spann@testamericainc.com

ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-134053-1
Client Project/Site: KSL-LC34

For:

Tetra Tech, Inc.
Foster Plaza 7
661 Anderson Drive
Suite 200
Pittsburgh, Pennsylvania 15220-2745

Attn: Debbie Wilson



Authorized for release by:
8/7/2020 11:32:24 AM

Opal Johnson, Project Manager II
(330)966-9279
Opal.Johnson@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Definitions/Glossary

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Indicates that the compound was analyzed for but not detected.

GC/MS Semi VOA

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Indicates that the compound was analyzed for but not detected.

GC Semi VOA

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

Dioxin

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J	Estimated value; value may not be accurate.
U	Indicates that the compound was analyzed for but not detected.

Metals

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J	Estimated value; value may not be accurate.
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)

Eurofins TestAmerica, Canton

Definitions/Glossary

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

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Case Narrative

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Job ID: 240-134053-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: Tetra Tech, Inc.

Project: KSL-LC34

Report Number: 240-134053-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, Canton attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The sample was received on 7/28/2020 9:30 AM; the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 5.4° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Sample LC34-CP0005-000.5-20200727 (240-134053-1) was analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260C. The samples were prepared on 07/28/2020 and analyzed on 08/05/2020.

1,2,3-Trichlorobenzene and 1,2,4-Trichlorobenzene were detected in method blank MB 240-445664/7 at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

The continuing calibration verification (CCV) analyzed in batch 240-445664 was outside the method criteria for the following analyte(s): Methyl tert-Butyl Ether and 1,2,3-Trichlorobenzene. An MRL standard at or below the reporting limit (RL) was analyzed with the affected samples LC34-CP0005-000.5-20200727 (240-134053-1), (CCV 240-445664/5), (CCVIS 240-445664/4), (LCS 240-445664/6) and (MB 240-445664/7) and found to be acceptable. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte(s) is considered estimated.

Case Narrative

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Job ID: 240-134053-1 (Continued)

Laboratory: Eurofins TestAmerica, Canton (Continued)

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 240-445026 and analytical batch 240-445664 on these samples LC34-CP0005-000.5-20200727 (240-134053-1).

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS (GCMS)

Sample LC34-CP0005-000.5-20200727 (240-134053-1) was analyzed for semivolatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8270D. The samples were prepared on 07/29/2020 and analyzed on 08/05/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DIOXINS AND FURANS

Sample LC34-CP0005-000.5-20200727 (240-134053-1) was analyzed for dioxins and furans in accordance with EPA SW-846 Method 8290. The samples were prepared on 07/31/2020 and analyzed on 08/05/2020 and 08/06/2020.

1,2,3,4,6,7,8-HpCDF, OCDD, OCDF, Total HpCDF and Total TCDF were detected in method blank MB 140-41470/4-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

The following sample went through Gel-Permeation Cleanup procedure, based on EPA method 3640A: LC34-CP0005-000.5-20200727 (240-134053-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

POLYCHLORINATED BIPHENYLS (PCBS)

Sample LC34-CP0005-000.5-20200727 (240-134053-1) was analyzed for polychlorinated biphenyls (PCBs) in accordance with EPA SW-846 Method 8082A. The samples were prepared on 07/29/2020 and analyzed on 07/31/2020.

Sample LC34-CP0005-000.5-20200727 (240-134053-1)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The following samples were diluted due to abundance of target analytes : (240-133849-D-15-A). As such, surrogate recoveries are below the calibration range or are not reported, and elevated reporting limits (RLs) are provided.

The following samples were diluted due to the nature of the sample matrix: (240-133849-D-15-B MS) and (240-133849-D-15-C MSD). Because of this dilution, the surrogate spike and matrix spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

All of the samples in this data set analyzed for PCBs were subjected to the sulfuric acid cleanup procedure before instrumental analysis, per EPA Method 3665A.

DCB Decachlorobiphenyl failed the surrogate recovery criteria high for 240-133849-D-15-B MS and 240-133849-D-15-C MSD.

Aroclor-1260 failed the recovery criteria high for the MS and the MSD of sample 240-133849-15 in batch 240-445044. No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TCLP METALS

Sample LC34-CP0005-000.5-20200727 (240-134053-1) was analyzed for TCLP Metals in accordance with SW-846 Method 6020A. The samples were leached on 07/29/2020, prepared on 07/30/2020 and analyzed on 07/31/2020.

Barium was detected in method blank LB 240-444805/1-D at a level exceeding the reporting limit. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Chromium was detected in method blank LB 240-444805/1-D at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL

Case Narrative

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Job ID: 240-134053-1 (Continued)

Laboratory: Eurofins TestAmerica, Canton (Continued)

and/or RL, the result has been flagged.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICPMS)

Sample LC34-CP0005-000.5-20200727 (240-134053-1) was analyzed for metals (ICPMS) in accordance with EPA SW-846 Methods 6020A. The samples were prepared on 07/29/2020 and analyzed on 07/30/2020.

Chromium and Lead failed the recovery criteria high for the MSD of sample LC34-CP0005-000.5-20200727MSD (240-134053-1) in batch 240-444965. Lead exceeded the RPD limit.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TCLP MERCURY

Sample LC34-CP0005-000.5-20200727 (240-134053-1) was analyzed for TCLP mercury in accordance with EPA SW-846 Methods 1311/7470A. The samples were leached on 07/29/2020, prepared on 07/30/2020 and analyzed on 07/31/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

MERCURY

Sample LC34-CP0005-000.5-20200727 (240-134053-1) was analyzed for mercury in accordance with EPA SW-846 Method 7471B. The samples were prepared on 07/29/2020 and analyzed on 07/30/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCENT SOLIDS

Sample LC34-CP0005-000.5-20200727 (240-134053-1) was analyzed for percent solids in accordance with ASTM Method D2216-80. The samples were analyzed on 07/30/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL CAN
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CAN
8082A	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	TAL CAN
8290A	Dioxins and Furans (HRGC/HRMS)	SW846	TAL KNX
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
7471B	Mercury (CVAA)	SW846	TAL CAN
Moisture	Percent Moisture	EPA	TAL CAN
1311	TCLP Extraction	SW846	TAL CAN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
3050B	Preparation, Metals	SW846	TAL CAN
3540C	Soxhlet Extraction	SW846	TAL CAN
5035	Closed System Purge and Trap	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN
7471B	Preparation, Mercury	SW846	TAL CAN
8290	Soxhlet Extraction of Dioxins and Furans	SW846	TAL KNX

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Sample Summary

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-134053-1	LC34-CP0005-000.5-20200727	Solid	07/27/20 14:30	07/28/20 09:30	

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Detection Summary

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Client Sample ID: LC34-CP0005-000.5-20200727

Lab Sample ID: 240-134053-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.066	I	0.16	0.016	mg/Kg	1	☼	8270D	Total/NA
2-Methylnaphthalene	0.0040	I	0.016	0.0021	mg/Kg	1	☼	8270D	Total/NA
Acenaphthene	0.0062	I	0.016	0.0030	mg/Kg	1	☼	8270D	Total/NA
Acenaphthylene	0.0076	I	0.016	0.0043	mg/Kg	1	☼	8270D	Total/NA
Anthracene	0.029		0.016	0.0026	mg/Kg	1	☼	8270D	Total/NA
Benzo[a]anthracene	0.40		0.016	0.0036	mg/Kg	1	☼	8270D	Total/NA
Benzo[a]pyrene	0.57		0.016	0.0099	mg/Kg	1	☼	8270D	Total/NA
Benzo[b]fluoranthene	0.76		0.016	0.0069	mg/Kg	1	☼	8270D	Total/NA
Benzo[g,h,i]perylene	0.40		0.016	0.0075	mg/Kg	1	☼	8270D	Total/NA
Benzo[k]fluoranthene	0.28		0.016	0.0073	mg/Kg	1	☼	8270D	Total/NA
Bis(2-ethylhexyl) phthalate	0.090		0.074	0.054	mg/Kg	1	☼	8270D	Total/NA
Chrysene	0.44		0.016	0.0016	mg/Kg	1	☼	8270D	Total/NA
Dibenz(a,h)anthracene	0.11		0.016	0.0073	mg/Kg	1	☼	8270D	Total/NA
Fluoranthene	0.65		0.016	0.0047	mg/Kg	1	☼	8270D	Total/NA
Fluorene	0.0047	I	0.016	0.0029	mg/Kg	1	☼	8270D	Total/NA
Indeno[1,2,3-cd]pyrene	0.37		0.016	0.0078	mg/Kg	1	☼	8270D	Total/NA
Naphthalene	0.0044	I	0.016	0.0026	mg/Kg	1	☼	8270D	Total/NA
Phenanthrene	0.12		0.016	0.0024	mg/Kg	1	☼	8270D	Total/NA
Pyrene	0.56		0.016	0.0023	mg/Kg	1	☼	8270D	Total/NA
Butyl benzyl phthalate	0.028	I	0.074	0.023	mg/Kg	1	☼	8270D	Total/NA
Carbazole	0.022	I	0.053	0.020	mg/Kg	1	☼	8270D	Total/NA
Aroclor-1260	1.8		0.26	0.11	mg/Kg	5	☼	8082A	Total/NA
Total TCDD	1.7		1.0	0.12	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDD	23	J	15	15	pg/g	1	☼	8290A	Total/NA
Total PeCDD	2200	J	15	15	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDD	0.33	I	5.1	0.25	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDD	0.88	I J	5.1	0.25	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDD	0.75	I J	5.1	0.24	pg/g	1	☼	8290A	Total/NA
Total HxCDD	15	J	5.1	0.24	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDD	16		5.1	0.13	pg/g	1	☼	8290A	Total/NA
Total HpCDD	39		5.1	0.13	pg/g	1	☼	8290A	Total/NA
OCDD	110		10	0.022	pg/g	1	☼	8290A	Total/NA
2,3,7,8-TCDF	20		1.0	0.11	pg/g	1	☼	8290A	Total/NA
Total TCDF	80	J	1.0	0.13	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDF	3.0	I	5.1	0.17	pg/g	1	☼	8290A	Total/NA
2,3,4,7,8-PeCDF	8.2		5.1	0.15	pg/g	1	☼	8290A	Total/NA
Total PeCDF	57	J	5.1	0.16	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDF	6.9		5.1	0.23	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDF	2.8	I J	5.1	0.22	pg/g	1	☼	8290A	Total/NA
2,3,4,6,7,8-HxCDF	2.2	I	5.1	0.24	pg/g	1	☼	8290A	Total/NA
Total HxCDF	31	J	5.1	0.24	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDF	12		5.1	0.065	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8,9-HpCDF	1.4	I	5.1	0.083	pg/g	1	☼	8290A	Total/NA
Total HpCDF	20	J	5.1	0.074	pg/g	1	☼	8290A	Total/NA
OCDF	13		10	0.44	pg/g	1	☼	8290A	Total/NA
Silver	0.033	I	0.19	0.021	mg/Kg	2	☼	6020A	Total/NA
Arsenic	1.9		0.94	0.056	mg/Kg	2	☼	6020A	Total/NA
Chromium	20		0.38	0.24	mg/Kg	2	☼	6020A	Total/NA
Cadmium	1.4		0.19	0.040	mg/Kg	2	☼	6020A	Total/NA
Barium	50		0.94	0.27	mg/Kg	2	☼	6020A	Total/NA
Lead	46		0.19	0.059	mg/Kg	2	☼	6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Canton

Detection Summary

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Client Sample ID: LC34-CP0005-000.5-20200727 (Continued)

Lab Sample ID: 240-134053-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.0013	I	0.0050	0.00075	mg/L	1		6020A	TCLP
Chromium	0.0039		0.0020	0.00098	mg/L	1		6020A	TCLP
Cadmium	0.0087		0.0010	0.00020	mg/L	1		6020A	TCLP
Barium	0.13		0.0050	0.0022	mg/L	1		6020A	TCLP
Lead	0.00064	I	0.0010	0.00045	mg/L	1		6020A	TCLP

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Canton



Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Client Sample ID: LC34-CP0005-000.5-20200727

Lab Sample ID: 240-134053-1

Date Collected: 07/27/20 14:30

Matrix: Solid

Date Received: 07/28/20 09:30

Percent Solids: 94.9

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	0.0029	U	0.0049	0.0029	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,1,1-Trichloroethane	0.00080	U	0.0049	0.00080	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,1,2,2-Tetrachloroethane	0.0014	U	0.0049	0.0014	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.0013	U	0.0049	0.0013	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,1,2-Trichloroethane	0.0011	U	0.0049	0.0011	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,1-Dichloroethane	0.00068	U	0.0049	0.00068	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,1-Dichloroethene	0.00089	U	0.0049	0.00089	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,2,3-Trichlorobenzene	0.00056	U	0.0049	0.00056	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,2,4-Trichlorobenzene	0.00056	U	0.0049	0.00056	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,2-Dibromo-3-Chloropropane	0.0035	U	0.0098	0.0035	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,2-Dichlorobenzene	0.0011	U	0.0049	0.0011	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,2-Dichloroethane	0.00076	U	0.0049	0.00076	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,2-Dichloropropane	0.00083	U	0.0049	0.00083	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,3-Dichlorobenzene	0.00080	U	0.0049	0.00080	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,4-Dichlorobenzene	0.00087	U	0.0049	0.00087	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
2-Butanone (MEK)	0.0035	U	0.020	0.0035	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
2-Hexanone	0.0040	U	0.020	0.0040	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
4-Methyl-2-pentanone (MIBK)	0.0036	U	0.020	0.0036	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Acetone	0.021	U	0.025	0.021	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Benzene	0.00068	U	0.0049	0.00068	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Bromoform	0.0024	U	0.0049	0.0024	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Bromomethane	0.00097	U	0.0049	0.00097	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Carbon disulfide	0.0011	U	0.0049	0.0011	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Carbon tetrachloride	0.0032	U	0.0049	0.0032	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Chlorobenzene	0.00090	U	0.0049	0.00090	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Bromochloromethane	0.00058	U	0.0049	0.00058	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Dibromochloromethane	0.0027	U	0.0049	0.0027	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Chloroethane	0.0012	U	0.0049	0.0012	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Chloroform	0.00077	U	0.0049	0.00077	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Chloromethane	0.0010	U	0.0049	0.0010	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
cis-1,2-Dichloroethene	0.00064	U	0.0049	0.00064	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
cis-1,3-Dichloropropene	0.0014	U	0.0049	0.0014	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Cyclohexane	0.0013	U	0.0098	0.0013	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Bromodichloromethane	0.00067	U	0.0049	0.00067	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Dichlorodifluoromethane	0.00093	U	0.0049	0.00093	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Ethylbenzene	0.0010	U	0.0049	0.0010	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
1,2-Dibromoethane	0.00076	U	0.0049	0.00076	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Isopropylbenzene	0.00082	U	0.0049	0.00082	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Methyl acetate	0.0033	U	0.025	0.0033	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Methyl tert-butyl ether	0.00080	U	0.0049	0.00080	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Methylene Chloride	0.012	U	0.025	0.012	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Styrene	0.0011	U	0.0049	0.0011	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Tetrachloroethene	0.00072	U	0.0049	0.00072	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Toluene	0.00076	U	0.0049	0.00076	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
trans-1,2-Dichloroethene	0.00046	U	0.0049	0.00046	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
trans-1,3-Dichloropropene	0.0010	U	0.0049	0.0010	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Trichloroethene	0.00062	U	0.0049	0.00062	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Trichlorofluoromethane	0.0011	U	0.0049	0.0011	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Vinyl chloride	0.00082	U	0.0049	0.00082	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1

Eurofins TestAmerica, Canton

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Client Sample ID: LC34-CP0005-000.5-20200727

Lab Sample ID: 240-134053-1

Date Collected: 07/27/20 14:30

Matrix: Solid

Date Received: 07/28/20 09:30

Percent Solids: 94.9

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	0.0016	U	0.0098	0.0016	mg/Kg	☼	07/28/20 09:55	08/05/20 09:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	81		64 - 124				07/28/20 09:55	08/05/20 09:14	1
Dibromofluoromethane (Surr)	74		56 - 122				07/28/20 09:55	08/05/20 09:14	1
4-Bromofluorobenzene (Surr)	74		51 - 127				07/28/20 09:55	08/05/20 09:14	1
1,2-Dichloroethane-d4 (Surr)	78		59 - 120				07/28/20 09:55	08/05/20 09:14	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	0.018	U	0.053	0.018	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
1,2,4,5-Tetrachlorobenzene	0.015	U	0.11	0.015	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
1,4-Dioxane	0.066	I	0.16	0.016	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
2,4,5-Trichlorophenol	0.073	U	0.16	0.073	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
2,4,6-Trichlorophenol	0.068	U	0.16	0.068	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
2,4-Dichlorophenol	0.047	U	0.16	0.047	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
2,4-Dimethylphenol	0.042	U	0.16	0.042	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
2,4-Dinitrophenol	0.15	U	0.35	0.15	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
2,4-Dinitrotoluene	0.066	U	0.21	0.066	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
2-Chlorophenol	0.011	U	0.053	0.011	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
2-Chloronaphthalene	0.015	U	0.053	0.015	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
2-Methylnaphthalene	0.0040	I	0.016	0.0021	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
2-Methylphenol	0.033	U	0.21	0.033	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
2-Nitroaniline	0.042	U	0.21	0.042	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
2-Nitrophenol	0.014	U	0.053	0.014	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
3 & 4 Methylphenol	0.031	U	0.42	0.031	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
3,3'-Dichlorobenzidine	0.046	U	0.11	0.046	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
3-Nitroaniline	0.052	U	0.21	0.052	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
4,6-Dinitro-o-cresol	0.085	U	0.35	0.085	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
4-Bromophenyl phenyl ether	0.015	U	0.053	0.015	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
4-Chloro-3-methylphenol	0.048	U	0.16	0.048	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
4-Chloroaniline	0.032	U	0.16	0.032	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
4-Nitroaniline	0.064	U	0.21	0.064	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Acenaphthene	0.0062	I	0.016	0.0030	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Acenaphthylene	0.0076	I	0.016	0.0043	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Acetophenone	0.012	U	0.11	0.012	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Aniline	0.036	U	0.35	0.036	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Anthracene	0.029		0.016	0.0026	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Benzo[a]anthracene	0.40		0.016	0.0036	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Benzo[a]pyrene	0.57		0.016	0.0099	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Benzo[b]fluoranthene	0.76		0.016	0.0069	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Benzo[g,h,i]perylene	0.40		0.016	0.0075	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Benzo[k]fluoranthene	0.28		0.016	0.0073	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Bis(2-chloroethoxy)methane	0.013	U	0.11	0.013	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Bis(2-chloroethyl)ether	0.013	U	0.11	0.013	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Bis(2-ethylhexyl) phthalate	0.090		0.074	0.054	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Chrysene	0.44		0.016	0.0016	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Dibenz(a,h)anthracene	0.11		0.016	0.0073	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Dibenzofuran	0.014	U	0.053	0.014	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Di-n-butyl phthalate	0.023	U	0.074	0.023	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1

Eurofins TestAmerica, Canton

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Client Sample ID: LC34-CP0005-000.5-20200727

Lab Sample ID: 240-134053-1

Date Collected: 07/27/20 14:30

Matrix: Solid

Date Received: 07/28/20 09:30

Percent Solids: 94.9

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diethyl phthalate	0.033	U	0.074	0.033	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Dimethyl phthalate	0.015	U	0.074	0.015	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Di-n-octyl phthalate	0.030	U	0.074	0.030	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Fluoranthene	0.65		0.016	0.0047	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Fluorene	0.0047	I	0.016	0.0029	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Hexachlorobenzene	0.0030	U	0.016	0.0030	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Hexachlorobutadiene	0.013	U	0.053	0.013	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Hexachlorocyclopentadiene	0.066	U	0.35	0.066	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Hexachloroethane	0.0095	U	0.053	0.0095	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Indeno[1,2,3-cd]pyrene	0.37		0.016	0.0078	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Isophorone	0.013	U	0.053	0.013	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Naphthalene	0.0044	I	0.016	0.0026	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Nitrobenzene	0.014	U	0.11	0.014	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
N-Nitrosodiphenylamine	0.013	U	0.053	0.013	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
N-Nitrosodi-n-propylamine	0.012	U	0.053	0.012	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Pentachlorophenol	0.061	U	0.16	0.061	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Phenanthrene	0.12		0.016	0.0024	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Phenol	0.0085	U	0.053	0.0085	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Pyrene	0.56		0.016	0.0023	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Butyl benzyl phthalate	0.028	I	0.074	0.023	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
bis (2-chloroisopropyl) ether	0.011	U	0.11	0.011	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Carbazole	0.022	I	0.053	0.020	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
2,6-Dinitrotoluene	0.059	U	0.21	0.059	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
1-Methylnaphthalene	0.0028	U	0.016	0.0028	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
4-Nitrophenol	0.10	U	0.35	0.10	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Atrazine	0.038	U	0.21	0.038	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1
Benzaldehyde	0.024	U	0.11	0.024	mg/Kg	☼	07/29/20 08:53	08/05/20 17:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	58		35 - 120	07/29/20 08:53	08/05/20 17:24	1
2,4,6-Tribromophenol (Surr)	35		10 - 120	07/29/20 08:53	08/05/20 17:24	1
2-Fluorophenol (Surr)	53		26 - 120	07/29/20 08:53	08/05/20 17:24	1
Terphenyl-d14 (Surr)	66		39 - 120	07/29/20 08:53	08/05/20 17:24	1
Phenol-d5 (Surr)	57		28 - 120	07/29/20 08:53	08/05/20 17:24	1
Nitrobenzene-d5 (Surr)	50		28 - 120	07/29/20 08:53	08/05/20 17:24	1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	0.11	U	0.26	0.11	mg/Kg	☼	07/29/20 07:45	07/31/20 11:48	5
Aroclor-1221	0.12	U	0.26	0.12	mg/Kg	☼	07/29/20 07:45	07/31/20 11:48	5
Aroclor-1232	0.12	U	0.26	0.12	mg/Kg	☼	07/29/20 07:45	07/31/20 11:48	5
Aroclor-1242	0.097	U	0.26	0.097	mg/Kg	☼	07/29/20 07:45	07/31/20 11:48	5
Aroclor-1248	0.12	U	0.26	0.12	mg/Kg	☼	07/29/20 07:45	07/31/20 11:48	5
Aroclor-1254	0.12	U	0.26	0.12	mg/Kg	☼	07/29/20 07:45	07/31/20 11:48	5
Aroclor-1260	1.8		0.26	0.11	mg/Kg	☼	07/29/20 07:45	07/31/20 11:48	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	64		14 - 128	07/29/20 07:45	07/31/20 11:48	5
DCB Decachlorobiphenyl	79		10 - 132	07/29/20 07:45	07/31/20 11:48	5

Eurofins TestAmerica, Canton

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Client Sample ID: LC34-CP0005-000.5-20200727

Lab Sample ID: 240-134053-1

Date Collected: 07/27/20 14:30

Matrix: Solid

Date Received: 07/28/20 09:30

Percent Solids: 94.9

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.12	U	1.0	0.12	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
Total TCDD	1.7		1.0	0.12	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
1,2,3,7,8-PeCDD	23	J	15	15	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
Total PeCDD	2200	J	15	15	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
1,2,3,4,7,8-HxCDD	0.33	I	5.1	0.25	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
1,2,3,6,7,8-HxCDD	0.88	I J	5.1	0.25	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
1,2,3,7,8,9-HxCDD	0.75	I J	5.1	0.24	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
Total HxCDD	15	J	5.1	0.24	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
1,2,3,4,6,7,8-HpCDD	16		5.1	0.13	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
Total HpCDD	39		5.1	0.13	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
OCDD	110		10	0.022	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
2,3,7,8-TCDF	20		1.0	0.11	pg/g	☼	07/31/20 08:45	08/06/20 01:40	1
Total TCDF	80	J	1.0	0.13	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
1,2,3,7,8-PeCDF	3.0	I	5.1	0.17	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
2,3,4,7,8-PeCDF	8.2		5.1	0.15	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
Total PeCDF	57	J	5.1	0.16	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
1,2,3,4,7,8-HxCDF	6.9		5.1	0.23	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
1,2,3,6,7,8-HxCDF	2.8	I J	5.1	0.22	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
2,3,4,6,7,8-HxCDF	2.2	I	5.1	0.24	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
1,2,3,7,8,9-HxCDF	0.26	U	5.1	0.26	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
Total HxCDF	31	J	5.1	0.24	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
1,2,3,4,6,7,8-HpCDF	12		5.1	0.065	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
1,2,3,4,7,8,9-HpCDF	1.4	I	5.1	0.083	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
Total HpCDF	20	J	5.1	0.074	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1
OCDF	13		10	0.44	pg/g	☼	07/31/20 08:45	08/05/20 22:31	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	70		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-1,2,3,7,8-PeCDD	62		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-1,2,3,4,7,8-HxCDD	66		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-1,2,3,6,7,8-HxCDD	79		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-1,2,3,4,6,7,8-HpCDD	72		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-OCDD	69		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-2,3,7,8-TCDF	73		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-2,3,7,8-TCDF	68		40 - 135	07/31/20 08:45	08/06/20 01:40	1
13C-1,2,3,7,8-PeCDF	66		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-2,3,4,7,8-PeCDF	65		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-1,2,3,4,7,8-HxCDF	74		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-1,2,3,6,7,8-HxCDF	77		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-2,3,4,6,7,8-HxCDF	76		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-1,2,3,7,8,9-HxCDF	80		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-1,2,3,4,6,7,8-HpCDF	75		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-1,2,3,4,7,8,9-HpCDF	73		40 - 135	07/31/20 08:45	08/05/20 22:31	1
13C-OCDF	66		40 - 135	07/31/20 08:45	08/05/20 22:31	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.033	I	0.19	0.021	mg/Kg	☼	07/29/20 14:00	07/30/20 12:29	2
Arsenic	1.9		0.94	0.056	mg/Kg	☼	07/29/20 14:00	07/30/20 12:29	2
Chromium	20		0.38	0.24	mg/Kg	☼	07/29/20 14:00	07/30/20 12:29	2

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Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Client Sample ID: LC34-CP0005-000.5-20200727

Lab Sample ID: 240-134053-1

Date Collected: 07/27/20 14:30

Matrix: Solid

Date Received: 07/28/20 09:30

Percent Solids: 94.9

Method: 6020A - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	1.4		0.19	0.040	mg/Kg	☼	07/29/20 14:00	07/30/20 12:29	2
Barium	50		0.94	0.27	mg/Kg	☼	07/29/20 14:00	07/30/20 12:29	2
Lead	46		0.19	0.059	mg/Kg	☼	07/29/20 14:00	07/30/20 12:29	2
Selenium	0.11	U	0.94	0.11	mg/Kg	☼	07/29/20 14:00	07/30/20 12:29	2

Method: 6020A - Metals (ICP/MS) - TCLP

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.000053	U	0.0010	0.000053	mg/L		07/30/20 14:00	07/31/20 12:18	1
Arsenic	0.0013	I	0.0050	0.00075	mg/L		07/30/20 14:00	07/31/20 12:18	1
Chromium	0.0039		0.0020	0.00098	mg/L		07/30/20 14:00	07/31/20 12:18	1
Cadmium	0.0087		0.0010	0.00020	mg/L		07/30/20 14:00	07/31/20 12:18	1
Barium	0.13		0.0050	0.0022	mg/L		07/30/20 14:00	07/31/20 12:18	1
Lead	0.00064	I	0.0010	0.00045	mg/L		07/30/20 14:00	07/31/20 12:18	1
Selenium	0.00089	U	0.0050	0.00089	mg/L		07/30/20 14:00	07/31/20 12:18	1

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.00013	U	0.0020	0.00013	mg/L		07/30/20 12:00	07/31/20 12:38	1

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.019	U	0.11	0.019	mg/Kg	☼	07/29/20 14:00	07/30/20 10:37	1

General Chemistry

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.1		0.1	0.1	%			07/30/20 09:22	1

Surrogate Summary

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Solid

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TOL	DBFM	BFB	DCA
		(64-124)	(56-122)	(51-127)	(59-120)
240-134053-1	LC34-CP0005-000.5-20200727	81	74	74	78
LCS 240-445664/6	Lab Control Sample	82	71	90	73
MB 240-445664/7	Method Blank	78	72	83	74

Surrogate Legend

TOL = Toluene-d8 (Surr)

DBFM = Dibromofluoromethane (Surr)

BFB = 4-Bromofluorobenzene (Surr)

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	FBP	TBP	2FP	TPHL	PHL	NBZ
		(35-120)	(10-120)	(26-120)	(39-120)	(28-120)	(28-120)
240-134053-1	LC34-CP0005-000.5-20200727	58	35	53	66	57	50
LCS 240-444710/24-A	Lab Control Sample	70	82	66	89	70	67
MB 240-444710/23-A	Method Blank	66	29	56	84	64	65

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)

TBP = 2,4,6-Tribromophenol (Surr)

2FP = 2-Fluorophenol (Surr)

TPHL = Terphenyl-d14 (Surr)

PHL = Phenol-d5 (Surr)

NBZ = Nitrobenzene-d5 (Surr)

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Solid

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TCX2	DCBP2
		(14-128)	(10-132)
240-134053-1	LC34-CP0005-000.5-20200727	64	79
LCS 240-444694/24-A	Lab Control Sample	78	87
MB 240-444694/23-A	Method Blank	72	90

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCBP = DCB Decachlorobiphenyl

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 240-445664/7
Matrix: Solid
Analysis Batch: 445664

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB	MB	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,1,1,2-Tetrachloroethane	0.0030	U	0.0050	0.0030	mg/Kg			08/05/20 06:58	1
1,1,1-Trichloroethane	0.00082	U	0.0050	0.00082	mg/Kg			08/05/20 06:58	1
1,1,2,2-Tetrachloroethane	0.0014	U	0.0050	0.0014	mg/Kg			08/05/20 06:58	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.0013	U	0.0050	0.0013	mg/Kg			08/05/20 06:58	1
1,1,2-Trichloroethane	0.0011	U	0.0050	0.0011	mg/Kg			08/05/20 06:58	1
1,1-Dichloroethane	0.00069	U	0.0050	0.00069	mg/Kg			08/05/20 06:58	1
1,1-Dichloroethene	0.00090	U	0.0050	0.00090	mg/Kg			08/05/20 06:58	1
1,2,3-Trichlorobenzene	0.000933	I	0.0050	0.00057	mg/Kg			08/05/20 06:58	1
1,2,4-Trichlorobenzene	0.000659	I	0.0050	0.00057	mg/Kg			08/05/20 06:58	1
1,2-Dibromo-3-Chloropropane	0.0036	U	0.010	0.0036	mg/Kg			08/05/20 06:58	1
1,2-Dichlorobenzene	0.0011	U	0.0050	0.0011	mg/Kg			08/05/20 06:58	1
1,2-Dichloroethane	0.00077	U	0.0050	0.00077	mg/Kg			08/05/20 06:58	1
1,2-Dichloropropane	0.00085	U	0.0050	0.00085	mg/Kg			08/05/20 06:58	1
1,3-Dichlorobenzene	0.00082	U	0.0050	0.00082	mg/Kg			08/05/20 06:58	1
1,4-Dichlorobenzene	0.00088	U	0.0050	0.00088	mg/Kg			08/05/20 06:58	1
2-Butanone (MEK)	0.0036	U	0.020	0.0036	mg/Kg			08/05/20 06:58	1
2-Hexanone	0.0041	U	0.020	0.0041	mg/Kg			08/05/20 06:58	1
4-Methyl-2-pentanone (MIBK)	0.0037	U	0.020	0.0037	mg/Kg			08/05/20 06:58	1
Acetone	0.021	U	0.025	0.021	mg/Kg			08/05/20 06:58	1
Benzene	0.00070	U	0.0050	0.00070	mg/Kg			08/05/20 06:58	1
Bromoform	0.0024	U	0.0050	0.0024	mg/Kg			08/05/20 06:58	1
Bromomethane	0.00099	U	0.0050	0.00099	mg/Kg			08/05/20 06:58	1
Carbon disulfide	0.0012	U	0.0050	0.0012	mg/Kg			08/05/20 06:58	1
Carbon tetrachloride	0.0033	U	0.0050	0.0033	mg/Kg			08/05/20 06:58	1
Chlorobenzene	0.00092	U	0.0050	0.00092	mg/Kg			08/05/20 06:58	1
Bromochloromethane	0.00059	U	0.0050	0.00059	mg/Kg			08/05/20 06:58	1
Dibromochloromethane	0.0028	U	0.0050	0.0028	mg/Kg			08/05/20 06:58	1
Chloroethane	0.0012	U	0.0050	0.0012	mg/Kg			08/05/20 06:58	1
Chloroform	0.00079	U	0.0050	0.00079	mg/Kg			08/05/20 06:58	1
Chloromethane	0.0010	U	0.0050	0.0010	mg/Kg			08/05/20 06:58	1
cis-1,2-Dichloroethene	0.00065	U	0.0050	0.00065	mg/Kg			08/05/20 06:58	1
cis-1,3-Dichloropropene	0.0014	U	0.0050	0.0014	mg/Kg			08/05/20 06:58	1
Cyclohexane	0.0014	U	0.010	0.0014	mg/Kg			08/05/20 06:58	1
Bromodichloromethane	0.00068	U	0.0050	0.00068	mg/Kg			08/05/20 06:58	1
Dichlorodifluoromethane	0.00094	U	0.0050	0.00094	mg/Kg			08/05/20 06:58	1
Ethylbenzene	0.0010	U	0.0050	0.0010	mg/Kg			08/05/20 06:58	1
1,2-Dibromoethane	0.00077	U	0.0050	0.00077	mg/Kg			08/05/20 06:58	1
Isopropylbenzene	0.00083	U	0.0050	0.00083	mg/Kg			08/05/20 06:58	1
Methyl acetate	0.0034	U	0.025	0.0034	mg/Kg			08/05/20 06:58	1
Methyl tert-butyl ether	0.00082	U	0.0050	0.00082	mg/Kg			08/05/20 06:58	1
Methylene Chloride	0.012	U	0.025	0.012	mg/Kg			08/05/20 06:58	1
Styrene	0.0012	U	0.0050	0.0012	mg/Kg			08/05/20 06:58	1
Tetrachloroethene	0.00073	U	0.0050	0.00073	mg/Kg			08/05/20 06:58	1
Toluene	0.00077	U	0.0050	0.00077	mg/Kg			08/05/20 06:58	1
trans-1,2-Dichloroethene	0.00047	U	0.0050	0.00047	mg/Kg			08/05/20 06:58	1
trans-1,3-Dichloropropene	0.0010	U	0.0050	0.0010	mg/Kg			08/05/20 06:58	1
Trichloroethene	0.00063	U	0.0050	0.00063	mg/Kg			08/05/20 06:58	1
Trichlorofluoromethane	0.0011	U	0.0050	0.0011	mg/Kg			08/05/20 06:58	1

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QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 240-445664/7
Matrix: Solid
Analysis Batch: 445664

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB MB		PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Vinyl chloride	0.00084	U	0.0050	0.00084	mg/Kg			08/05/20 06:58	1
Xylenes, Total	0.0016	U	0.010	0.0016	mg/Kg			08/05/20 06:58	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
Toluene-d8 (Surr)	78		64 - 124		08/05/20 06:58	1
Dibromofluoromethane (Surr)	72		56 - 122		08/05/20 06:58	1
4-Bromofluorobenzene (Surr)	83		51 - 127		08/05/20 06:58	1
1,2-Dichloroethane-d4 (Surr)	74		59 - 120		08/05/20 06:58	1

Lab Sample ID: LCS 240-445664/6
Matrix: Solid
Analysis Batch: 445664

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	82		64 - 124
Dibromofluoromethane (Surr)	71		56 - 122
4-Bromofluorobenzene (Surr)	90		51 - 127
1,2-Dichloroethane-d4 (Surr)	73		59 - 120

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-444710/23-A
Matrix: Solid
Analysis Batch: 445770

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444710

Analyte	MB MB		PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,1'-Biphenyl	0.017	U	0.050	0.017	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
1,2,4,5-Tetrachlorobenzene	0.014	U	0.10	0.014	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
1,4-Dioxane	0.015	U	0.15	0.015	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
2,4,5-Trichlorophenol	0.069	U	0.15	0.069	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
2,4,6-Trichlorophenol	0.064	U	0.15	0.064	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
2,4-Dichlorophenol	0.044	U	0.15	0.044	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
2,4-Dimethylphenol	0.040	U	0.15	0.040	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
2,4-Dinitrophenol	0.14	U	0.33	0.14	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
2,4-Dinitrotoluene	0.062	U	0.20	0.062	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
2-Chlorophenol	0.010	U	0.050	0.010	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
2-Chloronaphthalene	0.014	U	0.050	0.014	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
2-Methylnaphthalene	0.0020	U	0.015	0.0020	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
2-Methylphenol	0.031	U	0.20	0.031	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
2-Nitroaniline	0.040	U	0.20	0.040	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
2-Nitrophenol	0.013	U	0.050	0.013	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
3 & 4 Methylphenol	0.029	U	0.40	0.029	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
3,3'-Dichlorobenzidine	0.043	U	0.10	0.043	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
3-Nitroaniline	0.049	U	0.20	0.049	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
4,6-Dinitro-o-cresol	0.080	U	0.33	0.080	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
4-Bromophenyl phenyl ether	0.014	U	0.050	0.014	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
4-Chloro-3-methylphenol	0.045	U	0.15	0.045	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
4-Chloroaniline	0.030	U	0.15	0.030	mg/Kg		07/29/20 08:53	08/05/20 15:30	1

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QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-444710/23-A
Matrix: Solid
Analysis Batch: 445770

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444710

Analyte	MB	MB	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
4-Nitroaniline	0.060	U	0.20	0.060	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Acenaphthene	0.0029	U	0.015	0.0029	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Acenaphthylene	0.0040	U	0.015	0.0040	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Acetophenone	0.011	U	0.10	0.011	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Aniline	0.034	U	0.33	0.034	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Anthracene	0.0024	U	0.015	0.0024	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Benzo[a]anthracene	0.0034	U	0.015	0.0034	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Benzo[a]pyrene	0.0093	U	0.015	0.0093	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Benzo[b]fluoranthene	0.0065	U	0.015	0.0065	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Benzo[g,h,i]perylene	0.0071	U	0.015	0.0071	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Benzo[k]fluoranthene	0.0069	U	0.015	0.0069	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Bis(2-chloroethoxy)methane	0.012	U	0.10	0.012	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Bis(2-chloroethyl)ether	0.012	U	0.10	0.012	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Bis(2-ethylhexyl) phthalate	0.051	U	0.070	0.051	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Chrysene	0.0015	U	0.015	0.0015	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Dibenz(a,h)anthracene	0.0069	U	0.015	0.0069	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Dibenzofuran	0.013	U	0.050	0.013	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Di-n-butyl phthalate	0.022	U	0.070	0.022	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Diethyl phthalate	0.031	U	0.070	0.031	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Dimethyl phthalate	0.014	U	0.070	0.014	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Di-n-octyl phthalate	0.028	U	0.070	0.028	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Fluoranthene	0.0045	U	0.015	0.0045	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Fluorene	0.0027	U	0.015	0.0027	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Hexachlorobenzene	0.0029	U	0.015	0.0029	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Hexachlorobutadiene	0.012	U	0.050	0.012	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Hexachlorocyclopentadiene	0.062	U	0.33	0.062	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Hexachloroethane	0.0090	U	0.050	0.0090	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Indeno[1,2,3-cd]pyrene	0.0074	U	0.015	0.0074	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Isophorone	0.012	U	0.050	0.012	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Naphthalene	0.0024	U	0.015	0.0024	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Nitrobenzene	0.013	U	0.10	0.013	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
N-Nitrosodiphenylamine	0.012	U	0.050	0.012	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
N-Nitrosodi-n-propylamine	0.011	U	0.050	0.011	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Pentachlorophenol	0.058	U	0.15	0.058	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Phenanthrene	0.0022	U	0.015	0.0022	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Phenol	0.0080	U	0.050	0.0080	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Pyrene	0.0021	U	0.015	0.0021	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Butyl benzyl phthalate	0.022	U	0.070	0.022	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
bis (2-chloroisopropyl) ether	0.010	U	0.10	0.010	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Carbazole	0.019	U	0.050	0.019	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
2,6-Dinitrotoluene	0.056	U	0.20	0.056	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
1-Methylnaphthalene	0.0027	U	0.015	0.0027	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
4-Nitrophenol	0.094	U	0.33	0.094	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Atrazine	0.036	U	0.20	0.036	mg/Kg		07/29/20 08:53	08/05/20 15:30	1
Benzaldehyde	0.023	U	0.10	0.023	mg/Kg		07/29/20 08:53	08/05/20 15:30	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2-Fluorobiphenyl (Surr)	66		35 - 120	07/29/20 08:53	08/05/20 15:30	1

Eurofins TestAmerica, Canton

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-444710/23-A
Matrix: Solid
Analysis Batch: 445770

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444710

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2,4,6-Tribromophenol (Surr)	29		10 - 120	07/29/20 08:53	08/05/20 15:30	1
2-Fluorophenol (Surr)	56		26 - 120	07/29/20 08:53	08/05/20 15:30	1
Terphenyl-d14 (Surr)	84		39 - 120	07/29/20 08:53	08/05/20 15:30	1
Phenol-d5 (Surr)	64		28 - 120	07/29/20 08:53	08/05/20 15:30	1
Nitrobenzene-d5 (Surr)	65		28 - 120	07/29/20 08:53	08/05/20 15:30	1

Lab Sample ID: LCS 240-444710/24-A
Matrix: Solid
Analysis Batch: 445770

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 444710

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	Limits
		Result	Qualifier				
1,1'-Biphenyl	0.667	0.484		mg/Kg		73	43 - 120
1,2,4,5-Tetrachlorobenzene	0.667	0.457		mg/Kg		69	36 - 120
1,4-Dioxane	0.667	0.224		mg/Kg		34	10 - 120
2,4,5-Trichlorophenol	0.667	0.484		mg/Kg		73	28 - 120
2,4,6-Trichlorophenol	0.667	0.495		mg/Kg		74	14 - 120
2,4-Dichlorophenol	0.667	0.493		mg/Kg		74	40 - 120
2,4-Dimethylphenol	0.667	0.351		mg/Kg		53	31 - 120
2,4-Dinitrophenol	1.33	0.989		mg/Kg		74	10 - 120
2,4-Dinitrotoluene	0.667	0.529		mg/Kg		79	49 - 120
2-Chlorophenol	0.667	0.456		mg/Kg		68	42 - 120
2-Chloronaphthalene	0.667	0.479		mg/Kg		72	42 - 120
2-Methylnaphthalene	0.667	0.478		mg/Kg		72	42 - 120
2-Methylphenol	0.667	0.451		mg/Kg		68	42 - 120
2-Nitroaniline	0.667	0.567		mg/Kg		85	44 - 120
2-Nitrophenol	0.667	0.467		mg/Kg		70	41 - 120
3 & 4 Methylphenol	0.667	0.487		mg/Kg		73	43 - 120
3,3'-Dichlorobenzidine	1.33	1.23		mg/Kg		92	29 - 120
3-Nitroaniline	0.667	0.518		mg/Kg		78	41 - 120
4,6-Dinitro-o-cresol	1.33	1.01		mg/Kg		75	27 - 120
4-Bromophenyl phenyl ether	0.667	0.546		mg/Kg		82	47 - 120
4-Chloro-3-methylphenol	0.667	0.551		mg/Kg		83	39 - 120
4-Chloroaniline	0.667	0.418		mg/Kg		63	30 - 120
4-Nitroaniline	0.667	0.553		mg/Kg		83	47 - 120
Acenaphthene	0.667	0.466		mg/Kg		70	45 - 120
Acenaphthylene	0.667	0.439		mg/Kg		66	45 - 120
Acetophenone	0.667	0.468		mg/Kg		70	42 - 120
Aniline	0.667	0.391		mg/Kg		59	29 - 120
Anthracene	0.667	0.489		mg/Kg		73	52 - 120
Benzo[a]anthracene	0.667	0.519		mg/Kg		78	52 - 120
Benzo[a]pyrene	0.667	0.535		mg/Kg		80	50 - 120
Benzo[b]fluoranthene	0.667	0.550		mg/Kg		82	52 - 120
Benzo[g,h,i]perylene	0.667	0.565		mg/Kg		85	54 - 120
Benzo[k]fluoranthene	0.667	0.527		mg/Kg		79	54 - 120
Bis(2-chloroethoxy)methane	0.667	0.471		mg/Kg		71	43 - 120
Bis(2-chloroethyl)ether	0.667	0.407		mg/Kg		61	41 - 120
Bis(2-ethylhexyl) phthalate	0.667	0.496		mg/Kg		74	47 - 124
Chrysene	0.667	0.509		mg/Kg		76	53 - 120

Eurofins TestAmerica, Canton

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-444710/24-A
Matrix: Solid
Analysis Batch: 445770

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 444710

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dibenz(a,h)anthracene	0.667	0.553		mg/Kg		83	50 - 120
Dibenzofuran	0.667	0.469		mg/Kg		70	46 - 120
Di-n-butyl phthalate	0.667	0.519		mg/Kg		78	50 - 120
Diethyl phthalate	0.667	0.541		mg/Kg		81	45 - 120
Dimethyl phthalate	0.667	0.500		mg/Kg		75	47 - 120
Di-n-octyl phthalate	0.667	0.467		mg/Kg		70	38 - 122
Fluoranthene	0.667	0.569		mg/Kg		85	54 - 120
Fluorene	0.667	0.490		mg/Kg		73	48 - 120
Hexachlorobenzene	0.667	0.545		mg/Kg		82	45 - 120
Hexachlorobutadiene	0.667	0.436		mg/Kg		65	34 - 120
Hexachlorocyclopentadiene	0.667	0.244	I	mg/Kg		37	10 - 120
Hexachloroethane	0.667	0.445		mg/Kg		67	36 - 120
Indeno[1,2,3-cd]pyrene	0.667	0.563		mg/Kg		84	52 - 120
Isophorone	0.667	0.469		mg/Kg		70	42 - 120
Naphthalene	0.667	0.439		mg/Kg		66	39 - 120
Nitrobenzene	0.667	0.488		mg/Kg		73	42 - 120
N-Nitrosodiphenylamine	0.667	0.530		mg/Kg		80	50 - 120
N-Nitrosodi-n-propylamine	0.667	0.486		mg/Kg		73	39 - 120
Pentachlorophenol	1.33	0.627		mg/Kg		47	16 - 120
Phenanthrene	0.667	0.481		mg/Kg		72	50 - 120
Phenol	0.667	0.464		mg/Kg		70	39 - 120
Pyrene	0.667	0.525		mg/Kg		79	50 - 120
Butyl benzyl phthalate	0.667	0.562		mg/Kg		84	47 - 120
bis (2-chloroisopropyl) ether	0.667	0.439		mg/Kg		66	29 - 120
Carbazole	0.667	0.638		mg/Kg		96	51 - 120
2,6-Dinitrotoluene	0.667	0.512		mg/Kg		77	49 - 120
1-Methylnaphthalene	0.667	0.490		mg/Kg		73	42 - 120
4-Nitrophenol	1.33	1.17		mg/Kg		88	29 - 120
Atrazine	1.33	1.02		mg/Kg		76	54 - 120
Benzaldehyde	1.33	0.856		mg/Kg		64	38 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	70		35 - 120
2,4,6-Tribromophenol (Surr)	82		10 - 120
2-Fluorophenol (Surr)	66		26 - 120
Terphenyl-d14 (Surr)	89		39 - 120
Phenol-d5 (Surr)	70		28 - 120
Nitrobenzene-d5 (Surr)	67		28 - 120

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 240-444694/23-A
Matrix: Solid
Analysis Batch: 445044

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444694

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	0.022	U	0.050	0.022	mg/Kg		07/29/20 07:45	07/31/20 08:18	1
Aroclor-1221	0.024	U	0.050	0.024	mg/Kg		07/29/20 07:45	07/31/20 08:18	1
Aroclor-1232	0.023	U	0.050	0.023	mg/Kg		07/29/20 07:45	07/31/20 08:18	1

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QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: MB 240-444694/23-A
Matrix: Solid
Analysis Batch: 445044

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444694

Analyte	MB MB		PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Aroclor-1242	0.019	U	0.050	0.019	mg/Kg		07/29/20 07:45	07/31/20 08:18	1
Aroclor-1248	0.024	U	0.050	0.024	mg/Kg		07/29/20 07:45	07/31/20 08:18	1
Aroclor-1254	0.023	U	0.050	0.023	mg/Kg		07/29/20 07:45	07/31/20 08:18	1
Aroclor-1260	0.022	U	0.050	0.022	mg/Kg		07/29/20 07:45	07/31/20 08:18	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
Tetrachloro-m-xylene	72		14 - 128	07/29/20 07:45	07/31/20 08:18	1
DCB Decachlorobiphenyl	90		10 - 132	07/29/20 07:45	07/31/20 08:18	1

Lab Sample ID: LCS 240-444694/24-A
Matrix: Solid
Analysis Batch: 445044

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 444694

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
Aroclor-1016	1.00	0.672		mg/Kg		67	47 - 120
Aroclor-1260	1.00	0.706		mg/Kg		71	46 - 120

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
Tetrachloro-m-xylene	78		14 - 128
DCB Decachlorobiphenyl	87		10 - 132

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Lab Sample ID: MB 140-41470/4-A
Matrix: Solid
Analysis Batch: 41651

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 41470

Analyte	MB MB		RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
2,3,7,8-TCDD	0.11	U	1.0	0.11	pg/g		07/31/20 08:45	08/05/20 16:03	1
Total TCDD	0.11	U	1.0	0.11	pg/g		07/31/20 08:45	08/05/20 16:03	1
1,2,3,7,8-PeCDD	0.054	U	5.0	0.054	pg/g		07/31/20 08:45	08/05/20 16:03	1
Total PeCDD	0.054	U	5.0	0.054	pg/g		07/31/20 08:45	08/05/20 16:03	1
1,2,3,4,7,8-HxCDD	0.068	U	5.0	0.068	pg/g		07/31/20 08:45	08/05/20 16:03	1
1,2,3,6,7,8-HxCDD	0.068	U	5.0	0.068	pg/g		07/31/20 08:45	08/05/20 16:03	1
1,2,3,7,8,9-HxCDD	0.064	U	5.0	0.064	pg/g		07/31/20 08:45	08/05/20 16:03	1
Total HxCDD	0.068	U	5.0	0.068	pg/g		07/31/20 08:45	08/05/20 16:03	1
1,2,3,4,6,7,8-HpCDD	0.10	U	5.0	0.10	pg/g		07/31/20 08:45	08/05/20 16:03	1
Total HpCDD	0.10	U	5.0	0.10	pg/g		07/31/20 08:45	08/05/20 16:03	1
OCDD	0.113	I J	10	0.034	pg/g		07/31/20 08:45	08/05/20 16:03	1
2,3,7,8-TCDF	0.087	U	1.0	0.087	pg/g		07/31/20 08:45	08/05/20 16:03	1
Total TCDF	0.612	I J	1.0	0.087	pg/g		07/31/20 08:45	08/05/20 16:03	1
1,2,3,7,8-PeCDF	0.040	U	5.0	0.040	pg/g		07/31/20 08:45	08/05/20 16:03	1
2,3,4,7,8-PeCDF	0.038	U	5.0	0.038	pg/g		07/31/20 08:45	08/05/20 16:03	1
Total PeCDF	0.040	U	5.0	0.040	pg/g		07/31/20 08:45	08/05/20 16:03	1
1,2,3,4,7,8-HxCDF	0.055	U	5.0	0.055	pg/g		07/31/20 08:45	08/05/20 16:03	1
1,2,3,6,7,8-HxCDF	0.051	U	5.0	0.051	pg/g		07/31/20 08:45	08/05/20 16:03	1
2,3,4,6,7,8-HxCDF	0.058	U	5.0	0.058	pg/g		07/31/20 08:45	08/05/20 16:03	1
1,2,3,7,8,9-HxCDF	0.072	U	5.0	0.072	pg/g		07/31/20 08:45	08/05/20 16:03	1

Eurofins TestAmerica, Canton

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: MB 140-41470/4-A
Matrix: Solid
Analysis Batch: 41651

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 41470

Analyte	MB	MB	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Total HxCDF	0.072	U	5.0	0.072	pg/g		07/31/20 08:45	08/05/20 16:03	1
1,2,3,4,6,7,8-HpCDF	0.0269	I	5.0	0.017	pg/g		07/31/20 08:45	08/05/20 16:03	1
1,2,3,4,7,8,9-HpCDF	0.022	U	5.0	0.022	pg/g		07/31/20 08:45	08/05/20 16:03	1
Total HpCDF	0.0269	I	5.0	0.019	pg/g		07/31/20 08:45	08/05/20 16:03	1
OCDF	0.0728	I J	10	0.022	pg/g		07/31/20 08:45	08/05/20 16:03	1
MB MB									
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	67		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-1,2,3,7,8-PeCDD	67		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-1,2,3,4,7,8-HxCDD	74		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-1,2,3,6,7,8-HxCDD	76		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-1,2,3,4,6,7,8-HpCDD	86		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-OCDD	87		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-2,3,7,8-TCDF	71		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-1,2,3,7,8-PeCDF	74		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-2,3,4,7,8-PeCDF	68		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-1,2,3,4,7,8-HxCDF	76		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-1,2,3,6,7,8-HxCDF	79		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-2,3,4,6,7,8-HxCDF	78		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-1,2,3,7,8,9-HxCDF	77		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-1,2,3,4,6,7,8-HpCDF	84		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-1,2,3,4,7,8,9-HpCDF	83		40 - 135				07/31/20 08:45	08/05/20 16:03	1
13C-OCDF	79		40 - 135				07/31/20 08:45	08/05/20 16:03	1

Lab Sample ID: LCS 140-41470/3-A
Matrix: Solid
Analysis Batch: 41651

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 41470

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	
							Limits	
2,3,7,8-TCDD	20.0	20.1		pg/g		101	79 - 129	
1,2,3,7,8-PeCDD	100	105		pg/g		105	79 - 129	
1,2,3,4,7,8-HxCDD	100	109		pg/g		109	73 - 123	
1,2,3,6,7,8-HxCDD	100	108		pg/g		108	74 - 124	
1,2,3,7,8,9-HxCDD	100	115		pg/g		115	70 - 124	
1,2,3,4,6,7,8-HpCDD	100	105		pg/g		105	73 - 123	
OCDD	200	211		pg/g		106	75 - 125	
2,3,7,8-TCDF	20.0	20.9		pg/g		105	75 - 125	
1,2,3,7,8-PeCDF	100	102		pg/g		102	74 - 124	
2,3,4,7,8-PeCDF	100	104		pg/g		104	75 - 125	
1,2,3,4,7,8-HxCDF	100	109		pg/g		109	75 - 125	
1,2,3,6,7,8-HxCDF	100	109		pg/g		109	76 - 126	
2,3,4,6,7,8-HxCDF	100	105		pg/g		105	76 - 126	
1,2,3,7,8,9-HxCDF	100	105		pg/g		105	77 - 127	
1,2,3,4,6,7,8-HpCDF	100	110		pg/g		110	77 - 127	
1,2,3,4,7,8,9-HpCDF	100	106		pg/g		106	73 - 123	
OCDF	200	221		pg/g		110	49 - 128	
LCS LCS								
Isotope Dilution	%Recovery	Qualifier	Limits					
13C-2,3,7,8-TCDD	65		40 - 135					

Eurofins TestAmerica, Canton

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCS 140-41470/3-A
Matrix: Solid
Analysis Batch: 41651

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 41470

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C-1,2,3,7,8-PeCDD	59		40 - 135
13C-1,2,3,4,7,8-HxCDD	68		40 - 135
13C-1,2,3,6,7,8-HxCDD	77		40 - 135
13C-1,2,3,4,6,7,8-HpCDD	78		40 - 135
13C-OCDD	75		40 - 135
13C-2,3,7,8-TCDF	69		40 - 135
13C-1,2,3,7,8-PeCDF	61		40 - 135
13C-2,3,4,7,8-PeCDF	60		40 - 135
13C-1,2,3,4,7,8-HxCDF	71		40 - 135
13C-1,2,3,6,7,8-HxCDF	78		40 - 135
13C-2,3,4,6,7,8-HxCDF	78		40 - 135
13C-1,2,3,7,8,9-HxCDF	76		40 - 135
13C-1,2,3,4,6,7,8-HpCDF	78		40 - 135
13C-1,2,3,4,7,8,9-HpCDF	76		40 - 135
13C-OCDF	71		40 - 135

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-444752/1-A ^2
Matrix: Solid
Analysis Batch: 444965

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444752

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.022	U	0.20	0.022	mg/Kg		07/29/20 14:00	07/30/20 12:24	2
Arsenic	0.060	U	1.0	0.060	mg/Kg		07/29/20 14:00	07/30/20 12:24	2
Chromium	0.25	U	0.40	0.25	mg/Kg		07/29/20 14:00	07/30/20 12:24	2
Cadmium	0.043	U	0.20	0.043	mg/Kg		07/29/20 14:00	07/30/20 12:24	2
Barium	0.29	U	1.0	0.29	mg/Kg		07/29/20 14:00	07/30/20 12:24	2
Lead	0.062	U	0.20	0.062	mg/Kg		07/29/20 14:00	07/30/20 12:24	2
Selenium	0.12	U	1.0	0.12	mg/Kg		07/29/20 14:00	07/30/20 12:24	2

Lab Sample ID: LCS 240-444752/20-A ^2
Matrix: Solid
Analysis Batch: 444965

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 444752

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Silver	10.0	9.66		mg/Kg		97	80 - 120
Arsenic	100	92.6		mg/Kg		93	80 - 120
Chromium	50.0	49.6		mg/Kg		99	80 - 120
Cadmium	50.0	48.2		mg/Kg		96	80 - 120
Barium	100	94.5		mg/Kg		95	80 - 120
Lead	50.0	49.8		mg/Kg		100	80 - 120
Selenium	100	92.7		mg/Kg		93	80 - 120

Lab Sample ID: 240-134053-1 MS
Matrix: Solid
Analysis Batch: 444965

Client Sample ID: LC34-CP0005-000.5-20200727
Prep Type: Total/NA
Prep Batch: 444752

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Silver	0.033	I	9.67	9.39		mg/Kg	☼	97	75 - 125

Eurofins TestAmerica, Canton

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 240-134053-1 MS

Matrix: Solid

Analysis Batch: 444965

Client Sample ID: LC34-CP0005-000.5-20200727

Prep Type: Total/NA

Prep Batch: 444752

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	1.9		96.7	93.0		mg/Kg	☼	94	75 - 125
Chromium	20		48.3	68.7		mg/Kg	☼	100	75 - 125
Cadmium	1.4		48.3	47.2		mg/Kg	☼	95	75 - 125
Barium	50		96.7	145		mg/Kg	☼	98	75 - 125
Lead	46		48.3	97.7		mg/Kg	☼	107	75 - 125
Selenium	0.11	U	96.7	88.0		mg/Kg	☼	91	75 - 125

Lab Sample ID: 240-134053-1 MSD

Matrix: Solid

Analysis Batch: 444965

Client Sample ID: LC34-CP0005-000.5-20200727

Prep Type: Total/NA

Prep Batch: 444752

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Silver	0.033	I	9.67	9.47		mg/Kg	☼	98	75 - 125	1	20
Arsenic	1.9		96.7	94.0		mg/Kg	☼	95	75 - 125	1	20
Chromium	20		48.3	83.5	J	mg/Kg	☼	130	75 - 125	19	20
Cadmium	1.4		48.3	47.6		mg/Kg	☼	96	75 - 125	1	20
Barium	50		96.7	146		mg/Kg	☼	100	75 - 125	1	20
Lead	46		48.3	133	J	mg/Kg	☼	181	75 - 125	31	20
Selenium	0.11	U	96.7	88.3		mg/Kg	☼	91	75 - 125	0	20

Lab Sample ID: MB 240-444939/2-A

Matrix: Solid

Analysis Batch: 445150

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 444939

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.000053	U	0.0010	0.000053	mg/L		07/30/20 14:00	07/31/20 12:13	1
Arsenic	0.00075	U	0.0050	0.00075	mg/L		07/30/20 14:00	07/31/20 12:13	1
Chromium	0.00098	U	0.0020	0.00098	mg/L		07/30/20 14:00	07/31/20 12:13	1
Cadmium	0.00020	U	0.0010	0.00020	mg/L		07/30/20 14:00	07/31/20 12:13	1
Barium	0.0022	U	0.0050	0.0022	mg/L		07/30/20 14:00	07/31/20 12:13	1
Lead	0.00045	U	0.0010	0.00045	mg/L		07/30/20 14:00	07/31/20 12:13	1
Selenium	0.00089	U	0.0050	0.00089	mg/L		07/30/20 14:00	07/31/20 12:13	1

Lab Sample ID: LCS 240-444939/3-A

Matrix: Solid

Analysis Batch: 445150

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 444939

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Silver	0.100	0.0912		mg/L		91	80 - 120
Arsenic	1.00	0.994		mg/L		99	80 - 120
Chromium	0.500	0.473		mg/L		95	80 - 120
Cadmium	0.500	0.467		mg/L		93	80 - 120
Barium	1.00	0.961		mg/L		96	80 - 120
Lead	0.500	0.462		mg/L		92	80 - 120
Selenium	1.00	0.965		mg/L		96	80 - 120

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LB 240-444805/1-D
Matrix: Solid
Analysis Batch: 445150

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 444939

Analyte	LB LB		PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Silver	0.000053	U	0.0010	0.000053	mg/L		07/30/20 14:00	07/31/20 12:11	1
Arsenic	0.00075	U	0.0050	0.00075	mg/L		07/30/20 14:00	07/31/20 12:11	1
Chromium	0.00164	I	0.0020	0.00098	mg/L		07/30/20 14:00	07/31/20 12:11	1
Cadmium	0.00020	U	0.0010	0.00020	mg/L		07/30/20 14:00	07/31/20 12:11	1
Barium	0.0190		0.0050	0.0022	mg/L		07/30/20 14:00	07/31/20 12:11	1
Lead	0.00045	U	0.0010	0.00045	mg/L		07/30/20 14:00	07/31/20 12:11	1
Selenium	0.00089	U	0.0050	0.00089	mg/L		07/30/20 14:00	07/31/20 12:11	1

Lab Sample ID: 240-134053-1 MS
Matrix: Solid
Analysis Batch: 445150

Client Sample ID: LC34-CP0005-000.5-20200727
Prep Type: TCLP
Prep Batch: 444939

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS		Unit	D	%Rec	Limits
				Result	Qualifier				
Silver	0.000053	U	0.100	0.0979		mg/L		98	75 - 125
Arsenic	0.0013	I	1.00	1.07		mg/L		107	75 - 125
Chromium	0.0039		0.500	0.500		mg/L		99	75 - 125
Cadmium	0.0087		0.500	0.493		mg/L		97	75 - 125
Barium	0.13		1.00	1.13		mg/L		100	75 - 125
Lead	0.00064	I	0.500	0.484		mg/L		97	75 - 125
Selenium	0.00089	U	1.00	1.02		mg/L		102	75 - 125

Lab Sample ID: 240-134053-1 MSD
Matrix: Solid
Analysis Batch: 445150

Client Sample ID: LC34-CP0005-000.5-20200727
Prep Type: TCLP
Prep Batch: 444939

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD MSD		Unit	D	%Rec	Limits	RPD	Limit
				Result	Qualifier						
Silver	0.000053	U	0.100	0.0971		mg/L		97	75 - 125	1	20
Arsenic	0.0013	I	1.00	1.07		mg/L		107	75 - 125	0	20
Chromium	0.0039		0.500	0.496		mg/L		98	75 - 125	1	20
Cadmium	0.0087		0.500	0.491		mg/L		96	75 - 125	0	20
Barium	0.13		1.00	1.13		mg/L		100	75 - 125	0	20
Lead	0.00064	I	0.500	0.487		mg/L		97	75 - 125	1	20
Selenium	0.00089	U	1.00	1.03		mg/L		103	75 - 125	1	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-444930/2-A
Matrix: Solid
Analysis Batch: 445342

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444930

Analyte	MB MB		PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	0.00013	U	0.0020	0.00013	mg/L		07/30/20 12:00	07/31/20 12:02	1

Lab Sample ID: LCS 240-444930/3-A
Matrix: Solid
Analysis Batch: 445342

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 444930

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	Limits
		Result	Qualifier				
Mercury	0.00500	0.00534		mg/L		107	80 - 120

Eurofins TestAmerica, Canton

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LB 240-444805/1-C
Matrix: Solid
Analysis Batch: 445342

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 444930

Analyte	LB Result	LB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.00013	U	0.0020	0.00013	mg/L		07/30/20 12:00	07/31/20 12:00	1

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 240-444765/1-A
Matrix: Solid
Analysis Batch: 444952

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 444765

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.018	U	0.10	0.018	mg/Kg		07/29/20 14:00	07/30/20 10:33	1

Lab Sample ID: LCS 240-444765/2-A
Matrix: Solid
Analysis Batch: 444952

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 444765

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	0.833	0.797		mg/Kg		96	80 - 120

Lab Sample ID: 240-134053-1 MS
Matrix: Solid
Analysis Batch: 444952

Client Sample ID: LC34-CP0005-000.5-20200727
Prep Type: Total/NA
Prep Batch: 444765

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	0.019	U	0.188	0.189		mg/Kg	☼	101	80 - 120

Lab Sample ID: 240-134053-1 MSD
Matrix: Solid
Analysis Batch: 444952

Client Sample ID: LC34-CP0005-000.5-20200727
Prep Type: Total/NA
Prep Batch: 444765

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	0.019	U	0.188	0.190		mg/Kg	☼	101	80 - 120	0	20

QC Association Summary

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

GC/MS VOA

Prep Batch: 445026

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	Total/NA	Solid	5035	

Analysis Batch: 445664

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	Total/NA	Solid	8260C	445026
MB 240-445664/7	Method Blank	Total/NA	Solid	8260C	
LCS 240-445664/6	Lab Control Sample	Total/NA	Solid	8260C	

GC/MS Semi VOA

Prep Batch: 444710

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	Total/NA	Solid	3540C	
MB 240-444710/23-A	Method Blank	Total/NA	Solid	3540C	
LCS 240-444710/24-A	Lab Control Sample	Total/NA	Solid	3540C	

Analysis Batch: 445770

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	Total/NA	Solid	8270D	444710
MB 240-444710/23-A	Method Blank	Total/NA	Solid	8270D	444710
LCS 240-444710/24-A	Lab Control Sample	Total/NA	Solid	8270D	444710

GC Semi VOA

Prep Batch: 444694

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	Total/NA	Solid	3540C	
MB 240-444694/23-A	Method Blank	Total/NA	Solid	3540C	
LCS 240-444694/24-A	Lab Control Sample	Total/NA	Solid	3540C	

Analysis Batch: 445044

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	Total/NA	Solid	8082A	444694
MB 240-444694/23-A	Method Blank	Total/NA	Solid	8082A	444694
LCS 240-444694/24-A	Lab Control Sample	Total/NA	Solid	8082A	444694

Specialty Organics

Prep Batch: 41470

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	Total/NA	Solid	8290	
MB 140-41470/4-A	Method Blank	Total/NA	Solid	8290	
LCS 140-41470/3-A	Lab Control Sample	Total/NA	Solid	8290	

Analysis Batch: 41651

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 140-41470/4-A	Method Blank	Total/NA	Solid	8290A	41470
LCS 140-41470/3-A	Lab Control Sample	Total/NA	Solid	8290A	41470

Analysis Batch: 41657

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	Total/NA	Solid	8290A	41470

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QC Association Summary

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Specialty Organics

Analysis Batch: 41658

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	Total/NA	Solid	8290A	41470

Metals

Prep Batch: 444752

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	Total/NA	Solid	3050B	
MB 240-444752/1-A ^2	Method Blank	Total/NA	Solid	3050B	
LCS 240-444752/20-A ^2	Lab Control Sample	Total/NA	Solid	3050B	
240-134053-1 MS	LC34-CP0005-000.5-20200727	Total/NA	Solid	3050B	
240-134053-1 MSD	LC34-CP0005-000.5-20200727	Total/NA	Solid	3050B	

Prep Batch: 444765

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	Total/NA	Solid	7471B	
MB 240-444765/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 240-444765/2-A	Lab Control Sample	Total/NA	Solid	7471B	
240-134053-1 MS	LC34-CP0005-000.5-20200727	Total/NA	Solid	7471B	
240-134053-1 MSD	LC34-CP0005-000.5-20200727	Total/NA	Solid	7471B	

Leach Batch: 444805

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	TCLP	Solid	1311	
LB 240-444805/1-C	Method Blank	TCLP	Solid	1311	
LB 240-444805/1-D	Method Blank	TCLP	Solid	1311	
240-134053-1 MS	LC34-CP0005-000.5-20200727	TCLP	Solid	1311	
240-134053-1 MSD	LC34-CP0005-000.5-20200727	TCLP	Solid	1311	

Prep Batch: 444930

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	TCLP	Solid	7470A	444805
LB 240-444805/1-C	Method Blank	TCLP	Solid	7470A	444805
MB 240-444930/2-A	Method Blank	Total/NA	Solid	7470A	
LCS 240-444930/3-A	Lab Control Sample	Total/NA	Solid	7470A	

Prep Batch: 444939

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	TCLP	Solid	3005A	444805
LB 240-444805/1-D	Method Blank	TCLP	Solid	3005A	444805
MB 240-444939/2-A	Method Blank	Total Recoverable	Solid	3005A	
LCS 240-444939/3-A	Lab Control Sample	Total Recoverable	Solid	3005A	
240-134053-1 MS	LC34-CP0005-000.5-20200727	TCLP	Solid	3005A	444805
240-134053-1 MSD	LC34-CP0005-000.5-20200727	TCLP	Solid	3005A	444805

Analysis Batch: 444952

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	Total/NA	Solid	7471B	444765
MB 240-444765/1-A	Method Blank	Total/NA	Solid	7471B	444765
LCS 240-444765/2-A	Lab Control Sample	Total/NA	Solid	7471B	444765
240-134053-1 MS	LC34-CP0005-000.5-20200727	Total/NA	Solid	7471B	444765
240-134053-1 MSD	LC34-CP0005-000.5-20200727	Total/NA	Solid	7471B	444765

Eurofins TestAmerica, Canton

QC Association Summary

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Metals

Analysis Batch: 444965

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	Total/NA	Solid	6020A	444752
MB 240-444752/1-A ^2	Method Blank	Total/NA	Solid	6020A	444752
LCS 240-444752/20-A ^2	Lab Control Sample	Total/NA	Solid	6020A	444752
240-134053-1 MS	LC34-CP0005-000.5-20200727	Total/NA	Solid	6020A	444752
240-134053-1 MSD	LC34-CP0005-000.5-20200727	Total/NA	Solid	6020A	444752

Analysis Batch: 445150

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	TCLP	Solid	6020A	444939
LB 240-444805/1-D	Method Blank	TCLP	Solid	6020A	444939
MB 240-444939/2-A	Method Blank	Total Recoverable	Solid	6020A	444939
LCS 240-444939/3-A	Lab Control Sample	Total Recoverable	Solid	6020A	444939
240-134053-1 MS	LC34-CP0005-000.5-20200727	TCLP	Solid	6020A	444939
240-134053-1 MSD	LC34-CP0005-000.5-20200727	TCLP	Solid	6020A	444939

Analysis Batch: 445342

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	TCLP	Solid	7470A	444930
LB 240-444805/1-C	Method Blank	TCLP	Solid	7470A	444930
MB 240-444930/2-A	Method Blank	Total/NA	Solid	7470A	444930
LCS 240-444930/3-A	Lab Control Sample	Total/NA	Solid	7470A	444930

General Chemistry

Analysis Batch: 444900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-134053-1	LC34-CP0005-000.5-20200727	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Client Sample ID: LC34-CP0005-000.5-20200727

Lab Sample ID: 240-134053-1

Date Collected: 07/27/20 14:30

Matrix: Solid

Date Received: 07/28/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			444805	07/29/20 15:35	DRJ	TAL CAN
TCLP	Prep	3005A			444939	07/30/20 14:00	MRL	TAL CAN
TCLP	Analysis	6020A		1	445150	07/31/20 12:18	DSH	TAL CAN
TCLP	Leach	1311			444805	07/29/20 15:35	DRJ	TAL CAN
TCLP	Prep	7470A			444930	07/30/20 12:00	MRL	TAL CAN
TCLP	Analysis	7470A		1	445342	07/31/20 12:38	SLD	TAL CAN
Total/NA	Analysis	Moisture		1	444900	07/30/20 09:22	BWL	TAL CAN

Client Sample ID: LC34-CP0005-000.5-20200727

Lab Sample ID: 240-134053-1

Date Collected: 07/27/20 14:30

Matrix: Solid

Date Received: 07/28/20 09:30

Percent Solids: 94.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			445026	07/28/20 09:55	LAM	TAL CAN
Total/NA	Analysis	8260C		1	445664	08/05/20 09:14	SAM	TAL CAN
Total/NA	Prep	3540C			444710	07/29/20 08:53	EMB	TAL CAN
Total/NA	Analysis	8270D		1	445770	08/05/20 17:24	MRU	TAL CAN
Total/NA	Prep	3540C			444694	07/29/20 07:45	EMB	TAL CAN
Total/NA	Analysis	8082A		5	445044	07/31/20 11:48	LSH	TAL CAN
Total/NA	Prep	8290			41470	07/31/20 08:45	SSS	TAL KNX
Total/NA	Analysis	8290A		1	41658	08/06/20 01:40	PMP	TAL KNX
Total/NA	Prep	8290			41470	07/31/20 08:45	SSS	TAL KNX
Total/NA	Analysis	8290A		1	41657	08/05/20 22:31	LKM	TAL KNX
Total/NA	Prep	3050B			444752	07/29/20 14:00	DEE	TAL CAN
Total/NA	Analysis	6020A		2	444965	07/30/20 12:29	DSH	TAL CAN
Total/NA	Prep	7471B			444765	07/29/20 14:00	DEE	TAL CAN
Total/NA	Analysis	7471B		1	444952	07/30/20 10:37	SLD	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396
TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Accreditation/Certification Summary

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Laboratory: Eurofins TestAmerica, Canton

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E87225	06-30-21
The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.			
Analysis Method	Prep Method	Matrix	Analyte
7470A	7470A	Solid	Mercury
8270D	3540C	Solid	1-Methylnaphthalene
8270D	3540C	Solid	bis (2-chloroisopropyl) ether
Moisture		Solid	Percent Moisture

Laboratory: Eurofins TestAmerica, Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
	AFCEE	N/A	
ANAB	Dept. of Defense ELAP	L2311	02-13-22
ANAB	Dept. of Energy	L2311.01	02-13-22
ANAB	ISO/IEC 17025	L2311	02-13-22
ANAB	ISO/IEC 17025	L2311	02-14-22
Arkansas DEQ	State	88-0688	06-17-21
California	State	2423	06-30-21
Colorado	State	TN00009	02-28-21
Connecticut	State	PH-0223	09-30-21
Florida	NELAP	E87177	07-01-21
Georgia (DW)	State	906	12-11-22
Hawaii	State	NA	12-11-21
Kansas	NELAP	E-10349	11-01-20
Kentucky (DW)	State	90101	01-01-21
Louisiana	NELAP	LA110001	12-31-12 *
Louisiana	NELAP	83979	06-30-21
Louisiana (DW)	State	LA019	12-31-20
Maryland	State	277	03-31-21
Michigan	State	9933	12-11-22
Nevada	State	TN00009	08-31-20
New Hampshire	NELAP	299919	01-17-21
New Jersey	NELAP	TN001	07-01-21
New York	NELAP	10781	03-31-21
North Carolina (DW)	State	21705	07-31-21
North Carolina (WW/SW)	State	64	12-31-20
Ohio VAP	State	CL0059	06-02-23
Oklahoma	State	9415	09-01-20
Oregon	NELAP	TNI0189	01-02-21
Pennsylvania	NELAP	68-00576	12-31-20
Tennessee	State	02014	12-11-22
Texas	NELAP	T104704380-18-12	08-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	P330-19-00236	08-20-22
Utah	NELAP	TN00009	07-31-20 *
Virginia	NELAP	460176	09-15-20
Washington	State	C593	01-19-21
West Virginia (DW)	State	9955C	01-01-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins TestAmerica, Canton

Accreditation/Certification Summary

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Laboratory: Eurofins TestAmerica, Knoxville (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
West Virginia DEP	State	345	05-01-21
Wisconsin	State	998044300	08-31-21

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Canton Facility
 Client Tetra Tech Site Name _____ Cooler unpacked by: Jenny Ray
 Cooler Received on 7-28-20 Opened on 7-28-20
 FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____
 Packing material used: Bubble Wrap Foam Plastic Bag None Other _____
 COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-10 (CF +0.7 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
 IR GUN #IR-11 (CF +0.9 °C) Observed Cooler Temp. 4.5 °C Corrected Cooler Temp. 5.4 °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
 -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
 -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
 If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC911298
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? Yes No NA ● ← Larger than this.
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
16. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:
 VOAs
 Oil and Grease
 TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____
 Concerning _____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by: _____

18. SAMPLE CONDITION
 Sample(s) _____ were received after the recommended holding time had expired.
 Sample(s) _____ were received in a broken container.
 Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION
 Sample(s) AKZ 7-28-20 were further preserved in the laboratory.
 Time preserved: 9:55 Preservative(s) added/Lot number(s): _____
 VOA Sample Preservation - Date/Time VOAs Frozen: 7-28-20 / 0955

Chain of Custody Record

Client Information (Sub Contract Lab)		Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:
TestAmerica Laboratories, Inc.		Johnson, Opal	Johnson, Opal	240-123355.1	240-123355.1
5815 Middlebrook Pike,		Phone:	E-Mail:	State of Origin:	Page:
Knoxville		Opal.Johnson@Eurofinset.com	Opal.Johnson@Eurofinset.com	Florida	Page 1 of 1
TN, 37921		Accreditations Required (See note):			
Phone: 865-291-3000(Tel) 865-584-4315(Fax)		NELAP - Florida			
Email:		Analysis Requested			
Project Name: NASA KSC Headquarters		A - HCL			
Site:		B - NaOH			
Due Date Requested: 8/7/2020		C - Zn Acetate			
TAT Requested (days):		D - Nitric Acid			
PO #:		E - NaHSO4			
WO #:		F - MeOH			
Project #: 24024616		G - Amchlor			
SSOW#:		H - Ascorbic Acid			
Sample Date: 7/27/20		I - Ice			
Sample Time: 14:30 Eastern		J - DI Water			
Sample Type (C=Comp, G=grab)		K - EDTA			
Matrix (W=water, S=solid, O=wastefoil, BT=Tissue, A=Air)		L - EDA			
Preservation Code:		Other:			
Sample Identification - Client ID (Lab ID)		Total Number of Containers			
LC34-CP005-000.5-20200727 (240-134053-1)		1			
NO COSTUMY SEALS		Special Instructions/Note:			
REMOVED AT AT 03/CTO3C		240-134053 Chain of Custody			
HAD 7-29-20		Laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instr. TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins TestAmerica.			
1 COOLANT FEED X# 110361209873 PD		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)			
		<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
		Special Instructions/QC Requirements:			
		Empty Kit Relinquished by:			
		Relinquished by: _____ Date: _____			
		Relinquished by: _____ Date: 7-28-20 1510			
		Relinquished by: _____ Date: _____			
		Custody Seals Intact: _____ Cooler Temperature(s) °C and Other Remarks:			
		Company: 240			
		Company: ETA KX			

EUROFINS/TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Are the shipping containers intact?	/			<input type="checkbox"/> Containers, Broken	
2. Were ambient air containers received intact?			/	<input type="checkbox"/> Checked in lab	
3. The coolers/containers custody seal if present, is it intact?			/	<input type="checkbox"/> Yes <input type="checkbox"/> NA	
4. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) Thermometer ID : <u>368</u> Correction factor: <u>0.0</u>	/			<input type="checkbox"/> Cooler Out of Temp, Client Contacted, Proceed/Cancel <input type="checkbox"/> Cooler Out of Temp, Same Day Receipt	
5. Were all of the sample containers received intact?	/			<input type="checkbox"/> Containers, Broken	
6. Were samples received in appropriate containers?	/			<input type="checkbox"/> Containers, Improper; Client Contacted; Proceed/Cancel	
7. Do sample container labels match COC? (IDs, Dates, Times)	/			<input type="checkbox"/> COC & Samples Do Not Match <input type="checkbox"/> COC Incorrect/Incomplete <input type="checkbox"/> COC Not Received	
8. Were all of the samples listed on the COC received?	/			<input type="checkbox"/> Sample Received, Not on COC <input type="checkbox"/> Sample on COC, Not Received	
9. Is the date/time of sample collection noted?	/			<input type="checkbox"/> COC; No Date/Time; Client Contacted	Labeling Verified by: _____ Date: _____
10. Was the sampler identified on the COC?	/			<input type="checkbox"/> Sampler Not Listed on COC	
11. Is the client and project name/# identified?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
12. Are tests/parameters listed for each sample?	/			<input type="checkbox"/> COC No tests on COC	pH test strip lot number: _____
13. Is the matrix of the samples noted?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
14. Was COC relinquished? (Signed/Dated/Timed)	/			<input type="checkbox"/> COC Incorrect/Incomplete	Box 16A: pH Preservation Box 18A: Residual Chlorine
15. Were samples received within holding time?	/			<input type="checkbox"/> Holding Time - Receipt	Preservative: _____
16. Were samples received with correct chemical preservative (excluding Encore)?			/	<input type="checkbox"/> pH Adjusted, pH Included (See box 16A) <input type="checkbox"/> Incorrect Preservative	Lot Number: _____ Exp Date: _____ Analyst: _____ Date: _____ Time: _____
17. Were VOA samples received without headspace?			/	<input type="checkbox"/> Headspace (VOA only) <input type="checkbox"/> Residual Chlorine	
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number: _____			/		
19. For 1613B water samples is pH<9?			/	<input type="checkbox"/> If no, notify lab to adjust	
20. For rad samples was sample activity info. Provided?			/	<input type="checkbox"/> Project missing info	
Project #: _____				PM Instructions: _____	



Isotope Dilution Summary

Client: Tetra Tech, Inc.
Project/Site: KSL-LC34

Job ID: 240-134053-1

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Matrix: Solid

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TCDD (40-135)	PeCDD (40-135)	HxCDD (40-135)	HxDD (40-135)	HpCDD (40-135)	OCDD (40-135)	TCDF (40-135)	PeCDF (40-135)
240-134053-1	LC34-CP0005-000.5-20200727	70	62	66	79	72	69	73	66
240-134053-1	LC34-CP0005-000.5-20200727							68	
LCS 140-41470/3-A	Lab Control Sample	65	59	68	77	78	75	69	61
MB 140-41470/4-A	Method Blank	67	67	74	76	86	87	71	74

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PeCF (40-135)	HxCDF (40-135)	HxDF (40-135)	13CHxCF (40-135)	HxCF (40-135)	HpCDF (40-135)	HpCDF2 (40-135)	OCDF (40-135)
240-134053-1	LC34-CP0005-000.5-20200727	65	74	77	76	80	75	73	66
240-134053-1	LC34-CP0005-000.5-20200727								
LCS 140-41470/3-A	Lab Control Sample	60	71	78	78	76	78	76	71
MB 140-41470/4-A	Method Blank	68	76	79	78	77	84	83	79

Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD
 PeCDD = 13C-1,2,3,7,8-PeCDD
 HxCDD = 13C-1,2,3,4,7,8-HxCDD
 HxDD = 13C-1,2,3,6,7,8-HxCDD
 HpCDD = 13C-1,2,3,4,6,7,8-HpCDD
 OCDD = 13C-OCDD
 TCDF = 13C-2,3,7,8-TCDF
 PeCDF = 13C-1,2,3,7,8-PeCDF
 PeCF = 13C-2,3,4,7,8-PeCDF
 HxCDF = 13C-1,2,3,4,7,8-HxCDF
 HxDF = 13C-1,2,3,6,7,8-HxCDF
 13CHxCF = 13C-2,3,4,6,7,8-HxCDF
 HxCF = 13C-1,2,3,7,8,9-HxCDF
 HpCDF = 13C-1,2,3,4,6,7,8-HpCDF
 HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF
 OCDF = 13C-OCDF