Final

PHASE II
ENVIRONMENTAL SITE ASSESSMENT REPORT
FOR MEMORIAL DRIVE
RECONSTRUCTION
HOUSTON, TEXAS

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AEC Project No. E101-17

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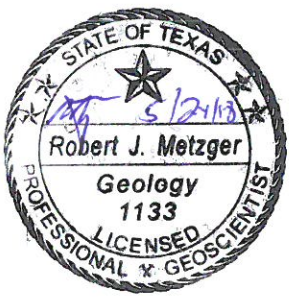

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APPENDICES

1.0 EXECUTIVE SUMMARY

The City of Houston plans to reconstruct Memorial Drive from the West Sam Houston Parkway North northbound feeder road to approximately 100 feet east of Tallowood Drive in Western Harris County, Texas (referred to herein as the Subject Right-of-Way). Figure 1 in Appendix A shows a site vicinity map with the approximate project limits. Figures 2a and 2b (refer to Appendix A) show the location of the Subject Right-of-Way on aerial photographs.

AEC performed a Phase I Environmental Site Assessment (ESA-I) of the Subject Right-of-Way (refer to ESA-I report E102-15 dated October 26, 2015). The ESA-I identified the following recognized environmental conditions (RECs) in connection with the Subject Right-of-Way which needed further investigation (refer to attached Figures 2a and 2b):

- REC #1: Chevron leaking petroleum storage tank (LPST) site/Wheatley Investments at 12860 Memorial Drive.
- REC #2: The contaminant plume associated with leaks from Your Valet Cleaners at 614 West Bough Lane; and A-1 Cleaners LPST and voluntary cleanup program (VCP) site at 12754 Memorial Drive.
- REC #3: Sprint PCS Tower Innocent Owner and Operator Program (IOP) site at 608 West Bough Lane.
- REC #4: Former Mobil gasoline station at 12802 Memorial Drive.
- REC #5: The contaminant plume associated with Conoco 43059 LPST site at 12699 Memorial Drive.
- REC #6: Alexan Memorial Bend Apartments IOP site at 12667 Memorial Drive.
- REC #7: The contaminant plume associated with the MW Cleaners/Lantern Lane Shopping Center-Pro Cleaners VCP and Industrial and Hazardous Waste Corrective Action (IHWCA) site at 12534 Memorial Drive and the Memorial Green VCP site at 12601 Memorial Drive.

The ESA-I recommended that a limited Phase II ESA (ESA-II) investigation be conducted with the installation of soil borings and temporary groundwater sampling wells in the Subject Right-of-Way near each REC.

During a meeting on February 16, 2017 between the City of Houston, Public Works, Geo-Environmental (COH); Lockwood, Andrews & Newnam, Inc. (LAN); and an AEC representative, the COH indicated that RECs #2, #3, #4, and #7 should be considered as potentially petroleum contaminated areas (PPCAs) without any further ESA-II drilling since the ESA-I investigation revealed that contamination had crossed Memorial Drive and into the area south of Memorial Drive near each of those RECs. COH personnel also indicated that if there was evidence of contamination under Memorial Drive at REC #5, that it also should be considered a PPCA without additional drilling. After the meeting, AEC reviewed the ESA-I and determined that there were monitor wells located on the eastern side of Memorial Drive at REC #5, therefore REC #5 is a PPCA and no additional drilling is needed. The following RECs were therefore determined to be the only ones needing further investigation by drilling soil borings during an ESA-II.

- REC #1: Chevron LPST site/Wheatley Investments at 12860 Memorial Drive.

- REC #2: (former REC #6): Alexan Memorial Bend Apartments IOP site at 12667 Memorial Drive.

Attached Figures 3a and 3b show the locations of the two RECs and the five PPCAs identified during the COH meeting.

AEC performed the limited ESA-II in general accordance with Chapter 11 – Geotechnical and Environmental Requirements of the City of Houston Department of Public Works and Engineering Infrastructure Design Manual and ASTM Standard Practice E 1903 (July 1, 2016) to investigate and assess if petroleum products or hazardous substances from the two RECs contaminated the Subject Right-of-Way. A total of six soil borings were drilled to depths ranging from 20 to 28 feet below ground surface (bgs). The soils encountered were mainly either sandy clay or clays. Sand and/or silt partings, seams, pockets, and layers were encountered in each of the six borings. The PID readings were less than 1.0 parts per million (ppm) in each of the soil intervals measured from soil cores from boring locations B-1, B-4, and B-5. In the soils of B-2, PID readings ranged from 1.2 to 1.3 ppm from 8 to 10 feet bgs. The PID readings of soil from 19 to 28 feet bgs ranged from 1.5 to 5.8 ppm. The remainder of the PID readings of the soil from B-2 were less than 1.0 ppm. The PID readings of soil from 21 to 28 feet bgs at the B-3 boring location ranged from 0.9 to 4.3 ppm. The rest of the PID readings of soil from B-3 were less than 1.0 ppm. The PID readings of soil from 20 to 22 feet bgs at boring location B-6 were 1.3 to 1.5 ppm. The rest of the PID readings from the soil at boring location B-6 were less than 1.0 ppm. Petroleum product odors were detected in the soils from 26 to 28 feet bgs at boring location B-2. A soil sample was collected from each soil boring. Soil borings B-2 and B-5 were each converted to a temporary monitor well and a groundwater sample was collected from each. Soil from B-1 through B-3 and groundwater from B-2 were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tertiary butyl ether (MTBE), and total petroleum hydrocarbons (TPH) 1005. Soil from B-4 through B-6 and groundwater from B-5 were analyzed for volatile organic compounds (VOCs) and TPH 1005. The BTEX, MTBE, VOC and TPH concentrations for each of the soil samples collected are below the laboratory detection limits. The VOC concentrations in the groundwater sample from B-5 and the TPH concentrations in the groundwater samples from B-2 and B-5 are below the laboratory detection limits shown. Benzene, toluene, m-&p-xylenes, and MTBE concentrations in the groundwater sample from B-2 exceeded the laboratory detection limits.

Based on the guidelines provided by the City of Houston, the results of the AEC ESA-I report dated March 25, 2015; and the results of this ESA-II investigation, AEC has identified the following areas along the Subject Right-of-Way as PPCAs (refer to Figures 4a and 4b and 5 through 28 in Appendix A).

- PPCA #1: Benzene, toluene, m&p xylenes, and methyl tertiary butyl ether contamination in the groundwater were detected and hydrocarbon odor noted in the soil near the Chevron Station at 12860 Memorial Drive. The extent of the PPCA is from Station 1+95.3 to Station 3+63.7. Even though laboratory analysis of the soil sample collected from boring B-2 (located in the PPCA) did not exhibit any contaminants, the soil in the PPCA should be assumed to be contaminated, since there could be sources of soil contamination in the PPCA which could have migrated into the groundwater, but were missed since only one soil sample was collected. In addition, the PID readings in most of

the soil exceeded background concentrations. Therefore, the entire soil column should be assumed to be contaminated unless proven otherwise during construction activities.

- PPCA #2, #3, and #4: These three PPCAs are adjacent to each other and the exact boundaries between each cannot be readily determined. The releases comprising these RECs were from dry cleaners and a former gasoline station. PPCA#2 (a dry cleaner release) makes up the vast majority of the area of contamination. At one time there were 88 monitoring and recovery wells located in PPCA#2 and 18 injection wells located along Memorial Drive (refer to AEC ESA-I report, March 24, 2015). The extent of the PPCAs extends from Station 7+37.3 to Station 17+74.6. Soil and groundwater are contaminated with volatile organic compounds, BTEX, MTBE, and TPH. Not much is known about the vertical extent of the soil contamination, therefore, the vertical extent of the PPCA is presumed to be contaminated from below the pavement to 5 feet below the deepest utility to be installed during construction, unless proven otherwise during construction activities.
- PPCA#5: This PPCA is associated with a gasoline leak from a former Conoco station at 12699 Memorial Drive. There were a total of 30 monitor and recovery wells at the site and in the right-of-way of Memorial Drive (refer to ESA-I report dated March 24, 2015). The extent of the PPCA is from Station 27+06.2 to Station 31+60.6. Groundwater was impacted by petroleum products (BTEX, MTBE, and TPH). No information was found during the ESA-I regarding soil contamination. AEC believes that as contaminated as the groundwater was, that there is a high probability of soil contamination. Therefore the soil from the base of pavement to 5 feet below the base of the deepest utility to be installed during construction is presumed to be contaminated unless proven otherwise during the construction activities.
- PPCA#6: This PPCA is associated with a dry cleaner leak from MW Cleaners/Pro Cleaners at 12534 Memorial Drive. There were a total of 34 wells installed in two different groundwater bearing zones (refer to ESA-1 report dated March 24, 2015). The extent of the PPCA is from Station 42+40.4 to Station 49+72.8. Soil and groundwater are contaminated with volatile organics and chlorinated solvents. Not much is known about the vertical extent of the soil contamination, therefore the soil from beneath the pavement to 5 feet below the depth of the deepest utility to be installed during construction is presumed to be contaminated unless proven otherwise during the construction activities.

It should be noted that plugged borings were observed during the ESA-II on Memorial Drive between PPCA #1 and PPCA #2, and between PPCA #2 and PPCA#5 near the intersection of Memorial Drive and Old Oaks Drive and near the intersection of Memorial Drive and Huntingwick Drive. The source and purpose of these plugged borings is unknown.

For this project, the contractor should follow the Texas Department of Transportation (TxDOT) Specifications for 1) Safety (workers and public), 2) Selections of proper pipes and gaskets, and 3) Legal disposal of the wastes.

2.0 INTRODUCTION

2.1 Project Background and Location

The City of Houston plans to reconstruct Memorial Drive from the West Sam Houston Parkway North northbound feeder road to approximately 100 feet east of Tallowood Drive in Western

Harris County, Texas (referred to herein as the Subject Right-of-Way). Figure 1 in Appendix A shows a site vicinity map with the approximate project limits. Figures 2a and 2b (refer to Appendix A) show the location of the Subject Right-of-Way on aerial photographs.

AEC performed a Phase I Environmental Site Assessment (ESA-I) of the Subject Right-of-Way (refer to ESA-I report E102-15 dated October 26, 2015). The ESA-I identified the following recognized environmental conditions (RECs) in connection with the Subject Right-of-Way which needed further investigation (refer to attached Figures 2a and 2b):

- REC #1: Chevron leaking petroleum storage tank (LPST) site/Wheatley Investments at 12860 Memorial Drive.
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The ESA-I recommended that a limited Phase II Environmental Site Assessment (ESA-II) investigation be conducted with the installation of soil borings and temporary groundwater sampling wells in the Subject Right-of-Way near each REC

During a meeting on February 16, 2017 between the City of Houston, Public Works, Geo-Environmental (COH); Lockwood, Andrews & Newnam, Inc. (LAN); and an AEC representative, the COH indicated that RECs #2, #3, #4, and #7 should be considered as potentially petroleum contaminated areas (PPCAs) without any further ESA-II drilling since the ESA-I investigation revealed that contamination had crossed Memorial Drive and into the area south of Memorial Drive near each of those RECs. COH personnel also indicated that if there was evidence of contamination under Memorial Drive at REC #5, that it also should be considered a PPCA without additional drilling. After the meeting, AEC reviewed the ESA-I and determined that there were monitor wells located on the eastern side of Memorial Drive at REC #5, therefore REC #5 is a PPCA and no additional drilling is needed. The following RECs were therefore determined to be the only ones needing further investigation by drilling soil borings during an ESA-II.

- REC #1: Chevron LPST site/Wheatley Investments at 12860 Memorial Drive.
- REC #2: (former REC #6): Alexan Memorial Bend Apartments IOP site at 12667 Memorial Drive.

Attached Figures 3a and 3b show the locations of the two RECs and the five PPCAs identified during the COH meeting.

2.2 Authorization

LAN authorized the limited ESA-II of the Subject Right-of-Way in an email dated March 9, 2017.

3.0 ON-SITE INVESTIGATION

AEC has performed this limited ESA-II investigation of the Subject Right-of-Way in general accordance with Chapter 11 – Geotechnical and Environmental Requirements of the City of Houston Department of Public Works and Engineering Infrastructure Design Manual and ASTM Standard Practice E1903 (July 1, 2016) and ASTM Standard Practice E1903-11.

A total of six boring locations (B-1 through B-6) were marked in the field prior to drilling. Each soil boring was placed in the best practicable location, considering the location of utilities and other site-specific conditions. Figures 3a and 3b in Appendix A shows the locations of the soil borings. City of Houston maps were reviewed to determine the location of water and sewer utilities and the Texas811 utility locate service was contacted prior to drilling to mark other subsurface utilities in the Subject Right-of-Way.

The pavement at each of the six boring locations was cored on May 24, 2017 (refer to Photograph 1 in Appendix B). The pavement at borings B-1 and B-2 was concrete (10 inches and 8.5 inches thick, respectively) over base material (15 inches and 25.5 inches thick, respectively). Pavement at boring locations B-3 through B-6 consisted of asphalt pavement over base material. The thickness of the asphalt ranged from 4.75 inches at B-3 to 11 inches at B-6. Base material ranged in thickness from 3 inches at B-6 to 23.25 inches at B-3. Attached Table 1 in Appendix A summarizes the pavement and base thicknesses.

On May 25 and 26, 2017, a continuous direct-push soil boring machine was used to obtain a soil core to the total depth at each boring location (refer to Photographs 2 through 5 in Appendix B). Each boring was drilled to 5 feet below the excavation depth of the deepest proposed utility near each location as determined from information provided by LAN–provided plans and profiles. The borings were drilled to depths ranging from 20 to 28 below pavement surface (bgs). The total depth of each soil boring is listed in Table 1 of Appendix A of this report.

Soil cores were collected in 5-foot long acetate liners within the 2-inch diameter direct push corer along the entire length of each boring (refer to Photographs 6 and 7). The majority of the soil encountered during drilling was clay and sandy clay (refer to the soil boring logs in Appendix C and summary of the borings in Table 1 in Appendix A). Sand and silt layers, seams, partings and pockets were observed in the soils of each of the borings.

A representative section of soil was cut from each 1-foot section of each 5-foot core (when available) and placed in a zip-lock type sandwich bag for approximately 10 minutes for head-space evaluation of volatile organic compound vapors. The remainder of each 1-foot section of each 5-foot soil core was placed in a zip-lock bag in a cooler with ice for possible laboratory analysis. After approximately 10 minutes, the headspace concentration of volatile organic vapors

from each bagged section of soil not in the cooler was analyzed by inserting the probe tip of a calibrated photoionization detector (PID) into a narrow opening of the bag seal.

The resulting PID readings are listed on the boring logs in Appendix C. The PID readings were less than 1.0 parts per million (ppm) in each of the soil intervals measured from soil cores from boring locations B-1, B-4, and B-5. In the soils of B-2, PID readings ranged from 1.2 to 1.3 ppm from 8 to 10 feet below grade surface (bgs). The PID readings of soil from 19 to 28 feet bgs ranged from 1.5 to 5.8 ppm. The remainder of the PID readings of the soil from B-2 were less than 1.0 ppm. The PID readings of soil from 21 to 28 feet bgs at the B-3 boring location ranged from 0.9 to 4.3 ppm. The rest of the PID readings of soil from B-3 were less than 1.0 ppm. The PID readings of soil from 20 to 22 feet bgs at boring location B-6 were 1.3 to 1.5 ppm. The rest of the PID readings from the soil at boring location B-6 were less than 1.0 ppm. PID readings of background air (control samples) ranged from 0.0 ppm and 0.3 ppm. PID readings of air in new empty sample bags (control samples) ranged from 0.0 ppm to 0.2 ppm. Petroleum product odors were detected in the soils from 26 to 28 feet bgs at boring location B-2.

A soil sample for laboratory analysis was collected at each boring location from the intervals identified in Table 1 in Appendix A and on the boring logs of Appendix C. The soil sample was collected from the highest PID reading in each of borings B-1 through B-4 and B-6. The soil sample was collected in B-5 above where groundwater was encountered since all the PID readings in the soils of that boring were 0.0 ppm. Each soil sample was collected and placed in a clean container. For each soil interval collected for analysis, a sample was also placed in a 4-ounce glass jar for analysis of moisture content as required by the laboratory. Each sample container was labeled with the date and time of sample collection, the soil boring number, and the requested analyses. Each of the collected soil samples were preserved on ice and transported to A&B Environmental Services, Inc. commercial analytical laboratory with a completed chain-of-custody form (refer to the analytical laboratory report in Appendix D).

Groundwater was not encountered during drilling of borings B-1 and B-2. Groundwater did not collect in the borehole of boring B-1 by approximately 0.25 hours after drilling was completed. Approximately 2.3 feet of water collected in the borehole of B-2 approximately 0.25 hours after drilling was completed. The depth groundwater was encountered in boring B-3 is unknown since water trapped under the pavement kept entering the borehole during drilling. Groundwater was encountered during drilling in borings B-4 through B-6 at depths ranging from approximately 21.3 to 22 feet bgs. The borehole at B-4 had approximately 8.5 feet of water in it after approximately 0.25 hours after drilling was completed. The borehole at B-5 had approximately 5.7 feet of water in it after approximately 0.25 hours after drilling was completed. Boring B-6 was dry 0.25 hours after drilling was completed. Refer to Table 1 in Appendix A and the soil borings in Appendix C for detailed information about the depth water was encountered and for 0.25 hour readings. No odor or petroleum product sheens were detected in the groundwater samples.

Soil borings B-2 and B-5 were each converted to a temporary monitor well which consisted of new 1-inch diameter polyvinyl chloride (PVC) screen and new 1-inch diameter PVC solid-wall casing. The length of screen and solid wall casing used in each temporary monitor well are identified at the bottom of the B-2 and B-5 boring logs in Appendix C. Once installed, each

temporary monitor well was developed by removing groundwater from the well until it was relatively clear. A groundwater sample was collected from each temporary monitor well. The groundwater sample collected was placed into clean, laboratory-provided sample containers, labeled with the date and time of sample collection, the well number, the requested analyses, and the initials of the sample collector. Each container containing groundwater was preserved on ice in a cooler and transported to A&B Environmental Services, Inc. in Houston, Texas with a completed chain-of-custody form (refer to the analytical laboratory report in Appendix E).

Following drilling and sampling, each of the six borings was grouted from the total depth to up to approximately 1 foot below the pavement surface. For B-1 and B-2, the approximately upper foot was patched with concrete (refer to Photograph 8 in Appendix B). The approximately upper foot of B-3 through B-6 was patched with asphalt (refer to Photograph 9 in Appendix B). Prior to plugging, the temporary monitor wells were removed from their boreholes.

4.0 LABORATORY ANALYSES

Each of the six soil and two groundwater samples was analyzed by A&B Environmental Services, Inc. laboratory. Laboratory analysis included:

- Benzene, toluene, ethylbenzene, and xylenes (BTEX); and methyl tertiary butyl ether (MTBE) using analytical method SW-846 8021B for soil samples from soil borings B-1, B-2, and B-3; and the groundwater sample from boring B-2.
- Volatile organic compounds (VOC) using analytical method SW-846 5035A for soil samples from soil borings B-4 through B-6 and the groundwater sample from boring B-5.
- Total petroleum hydrocarbons (TPH) by Texas Commission on Environmental Quality Method 1005 for all soil and groundwater samples.
- The moisture content of each of the soil samples was also determined as required for the above analyses.

The results of the soil sample analyses are summarized in Table 2 in Appendix D and the results of the groundwater sample analyses are summarized in Table 3 in Appendix D. Appendix E contains the laboratory analysis reports, quality control certificates, and chains-of-custody.

As shown in Table 2, the BTEX, MTBE, VOC and TPH concentrations for each of the soil samples collected are below the laboratory detection limits shown. As shown in Table 3, the VOC concentrations in the groundwater sample from B-5 and the TPH concentrations in the groundwater samples from B-2 and B-5 are below the laboratory detection limits shown. Benzene, toluene, m-&p-xylenes, and MTBE concentrations in the groundwater sample from B-2 exceeded the laboratory detection limits.

5.0 WASTE DISPOSAL

Waste soil and wastewater generated during the limited ESA-II on-site investigation were placed in 5-gallon plastic buckets and capped with a lid manufactured to fit the container. Each bucket of waste was transported to and stored at AEC's property at 5790 Windfern in Houston. Waste soil from borings B-1 and B-3 through B-6 was disposed of as solid waste since none of the laboratory concentrations of constituents in the soil exceeded their applicable Texas Commission on Environmental Quality Texas Risk Reduction Program Protective Concentration Levels. Soil

from B-2, groundwater from B-2 and decontamination water were disposed of via a waste manifest in a properly licensed facility. A copy of the waste manifest is attached in Appendix F.

One 5-gallon bucket of wastewater was generated during drilling activities. AEC checked the 5-gallon buckets containing soil and groundwater when preparing the paperwork for waste disposal and discovered a hole in the bottom of the bucket used for the wastewater through which all the contents had drained out. The bucket was located on a concrete surface which slopes to a storm sewer drain. The leaking contents of the bucket would have been confined to the concrete pavement and flowed into the storm drain. The wastewater was a mixture of contaminated and uncontaminated groundwater and decontamination water from the drilling and sampling activities so the contamination in the water would have been diluted when entering the storm sewer.

6.0 SUMMARY

AEC performed the limited ESA-II in general accordance with Chapter 11 – Geotechnical and Environmental Requirements of the City of Houston Department of Public Works and Engineering Infrastructure Design Manual (July 1, 2016) and ASTM Standard Practice E 1903 (July 1, 2016) to investigate and assess if petroleum products or hazardous substances from two RECs contaminated the Subject Right-of-Way. A total of six soil borings were drilled to depths ranging from 20 to 28 feet bgs. The soils encountered were mainly either sandy clay or clays. Sand and/or silt partings, seams, pockets, and layers were encountered in each of the six borings. The PID readings were less than 1.0 parts per million (ppm) in each of the soil intervals measured from soil cores from boring locations B-1, B-4, and B-5. In the soils of B-2, PID readings ranged from 1.2 to 1.3 ppm from 8 to 10 feet below grade surface (bgs). The PID readings of soil from 19 to 28 feet bgs ranged from 1.5 to 5.8 ppm. The remainder of the PID readings of the soil from B-2 were less than 1.0 ppm. The PID readings of soil from 21 to 28 feet bgs at the B-3 boring location ranged from 0.9 to 4.3 ppm. The rest of the PID readings of soil from B-3 were less than 0.1 ppm. The PID readings of soil from 20 to 22 feet bgs at boring location B-6 were 1.3 to 1.5 ppm. The rest of the PID readings from the soil at boring location B-6 were less than 1.0 ppm. Petroleum product odors were detected in the soils from 26 to 28 feet bgs at boring location B-2. A soil sample was collected from each soil boring location. Soil borings B-2 and B-5 were each converted to a temporary monitor well and a groundwater sample was collected from each. Soil from B-1 through B-3 and groundwater from B-2 were analyzed for BTEX, MTBE, and TPH 1005. Soil from B-4 through B-6 and groundwater from B-5 were analyzed for VOCs and TPH 1005. The BTEX, MTBE, VOC and TPH concentrations for each of the soil samples collected are below the laboratory detection limits. The VOC concentrations in the groundwater sample from B-5 and the TPH concentrations in the groundwater samples from B-2 and B-5 are below the laboratory detection limits shown. Benzene, toluene, m-&p-xylenes, and MTBE concentrations in the groundwater sample from B-2 exceeded the laboratory detection limits.

7.0 CONCLUSION AND RECOMMENDATIONS

Based on the guidelines provided by the City of Houston, the results of the AEC ESA-I report dated March 25, 2015; and the results of this ESA-II investigation, AEC has identified the following areas along the Subject Right-of-Way as PPCAs (refer to Figures 4a and 4b and 5

through 28 in Appendix A). These include the PPCAs which were identified by the City of Houston prior to the ESA-II.

- PPCA #1: Benzene, toluene, m&p xylenes, and methyl tertiary butyl ether contamination in the groundwater were detected and hydrocarbon odor noted in the soil near the Chevron Station at 12860 Memorial Drive. The extent of the PPCA is from Station 1+95.3 to Station 3+63.7. Even though laboratory analysis of the soil sample collected from boring B-2 (located in the PPCA) did not exhibit any contaminants, the soil in the PPCA should be assumed to be contaminated, since there could be sources of soil contamination in the PPCA which could have migrated into the groundwater, but were missed since only one soil sample was collected. In addition, the PID readings in most of the soil exceeded background concentrations. Therefore, the entire soil column should be assumed to be contaminated unless proven otherwise during construction activities.
- PPCA #2, #3, and #4: These three PPCAs are adjacent to each other and the exact boundaries between each cannot be readily determined. The releases comprising these RECs were from dry cleaners and a former gasoline station. PPCA#2 (a dry cleaner release) makes up the vast majority of the area of contamination. At one time there were 88 monitoring and recovery wells located in PPCA#2 and 18 injection wells located along Memorial Drive (refer to AEC ESA-I report, March 24, 2015). The extent of the PPCAs extends from Station 7+37.3 to Station 17+74.6. Soil and groundwater are contaminated with volatile organic compounds, BTEX, MTBE, and TPH. Not much is known about the vertical extent of the soil contamination, therefore, the vertical extent of the PPCA is presumed to be contaminated from below the pavement to 5 feet below the deepest utility to be installed during construction, unless proven otherwise during construction activities.
- PPCA#5: This PPCA is associated with a gasoline leak from a former Conoco station at 12699 Memorial Drive. There were a total of 30 monitor and recovery wells at the site and in the right-of-way of Memorial Drive (refer to ESA-I report dated March 24, 2015). The extent of the PPCA is from Station 27+06.2 to Station 31+60.6. Groundwater was impacted by petroleum products (BTEX, MTBE, and TPH). No information was found during the ESA-I regarding soil contamination. AEC believes that as contaminated as the groundwater was, that there is a high probability of soil contamination. Therefore the soil from the base of pavement to 5 feet below the base of the deepest utility to be installed during construction is presumed to be contaminated unless proven otherwise during the construction activities.
- PPCA#6: This PPCA is associated with a dry cleaner leak from MW Cleaners/Pro Cleaners at 12534 Memorial Drive. There were a total of 34 wells installed in two different groundwater bearing zones (refer to ESA-1 report dated March 24, 2015). The extent of the PPCA is from Station 42+40.4 to Station 49+72.8. Soil and groundwater are contaminated with volatile organics and chlorinated solvents. Not much is known about the vertical extent of the soil contamination, therefore the soil from beneath the pavement to 5 feet below the depth of the deepest utility to be installed during construction is presumed to be contaminated unless proven otherwise during the construction activities.

It should be noted that plugged borings were observed during the ESA-II on Memorial Drive between PPCA #1 and PPCA #2, and between PPCA #2 and PPCA#5 near the intersection of

Memorial Drive and Old Oaks Drive and near the intersection of Memorial Drive and Huntingwick Drive. The source and purpose of these plugged borings is unknown.

For this project, the contractor should follow the Texas Department of Transportation (TxDOT) Specifications for 1) Safety (workers and public), 2) Selections of proper pipes and gaskets, and 3) Legal disposal of the wastes.

8.0 LIMITATIONS

The information and conclusions provided in this report are based on a general knowledge of the Subject Right-of-Way, information provided to AEC about this project, and the results of the limited ESA-II investigation. This report documents the concentrations of petroleum products and hazardous substances detected in the respective soil and groundwater samples collected and analyzed during the limited ESA-II investigation. AEC cannot guarantee that not finding evidence of contamination means that contamination does not exist within the Subject Right-of-Way. There is a possibility that contaminated soil and groundwater may exist in the Subject Right-of-Way that were not detected during the limited ESA-II investigation due to the limited number and location of the soil borings and temporary monitor wells, samples collected, contaminants analyzed, and the cost and time constraints of the project. As a result, the goal of this investigation is to reduce, but not eliminate uncertainty regarding the presence of petroleum product contamination in the Subject Right-of-Way.

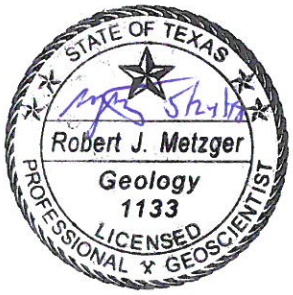
This investigation was performed using the standard level of care and diligence normally practiced by recognized professional environmental and engineering firms in this area, presently performing similar services under similar circumstances.

This report has been prepared specifically to investigate and assess if petroleum products or hazardous substances present in RECs are also present in the Subject Right-of-Way. The conclusions presented in this report should not be relied upon for other sites without additional evaluation and/or investigation. This document is not intended to constitute or substitute for legal counsel or guidance in connection with contamination in the Subject Right-of-Way, nor does it constitute a toxicological report on health effects from potential exposure to contamination during construction in the Subject Right-of-Way.

9.0 QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONAL

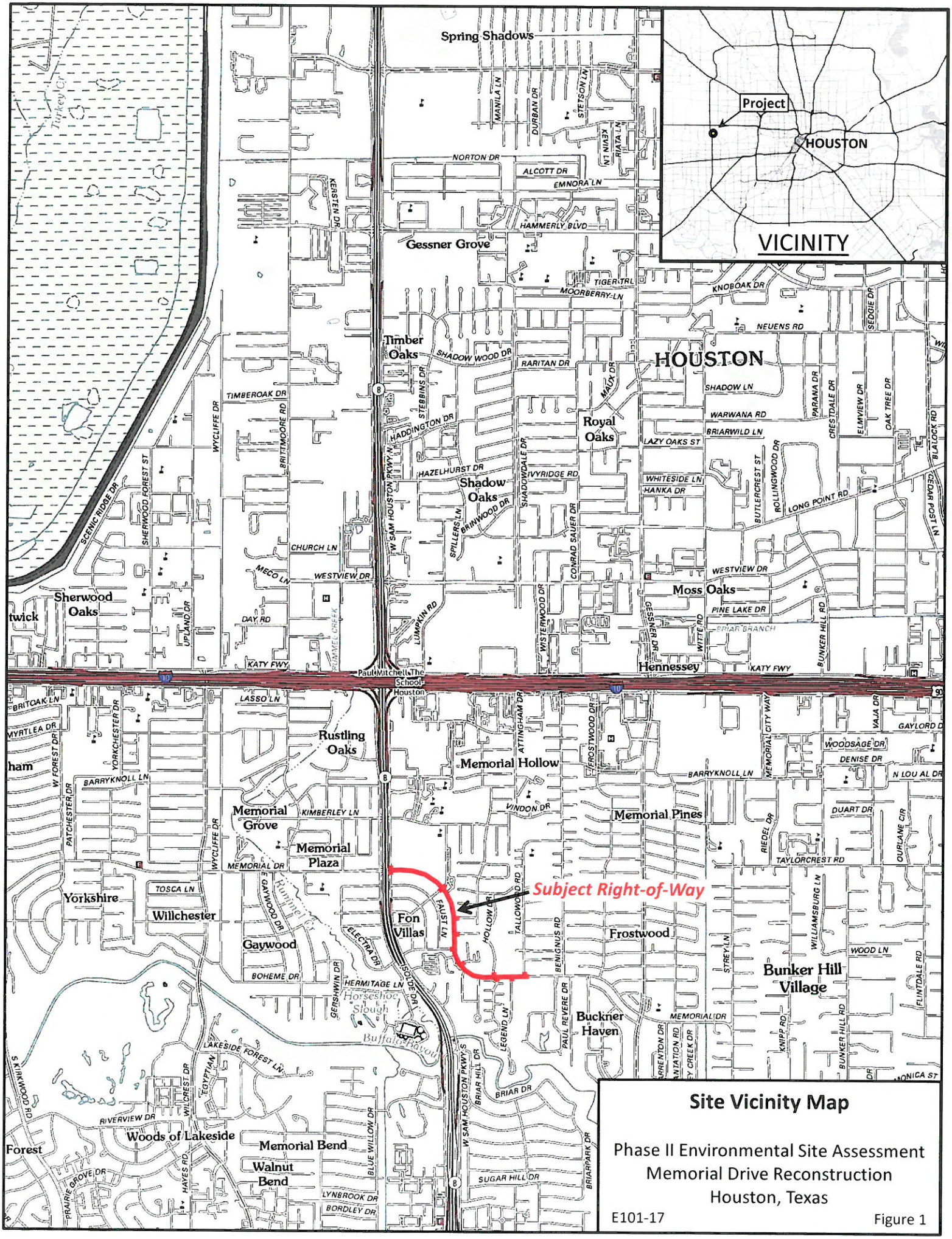
Robert J. Metzger, CAPM, P.G., AEC Senior Geologist, conducted the limited ESA-II investigations in general accordance with in general accordance with Chapter 11 – Geotechnical and Environmental Requirements of the City of Houston Department of Public Works and Engineering Design Manual (07-01-2016) and ASTM Standard Practice E1903 and prepared this report. He has conducted ESA-IIs for numerous City of Houston Department of Public Works and Engineering and other engineering projects. His qualifications are further described in his resume in Appendix G.

Prepared by:
Robert J. Metzger, CAPM, P.G.



APPENDIX A

FIGURES, SITE INFORMATION, AND SOIL BORING SUMMARY TABLE

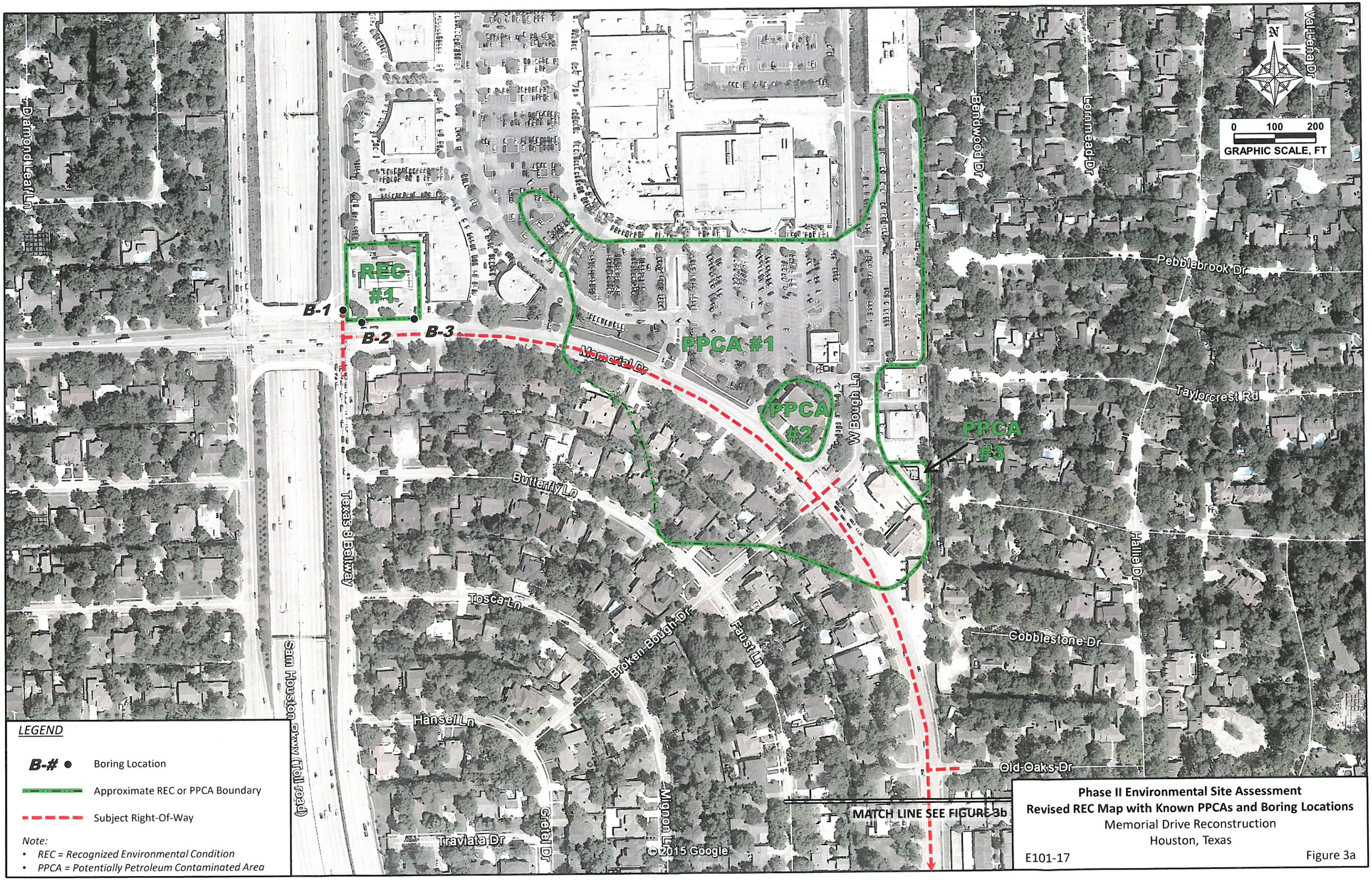

Project
HOUSTON
VICINITY
Subject Right-of-Way
Site Vicinity Map
Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas
E101-17
Figure 1

Phase II Environmental Site Assessment
Original REC Map
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 2a

Phase II Environmental Site Assessment
Original REC Map
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 2b



Phase II Environmental Site Assessment
Revised REC Map with Known PPCAs and Boring Locations
Memorial Drive Reconstruction
Houston, Texas

E101-17

Figure 3a

MATCH LINE SEE FIGURE 3a

Hallie Dr

Huntingwick Dr

Bendwood Dr

Boheme Dr

PPCA #4

REC #2
(approximate location)

B-4

B-5

B-6

Memorial Bend

Rip Van Win

Memorial Dr

Hollow Dr

Somerset Dr

Old Oaks Dr

Mossycup Dr

PPCA #5

Tallowood Rd

Benjamin Rd

Legend Ln

Litchfield Ln

N

0 100 200
GRAPHIC SCALE, FT

LEGEND

- B-# ● Boring Location
- Approximate REC or PPCA Boundary
- Subject Right-Of-Way

Note:
- *REC = Recognized Environmental Condition*
- *PPCA = Potentially Petroleum Contaminated Area*

Phase II Environmental Site Assessment
Revised REC Map with Known PPCAs and Boring Locations
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 3b

REC #1

PPCA #1

PPCA #2

PPCA #3

PPCA #4

B-1

B-2

B-3

Memorial Dr

Diamond Leaf Ln

Bendwood Dr

Lornmead Dr

Val Lena Dr

Pebblebrook Dr

Taylorcrest Rd

W Bough Ln

Butterfly Ln

Texas 8 Beltway

Tosca Ln

Broken Bough Dr

Faust Ln

Hallie Dr

Cobblestone Dr

Old Oaks Dr

Sam Houston Pkwy (Toll road)

Hansel Ln

Gretel Dr

Traviata Dr

Mignon Ln

MATCH LINE SEE FIGURE 4b

© 2015 Google

N

0 100 200

GRAPHIC SCALE, FT

LEGEND

B-# ● Boring Location

Approximate REC or PPCA Boundary

Subject Right-Of-Way

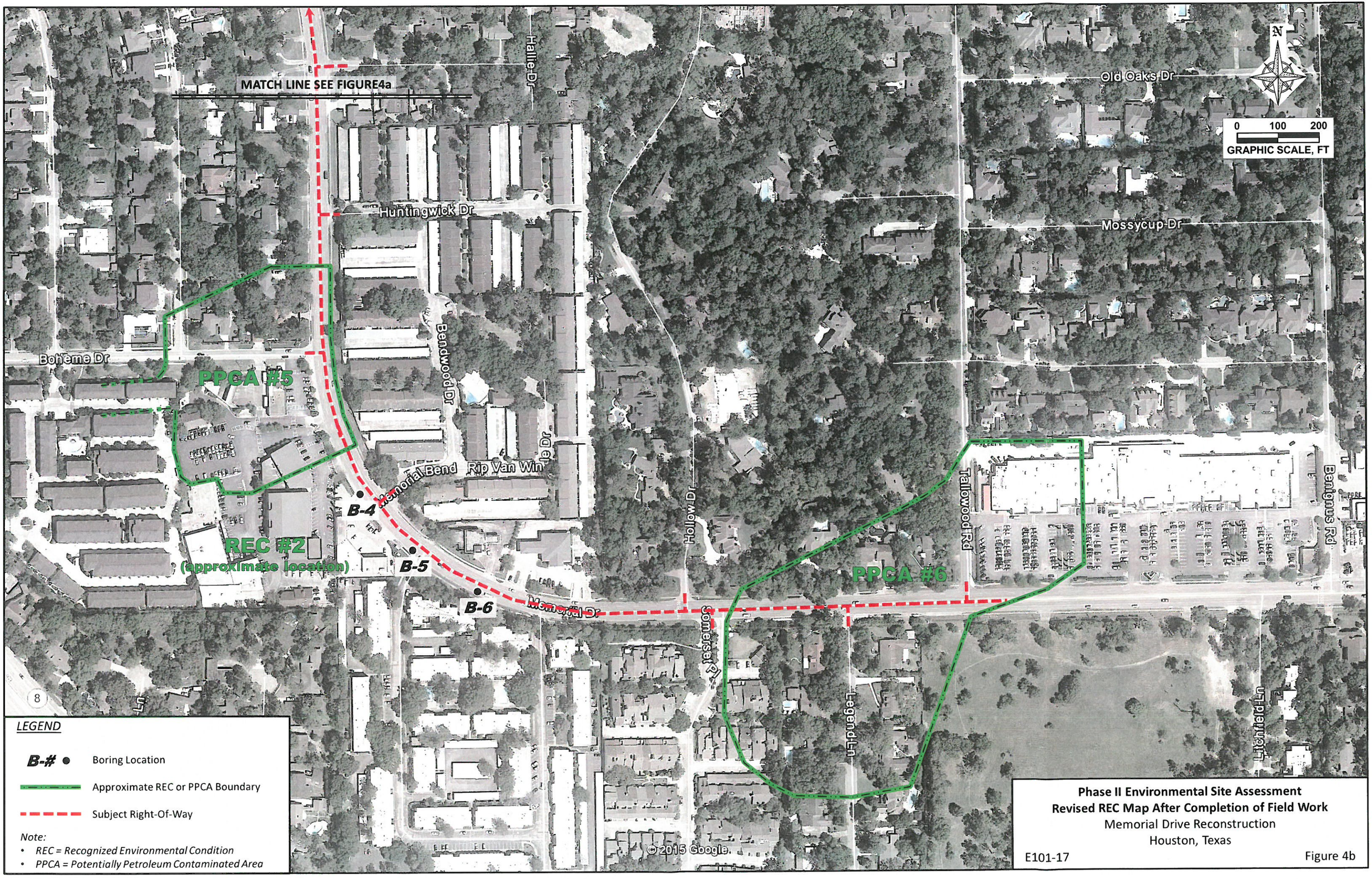
Note:

- *REC = Recognized Environmental Condition*
- *PPCA = Potentially Petroleum Contaminated Area*

Phase II Environmental Site Assessment
Revised REC Map After Completion of Field Work
Memorial Drive Reconstruction
Houston, Texas

E101-17

Figure 4a



LEGEND

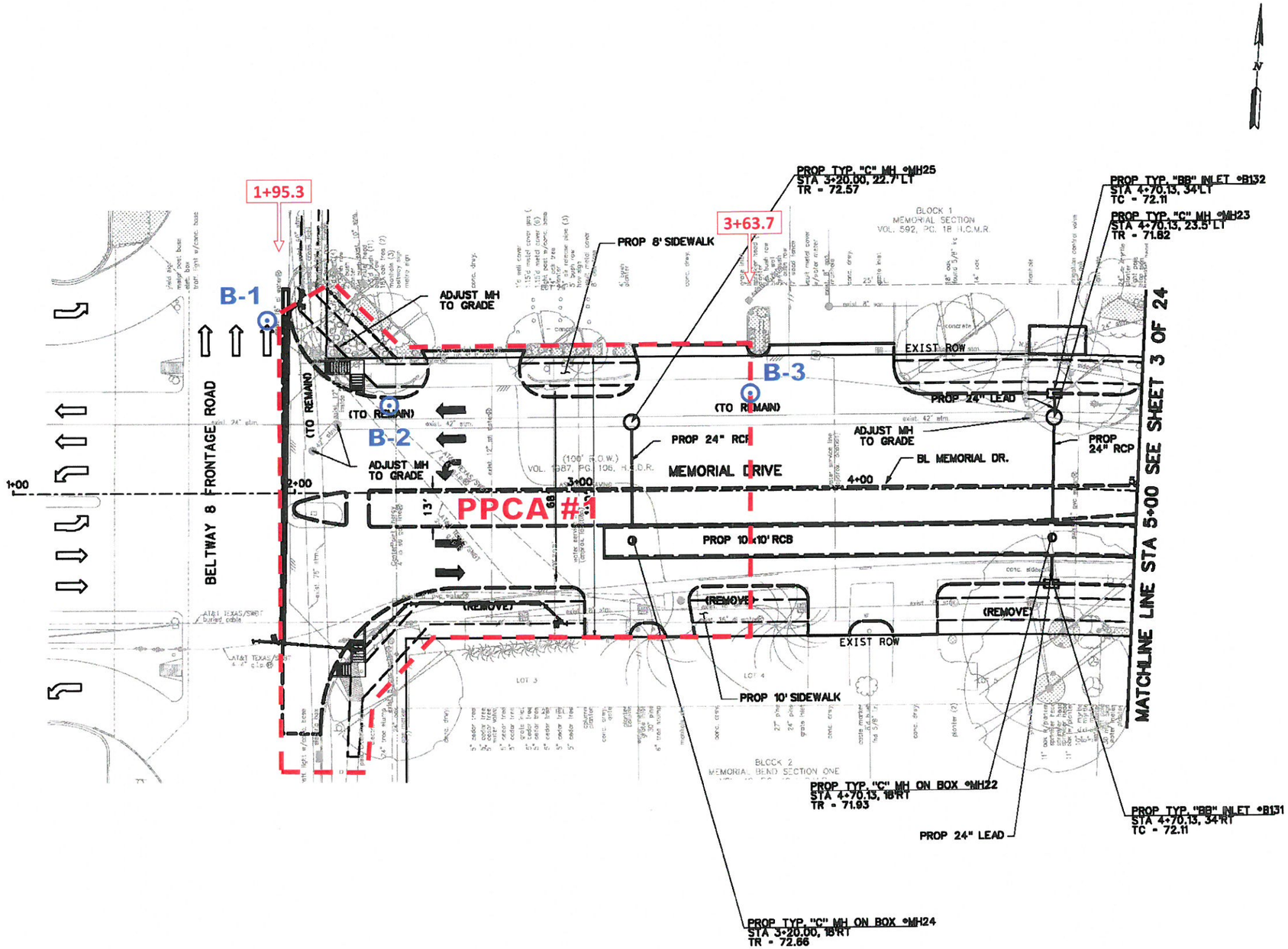
- B-# ● Boring Location
- Approximate REC or PPCA Boundary
- Subject Right-Of-Way

Note:

- *REC = Recognized Environmental Condition*
- *PPCA = Potentially Petroleum Contaminated Area*

Phase II Environmental Site Assessment
Revised REC Map After Completion of Field Work
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 4b



LEGEND

- PROPOSED LANE
- EXISTING LANE
- (CURVE) HORIZONTAL ALIGNMENT CURVE NAME
- PROPOSED ROW
- EXISTING ROW
- (A) 10" JRCP
- (B) 8" JRCP
- (C) 1" ASB
- (D) 6" CTB
- (E) 6" LIME TREATED SUBGRADE
- (F) 4" CONC RIPRAP CL B
- (G) SODDING & 4" TOPSOIL
- (H) MBGF
- (I) SSCB
- (XX) TYPICAL SECTION NUMBER
- (X) DRIVEWAY

NOTES:

1. ALL RCP ARE CLASS III UNLESS OTHERWISE NOTED.
2. SEE STORM SEWER LATERALS SHEETS FOR MORE INFORMATION.
3. SEE WATER & SAN SWR SHEETS FOR MORE INFORMATION.
4. PROPOSED HGL CALCULATED FOR POST-PROJECT CONDITIONS USING HFOWORKS SD.
5. SEE ROADWAY HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
6. SEE STORM SEWER HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
7. ALL EXISTING STORM SEWER TO BE REMOVED UNLESS SHOWN OTHERWISE. MAINTAIN DRAINAGE DURING CONSTRUCTION.

(X) SEE DRIVEWAY TABULATION & DETAILS SHEET

0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PLAN
PVMT & STM SWR IMPROVEMENTS
BEGIN PROJECT TO STA 5+00

SHEET 1 OF 24

DIST.	COUNTY	STATE	PROJECT NO.			HIGHWAY NO.
6	HARRIS	TEXAS				
DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.		SHEET NO.
HOU	HARRIS					53

LEGEND

Proposed P.P.C.A. (location is approximate—see report text for details)

Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 5

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Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 6

LEGEND

Proposed P.P.C.A.
(location is approximate—
see report text for details)

1+95.3 3+63.7

1+90.0 2+34.0 3+62.6

B-1 B-2 B-3

(B-1 is out of plane of section)

STA = 2+80.00
EL = 72.95'

STA = 4+70.13
EL = 72.11'

(+)1.00% (N&S) (-)0.40% (N&S) (-)0.40% (N&S)

PPCA #1

PROP 10 LF 2-10'x10' RCB @0.10%

PROP 50 LF 10'x10' RCB @0.10%

PROP 130 LF 10'x10' RCB @0.10%

STA 3+10.00

MATCHLINE LINE STA 5+00 SEE SHEET 4 OF 24

℄ = 52.95

PROP TYP "C" MH ON BOX #MH21
STA 3+20.00
10'X10'RCB ℄ = 53.13 (E)
24"℄ = 60.16 (N)

PROP TYP "C" MH ON BOX #MH22
STA 4+70.13
10'X10'RCB ℄ = 52.98 (E,W)
24"℄ = 60.48 (N,S)

TD=20' TD=28' TD=28'

0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

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PROFILE
PVMT & STM SWR IMPROVEMENTS
BEGIN PROJECT TO STA 5+00

SHEET 2 OF 24

DIST.	COUNTY	SHEET NO.
6	TEXAS	
HOU	HARRIS	54

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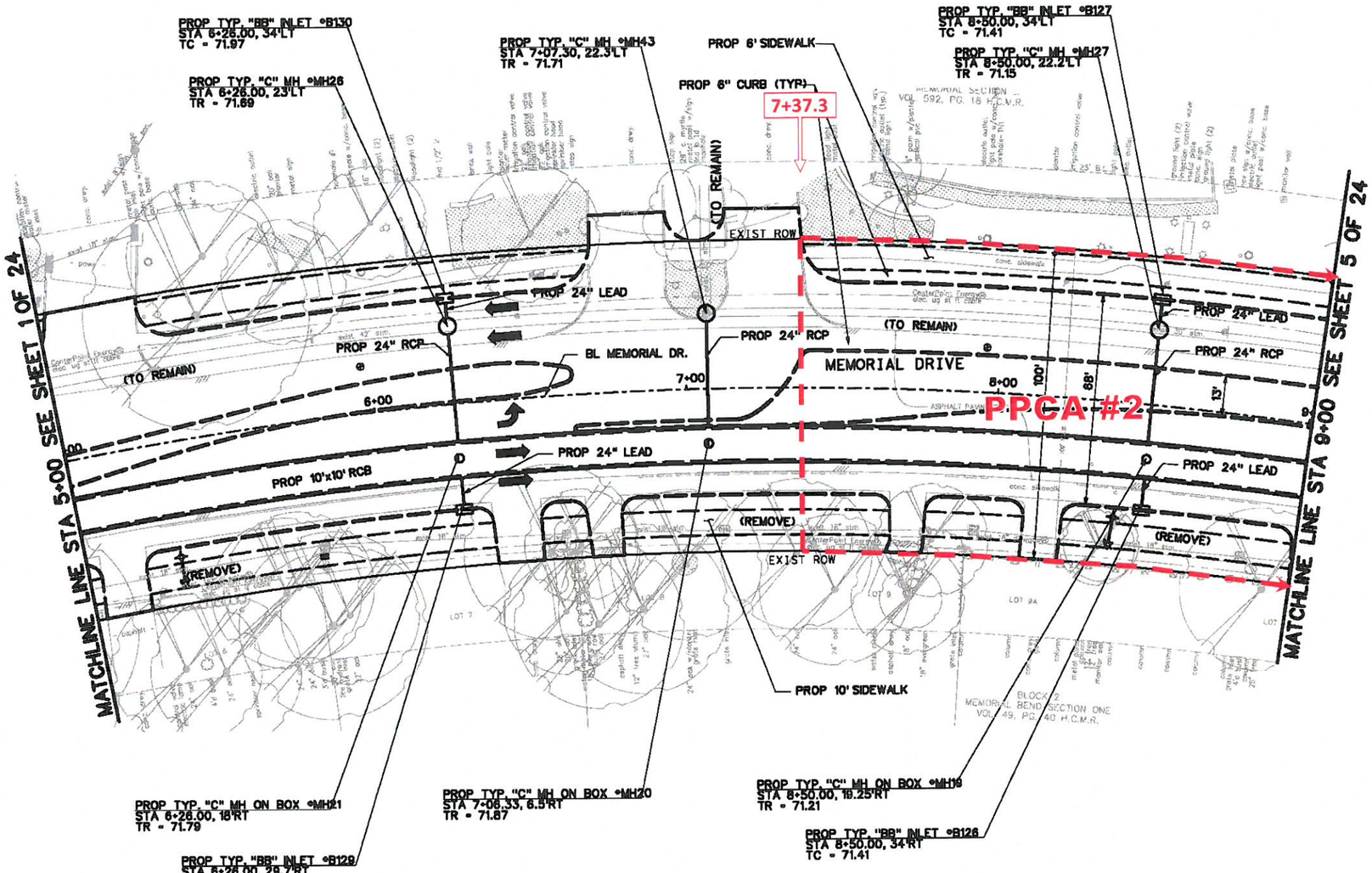

LEGEND

- PROPOSED LANE
- EXISTING LANE
- (CURVE) HORIZONTAL ALIGNMENT CURVE NAME
- PROPOSED ROW
- EXISTING ROW
- (A) 10" JRCP
- (B) 8" JRCP
- (C) 1" ASB
- (D) 6" CTB
- (E) 6" LIME TREATED SUBGRADE
- (F) 4" CONC RIPRAP CL B
- (G) SODDING & 4" TOPSOIL
- (H) MBGF
- (I) SSCB
- (X) TYPICAL SECTION NUMBER
- (X) DRIVEWAY

NOTES:

1. ALL RCP ARE CLASS III UNLESS OTHERWISE NOTED.
2. SEE STORM SEWER LATERALS SHEETS FOR MORE INFORMATION.
3. SEE WATER & SAN SWR SHEETS FOR MORE INFORMATION.
4. PROPOSED HGL CALCULATED FOR POST-PROJECT CONDITIONS USING NFOWORKS SD.
5. SEE ROADWAY HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
6. SEE STORM SEWER HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
7. ALL EXISTING STORM SEWER TO BE REMOVED UNLESS SHOWN OTHERWISE. MAINTAIN DRAINAGE DURING CONSTRUCTION.

(X) SEE DRIVEWAY TABULATION & DETAILS SHEET

0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

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PLAN
PVMT & STM SWR IMPROVEMENTS
STA 5+00 TO STA 9+00

SHEET 3 OF 24

DIST.	DIST. NO. CNTY. NO.	STATE	PROJECT NO.			HIGHWAY NO.
	6	TEXAS				
CNTL.	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
	HOU	HARRIS				55

Note:
PPCAs #3 and #4 are within the boundaries of PPCA #2.

LEGEND

Proposed P.P.C.A. (location is approximate—see report text for details)

Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 7

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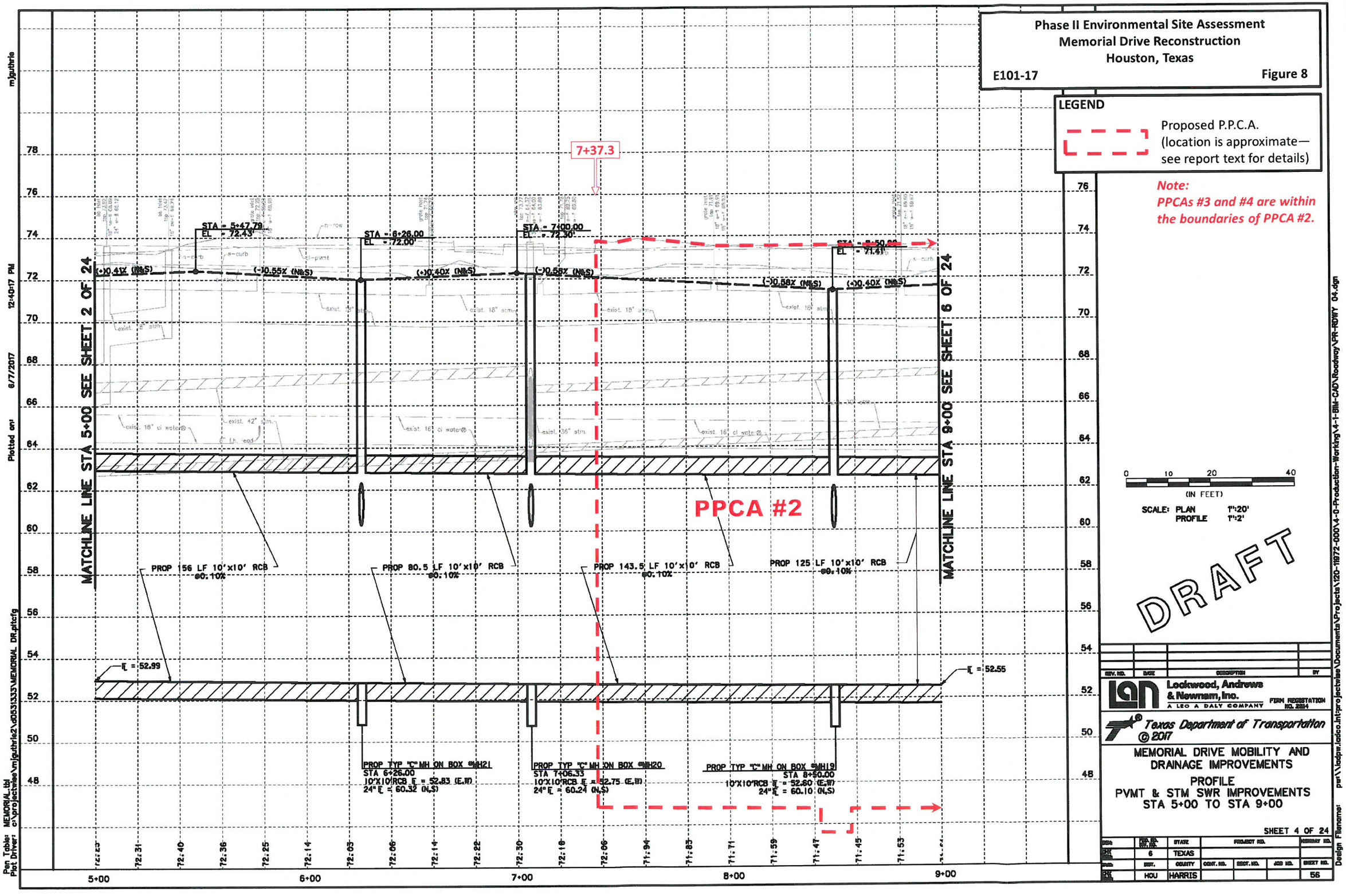
Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 8

LEGEND

Proposed P.P.C.A.
(location is approximate—
see report text for details)

Note:
PPCAs #3 and #4 are within the boundaries of PPCA #2.



0 10 20 40
(IN FEET)

SCALE: PLAN 1"=20'
PROFILE 1"=2'

DRAFT

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PROFILE
PVMT & STM SWR IMPROVEMENTS
STA 5+00 TO STA 9+00

SHEET 4 OF 24

DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
HOU	HARRIS				56

DIST. 6 STATE TEXAS

PROJECT NO.

HIGHWAY NO.

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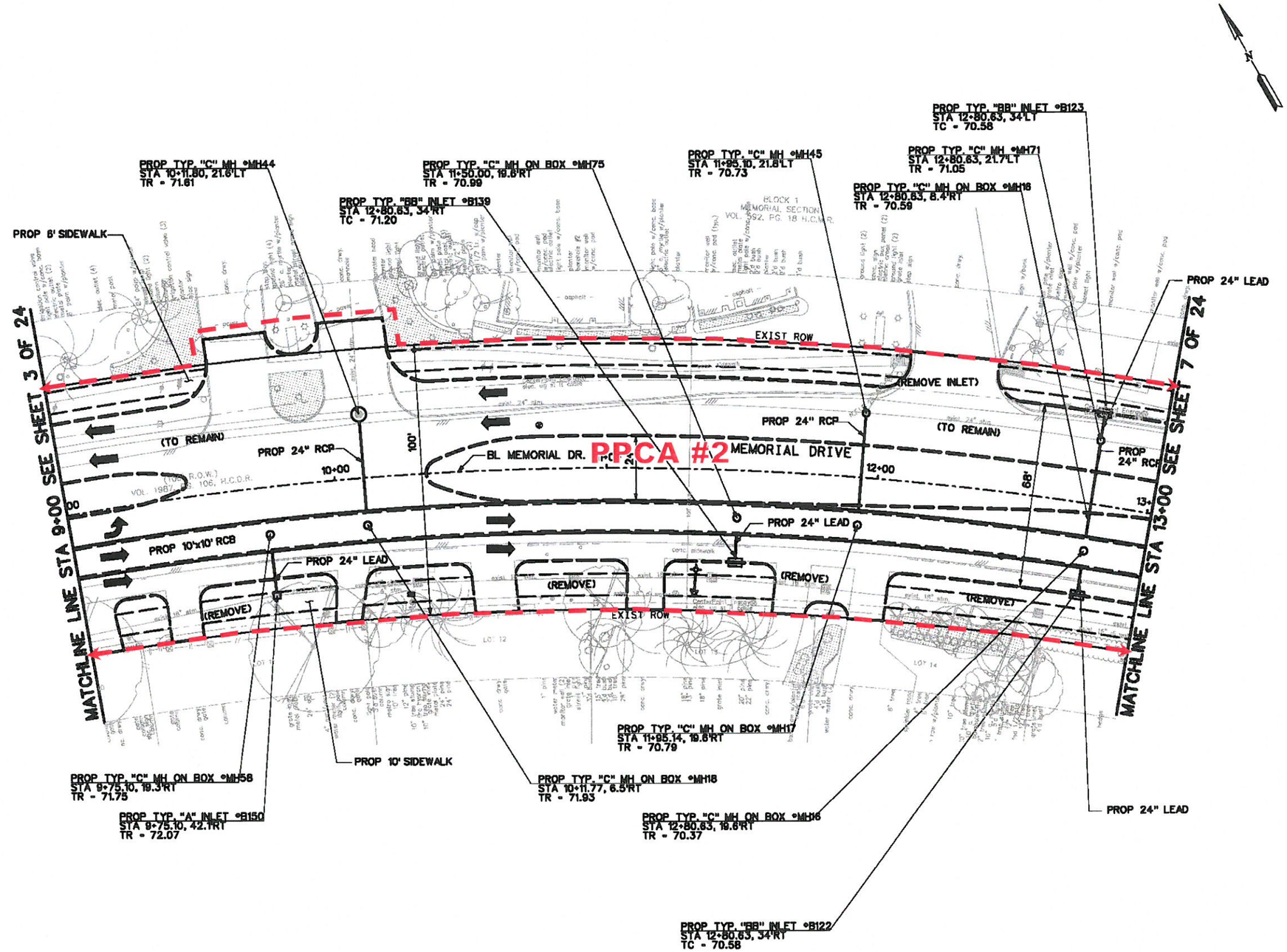

LEGEND

- PROPOSED LANE
- EXISTING LANE
- (CURVE) HORIZONTAL ALIGNMENT CURVE NAME
- PROPOSED ROW
- EXISTING ROW
- (A) 10" JRCP
- (B) 8" JRCP
- (C) 1" ASB
- (D) 6" CTB
- (E) 6" LIME TREATED SUBGRADE
- (F) 4" CONC RIPRAP CL B
- (G) SODDING & 4" TOPSOIL
- (H) MBGF
- (I) SSCB
- (X) TYPICAL SECTION NUMBER
- (X) DRIVEWAY

NOTES:

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2. SEE STORM SEWER LATERALS SHEETS FOR MORE INFORMATION.
3. SEE WATER & SAN SWR SHEETS FOR MORE INFORMATION.
4. PROPOSED HGL CALCULATED FOR POST-PROJECT CONDITIONS USING NFOWORKS SD.
5. SEE ROADWAY HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
6. SEE STORM SEWER HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
7. ALL EXISTING STORM SEWER TO BE REMOVED UNLESS SHOWN OTHERWISE. MAINTAIN DRAINAGE DURING CONSTRUCTION.

(X) SEE DRIVEWAY TABULATION & DETAILS SHEET

0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

Note:
PPCAs #3 and #4 are within the boundaries of PPCA #2.

LEGEND		Phase II Environmental Site Assessment Memorial Drive Reconstruction Houston, Texas
	Proposed P.P.C.A. (location is approximate—see report text for details)	E101-17 Figure 9

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PLAN
PVMT & STM SWR IMPROVEMENTS
STA 9+00 TO STA 13+00

SHEET 5 OF 24

DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
6	TEXAS				
HOU	HARRIS				57

Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 **Figure 10**

LEGEND

Proposed P.P.C.A.
(location is approximate—see report text for details)

Note:
PPCAs #3 and #4 are within the boundaries of PPCA #2.

STA = 9+80.03
EL = 71.64'

STA = 12+80.63
EL = 70.58'

(+)0.40% (N&S)

(-)0.48% (N&S)

(-)0.48% (N&S)

(+)0.30% (N&S)

PPCA #2

MATCHLINE LINE STA 9+00 SEE SHEET 4 OF 24

MATCHLINE LINE STA 13+00 SEE SHEET 8 OF 24

PROP 75 LF 10'x10' RCB @0.10%

PROP 36.5 LF 10'x10' RCB @0.10%

PROP 136 LF 10'x10' RCB @0.10%

PROP 45 LF 10'x10' RCB @0.10%

PROP 85.5 LF 10'x10' RCB @0.10%

PROP 19.5 LF 10'x10' RCB @0.10%

℄ = 52.56

℄ = 52.15

PROP TYP "C" MH ON BOX @MH58
STA 9+75.10
10'X10'RCB ℄ = 52.48 (E,W)
24" ℄ = 59.97 (N,S)

PROP TYP "C" MH ON BOX @MH18
STA 10+11.77
10'X10'RCB ℄ = 52.44 (SE,NW)
24" ℄ = 59.94 (NE)

PROP TYP "C" MH ON BOX @MH75
STA 11+50.00
10'X10'RCB ℄ = 52.30 (E,W)
24" ℄ = 65.08 (S)

PROP TYP "C" MH ON BOX @MH17
STA 11+95.10
10'X10'RCB ℄ = 52.26 (SE,NW)
24" ℄ = 65.08 (NE)

PROP TYP "C" MH ON BOX @MH16
STA 12+80.63
10'X10'RCB ℄ = 52.17 (SE,NW)
24" ℄ = 65.08 (NE,SW)

9+00 10+00 11+00 12+00 13+00

0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PROFILE
PVMT & STM SWR IMPROVEMENTS
STA 9+00 TO STA 13+00

SHEET 6 OF 24

DIST.	DIST. NO.	STATE	PROJECT NO.			HIGHWAY NO.
	6	TEXAS				
CNTY.	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
	HOU	HARRIS				58

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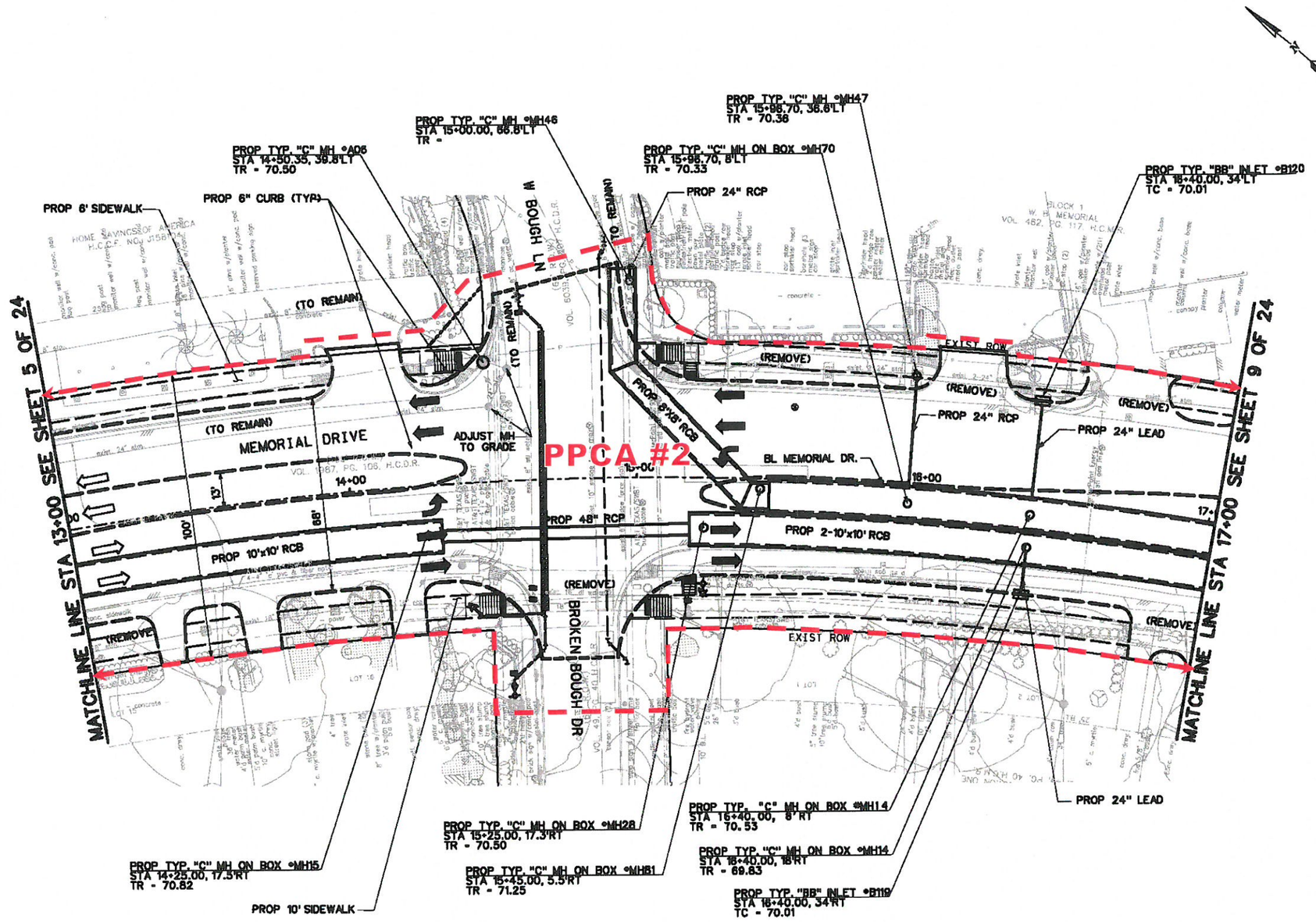

LEGEND

- PROPOSED LANE
- EXISTING LANE
- (CURVE) HORIZONTAL ALIGNMENT CURVE NAME
- PROPOSED ROW
- EXISTING ROW
- (A) 10" JRCP
- (B) 8" JRCP
- (C) 1" ASB
- (D) 6" CTB
- (E) 6" LIME TREATED SUBGRADE
- (F) 4" CONC RIPRAP CL B
- (G) SODDING & 4" TOPSOIL
- (H) MBGF
- (I) SSCB
- (X) TYPICAL SECTION NUMBER
- (X) DRIVEWAY

NOTES:

1. ALL RCP ARE CLASS III UNLESS OTHERWISE NOTED.
2. SEE STORM SEWER LATERALS SHEETS FOR MORE INFORMATION.
3. SEE WATER & SAN SWR SHEETS FOR MORE INFORMATION.
4. PROPOSED HGL CALCULATED FOR POST-PROJECT CONDITIONS USING NFOWORKS SD.
5. SEE ROADWAY HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
6. SEE STORM SEWER HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
7. ALL EXISTING STORM SEWER TO BE REMOVED UNLESS SHOWN OTHERWISE. MAINTAIN DRAINAGE DURING CONSTRUCTION.

(X) SEE DRIVEWAY TABULATION & DETAILS SHEET

0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PLAN
PVMT & STM SWR IMPROVEMENTS
STA 13+00 TO STA 17+00

SHEET 7 OF 24

DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
HOU	HARRIS				59

Note:
PPCAs #3 and #4 are within the boundaries of PPCA #2.

LEGEND

Proposed P.P.C.A. (location is approximate—see report text for details)

Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17

Figure 11

Pen Table: MEMORIAL.tbl
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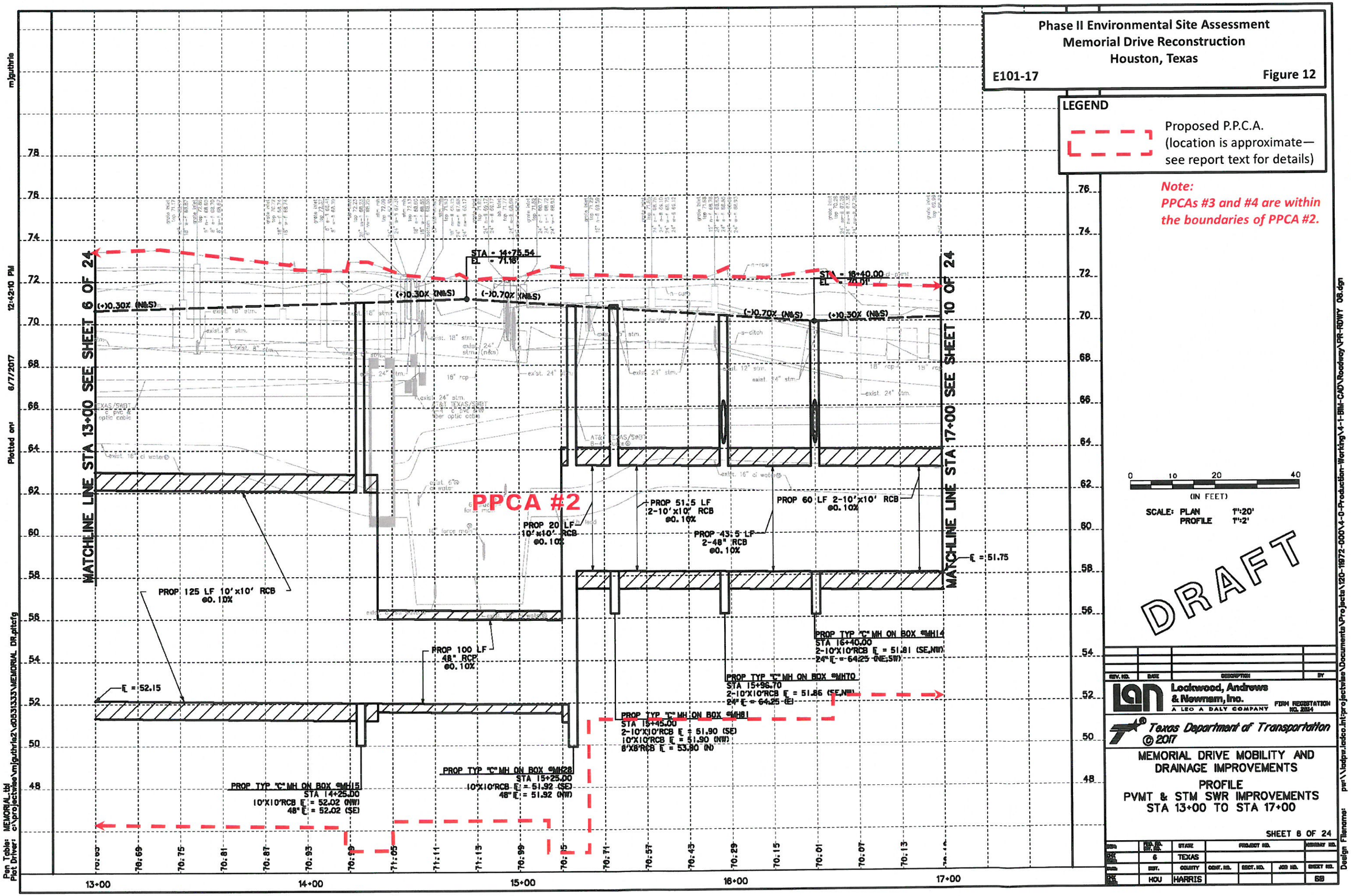
Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 **Figure 12**



LEGEND

Proposed P.P.C.A. (location is approximate—see report text for details)

Note:
PPCAs #3 and #4 are within the boundaries of PPCA #2.

0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PROFILE
PVMT & STM SWR IMPROVEMENTS
STA 13+00 TO STA 17+00

SHEET 8 OF 24

DIST.	COUNTY	STATE	PROJECT NO.	HIGHWAY NO.
12	HOU	TEXAS		
DIST.	HARRIS	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
					8B

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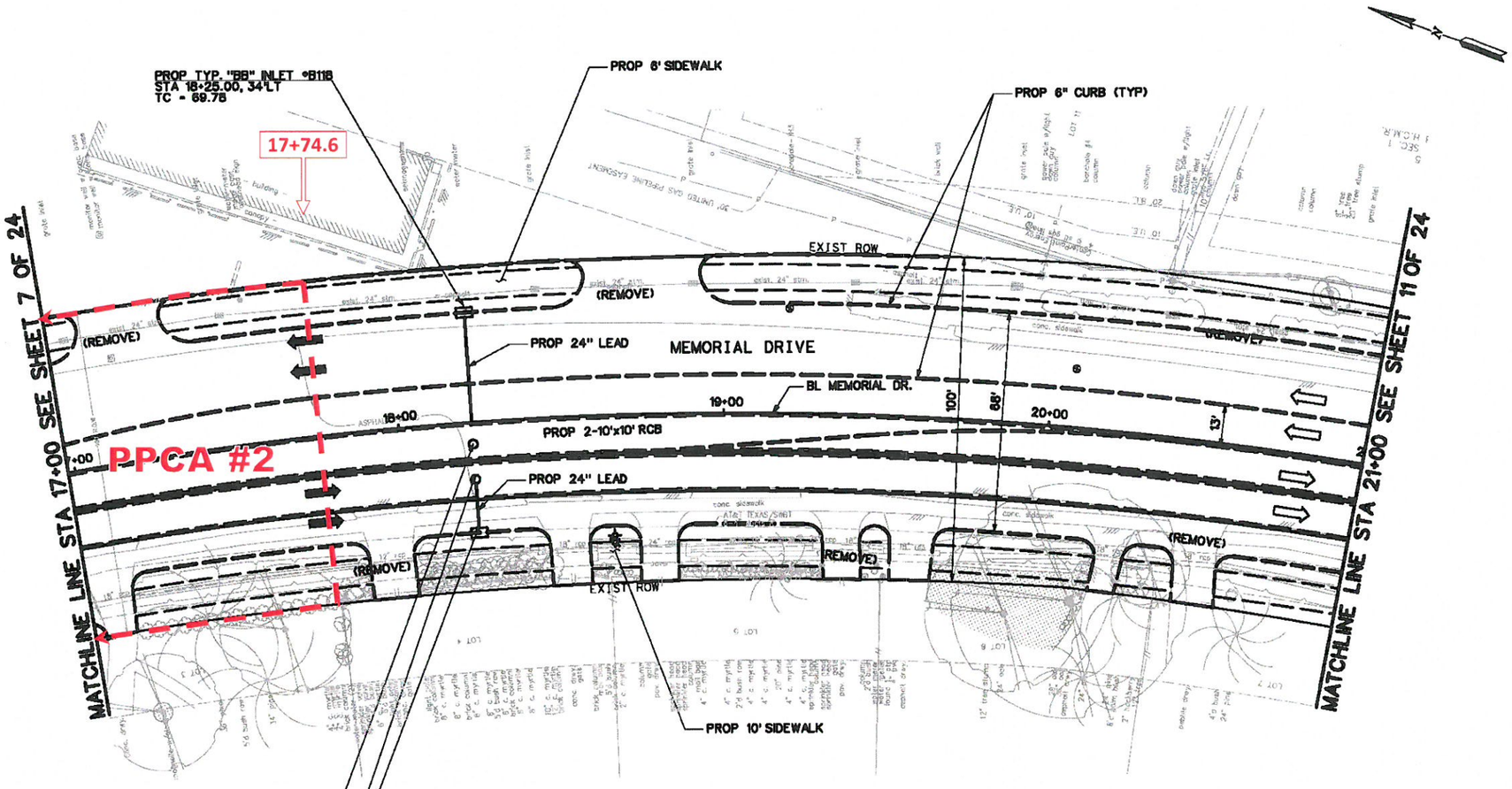

LEGEND

- PROPOSED LANE
- EXISTING LANE
- (CURVE) HORIZONTAL ALIGNMENT CURVE NAME
- PROPOSED ROW
- EXISTING ROW
- (A) 10" JRCP
- (B) 8" JRCP
- (C) 1" ASB
- (D) 6" CTB
- (E) 6" LIME TREATED SUBGRADE
- (F) 4" CONC RIPRAP CL B
- (G) SODDING & 4" TOPSOIL
- (H) MBGF
- (I) SSCB
- (XX) TYPICAL SECTION NUMBER
- (X) DRIVEWAY

NOTES:

1. ALL RCP ARE CLASS III UNLESS OTHERWISE NOTED.
2. SEE STORM SEWER LATERALS SHEETS FOR MORE INFORMATION.
3. SEE WATER & SAN SWR SHEETS FOR MORE INFORMATION.
4. PROPOSED HGL CALCULATED FOR POST-PROJECT CONDITIONS USING NFMWORKS SD.
5. SEE ROADWAY HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
6. SEE STORM SEWER HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
7. ALL EXISTING STORM SEWER TO BE REMOVED UNLESS SHOWN OTHERWISE. MAINTAIN DRAINAGE DURING CONSTRUCTION.

(X) SEE DRIVEWAY TABULATION & DETAILS SHEET

0 10 20 40
(IN FEET)

SCALE: PLAN 1"=20'
PROFILE 1"=2'

DRAFT

REV. NO.	DATE	DESCRIPTION	BY

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS
PLAN
PVMT & STM SWR IMPROVEMENTS
STA 17+00 TO STA 21+00

SHEET 9 OF 24

DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
HOU	HARRIS				61

Note:
PPCAs #3 and #4 are within the boundaries of PPCA #2.

LEGEND		Phase II Environmental Site Assessment Memorial Drive Reconstruction Houston, Texas
	Proposed P.P.C.A. (location is approximate—see report text for details)	E101-17 Figure 13

Pen Table: MEMORIAL.tbl
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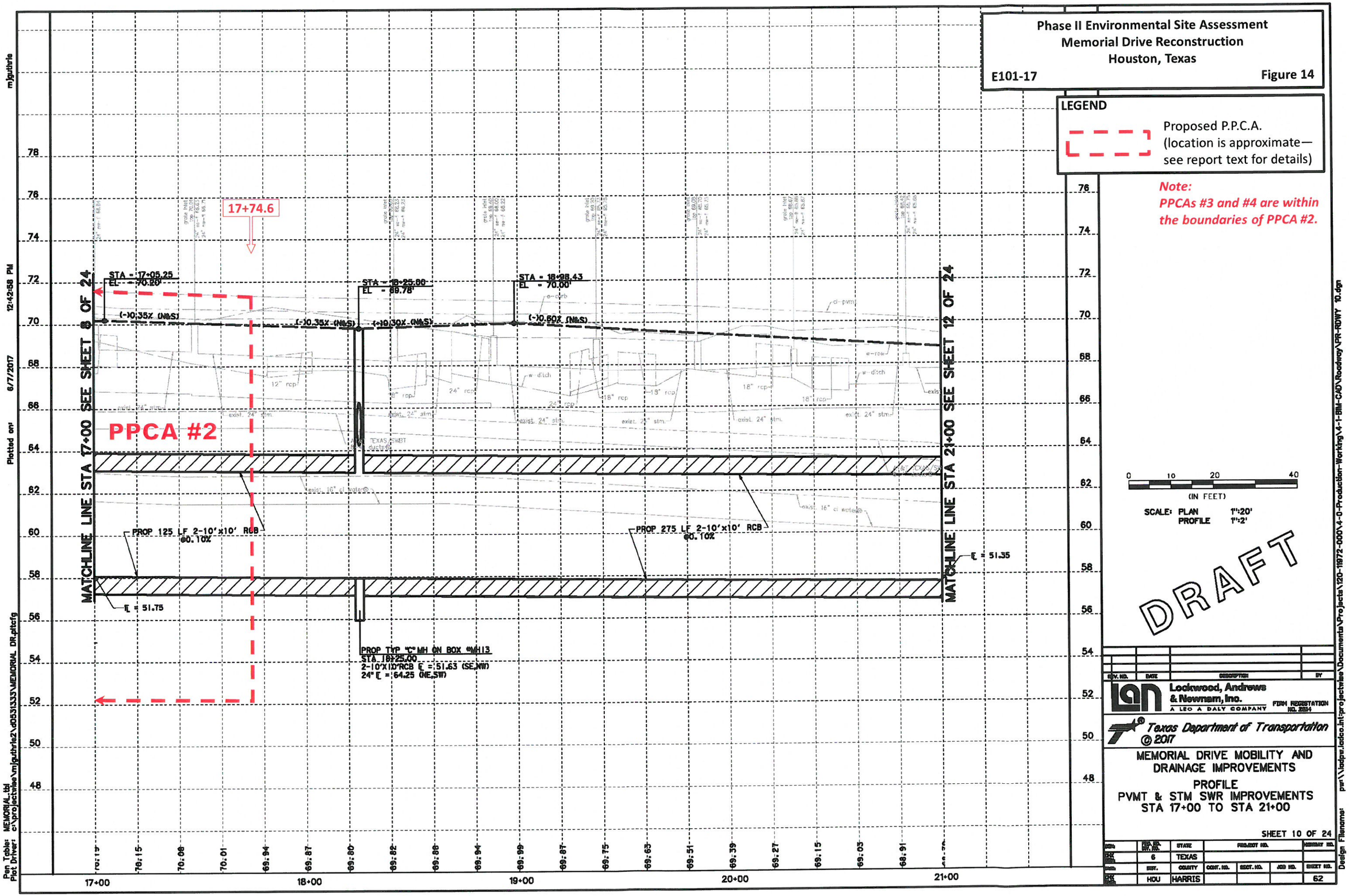
Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 14



LEGEND

Proposed P.P.C.A. (location is approximate—see report text for details)

Note:
PPCAs #3 and #4 are within the boundaries of PPCA #2.

0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

DIV. NO.	DATE	DESCRIPTION	BY

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PROFILE
PVMT & STM SWR IMPROVEMENTS
STA 17+00 TO STA 21+00

SHEET 10 OF 24

FED. RD. DIV. NO.	STATE	PROJECT NO.				CONTRACT NO.
6	TEXAS					
DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.		SHEET NO.
HOU	HARRIS					62

Pen Table: MEMORIAL.tbl
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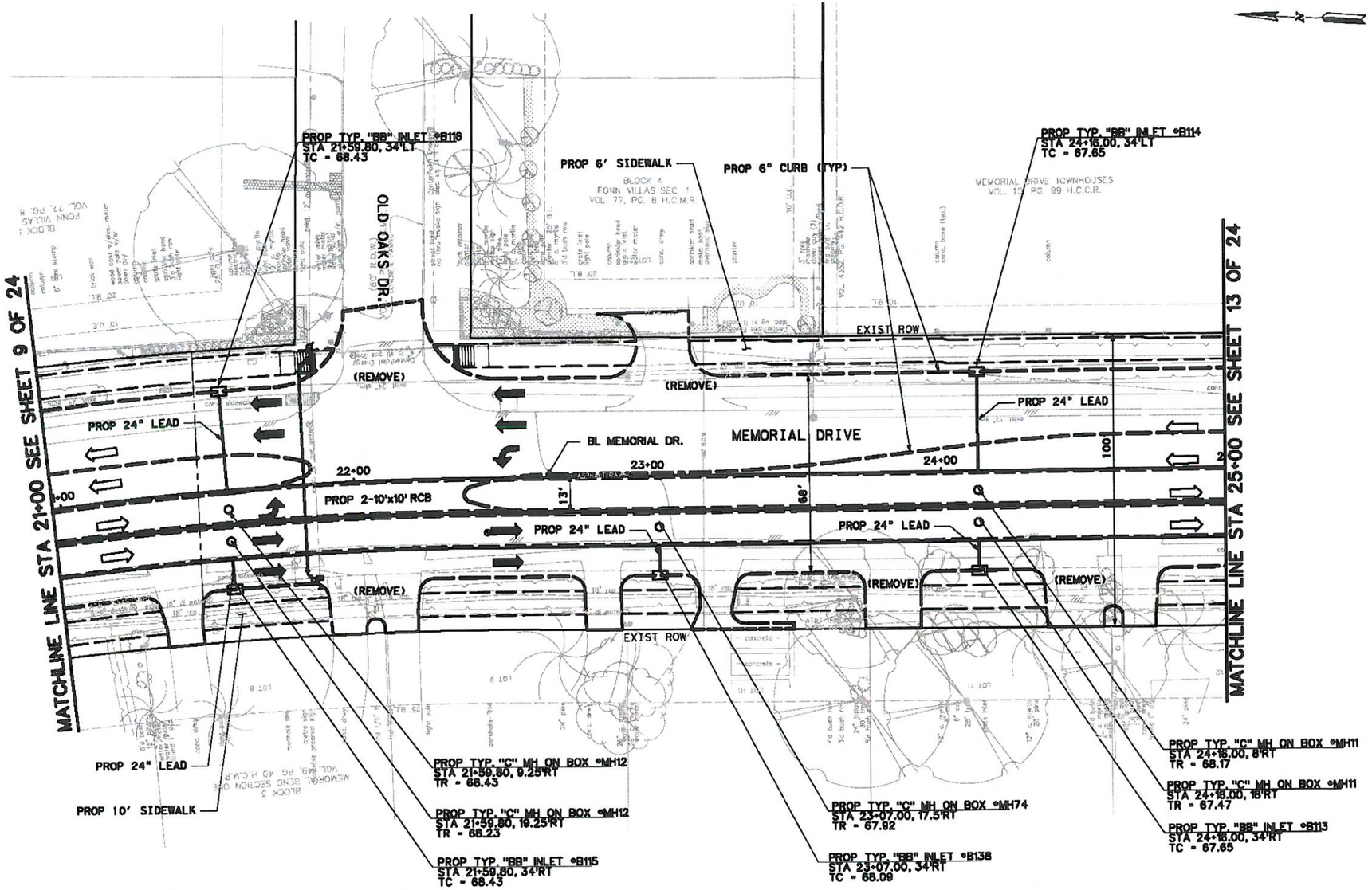

LEGEND

- PROPOSED LANE
- EXISTING LANE
- (CURVE) HORIZONTAL ALIGNMENT CURVE NAME
- PROPOSED ROW
- EXISTING ROW
- (A) 10" JRCP
- (B) 8" JRCP
- (C) 1" ASB
- (D) 6" CTB
- (E) 6" LIME TREATED SUBGRADE
- (F) 4" CONC RIPRAP CL B
- (G) SODDING & 4" TOPSOIL
- (H) MBGF
- (I) SSCB
- (J)(X) TYPICAL SECTION NUMBER
- (X) DRIVEWAY

NOTES:

1. ALL RCP ARE CLASS III UNLESS OTHERWISE NOTED.
2. SEE STORM SEWER LATERALS SHEETS FOR MORE INFORMATION.
3. SEE WATER & SAN SWR SHEETS FOR MORE INFORMATION.
4. PROPOSED HGL CALCULATED FOR POST-PROJECT CONDITIONS USING NFOWORKS SD.
5. SEE ROADWAY HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
6. SEE STORM SEWER HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
7. ALL EXISTING STORM SEWER TO BE REMOVED UNLESS SHOWN OTHERWISE. MAINTAIN DRAINAGE DURING CONSTRUCTION.

(X) SEE DRIVEWAY TABULATION & DETAILS SHEET

0 10 20 40
(IN FEET)

SCALE: PLAN 1"=20'
PROFILE 1"=2'

DRAFT

REV. NO.	DATE	DESCRIPTION	BY

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PLAN
PVMT & STM SWR IMPROVEMENTS
STA 21+00 TO STA 25+00

SHEET 11 OF 24

DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
HOU	HARRIS				63

LEGEND		Phase II Environmental Site Assessment Memorial Drive Reconstruction Houston, Texas	
	Proposed P.P.C.A. (location is approximate— see report text for details)	E101-17	Figure 15

Pen Table: MEMORIAL.tbl
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Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 **Figure 16**

LEGEND

Proposed P.P.C.A.
(location is approximate—
see report text for details)

STA = 21+59.80
EL = 68.43'

STA = 21+94.31
EL = 68.54'

STA = 24+16.00
EL = 67.65'

(-)0.80% (N&S)

(+)0.32% (N&S)

(-)0.40% (N&S)

(-)0.40% (N&S)

(-)0.30% (N&S)

MATCHLINE STA 21+00 SEE SHEET 10 OF 24

MATCHLINE STA 25+00 SEE SHEET 14 OF 24

PROP 60 LF 2-10'x10' RCB @0.10%

PROP 147 LF 2-10'x10' RCB @0.10%

PROP 109 LF 2-10'x10' RCB @0.10%

PROP 84 LF 2-10'x10' RCB @0.10%

℄ = 51.35

℄ = 50.95

PROP TYP "C" MH ON BOX @MH12
STA 21+59.80
2-10'X10'RCB ℄ = 51.29 (N,S)
24" ℄ = 58.20 (E,W)

PROP TYP "C" MH ON BOX @MH14
STA 23+07.00
2-10'X10'RCB ℄ = 51.15 (N,S)
24" ℄ = 58.20 (W)

PROP TYP "C" MH ON BOX @MH11
STA 24+16.00
2-10'X10'RCB ℄ = 51.04 (N,S)
24" ℄ = 58.20 (E,W)

78 76 74 72 70 68 66 64 62 60 58 56 54 52 50 48

21+00 22+00 23+00 24+00 25+00

0 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS
PROFILE
PVMT & STM SWR IMPROVEMENTS
STA 21+00 TO STA 25+00

SHEET 12 OF 24

DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
HOU	HARRIS				64

STATE: TEXAS

Pen Table: MEMORIAL.tbl
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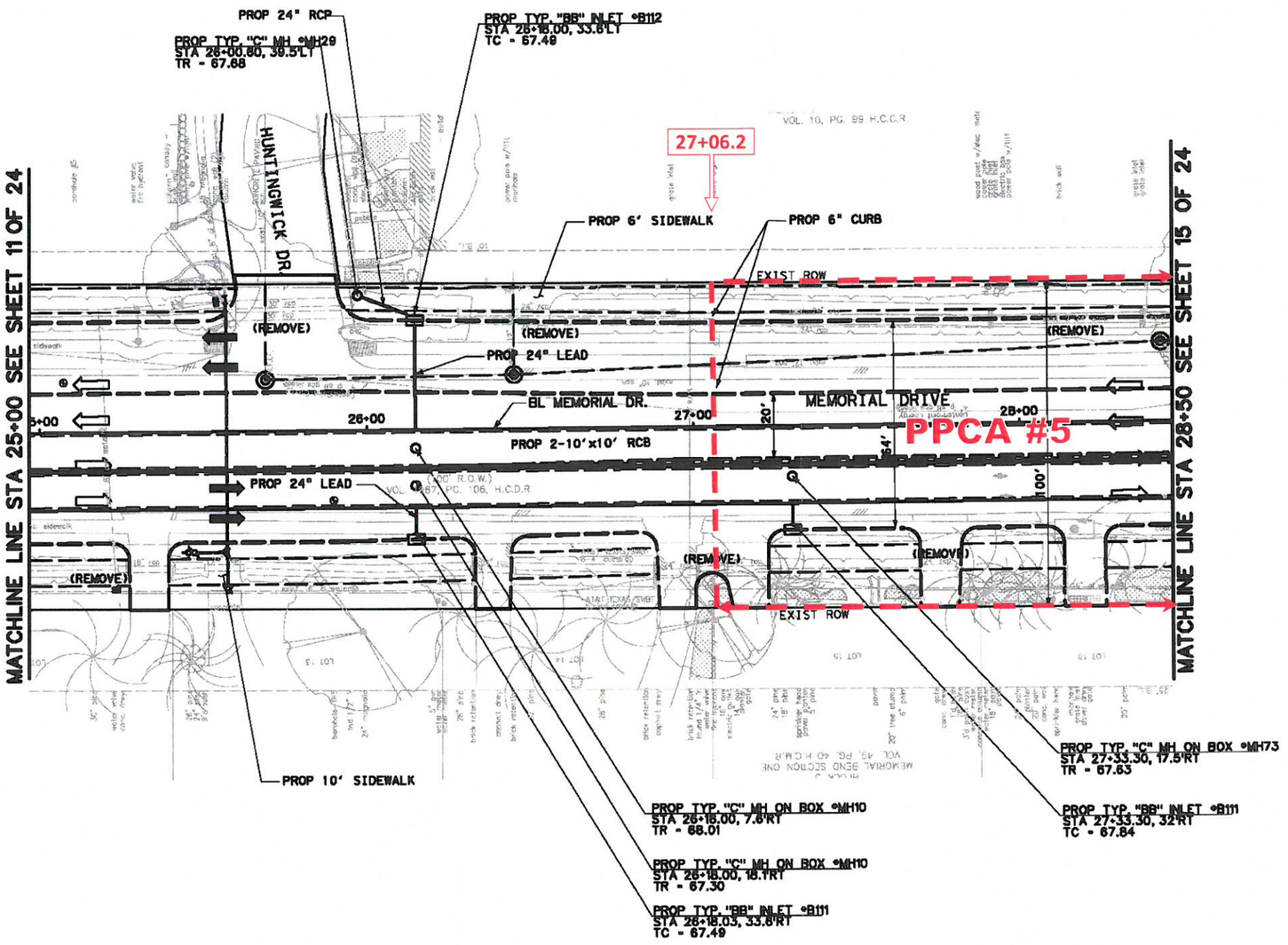

LEGEND

- PROPOSED LANE
- EXISTING LANE
- (CURVE) HORIZONTAL ALIGNMENT CURVE NAME
- PROPOSED ROW
- EXISTING ROW
- (A) 10" JRCP
- (B) 8" JRCP
- (C) 1" ASB
- (D) 6" CTB
- (E) 6" LIME TREATED SUBGRADE
- (F) 4" CONC RIPRAP CL B
- (G) SODDING & 4" TOPSOIL
- (H) MBGF
- (I) SSCB
- (XX) TYPICAL SECTION NUMBER
- (X) DRIVEWAY

NOTES:

1. ALL RCP ARE CLASS III UNLESS OTHERWISE NOTED.
2. SEE STORM SEWER LATERALS SHEETS FOR MORE INFORMATION.
3. SEE WATER & SAN SWR SHEETS FOR MORE INFORMATION.
4. PROPOSED HGL CALCULATED FOR POST-PROJECT CONDITIONS USING HFOWORKS SD.
5. SEE ROADWAY HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
6. SEE STORM SEWER HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
7. ALL EXISTING STORM SEWER TO BE REMOVED UNLESS SHOWN OTHERWISE. MAINTAIN DRAINAGE DURING CONSTRUCTION.

(X) SEE DRIVEWAY TABULATION & DETAILS SHEET

0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PLAN
PVMT & STM SWR IMPROVEMENTS
STA 25+00 TO STA 28+50

SHEET 13 OF 24

DIST.	COUNTY	SHEET NO.
6	TEXAS	
DIST.	COUNTY	SHEET NO.
HOU	HARRIS	65

LEGEND

Proposed P.P.C.A.
(location is approximate—see report text for details)

Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 17

Pen Table: MEMORIAL.tbl
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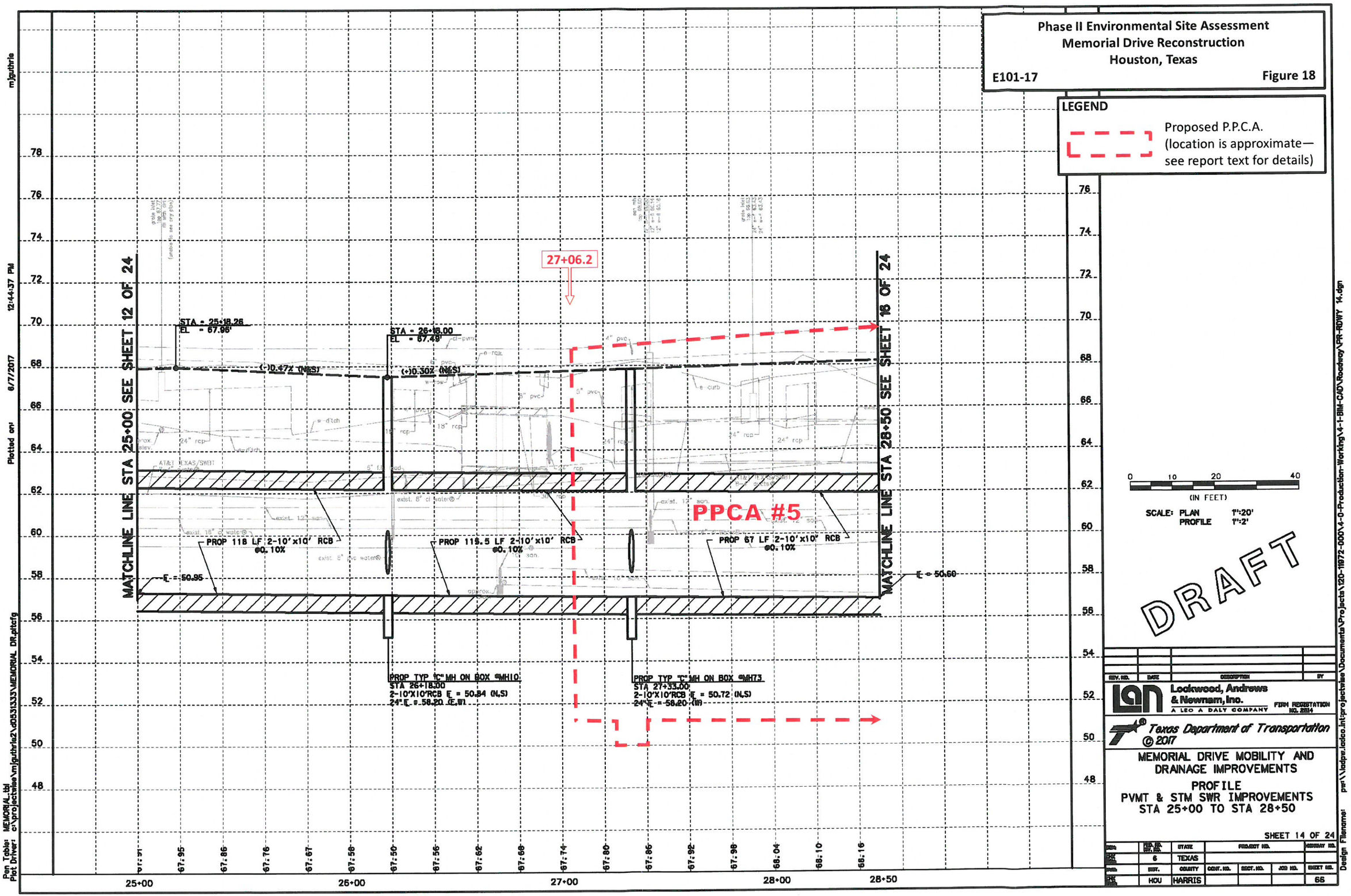
Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 18



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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PROFILE
PVMT & STM SWR IMPROVEMENTS
STA 25+00 TO STA 28+50

SHEET 14 OF 24

DIST.	STATE	PROJECT NO.	HIGHWAY NO.
6	TEXAS		
DIST.	COUNTY	CONT. NO. / SECT. NO. / JOB NO.	SHEET NO.
HOU	HARRIS		65

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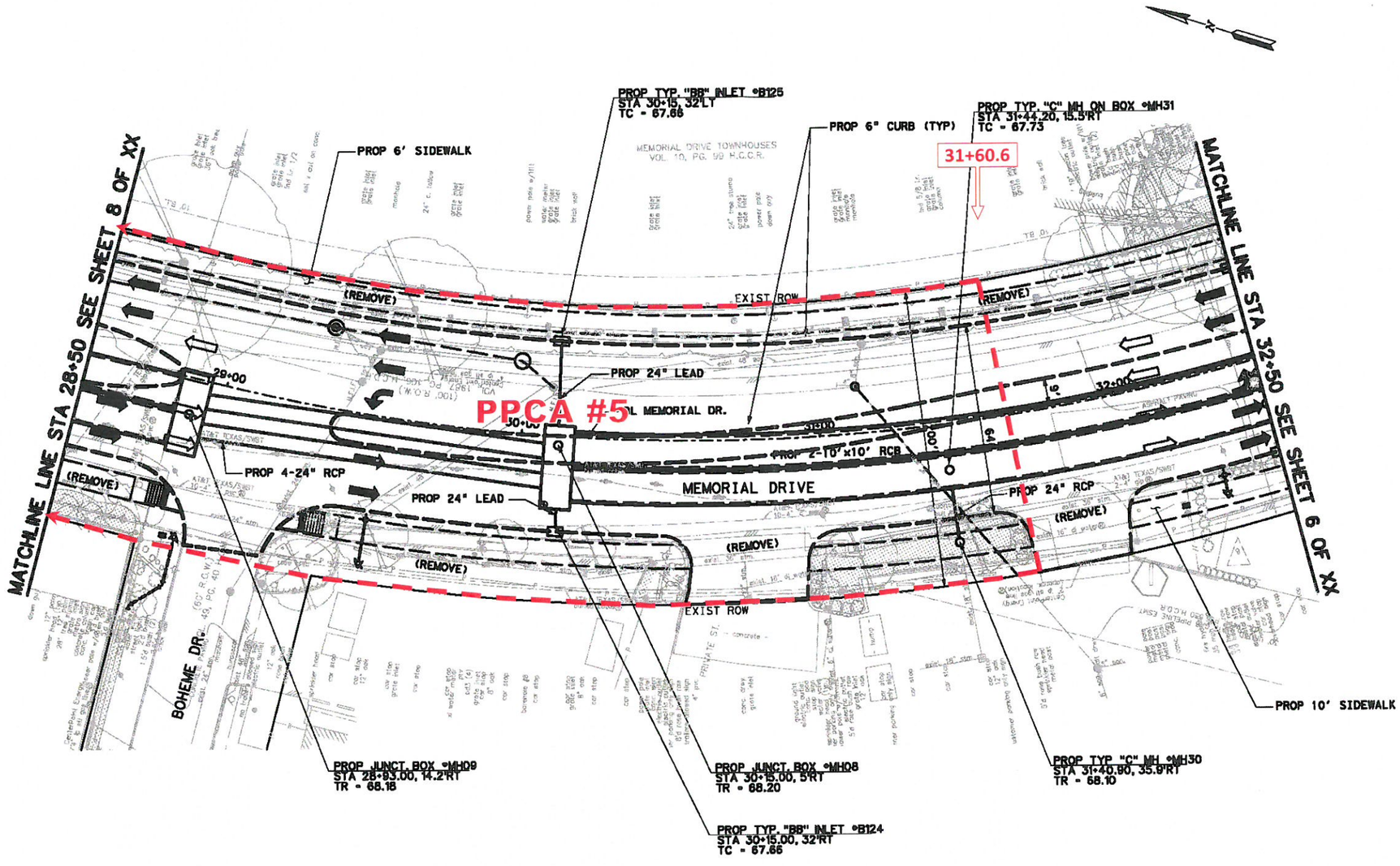

LEGEND

- PROPOSED LANE
- EXISTING LANE
- (CURVE) HORIZONTAL ALIGNMENT CURVE NAME
- PROPOSED ROW
- EXISTING ROW
- (A) 10" JRCP
- (B) 8" JRCP
- (C) 1" ASB
- (D) 6" CTB
- (E) 6" LIME TREATED SUBGRADE
- (F) 4" CONC RIPRAP CL B
- (G) SODDING & 4" TOPSOIL
- (H) MBGF
- (I) SSCB
- (J)(X) TYPICAL SECTION NUMBER
- (X) DRIVEWAY

NOTES:

1. ALL RCP ARE CLASS III UNLESS OTHERWISE NOTED.
2. SEE STORM SEWER LATERALS SHEETS FOR MORE INFORMATION.
3. SEE WATER & SAN SWR SHEETS FOR MORE INFORMATION.
4. PROPOSED HGL CALCULATED FOR POST-PROJECT CONDITIONS USING NFOWORKS SD.
5. SEE ROADWAY HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
6. SEE STORM SEWER HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
7. ALL EXISTING STORM SEWER TO BE REMOVED UNLESS SHOWN OTHERWISE. MAINTAIN DRAINAGE DURING CONSTRUCTION.

(X) SEE DRIVEWAY TABULATION & DETAILS SHEET

0 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

REV. NO.	DATE	DESCRIPTION	BY

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PLAN
PVMT & STM SWR IMPROVEMENTS
STA 28+50 TO STA 32+50

SHEET 15 OF 24

DIST.	DIST. NO. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
	6	TEXAS				
DIST.	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
	HOU	HARRIS				67

LEGEND	Phase II Environmental Site Assessment Memorial Drive Reconstruction Houston, Texas
Proposed P.P.C.A. (location is approximate—see report text for details)	E101-17 Figure 19

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Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 20

LEGEND

Proposed P.P.C.A.
(location is approximate—
see report text for details)

31+60.6

PPCA #5

STA = 29+00.69
EL = 68.34'

STA = 30+00.00
EL = 67.66'

STA = 31+27.04
EL = 67.99'

(+)0.30% (N&S)

(-)0.80% (N&S)

(+)0.30% (N&S)

(+)0.30% (N&S)

(-)0.48% (N&S)

(-)0.48% (N&S)

MATCHLINE LINE STA 28+50 SEE SHEET 14 OF 24

MATCHLINE LINE STA 32+50 SEE SHEET 18 OF 24

PROP 122 LF 4-24" RCP SIPHON
@0.17%

PROP 43 LF 2-10'x10' RCB
@0.10%

℄ = 50.60

PROP 129.5 LF 2-10'x10' RCB
@0.10%

PROP 105.5 LF 2-10'x10' RCB
@0.10%

℄ = 49.81

PROP JUNCT. BOX "MH09"
STA 29+93.00
2-10'X10'RCB ℄ = 50.56 (N)
24" ℄ = [illegible] (E)

PROP JUNCT. BOX "MH08"
STA 30+15.00
2-10'X10'RCB ℄ =50.05 (S)
24" ℄ = 58.[illegible] (E,W)
24" ℄ = 45.91 (N)

PROP TYP "C" MH ON BOX "MH31"
STA 31+44.60
2-10'X10'RCB ℄ =49.92 (S)
24" ℄ = 57.42 (E,W)

0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

REV. NO.	DATE	DESCRIPTION	BY

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PROFILE
PVMT & STM SWR IMPROVEMENTS
STA 28+50 TO STA 32+50

SHEET 16 OF 24

DIST.	COUNTY	SECT. NO.	JOB NO.	SHEET NO.
HOU	HARRIS			68

Pen Table: MEMORIAL.tbl
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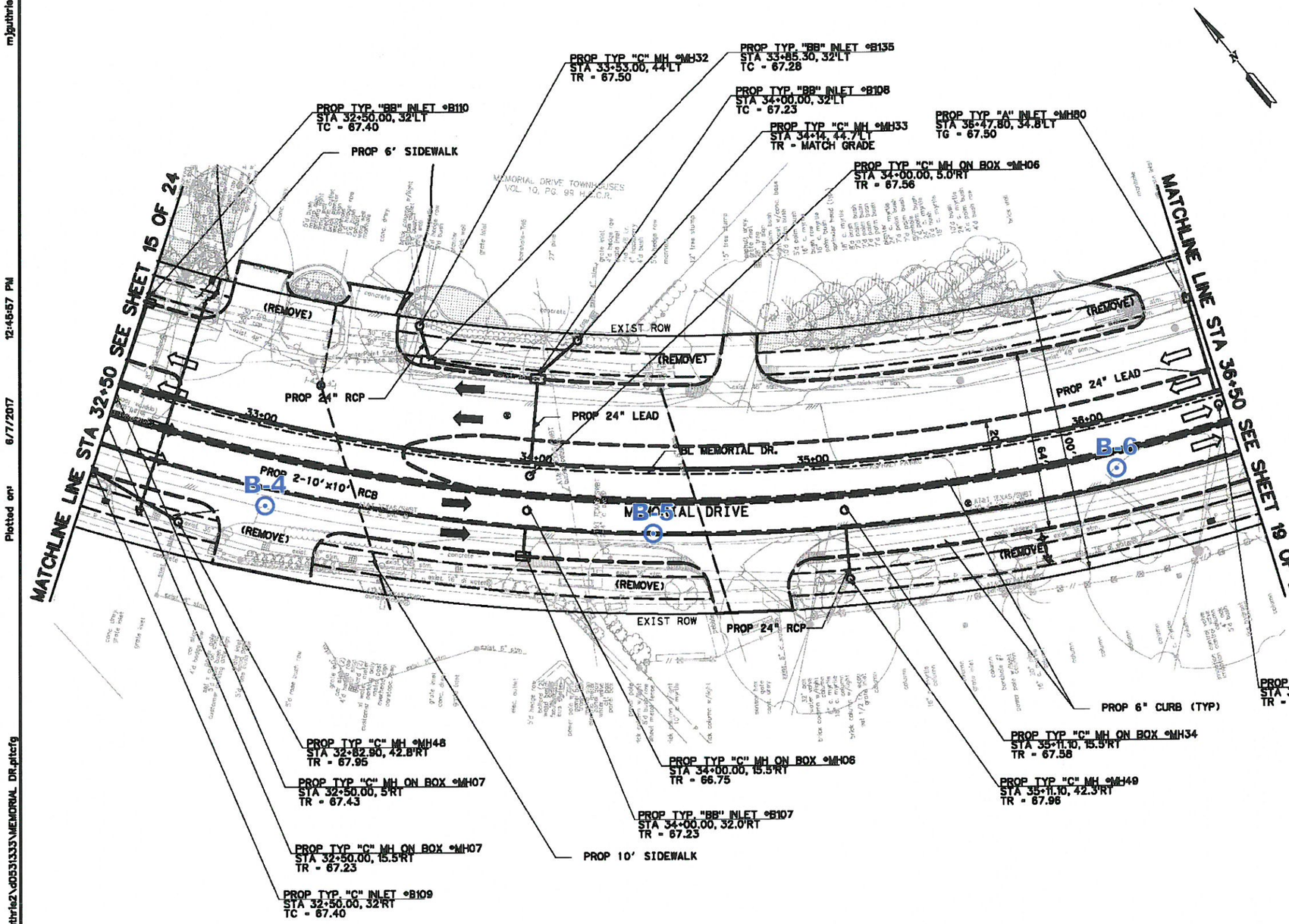

LEGEND

- PROPOSED LANE
- EXISTING LANE
- (CURVE) HORIZONTAL ALIGNMENT CURVE NAME
- PROPOSED ROW
- EXISTING ROW
- (A) 10" JRCP
- (B) 8" JRCP
- (C) 1" ASB
- (D) 6" CTB
- (E) 6" LIME TREATED SUBGRADE
- (F) 4" CONC RIPRAP CL B
- (G) SODDING & 4" TOPSOIL
- (H) MBGF
- (I) SSCB
- (XX) TYPICAL SECTION NUMBER
- (X) DRIVEWAY

NOTES:

1. ALL RCP ARE CLASS III UNLESS OTHERWISE NOTED.
2. SEE STORM SEWER LATERALS SHEETS FOR MORE INFORMATION.
3. SEE WATER & SAN SWR SHEETS FOR MORE INFORMATION.
4. PROPOSED HGL CALCULATED FOR POST-PROJECT CONDITIONS USING HFOWORKS SD.
5. SEE ROADWAY HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
6. SEE STORM SEWER HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
7. ALL EXISTING STORM SEWER TO BE REMOVED UNLESS SHOWN OTHERWISE. MAINTAIN DRAINAGE DURING CONSTRUCTION.

(X) SEE DRIVEWAY TABULATION & DETAILS SHEET

0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

REV. NO.	DATE	DESCRIPTION	BY

Lockwood, Andrews & Newnam, Inc.
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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS
PLAN
PVMT & STM SWR IMPROVEMENTS
STA 32+50 TO STA 36+50

SHEET 17 OF 24

DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
6	TEXAS				
DIST.	COUNTY				69
HOU	HARRIS				

LEGEND

Proposed P.P.C.A. (location is approximate—see report text for details)

Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 **Figure 21**

Pen Table: MEMORIAL.tbl
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Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 22

LEGEND

Proposed P.P.C.A.
(location is approximate—
see report text for details)

B-4 33+09.5
B-5 34+46.3
B-6 36+08.4

STA = 32+50.00
EL = 67.40'

STA = 33+00.21
67.80'

STA = 34+00.00
EL = 67.23'

(+)0.40% (N&S)
(-)0.37% (N&S)
(-)0.37% (N&S)
(+)0.30% (N&S)

MATCHLINE LINE STA 32+50 SEE SHEET 16 OF 24

MATCHLINE LINE STA 26+50 SEE SHEET 20 OF 24

PROP 150 LF 2-10'x10' RCB @0.10%

PROP 11 LF 2-10'x10' RCB @0.10%

PROP 136.5 LF 2-10'x10' RCB @0.10%

PROP TYP "C" MH ON BOX "MH07
STA 32+50.00
2-10'X10'RCB IE = 49.81 (NW,SE)
24" IE = 57.31 (NE,SW)

PROP TYP "C" MH ON BOX "MH06
STA 34+00.00
2-10'X10'RCB IE = 49.60 (NW,SE)
24" IE = 57.16 (NE)

PROP TYP "C" MH ON BOX "MH34
STA 35+11.20
2-10'X10'RCB IE = 49.55 (NW,SE)
24" IE = 57.05 (SW)

PROP TYP "C" MH ON BOX "MH35
STA 36+47.80
2-10'X10'RCB IE = 49.41 (NW,SE)
24" IE = 61.73 (NE)

IE = 49.81

IE = 49.41

TD=27'

TD=27'

TD=26'

67.44 67.52 67.60 67.53 67.45 67.38 67.30 67.23 67.29 67.35 67.41 67.47 67.53 67.59 67.65 67.71 67.77 67.83 67.89 67.95

32+50 33+00 34+00 35+00 36+00 36+50

70 68 66 64 62 60 58 56 54 52 50 48 46

0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

REV. NO.	DATE	DESCRIPTION	BY

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FIRM REGISTRATION NO. 2314

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS
PROFILE
PVMT & STM SWR IMPROVEMENTS
STA 32+50 TO STA 36+50

SHEET 18 OF 24

DIST.	DIST. NO. CONT. NO.	STATE	PROJECT NO.	HIGHWAY NO.
HOU	6	TEXAS		
	DIST.	COUNTY	CONT. NO. SECT. NO. JOB NO.	SHEET NO.
	HOU	HARRIS		78

mjguthrie 12:14:20 PM 6/7/2017

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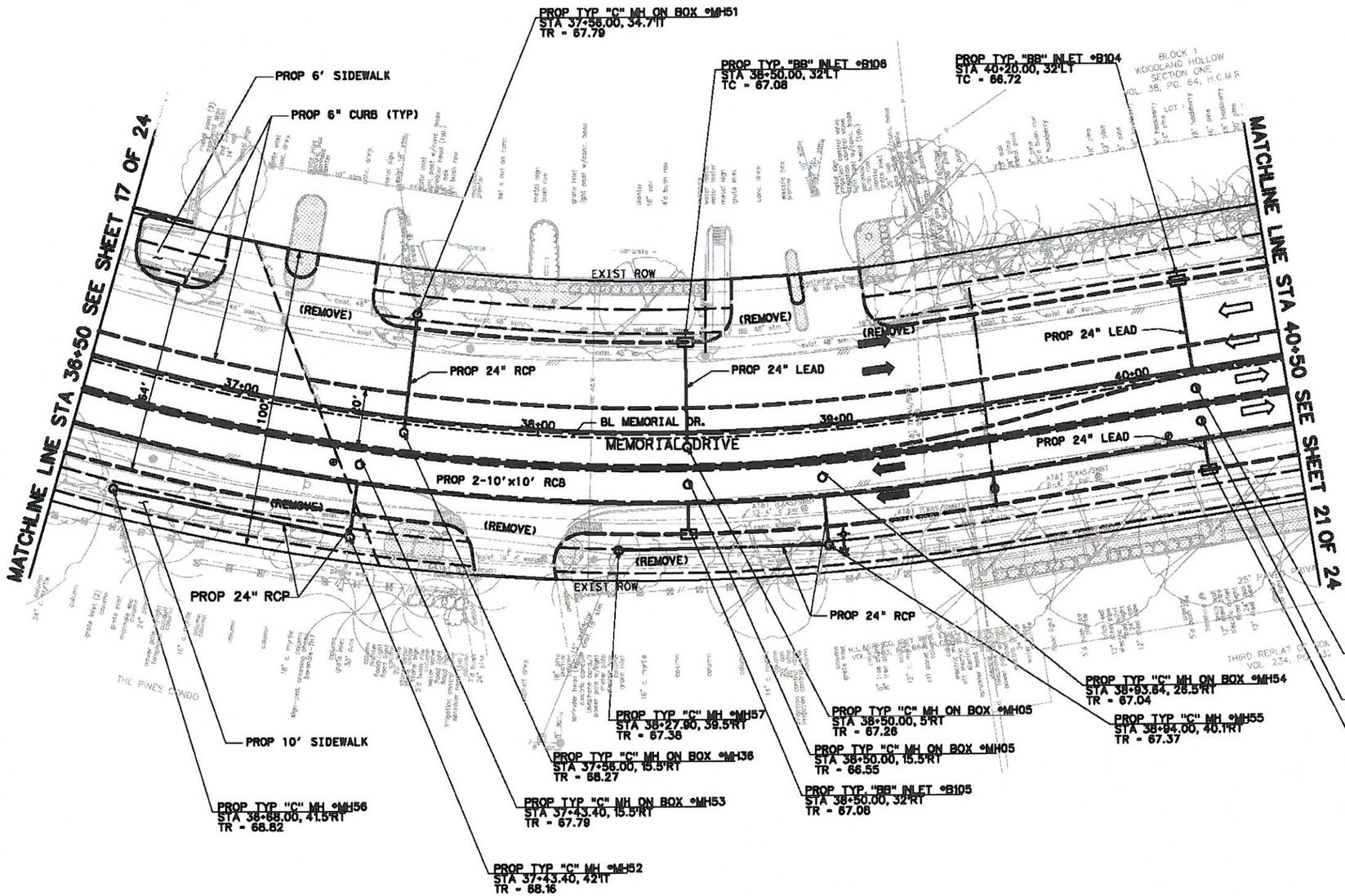

LEGEND

- PROPOSED LANE
- EXISTING LANE
- (CURVE) HORIZONTAL ALIGNMENT CURVE NAME
- PROPOSED ROW
- EXISTING ROW
- (A) 10" JRCP
- (B) 8" JRCP
- (C) 1" ASB
- (D) 6" CTB
- (E) 6" LIME TREATED SUBGRADE
- (F) 4" CONC RIPRAP CL B
- (G) SODDING & 4" TOPSOIL
- (H) MBGF
- (I) SSCB
- (XX) TYPICAL SECTION NUMBER
- (X) DRIVEWAY

NOTES:

1. ALL RCP ARE CLASS III UNLESS OTHERWISE NOTED.
2. SEE STORM SEWER LATERALS SHEETS FOR MORE INFORMATION.
3. SEE WATER & SAN SWR SHEETS FOR MORE INFORMATION.
4. PROPOSED HGL CALCULATED FOR POST-PROJECT CONDITIONS USING NFOWORKS SD.
5. SEE ROADWAY HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
6. SEE STORM SEWER HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
7. ALL EXISTING STORM SEWER TO BE REMOVED UNLESS SHOWN OTHERWISE. MAINTAIN DRAINAGE DURING CONSTRUCTION.

(X) SEE DRIVEWAY TABULATION & DETAILS SHEET

0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

REV. NO.	DATE	DESCRIPTION	BY

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FIRM REGISTRATION NO. 2614

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PLAN & PROFILE
PVMT & STM SWR IMPROVEMENTS
STA 36+50 TO STA 40+50

SHEET 19 OF 24

DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
HOU	HARRIS				71

LEGEND

Proposed P.P.C.A.
(location is approximate—see report text for details)

Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 23

Pen Table: MEMORIAL.tbl
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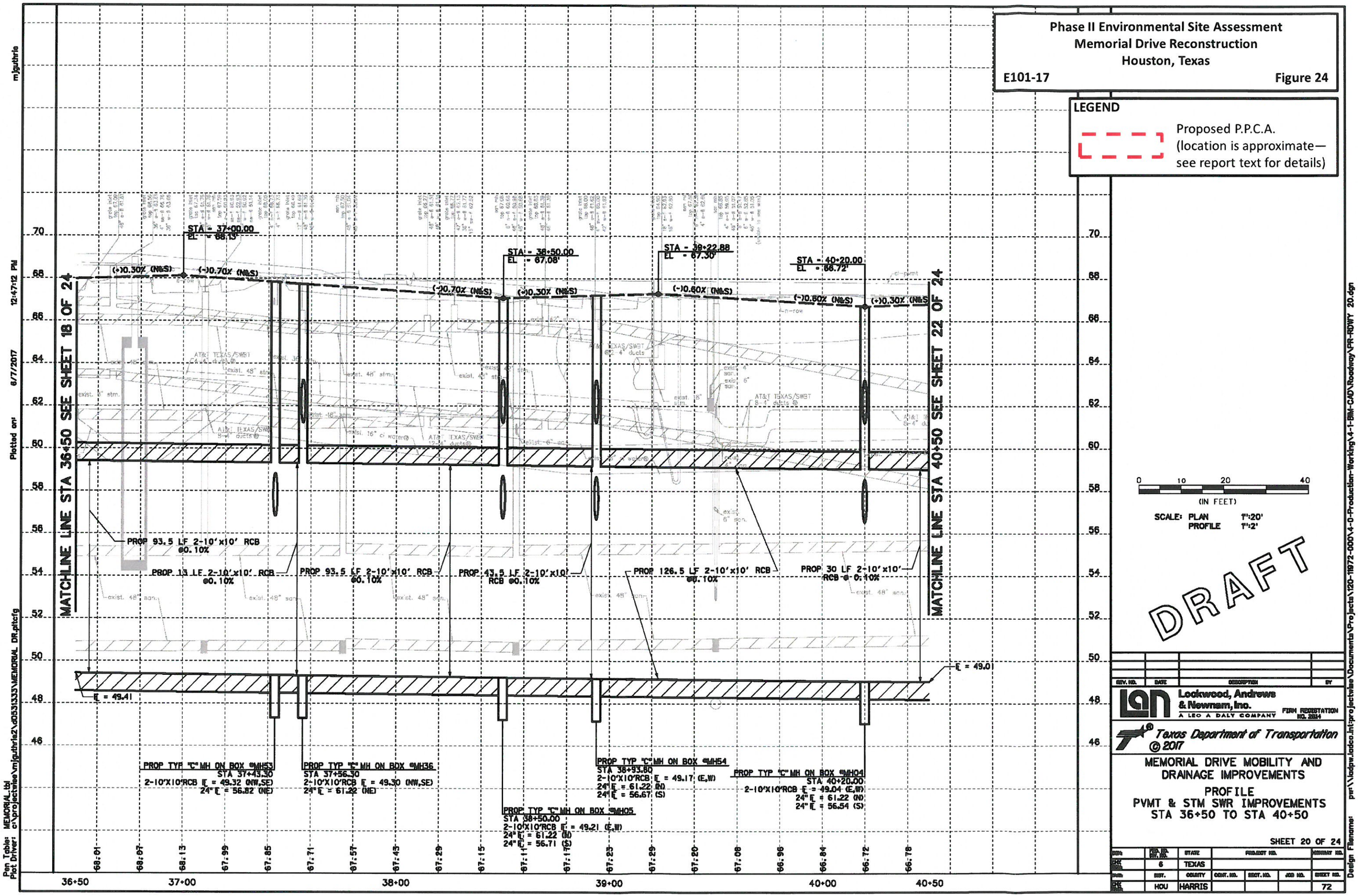
Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 24

LEGEND

Proposed P.P.C.A.
(location is approximate—
see report text for details)



0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

REV. NO.	DATE	DESCRIPTION	BY

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY
FIRM REGISTRATION NO. 2314

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PROFILE
PVMT & STM SWR IMPROVEMENTS
STA 36+50 TO STA 40+50

SHEET 20 OF 24

DIST.	COUNTY	STATE	PROJECT NO.			ASSIGNMENT NO.
6	HOU	TEXAS				
DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.		SHEET NO.
HOU	HARRIS					72

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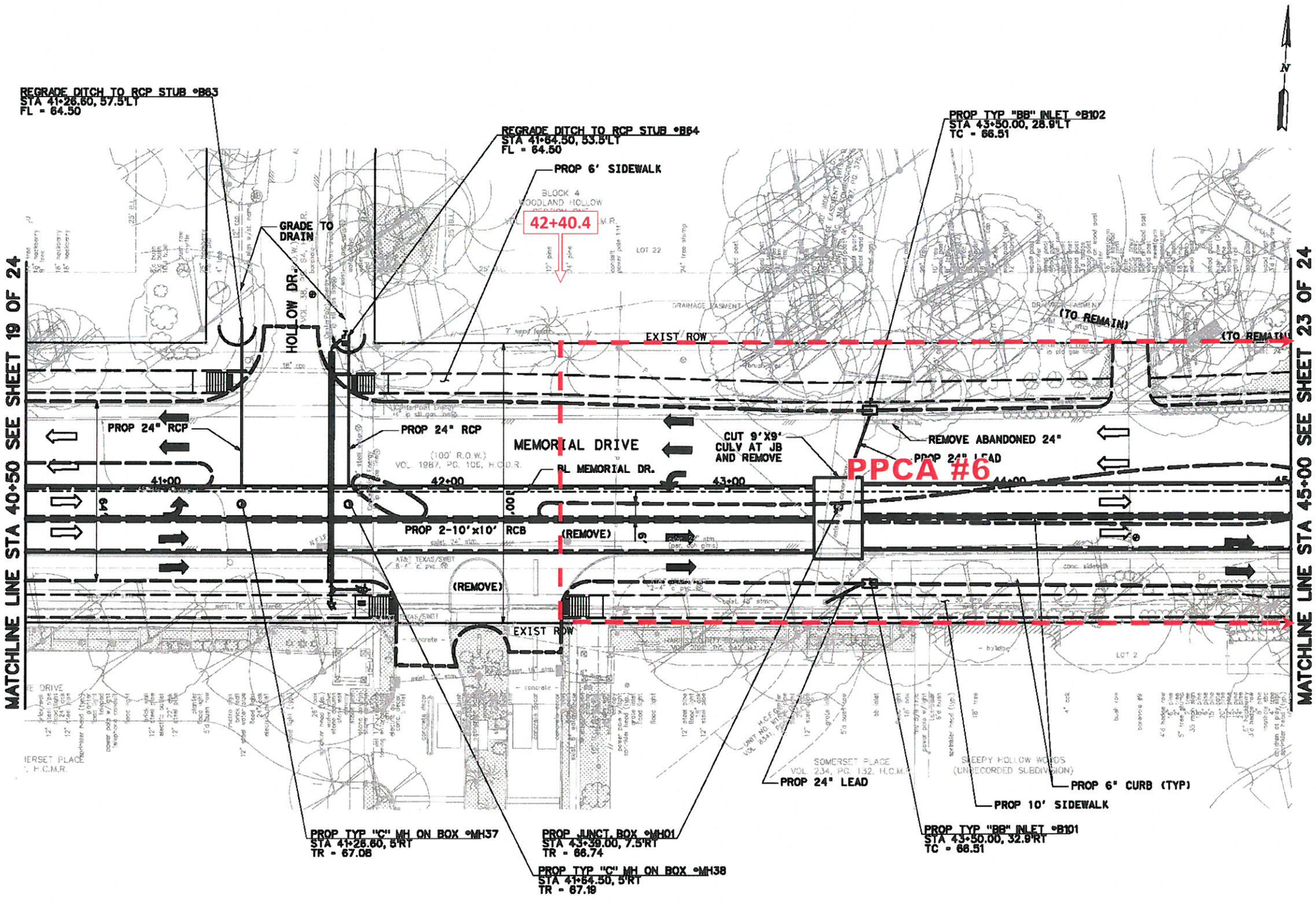

LEGEND

- PROPOSED LANE
- EXISTING LANE
- (CURVE) HORIZONTAL ALIGNMENT CURVE NAME
- PROPOSED ROW
- EXISTING ROW
- (A) 10" JRCP
- (B) 8" JRCP
- (C) 1" ASB
- (D) 6" CTB
- (E) 6" LIME TREATED SUBGRADE
- (F) 4" CONC RIPRAP CL B
- (G) SODDING & 4" TOPSOIL
- (H) MBGF
- (I) SSCB
- (X) TYPICAL SECTION NUMBER
- (X) DRIVEWAY

NOTES:

1. ALL RCP ARE CLASS III UNLESS OTHERWISE NOTED.
2. SEE STORM SEWER LATERALS SHEETS FOR MORE INFORMATION.
3. SEE WATER & SAN SWR SHEETS FOR MORE INFORMATION.
4. PROPOSED HGL CALCULATED FOR POST-PROJECT CONDITIONS USING NFOWORKS SD.
5. SEE ROADWAY HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
6. SEE STORM SEWER HORIZONTAL GEOMETRY SHEETS FOR MORE INFORMATION.
7. ALL EXISTING STORM SEWER TO BE REMOVED UNLESS SHOWN OTHERWISE. MAINTAIN DRAINAGE DURING CONSTRUCTION.

(X) SEE DRIVEWAY TABULATION & DETAILS SHEET

0 10 20 40
(IN FEET)

SCALE: PLAN 1"=20'
PROFILE 1"=2'

DRAFT

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PLAN
PVMT & STM SWR IMPROVEMENTS
STA 40+50 TO STA 45+00

SHEET 21 OF 24

DIST.	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
	6	TEXAS				
DIST.	DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
	HOU	HARRIS				73

LEGEND

Proposed P.P.C.A. (location is approximate—see report text for details)

Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 25

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Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 26

LEGEND

Proposed P.P.C.A.
(location is approximate—
see report text for details)

42+40.4

STA = 41+78.44
EL = 67.19'

(+)0.30% (N&S)

(-)0.40% (N&S)

STA = 43+50.00
= 66.51'

(-)0.40% (N&S)

(+)0.37% (N&S)

MATCHLINE LINE STA 40+50 SEE SHEET 20 OF 24

MATCHLINE LINE STA 45+00 SEE SHEET 24 OF 24

PROP 76.5 LF 2-10'x10' RCB @0.10%

PROP 40 LF 2-10'x10' RCB @0.10%

PROP 167.5 LF 2-10'x10' RCB @0.10%

PROP 152.5 LF 2-10'x10' RCB @0.10%

STA 43+42.50
24" \ = 58.00 (N)

PPCA #6

PROP JUNCT. BOX "MH01
STA 43+39.00
2-10'X10'RCB ℄ =49.73 (E)
2-10'X10'RCB ℄ =48.73 (W)
EX 9'X9'RCB ℄ =45.80 (N)
EX 9'X9'RCB ℄ =45.77 (S)

℄ = 49.01

℄ = 48.89

PROP TYP "C" MH ON BOX "MH37
STA 41+26.60
2-10'X10'RCB ℄ = 48.93 (E,W)
24" ℄ = 61.22 (N,S)

PROP TYP "C" MH ON BOX "MH38
STA 41+64.50
2-10'X10'RCB ℄ = 48.90 (E,W)
24" ℄ = 61.22 (N,S)

0 10 20 40
(IN FEET)

SCALE: PLAN 1":20'
PROFILE 1":2'

DRAFT

REV. NO.	DATE	DESCRIPTION	BY

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PROFILE
PVMT & STM SWR IMPROVEMENTS
STA 40+50 TO STA 45+00

SHEET 22 OF 24

DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
HOU	HARRIS				74

STATE: TEXAS

HIGHWAY NO.

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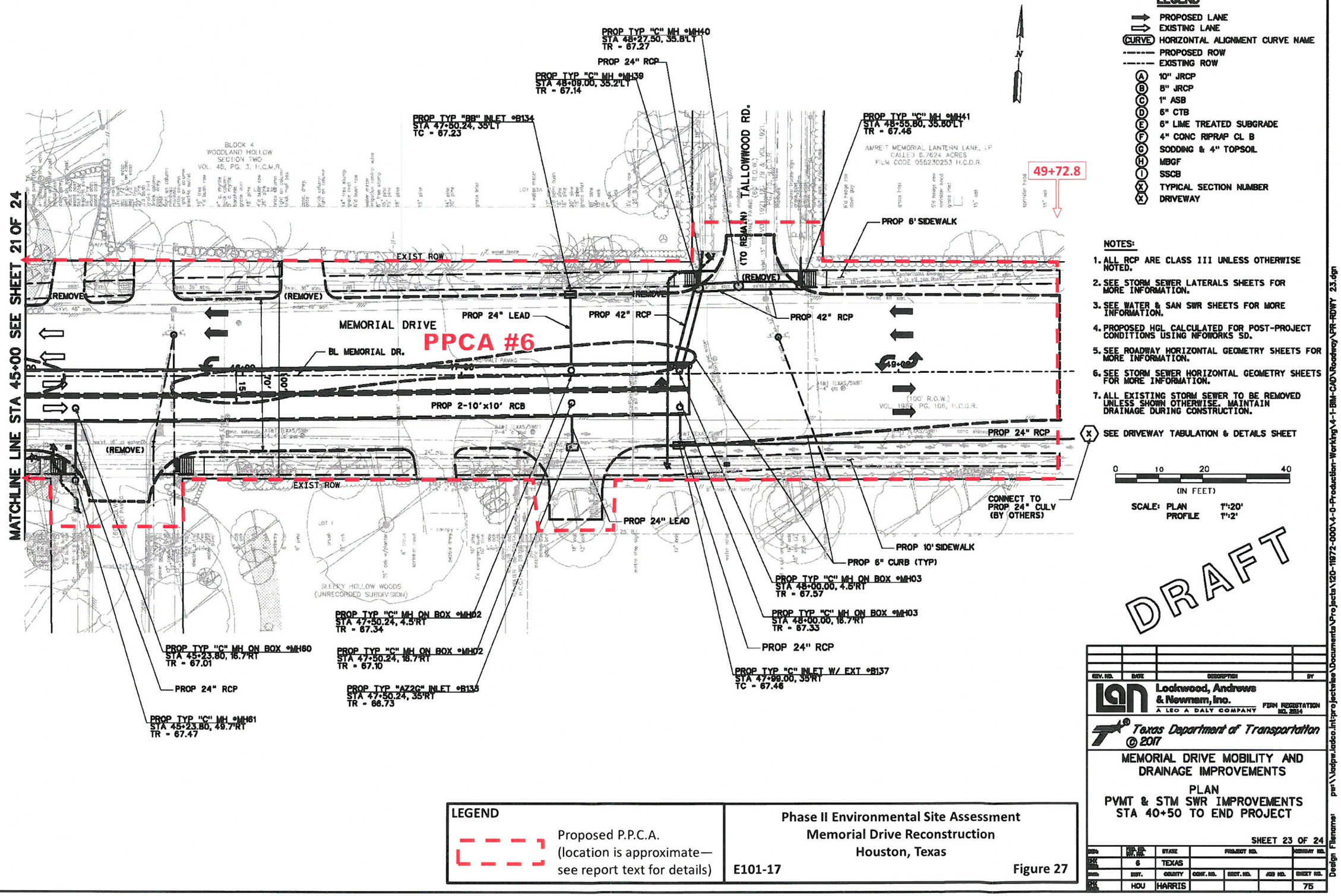
mjguthrie

40+50 41+00 42+00 43+00 44+00 45+00

66.84 66.90 66.95 67.02 67.08 67.14 67.19 67.11 67.03 66.95 66.87 66.79 66.71 66.63 66.55 66.54 66.62 66.69 66.77 66.84 66.92 66.99



LEGEND	
	Proposed P.P.C.A. (location is approximate—see report text for details)

Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 Figure 27

REV. NO.	DATE	DESCRIPTION	BY

Lockwood, Andrews & Newnam, Inc. A LEO A DALY COMPANY FIRM REGISTRATION NO. 2934

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PLAN
PVMT & STM SWR IMPROVEMENTS
STA 40+50 TO END PROJECT

SHEET 23 OF 24

DIST.	COUNTY	PROJECT NO.	HIGHWAY NO.
6	TEXAS		
DIST.	COUNTY	CONT. NO. / SECT. NO. / JOB NO.	SHEET NO.
HOU	HARRIS		75

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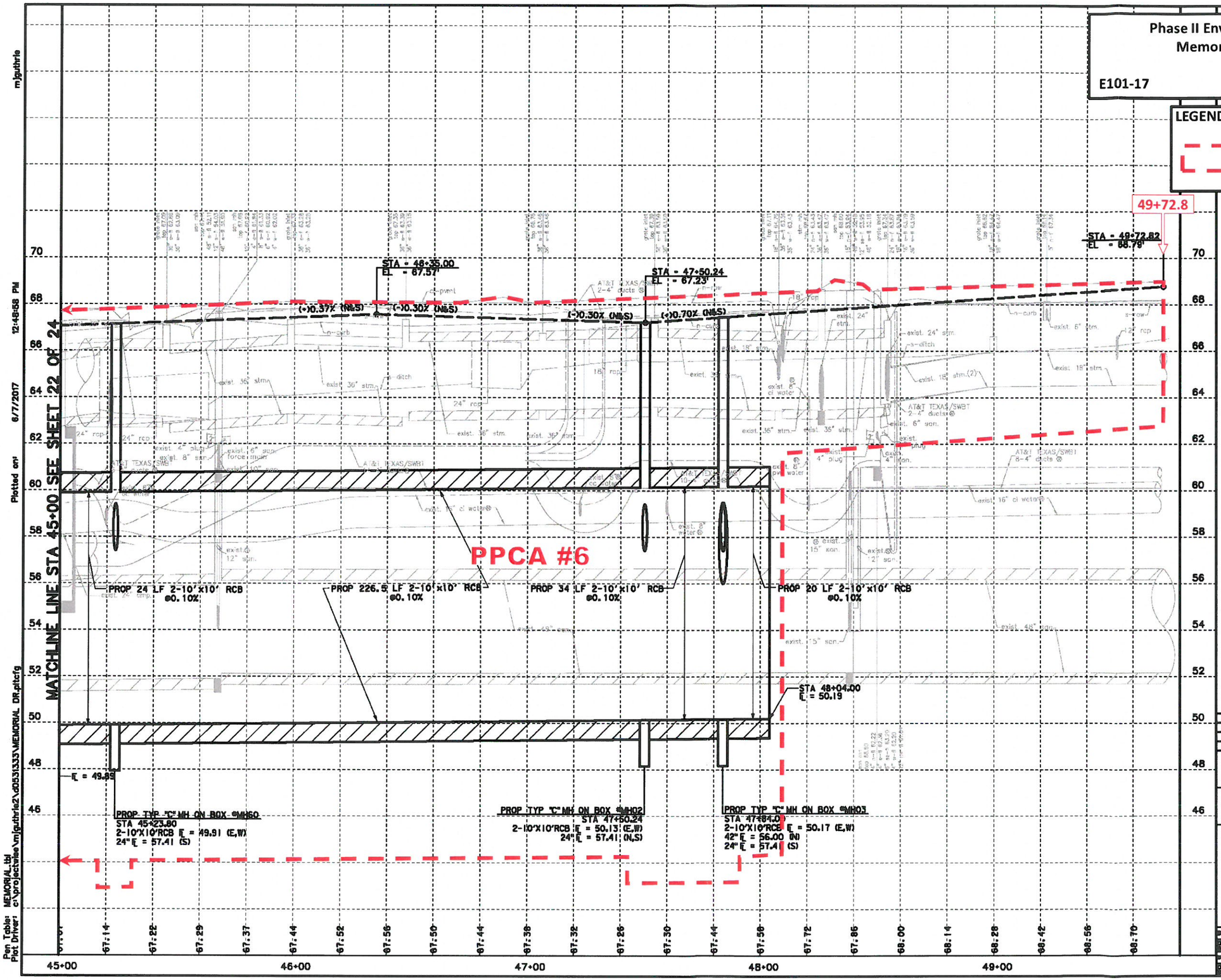
Phase II Environmental Site Assessment
Memorial Drive Reconstruction
Houston, Texas

E101-17 **Figure 28**

LEGEND

Proposed P.P.C.A.
(location is approximate—
see report text for details)



0 10 20 40
(IN FEET)

SCALE: PLAN 1"=20'
PROFILE 1"=2'

DRAFT

REV. NO.	DATE	DESCRIPTION	BY

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY
FIRM REGISTRATION NO. 2614

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MEMORIAL DRIVE MOBILITY AND DRAINAGE IMPROVEMENTS

PROFILE
PVMT & STM SWR IMPROVEMENTS
STA 40+50 TO END PROJECT

SHEET 24 OF 24

DIST.	COUNTY	CONT. NO.	SECT. NO.	JOB NO.	SHEET NO.
HOU	HARRIS				76

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TABLE 1
SOIL BORING, SOIL AND GROUNDWATER SAMPLING AND SAMPLE ANALYSIS INFORMATION
MEMORIAL DRIVE RECONSTRUCTION

Boring Number	Total Depth, feet*	Pavement and Base Thickness, inches	Soil Sample Interval, feet*	Primary Soil Type	Sand and Silt Zones feet*	Depth Water Encountered at During Drillng, feet*	Ground-water Sampled	Analyses
B-1	20	Concrete:10, Base: 15	14-15	Sandy Clay	Sand and Gravel at 10.8 to 10.9	Dry; also no water one-quarter hour after drilling	No	Benzene, toluene, ethylbenzene, and xylenes (BTEX); Methyl ethyl butyl ether (MTBE); Total petroleum hydrocarbons (TPH) 1005
B-2	28	Concrete: 8.5, Base: 25.5	23-24	Clay	Silty sand at 23.6 to 25 and 26 to 28	Dry, but water at 25.66 one half hour after drilling	Yes	BTEX, MTBE, and TPH 1005

*** Feet below grade**

continued

TABLE 1 (continued)
SOIL BORING, SOIL AND GROUNDWATER SAMPLING AND SAMPLE ANALYSIS INFORMATION
MEMORIAL DRIVE RECONSTRUCTION

Boring Number	Total Depth, feet*	Pavement and Base, inches	Soil Sample Interval, feet*	Primary Soil Type	Sand and Silt Zones feet*	Depth Water Encountered at During Drillng, feet*	Ground-water Sampled	Analyses
B-3	28	Asphalt: 4.75, Base: 25.25	21-22	Clay	Sandy Clay and Clayey Sand at 21.3 to 24; and Sand at 24 to 27 and 27.7 to 28	Unknown due to infiltration of surface water trapped beneath the pavement; at 24.03 one quarter hour after drilling	No	BTEX, MTBE, and TPH 1005
B-4	27	Asphalt: 7.5, Base: 7.5	25-26	Clay	Silty Sand at 17.3 to 20 feet and 20.9 to 26.7; Sandy Clay and Clayey Sand at 26.7 to 27	21.92; at 18.47 one quarter hour after drilling	No	Volatile organic compounds (VOC) and TPH 1005

*** Feet below grade**

continued

TABLE 1 (continued)
SOIL BORING, SOIL AND GROUNDWATER SAMPLING AND SAMPLE ANALYSIS INFORMATION
MEMORIAL DRIVE RECONSTRUCTION

Boring Number	Total Depth, feet*	Pavement and Base, inches	Soil Sample Interval, feet*	Primary Soil Type	Sand and Silt Zones feet*	Depth Water Encountered at During Drilling, feet*	Ground-water Sampled	Analyses
B-5	27	Asphalt: 6, Base: 13.5	20-21	Sandy Clay	Silty Sand at 8.4 to 10, 19.4 to 20, and 22.8 to 25; Sandy Silt at 21.3 to 22.8; and Sand at 26.3 to 27 feet	21.25; at 21.31 one quarter hour after drilling	Yes	VOC and TPH 1005
B-6	26	Asphalt: 11, Base: 3	20-22	Sandy Clay	Sandy Clay and Clayey Sand at 10.6 to 11.9; Clayey Sandy Silt at 21.2 to 21.6; and Interlayered Silty Sand and Clayey Sand at 21.6 to 24	21.58; dry one quarter hour after drilling	No	VOC and TPH 1005

*** Feet below grade**

APPENDIX B

PHOTOGRAPHS

Photograph 1: View to the north of the pavement coring of location B-1 on the West Sam Houston Parkway South.

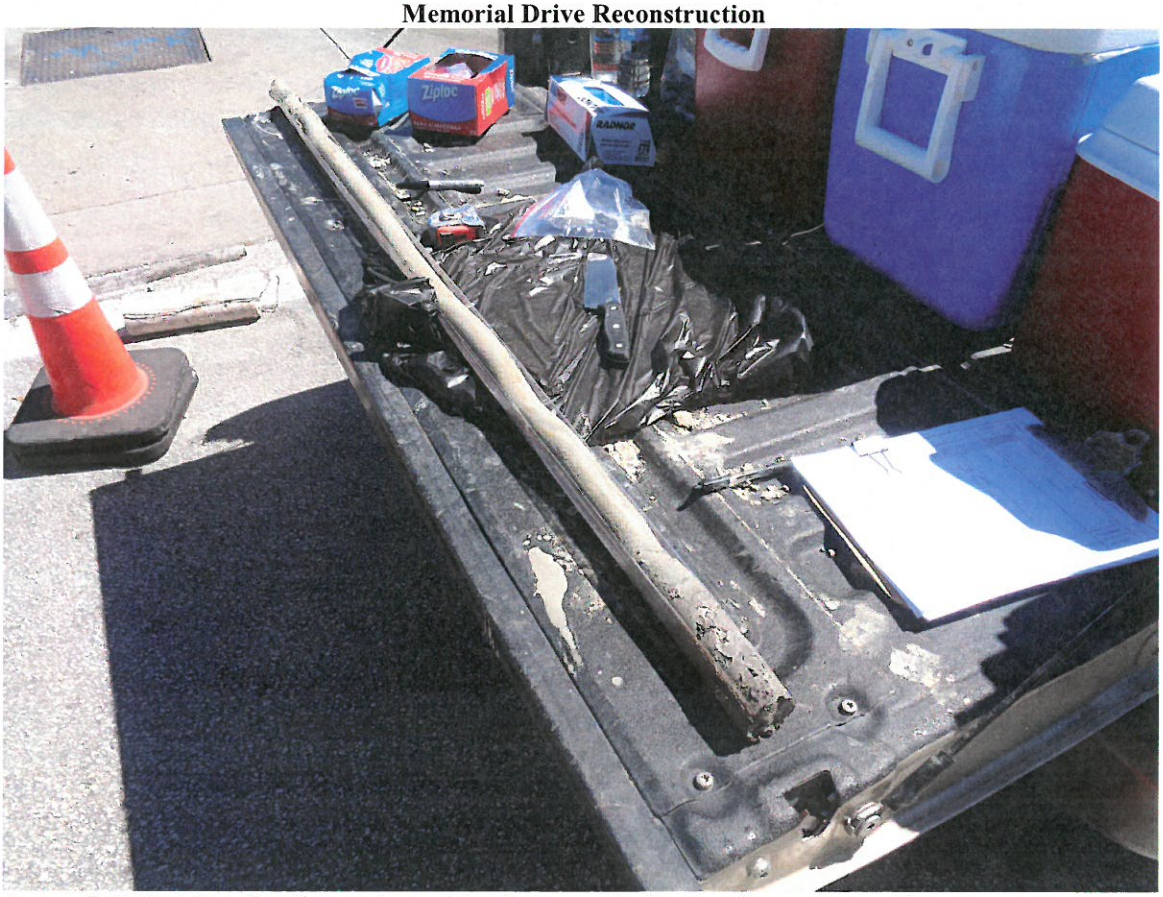
Photograph 2: View to the west of the drilling of soil boring B-2.

Photograph 3: View to the west of the drilling of soil boring B-3.

Photograph 4: View to the north of the drilling of soil boring B-4.

Photograph 5: View to the west of the drilling of soil boring B-6.

Photograph 6: View of the metal push tube with sample inside.



Photograph 7: Retrieved soil core in acetate sleeve ready for logging and sampling.

Photograph 8: View to the west of plugged and patched boring B-1.

Photograph 9: Plugged and patched boring B-2.

APPENDIX C

SOIL BORING LOGS

AVLES
ENGINEERING CORP.
GEOTECHNICAL ENGINEERS

PROJECT: **Memorial Drive Reconstruction, ESA-II** BORING **B-1**

COH WBS No. **N-T17000-031B-4** DRILL METHOD **Direct Push** DATE **5/25/17**

GPS COORDINATES:
N 29.77300
W 95.56239

DEPTH IN FEET	SYMBOL	PUSHED INTERVAL (IN.)	PUSH RECOVERY (IN.)	SAMPLE INTERVAL	SOIL DESCRIPTION	P.I.D. READING (PPM) PARTS PER MILLION
0					Pavement (10" PCC) and Base	
					FILL: GRAVEL and SANDY CLAY, brown and black	0.1
		36	20		CLAY, tan and brown, with ferrous stains	0.0
5					CLAY, tan and brown, with sand partings, and ferrous stains and nodules	0.0
		60	60			0.0
						0.0
					- with calcareous nodules 8'-10'	0.0
						0.0
10						0.0
					SAND and GRAVEL, tan	0.0
		60	58		SANDY CLAY, light gray and orange-brown, with slickensides, and ferrous stains and nodules	0.0
						0.1
15						0.2
						0.0
		60	57			0.0
					SANDY CLAY, light gray, with sand partings and seams, and calcareous material	0.0
						0.0
20						0.0
					Termination depth = 20'	
					Notes:	
					1. Background Air PID = 0.1ppm	
25						
30						

BORING DRILLED TO **20** FEET WITHOUT DRILLING FLUID
WATER ENCOUNTERED AT **DRY** FEET WHILE DRILLING ▽
WATER LEVEL AT **DRY** FEET AFTER **1/4-HR** ▽
DRILLED BY **ENVIROTECH** CHECKED BY **RJM** LOGGED BY **RJM**

PROJECT NO. E101-17

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Memorial Drive Reconstruction, ESA-II** BORING **B-2**

COH WBS No. **N-T17000-031B-4** DRILL METHOD **Direct Push** DATE **5/25/17**

GPS COORDINATES:
N 29.77290
W 95.56228

DEPTH IN FEET	SOIL DESCRIPTION	PUSHED INTERVAL (IN.)	PUSH RECOVERY (IN.)	SAMPLE INTERVAL	P.I.D. READING (PPM) PARTS PER MILLION
0	PAVEMENT (8.5" PCC) and BASE				
	-NO RECOVERY- water under pavement, lost sample	26	0		
5	CLAY, orange-brown and gray	60	57		0.0 0.1 0.1 1.2 1.3
10	- with ferrous stains 12'-12.8'	60	54.5		0.1 0.2 0.5
	SANDY CLAY, gray and orange-brown				0.1 0.9
15	CLAY, tan and orange-brown, with soft zones	60	57		0.4 0.2
	SANDY CLAY, light gray and tan, with sand partings				0.8 0.7 1.6
20	CLAY, orange-brown, gray and tan, with some sand	60	57		4.3 4.6
	SANDY CLAY, light gray and green-gray				1.5
	SILTY SAND, light gray				5.8 2.9
25	CLAY, tan and light gray ▼	36	36		1.8
	SILTY SAND, light gray and green-gray, wet; hydrocarbon odor				3.9 5.0
30	Termination depth = 28'				

Notes:
1. Background Air PID = 0.0 - 0.3ppm; 2. Empty Sample Bag Air PID = 0.1ppm; 3. Temporary Monitor Well installed to 28', with 25' screen; 4. Water Sample collected at 14:00

BORING DRILLED TO **28** FEET WITHOUT DRILLING FLUID
WATER ENCOUNTERED AT **DRY** FEET WHILE DRILLING ▽
WATER LEVEL AT **25.66** FEET AFTER **1/2-HR** ▼
DRILLED BY **ENVIROTECH** CHECKED BY **RJM** LOGGED BY **RJM**

PROJECT NO. E101-17

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Memorial Drive Reconstruction, ESA-II** BORING **B-3**

COH WBS No. **N-T17000-031B-4** DRILL METHOD **Direct Push** DATE **5/25/17**

GPS COORDINATES:
N 29.77291
W 95.56186

DEPTH IN FEET	SOIL DESCRIPTION	PUSHED INTERVAL (IN.)	PUSH RECOVERY (IN.)	SAMPLE INTERVAL	P.I.D. READING (PPM) PARTS PER MILLION
0	PAVEMENT (4.75" AC) and BASE				
	CLAY, gray, wet *(water trapped under pavement entered the borehole)	30	8		0.1
5	CLAY, light gray and orange-brown, with ferrous stains and nodules, wet (trapped water)	60	60		0.0 0.0 0.0 0.0 0.1
10					0.0 0.0 0.0
	SANDY CLAY, light gray and orange-brown, wet (trapped water)	60	57		0.0
	CLAY, gray and tan, with calcareous material				0.0
15					0.0 0.0 0.0
	SANDY CLAY, light gray and orange-brown, with sand partings, seams and layers, and ferrous stains	60	58.5		0.0 0.0 0.0
20	CLAY, tan and orange-brown				0.0
	SANDY CLAY and CLAYEY SAND, orange-brown and red-brown, with sand partings	60	57		4.3 2.5 0.9
25	SAND, light gray and light brown				2.7 1.8
		36	36		2.8
	CLAY, tan and orange-brown, with calcareous material				1.5
	SAND, light gray, orange-brown and green-gray				
30	Termination depth = 28'				

Notes:
1. Background Air PID = 0.0 - 0.2ppm
2. Empty Sample Bag Air PID = 0.0ppm

BORING DRILLED TO **28** FEET WITHOUT DRILLING FLUID
WATER ENCOUNTERED AT **unknown*** FEET WHILE DRILLING ▽
WATER LEVEL AT **24.03** FEET AFTER **1/4-HR** ▽
DRILLED BY **ENVIROTECH** CHECKED BY **RJM** LOGGED BY **RJM**

PROJECT NO. E101-17

AVLES
ENGINEERING CORP.
GEOTECHNICAL ENGINEERS

PROJECT: **Memorial Drive Reconstruction, ESA-II** BORING **B-4**

COH WBS No. **N-T17000-031B-4** DRILL METHOD **Direct Push** DATE **5/25/17**

GPS COORDINATES:
N 29.76696
W 95.55756

DEPTH IN FEET	SYMBOL	PUSHED INTERVAL (IN.)	PUSH RECOVERY (IN.)	SAMPLE INTERVAL	SOIL DESCRIPTION	P.I.D. READING (PPM) PARTS PER MILLION	DEPTH IN FEET
0					PAVEMENT (7.5" AC) and BASE		0
					SILTY SANDY CLAY, dark gray	0.0	
		45	43		CLAY, gray, with ferrous stains and silt partings	0.0	
						0.0	
						0.0	
5						0.2	5
						0.1	
		60	60		- with calcareous nodules 7'-8'	0.0	
						0.0	
					- with calcareous nodules 9'-10'	0.0	
10					SANDY CLAY, green-gray and tan, with sand pockets and partings	0.0	10
						0.0	
		60	58			0.0	
						0.0	
					- with calcareous nodules 14'-15'	0.0	
15					CLAY, tan and gray, with calcareous nodules	0.1	15
					SANDY CLAY, green-gray	0.0	
		60	47		SILTY SAND, light tan and light gray	0.0	
					▼	0.0	
20					CLAY, green-gray and tan, with ferrous stains	0.0	20
					SILTY SAND	0.0	
		60	NR		- wet at 21.92' ▽	0.0	
						0.0	
						0.6	
25						0.8	25
		24	24			0.0	
					SANDY CLAY and CLAYEY SAND, green-gray		
					Termination depth = 27'		
					Notes:		
30					1. NR--Not Recorded		30
					2. Background Air PID = 0.0ppm		
					3. Empty Sample Bag Air PID = 0.0 - 0.2ppm		

BORING DRILLED TO **27** FEET WITHOUT DRILLING FLUID
WATER ENCOUNTERED AT **21.92** FEET WHILE DRILLING ▽
WATER LEVEL AT **18.47** FEET AFTER **1/4-HR** ▼
DRILLED BY **ENVIROTECH** CHECKED BY **RJM** LOGGED BY **RJM**

PROJECT NO. E101-17

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Memorial Drive Reconstruction, ESA-II** BORING **B-5**

COH WBS No. **N-T17000-031B-4** DRILL METHOD **Direct Push** DATE **5/26/17**

GPS COORDINATES:
N 29.76657
W 95.55717

DEPTH IN FEET	SOIL DESCRIPTION	PUSHED INTERVAL (IN.)	PUSH RECOVERY (IN.)	SAMPLE INTERVAL	P.I.D. READING (PPM) PARTS PER MILLION
0	PAVEMENT (6" AC) and BASE				
	SILTY SANDY CLAY, brown and tan, with ferrous stains and calcareous nodules	40.5	27		0.0
5	SANDY CLAY, light gray and tan, with calcareous nodules and ferrous stains	60	49.5		0.0
	SILTY SAND, light tan				0.0
10	SANDY CLAY, gray and red-brown SANDY CLAY, light gray and orange-brown, with sand pockets and partings, and ferrous stains	60	57.5		0.0
15	SANDY CLAY, light gray and tan - sandier with depth	60	57		0.0
20	SILTY SAND, light gray and brown				0.0
	SANDY CLAY, brown, tan and gray				0.0
	SANDY SILT, light brown and light gray, with silty clay layers, wet	60	58		0.0
	SILTY SAND, light brown and light green-gray				0.0
25	CLAY, red-brown and light gray	24	24		0.0
	SAND				0.0
	Termination depth = 27'				
	Notes:				
30	1. Background Air PID = 0.0ppm 2. Empty Sample Bag Air PID = 0.0ppm 3. Temporary Monitor Well installed to 27' with 15' screen 4. Water Sample collected at 10:45				

BORING DRILLED TO **27** FEET WITHOUT DRILLING FLUID
WATER ENCOUNTERED AT **21.25** FEET WHILE DRILLING
WATER LEVEL AT **21.31** FEET AFTER **1/4-HR**
DRILLED BY **ENVIROTECH** CHECKED BY **RJM** LOGGED BY **RJM**

PROJECT NO. E101-17

AVLES ENGINEERING CORP. GEOTECHNICAL ENGINEERS

PROJECT: **Memorial Drive Reconstruction, ESA-II** BORING **B-6**

COH WBS No. **N-T17000-031B-4** DRILL METHOD **Direct Push** DATE **5/26/17**

GPS COORDINATES:
N 29.76636
W 95.55680

DEPTH IN FEET	SOIL DESCRIPTION	PUSHED INTERVAL (IN.)	PUSH RECOVERY (IN.)	SAMPLE INTERVAL	P.I.D. READING (PPM) PARTS PER MILLION
0	PAVEMENT (11" AC) and BASE				
	SILTY SANDY CLAY, tan and gray, with calcareous nodules and silt partings	46	36		0.0
					0.0
					0.8
5	SANDY CLAY, green-gray and gray				0.0
	CLAY, light gray and tan, with calcareous nodules, ferrous stains, and some sand	60	58		0.0
					0.1
					0.0
10	SANDY CLAY, tan and gray, with ferrous nodules				0.1
	SANDY CLAY and CLAYEY SAND, light gray, with ferrous stains				0.0
	SANDY CLAY, orange-brown, black and tan, with ferrous stains and nodules	60	58		0.1
					0.0
					0.0
15	SANDY CLAY, light gray, with calcareous material and calcareous nodules				0.0
					0.0
		60	57		0.1
					0.0
					0.1
20					0.2
	CLAYEY SANDY SILT, light gray ▽				1.5
	Interlayered SILTY SAND and CLAYEY SAND, wet	60	NR		1.3
					0.1
					0.9
	CLAY, light gray and orange-brown				0.2
25	SILTY SAND, light gray	12			0.9
	Termination depth = 26'				
	Notes:				
	1. NR--Not Recorded				
	2. Background Air PID = 0.0 - 0.2ppm				
	3. Empty Sample Bag Air PID = 0.0ppm				
30					

BORING DRILLED TO **26** FEET WITHOUT DRILLING FLUID
WATER ENCOUNTERED AT **21.58** FEET WHILE DRILLING ▽
WATER LEVEL AT **DRY** FEET AFTER **1/4-HR** ▼
DRILLED BY **ENVIROTECH** CHECKED BY **RJM** LOGGED BY **RJM**

PROJECT NO. E101-17

APPENDIX D

SUMMARY OF LABORATORY SAMPLE ANALYSIS RESULTS

TABLE 2
Summary of Soil Laboratory Analysis Results
Phase II Environmental Site Assessment
Memorial Drive Reconstruction

Soil Boring	Sample Interval (feet bgs[1])	BTEX, MTBE, AND TPH CONTAMINANT CONCENTRATIONS IN SOIL SAMPLES									
		Benzene mg/Kg[2]	Toluene mg/Kg	Ethyl-benzene mg/Kg	m- & p-Xylenes mg/Kg	o- Xylenes mg/Kg	Total Xylenes mg/Kg	MTBE mg/Kg	TPH C6-C12 mg/Kg	TPH >C12-C28 mg/Kg	TPH >C28-C35 mg/Kg
B-1	14 to 15	U[3], <0.001	U, <0.001	U, <0.001	U, <0.001	U, <0.001	U, <0.001	U, <0.003	U, <27.1	U, <23.3	U, <17.7
B-2	23 to 24	U, <0.001	U, <0.001	U, <0.001	U, <0.001	U, <0.001	U, <0.001	U, <0.003	U, <30.7	U, <26.3	U, <22.9
B-3	21 to 22	U, <0.0006	U, <0.001	U, <0.0006	U, <0.0006	U, <0.0006	U, <0.0006	U, <0.002	U, <27.2	U, <23.3	U, <20.3

Soil Boring	Sample Interval (feet bgs[1])	VOLATILE ORGANIC COMPOUNDS AND TPH CONTAMINANT CONCENTRATIONS IN SOIL SAMPLES			
		Volatile Organic Compounds mg/Kg	TPH C6-C12 mg/Kg	TPH >C12-C28 mg/Kg	TPH >C28-C35 mg/Kg
B-4	25 to 26	Nondetected; various detection limits (see laboratory report for detection limits)	U, <29.2	U, <25	U, <21.8
B-5	11 to 12	Nondetected; various detection limits (see laboratory report for detection limits)	U, <27	U, <23.1	U, <20.2
B-6	20 to 22	Nondetected; various detection limits (see laboratory report for detection limits)	U, <27.4	U, <23.4	U, <20.4

[1]bgs = below ground surface.

[2]mg/Kg = milligrams per Kilograms.

[3] U = Undetected at laboratory detection limit shown.

TABLE 3
Phase II Environmental Site Assessment
Memorial Drive Reconstruction

Soil Boring/ Temporary Well[1]	Depth Groundwater Encountered During Drilling (feet below ground surface)	CONTAMINANT CONCENTRATIONS IN GROUNDWATER SAMPLES									
		Benzene mg/L[2]	Toluene mg/L	Ethyl-benzene mg/L	m-&p-Xylenes	o-Xylenes	Total Xylenes mg/L	MTBE mg/L	TPH C6-C12 mg/L	TPH >C12-C28 mg/L	TPH >C28-C35 mg/L
B-2	Dry, but at 25.66 one half hour after drilling	**0.277**	**0.014**	U[3], <0.001	**0.015**	U, <0.001	**0.015**	**0.025**	U, <0.601	U, <0.783	U, <0.683

Soil Boring/ Temporary Well[1]	Depth Groundwater Encountered During Drilling (feet below ground surface)	CONTAMINANT CONCENTRATIONS IN GROUNDWATER SAMPLES			
		Volatile Organic Compounds mg/L	TPH C6-C12 mg/L	TPH >C12-C28 mg/L	TPH >C28-C35 mg/L
B-5	21.25	Nondetected; various detection limits (see laboratory report for detection limits)	U <0.618	U, <0.805	U, <0.702

[1]Refer to Boring Location Plan in Figure 2

[2]mg/L = milligrams per liter or parts per million.

[3]U = Undetected at sample detection limit shown.

0.277= Concentration exceeds laboratory detection limit.

APPENDIX E

ANALYTICAL LABORATORY REPORTS AND QUALITY ASSURANCE AND QUALITY CONTROL DOCUMENTATION

Laboratory Analysis Report

Total Number of Pages: 34

Job ID : 17051752

10100 East Freeway, Suite 100, Houston, TX 77029 tel: 713-453-6060, fax: 713-453-6091, http://www.ablabs.com

Client Project Name :
Memorial Reconstruction, Houston

Report To :	Client Name:	Aviles Engineering	P.O.#.:
	Attn:	Robert J. Metzger	Sample Collected By: Robert J. Metzger
	Client Address:	5790 Windfern	Date Collected: 05/25/17
	City, State, Zip:	Houston, Texas, 77041	

A&B Labs has analyzed the following samples...

Client Sample ID	Matrix	A&B Sample ID
B-1 14-15	Soil	17051752.01
B-2 23-24	Soil	17051752.02
B-2 Water	Water	17051752.03
B-3 21-22	Soil	17051752.04
B-4 25-26	Soil	17051752.05

Shantall Carpenter

Released By: Shantall Carpenter
Title: Senior Project Manager
Date: 6/5/2017

This Laboratory is NELAP (T104704213-17-16) accredited. Effective: 4/1/2017; Expires: 3/31/2018
Scope: Non-Potable Water, Drinking Water, Air, Solid, Biological Tissue, Hazardous Waste

I am the laboratory manager, or his/her designee, and I am responsible for the release of this data package. This laboratory data package has been reviewed and is complete and technically compliant with the requirements of the methods used, except where noted in the attached exception reports. I affirm, to the best of my knowledge that all problems/anomalies observed by this laboratory (and if applicable, any and all laboratories subcontracted through this laboratory) that might affect the quality of the data, have been identified in the Laboratory Review Checklist, and that no information or data have been knowingly withheld that would affect the quality of the data.

Date Received : 05/26/2017 12:45

LABORATORY TEST RESULTS

Client Sample ID: B-1 14-15
A&B Job Sample ID: 17051752.01

Date: 6/5/2017

Client Name:	Aviles Engineering
Project Name:	Memorial Reconstruction, Houston

Attn: Robert J. Metzger

Test Description:	**% Moisture**	Sample Matrix	Soil
Analytical Method:	SM 2540G	Date Collected	05/25/2017 10:10
QC Batch ID:	Qb17060177	Date Received	05/26/2017 12:45
Prep Method:	SM 2540G	Date Prepared	06/01/2017 11:45
Prepared By:	SRGade		
Prep Batch ID	PB17060156		
Analyst Initial	AJ	% Moisture	12.7

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture[1]	12.7					----	----	%	1	06/01/17 11:50

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-1 14-15
A&B Job Sample ID: 17051752.01

Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Robert J. Metzger
Project Name: Memorial Reconstruction, Houston

Test Description:		Sample Matrix	Soil
Analytical Method:	SW-846 8260C	Date Collected	05/25/2017 10:10
QC Batch ID:	Qb17052904	Date Received	05/26/2017 12:45
Prep Method:	SW-846 5035A	Date Prepared	05/26/2017 15:30
Prepared By:	Jdongre		
Prep Batch ID	PB17052910		
Analyst Initial	JKD	% Moisture	12.7

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.05	mg/Kg	0.97	05/26/17 16:47
100-41-4	Ethylbenzene	< 0.001	U	0.001	0.006	0.001	0.005	0.05	mg/Kg	0.97	05/26/17 16:47
108-38-3&106-4	m- & p-Xylenes	< 0.001	U	0.001	0.011	0.001	0.01	0.1	mg/Kg	0.97	05/26/17 16:47
1634-04-4	MTBE	< 0.003	U	0.003	0.006	0.003	0.005	0.05	mg/Kg	0.97	05/26/17 16:47
95-47-6	o-Xylene	< 0.001	U	0.001	0.006	0.001	0.005	0.05	mg/Kg	0.97	05/26/17 16:47
108-88-3	Toluene	< 0.001	U	0.001	0.006	0.001	0.005	0.05	mg/Kg	0.97	05/26/17 16:47
1330-20-7	Xylenes	< 0.001	U	0.001	0.006	0.001	0.005	0.15	mg/Kg	0.97	05/26/17 16:47
17060-07-0	1,2-Dichloroethane-d4	105					70	130	%	0.97	05/26/17 16:47
1868-53-7	Dibromofluoromethan	97.6					70	130	%	0.97	05/26/17 16:47
2037-26-5	Toluene-d8(surr)	97.9					70	130	%	0.97	05/26/17 16:47
460-00-4	p-Bromofluorobenzen	98.8					70	130	%	0.97	05/26/17 16:47

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-1 14-15
A&B Job Sample ID: 17051752.01

Date: 6/5/2017

Client Name:	Aviles Engineering
Project Name:	Memorial Reconstruction, Houston

Attn: Robert J. Metzger

Test Description:	**Total Petroleum Hydrocarbons**	Sample Matrix	Soil
Analytical Method:	TX 1005	Date Collected	05/25/2017 10:10
QC Batch ID:	Qb17053109	Date Received	05/26/2017 12:45
Prep Method:	TX 1005	Date Prepared	05/27/2017 08:00
Prepared By:	VNair		
Prep Batch ID	PB17053110		
Analyst Initial	VMN	% Moisture	12.7

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12[1]	< 27.1	U	27.1	28.6	23.7	25	1000	mg/Kg	1	05/27/17 19:49
TPH-1005-2	>C12-C28[1]	< 23.3	U	23.3	28.6	20.3	25	1000	mg/Kg	1	05/27/17 19:49
TPH-1005-4	>C28-C35[1]	< 20.3	U	20.3	28.6	17.7	25	1000	mg/Kg	1	05/27/17 19:49
	Total C6-C35	<					----	----	mg/Kg	1	05/27/17 19:49
111-85-3	1-Chlorooctane(surr)	106					60	143	%	1	05/27/17 19:49
3386-33-2	Chlorooctadecane(sur	105					60	150	%	1	05/27/17 19:49

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-2 23-24
A&B Job Sample ID: 17051752.02

Date: 6/5/2017

Client Name:	Aviles Engineering	Attn: Robert J. Metzger
Project Name:	Memorial Reconstruction, Houston	

Test Description:	**% Moisture**	Sample Matrix	Soil
Analytical Method:	SM 2540G	Date Collected	05/25/2017 13:45
QC Batch ID:	Qb17060177	Date Received	05/26/2017 12:45
Prep Method:	SM 2540G	Date Prepared	06/01/2017 11:45
Prepared By:	SRGade		
Prep Batch ID	PB17060156		
Analyst Initial	AJ	% Moisture	22.7

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture[1]	22.7					----	----	%	1	06/01/17 11:50

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-2 23-24
A&B Job Sample ID: 17051752.02

Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Robert J. Metzger
Project Name: Memorial Reconstruction, Houston

Test Description:		Sample Matrix	Soil
Analytical Method:	SW-846 8260C	Date Collected	05/25/2017 13:45
QC Batch ID:	Qb17052904	Date Received	05/26/2017 12:45
Prep Method:	SW-846 5035A	Date Prepared	05/26/2017 15:30
Prepared By:	Jdongre		
Prep Batch ID	PB17052910		
Analyst Initial	JKD	% Moisture	22.7

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
71-43-2	Benzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.82	05/26/17 17:20
100-41-4	Ethylbenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.82	05/26/17 17:20
108-38-3&106-4	m- & p-Xylenes	< 0.001	U	0.001	0.011	0.001	0.01	0.1	mg/Kg	0.82	05/26/17 17:20
1634-04-4	MTBE	< 0.003	U	0.003	0.005	0.003	0.005	0.05	mg/Kg	0.82	05/26/17 17:20
95-47-6	o-Xylene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.82	05/26/17 17:20
108-88-3	Toluene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.82	05/26/17 17:20
1330-20-7	Xylenes	< 0.001	U	0.001	0.005	0.001	0.005	0.15	mg/Kg	0.82	05/26/17 17:20
17060-07-0	1,2-Dichloroethane-d4	108					70	130	%	0.82	05/26/17 17:20
1868-53-7	Dibromofluoromethan	99.7					70	130	%	0.82	05/26/17 17:20
2037-26-5	Toluene-d8(surr)	96.8					70	130	%	0.82	05/26/17 17:20
460-00-4	p-Bromofluorobenzen	98.4					70	130	%	0.82	05/26/17 17:20

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-2 23-24
A&B Job Sample ID: 17051752.02

Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Robert J. Metzger
Project Name: Memorial Reconstruction, Houston

Test Description:	**Total Petroleum Hydrocarbons**	Sample Matrix	Soil
Analytical Method:	TX 1005	Date Collected	05/25/2017 13:45
QC Batch ID:	Qb17053109	Date Received	05/26/2017 12:45
Prep Method:	TX 1005	Date Prepared	05/27/2017 08:00
Prepared By:	VNair		
Prep Batch ID	PB17053110		
Analyst Initial	VMN	% Moisture	22.7

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12[1]	< 30.7	U	30.7	32.3	23.7	25	1000	mg/Kg	1	05/27/17 22:45
TPH-1005-2	>C12-C28[1]	< 26.3	U	26.3	32.3	20.3	25	1000	mg/Kg	1	05/27/17 22:45
TPH-1005-4	>C28-C35[1]	< 22.9	U	22.9	32.3	17.7	25	1000	mg/Kg	1	05/27/17 22:45
	Total C6-C35	<					----	----	mg/Kg	1	05/27/17 22:45
111-85-3	1-Chlorooctane(surr)	111					60	143	%	1	05/27/17 22:45
3386-33-2	Chlorooctadecane(sur	110					60	150	%	1	05/27/17 22:45

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-2 Water
A&B Job Sample ID: 17051752.03

Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Robert J. Metzger
Project Name: Memorial Reconstruction, Houston

Test Description:	**Volatile Organic Compounds**	Sample Matrix	Water
Analytical Method:	SW-846 8260C	Date Collected	05/25/2017 14:00
QC Batch ID:	Qb17053157	Date Received	05/26/2017 12:45
Prep Method:	SW-846 5030C	Date Prepared	05/26/2017 16:00
Prepared By:	Jdongre		
Prep Batch ID	PB17053147		
Analyst Initial	JKD	% Moisture	

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
71-43-2	Benzene	0.277		0.01	0.05	0.001	0.005	0.05	mg/L	10	05/31/17 18:16
100-41-4	Ethylbenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/27/17 06:34
108-38-3&106-4	m- & p-Xylenes	0.015		0.002	0.01	0.002	0.01	0.1	mg/L	1	05/27/17 06:34
1634-04-4	MTBE	0.025		0.001	0.005	0.001	0.005	0.05	mg/L	1	05/27/17 06:34
95-47-6	o-Xylene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/27/17 06:34
108-88-3	Toluene	0.014		0.001	0.005	0.001	0.005	0.05	mg/L	1	05/27/17 06:34
1330-20-7	Xylenes	0.015		0.002	0.015	0.002	0.015	0.15	mg/L	1	05/27/17 06:34
17060-07-0	1,2-Dichloroethane-d4	106					70	130	%	1	05/27/17 06:34
1868-53-7	Dibromofluoromethan	99.1					70	130	%	1	05/27/17 06:34
2037-26-5	Toluene-d8(surr)	99.3					70	130	%	1	05/27/17 06:34
460-00-4	p-Bromofluorobenzen	101					70	130	%	1	05/27/17 06:34

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-2 Water
A&B Job Sample ID: 17051752.03

Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Robert J. Metzger
Project Name: Memorial Reconstruction, Houston

Test Description:	**Total Petroleum Hydrocarbons**	Sample Matrix	Water
Analytical Method:	TX 1005	Date Collected	05/25/2017 14:00
QC Batch ID:	Qb17053056	Date Received	05/26/2017 12:45
Prep Method:	TX 1005	Date Prepared	05/26/2017 14:00
Prepared By:	VNair		
Prep Batch ID	PB17053066		
Analyst Initial	VMN	% Moisture	

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12[1]	< 0.601	U	0.601	1.37	0.66	1.5	60	mg/L	0.91	05/27/17 23:11
TPH-1005-2	>C12-C28[1]	< 0.783	U	0.783	1.37	0.86	1.5	60	mg/L	0.91	05/27/17 23:11
TPH-1005-4	>C28-C35[1]	< 0.683	U	0.683	1.37	0.75	1.5	60	mg/L	0.91	05/27/17 23:11
	Total C6-C35	<					----	----	mg/L	0.91	05/27/17 23:11
111-85-3	1-Chlorooctane(surr)	80.3					59	122	%	0.91	05/27/17 23:11
3386-33-2	Chlorooctadecane(sur	106					48	123	%	0.91	05/27/17 23:11

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-3 21-22
A&B Job Sample ID: 17051752.04

Date: 6/5/2017

Client Name:	Aviles Engineering
Project Name:	Memorial Reconstruction, Houston

Attn: Robert J. Metzger

Test Description:	**% Moisture**	Sample Matrix	Soil
Analytical Method:	SM 2540G	Date Collected	05/25/2017 12:04
QC Batch ID:	Qb17060177	Date Received	05/26/2017 12:45
Prep Method:	SM 2540G	Date Prepared	06/01/2017 11:45
Prepared By:	SRGade		
Prep Batch ID	PB17060156		
Analyst Initial	AJ	% Moisture	12.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture[1]	12.8					----	----	%	1	06/01/17 11:50

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-3 21-22
A&B Job Sample ID: 17051752.04

Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Robert J. Metzger
Project Name: Memorial Reconstruction, Houston

Test Description:		Sample Matrix	Soil
Analytical Method:	SW-846 8260C	Date Collected	05/25/2017 12:04
QC Batch ID:	Qb17052904	Date Received	05/26/2017 12:45
Prep Method:	SW-846 5035A	Date Prepared	05/26/2017 15:30
Prepared By:	Jdongre		
Prep Batch ID	PB17052910		
Analyst Initial	JKD	% Moisture	12.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
71-43-2	Benzene	< 0.0006	U	0.0006	0.003	0.001	0.005	0.05	mg/Kg	0.52	05/26/17 17:53
100-41-4	Ethylbenzene	< 0.0006	U	0.0006	0.003	0.001	0.005	0.05	mg/Kg	0.52	05/26/17 17:53
108-38-3&106-4	m- & p-Xylenes	< 0.0006	U	0.0006	0.006	0.001	0.01	0.1	mg/Kg	0.52	05/26/17 17:53
1634-04-4	MTBE	< 0.002	U	0.002	0.003	0.003	0.005	0.05	mg/Kg	0.52	05/26/17 17:53
95-47-6	o-Xylene	< 0.0006	U	0.0006	0.003	0.001	0.005	0.05	mg/Kg	0.52	05/26/17 17:53
108-88-3	Toluene	< 0.0006	U	0.0006	0.003	0.001	0.005	0.05	mg/Kg	0.52	05/26/17 17:53
1330-20-7	Xylenes	< 0.0006	U	0.0006	0.003	0.001	0.005	0.15	mg/Kg	0.52	05/26/17 17:53
17060-07-0	1,2-Dichloroethane-d4	111					70	130	%	0.52	05/26/17 17:53
1868-53-7	Dibromofluoromethan	102					70	130	%	0.52	05/26/17 17:53
2037-26-5	Toluene-d8(surr)	96.8					70	130	%	0.52	05/26/17 17:53
460-00-4	p-Bromofluorobenzen	98.9					70	130	%	0.52	05/26/17 17:53

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-3 21-22
A&B Job Sample ID: 17051752.04

Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Robert J. Metzger
Project Name: Memorial Reconstruction, Houston

Test Description:	**Total Petroleum Hydrocarbons**	Sample Matrix	Soil
Analytical Method:	TX 1005	Date Collected	05/25/2017 12:04
QC Batch ID:	Qb17053109	Date Received	05/26/2017 12:45
Prep Method:	TX 1005	Date Prepared	05/27/2017 08:00
Prepared By:	VNair		
Prep Batch ID	PB17053110		
Analyst Initial	VMN	% Moisture	12.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12[1]	< 27.2	U	27.2	28.7	23.7	25	1000	mg/Kg	1	05/27/17 23:20
TPH-1005-2	>C12-C28[1]	< 23.3	U	23.3	28.7	20.3	25	1000	mg/Kg	1	05/27/17 23:20
TPH-1005-4	>C28-C35[1]	< 20.3	U	20.3	28.7	17.7	25	1000	mg/Kg	1	05/27/17 23:20
	Total C6-C35	<					----	----	mg/Kg	1	05/27/17 23:20
111-85-3	1-Chlorooctane(surr)	110					60	143	%	1	05/27/17 23:20
3386-33-2	Chlorooctadecane(sur	107					60	150	%	1	05/27/17 23:20

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-4 25-26
A&B Job Sample ID: 17051752.05
Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Robert J. Metzger
Project Name: Memorial Reconstruction, Houston

Test Description:	**% Moisture**	Sample Matrix	Soil
Analytical Method:	SM 2540G	Date Collected	05/25/2017 16:00
QC Batch ID:	Qb17060177	Date Received	05/26/2017 12:45
Prep Method:	SM 2540G	Date Prepared	06/01/2017 11:45
Prepared By:	SRGade		
Prep Batch ID	PB17060156		
Analyst Initial	AJ	% Moisture	18.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture[1]	18.8					----	----	%	1	06/01/17 11:50

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-4 25-26
A&B Job Sample ID: 17051752.05
Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Robert J. Metzger
Project Name: Memorial Reconstruction, Houston

Test Description:		Sample Matrix	Soil
Analytical Method:	SW-846 8260C	Date Collected	05/25/2017 16:00
QC Batch ID:	Qb17052904	Date Received	05/26/2017 12:45
Prep Method:	SW-846 5035A	Date Prepared	05/26/2017 15:30
Prepared By:	Jdongre		
Prep Batch ID	PB17052910		
Analyst Initial	JKD	% Moisture	18.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
630-20-6	1,1,1,2-Tetrachloroet	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
71-55-6	1,1,1-Trichloroethane	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
79-34-5	1,1,2,2-Tetrachloroet	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
79-00-5	1,1,2-Trichloroethane	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
75-34-3	1,1-Dichloroethane	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
75-35-4	1,1-Dichloroethylene	< 0.001	U,V11	0.001	0.003	0.002	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
563-58-6	1,1-Dichloropropene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
87-61-6	1,2,3-trichlorobenzen	< 0.001	U	0.001	0.003	0.002	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
96-18-4	1,2,3-Trichloropropan	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
120-82-1	1,2,4-Trichlorobenzen	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
95-63-6	1,2,4-Trimethylbenze	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
96-12-8	1,2-Dibromo-3-chloro	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
106-93-4	1,2-Dibromoethane	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
95-50-1	1,2-Dichlorobenzene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
107-06-2	1,2-Dichloroethane	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
78-87-5	1,2-Dichloropropane	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
108-67-8	1,3,5-Trimethylbenze	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
541-73-1	1,3-Dichlorobenzene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
142-28-9	1,3-Dichloropropane	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
106-46-7	1,4-Dichlorobenzene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
123-91-1	1,4-Dioxane	< 0.052	U	0.052	0.221	0.075	0.32	1.6	mg/Kg	0.56	05/26/17 18:26
594-20-7	2,2-Dichloropropane	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
95-49-8	2-Chlorotoluene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
106-43-4	4-Chlorotoluene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
99-87-6	4-Isopropyltoluene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
71-43-2	Benzene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
108-86-1	Bromobenzene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
74-97-5	Bromochloromethane	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
75-27-4	Bromodichloromethan	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
75-25-2	Bromoform	< 0.00034	U	0.00034	0.003	0.0005	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
74-83-9	Bromomethane	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
75-15-0	Carbon disulfide	< 0.001	U,V11	0.001	0.003	0.002	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
56-23-5	Carbon tetrachloride	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
108-90-7	Chlorobenzene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
75-00-3	Chloroethane	< 0.002	U	0.002	0.003	0.003	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
67-66-3	Chloroform	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-4 25-26
A&B Job Sample ID: 17051752.05
Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Robert J. Metzger
Project Name: Memorial Reconstruction, Houston

Test Description:		Sample Matrix	Soil
Analytical Method:	SW-846 8260C	Date Collected	05/25/2017 16:00
QC Batch ID:	Qb17052904	Date Received	05/26/2017 12:45
Prep Method:	SW-846 5035A	Date Prepared	05/26/2017 15:30
Prepared By:	Jdongre		
Prep Batch ID	PB17052910		
Analyst Initial	JKD	% Moisture	18.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
74-87-3	Chloromethane	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
156-59-2	cis-1,2-Dichloroethyle	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
10061-01-5	cis-1,3-Dichloroprope	< 0.00028	U	0.00028	0.003	0.0004	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
124-48-1	Dibromochloromethan	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
74-95-3	Dibromomethane	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
75-71-8	Dichlorodifluorometha	< 0.001	U	0.001	0.003	0.002	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
100-41-4	Ethylbenzene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
98-82-8	Isopropylbenzene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
108-38-3&106-4	m- & p-Xylenes	< 0.00069	U	0.00069	0.007	0.001	0.01	0.1	mg/Kg	0.56	05/26/17 18:26
78-93-3	MEK	< 0.001	U	0.001	0.003	0.002	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
75-09-2	Methylene chloride	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
1634-04-4	MTBE	< 0.002	U	0.002	0.003	0.003	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
91-20-3	Naphthalene	< 0.00028	U	0.00028	0.003	0.0004	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
104-51-8	n-Butylbenzene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
103-65-1	n-Propylbenzene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
95-47-6	o-Xylene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
135-98-8	sec-Butylbenzene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
100-42-5	Styrene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
98-06-6	t-butylbenzene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
127-18-4	Tetrachloroethylene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
108-88-3	Toluene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
156-60-5	trans-1,2-Dichloroethy	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
10061-02-6	trans-1,3-Dichloropro	< 0.00028	U	0.00028	0.003	0.0004	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
79-01-6	Trichloroethylene	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
75-69-4	Trichlorofluoromethan	< 0.00069	U,V11	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
75-01-4	Vinyl Chloride	< 0.00069	U	0.00069	0.003	0.001	0.005	0.05	mg/Kg	0.56	05/26/17 18:26
1330-20-7	Xylenes	< 0.00069	U	0.00069	0.003	0.001	0.005	0.15	mg/Kg	0.56	05/26/17 18:26
17060-07-0	1,2-Dichloroethane-d4	112					70	130	%	0.56	05/26/17 18:26
1868-53-7	Dibromofluoromethan	102					70	130	%	0.56	05/26/17 18:26
2037-26-5	Toluene-d8(surr)	95.8					70	130	%	0.56	05/26/17 18:26
460-00-4	p-Bromofluorobenzen	100					70	130	%	0.56	05/26/17 18:26

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-4 25-26
A&B Job Sample ID: 17051752.05
Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Robert J. Metzger
Project Name: Memorial Reconstruction, Houston

Test Description:	**Total Petroleum Hydrocarbons**	Sample Matrix	Soil
Analytical Method:	TX 1005	Date Collected	05/25/2017 16:00
QC Batch ID:	Qb17053109	Date Received	05/26/2017 12:45
Prep Method:	TX 1005	Date Prepared	05/27/2017 08:00
Prepared By:	VNair		
Prep Batch ID	PB17053110		
Analyst Initial	VMN	% Moisture	18.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12[1]	< 29.2	U	29.2	30.8	23.7	25	1000	mg/Kg	1	05/27/17 23:55
TPH-1005-2	>C12-C28[1]	< 25	U	25	30.8	20.3	25	1000	mg/Kg	1	05/27/17 23:55
TPH-1005-4	>C28-C35[1]	< 21.8	U	21.8	30.8	17.7	25	1000	mg/Kg	1	05/27/17 23:55
	Total C6-C35	<					----	----	mg/Kg	1	05/27/17 23:55
111-85-3	1-Chlorooctane(surr)	108					60	143	%	1	05/27/17 23:55
3386-33-2	Chlorooctadecane(sur	106					60	150	%	1	05/27/17 23:55

Soil results reported on dry weight basis
[1]-Parameter not available for accreditation

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method :** SW-846 8260C **Reporting Units :** mg/Kg

QC Batch ID : Qb17052904 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051752.01,02,04,05

Sample Preparation : PB17052910 **Prep Method :** SW-846 5035A **Prep Date :** 05/26/17 15:30 **Prep By :** Jdongre

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
1,1,1,2-Tetrachloroethane	630-20-6	< MDL	mg/Kg	1	0.005	0.001		
1,1,1-Trichloroethane	71-55-6	< MDL	mg/Kg	1	0.005	0.001		
1,1,2,2-Tetrachloroethane	79-34-5	< MDL	mg/Kg	1	0.005	0.001		
1,1,2-Trichloroethane	79-00-5	< MDL	mg/Kg	1	0.005	0.001		
1,1-Dichloroethane	75-34-3	< MDL	mg/Kg	1	0.005	0.001		
1,1-Dichloroethylene	75-35-4	< MDL	mg/Kg	1	0.005	0.002		
1,1-Dichloropropene	563-58-6	< MDL	mg/Kg	1	0.005	0.001		
1,2,3-trichlorobenzene	87-61-6	< MDL	mg/Kg	1	0.005	0.002		
1,2,3-Trichloropropane	96-18-4	< MDL	mg/Kg	1	0.005	0.001		
1,2,4-Trichlorobenzene	120-82-1	< MDL	mg/Kg	1	0.005	0.001		
1,2,4-Trimethylbenzene	95-63-6	< MDL	mg/Kg	1	0.005	0.001		
1,2-Dibromo-3-chloropropa	96-12-8	< MDL	mg/Kg	1	0.005	0.001		
1,2-Dibromoethane	106-93-4	< MDL	mg/Kg	1	0.005	0.001		
1,2-Dichlorobenzene	95-50-1	< MDL	mg/Kg	1	0.005	0.001		
1,2-Dichloroethane	107-06-2	< MDL	mg/Kg	1	0.005	0.001		
1,2-Dichloropropane	78-87-5	< MDL	mg/Kg	1	0.005	0.001		
1,3,5-Trimethylbenzene	108-67-8	< MDL	mg/Kg	1	0.005	0.001		
1,3-Dichlorobenzene	541-73-1	< MDL	mg/Kg	1	0.005	0.001		
1,3-Dichloropropane	142-28-9	< MDL	mg/Kg	1	0.005	0.001		
1,4-Dichlorobenzene	106-46-7	< MDL	mg/Kg	1	0.005	0.001		
1,4-Dioxane	123-91-1	< MDL	mg/Kg	1	0.32	0.075		
2,2-Dichloropropane	594-20-7	< MDL	mg/Kg	1	0.005	0.001		
2-Chlorotoluene	95-49-8	< MDL	mg/Kg	1	0.005	0.001		
4-Chlorotoluene	106-43-4	< MDL	mg/Kg	1	0.005	0.001		
4-Isopropyltoluene	99-87-6	< MDL	mg/Kg	1	0.005	0.001		
Benzene	71-43-2	< MDL	mg/Kg	1	0.005	0.001		
Bromobenzene	108-86-1	< MDL	mg/Kg	1	0.005	0.001		
Bromochloromethane	74-97-5	< MDL	mg/Kg	1	0.005	0.001		
Bromodichloromethane	75-27-4	< MDL	mg/Kg	1	0.005	0.001		
Bromoform	75-25-2	< MDL	mg/Kg	1	0.005	0.0005		
Bromomethane	74-83-9	< MDL	mg/Kg	1	0.005	0.001		
Carbon disulfide	75-15-0	< MDL	mg/Kg	1	0.005	0.002		
Carbon tetrachloride	56-23-5	< MDL	mg/Kg	1	0.005	0.001		
Chlorobenzene	108-90-7	< MDL	mg/Kg	1	0.005	0.001		
Chloroethane	75-00-3	< MDL	mg/Kg	1	0.005	0.003		
Chloroform	67-66-3	< MDL	mg/Kg	1	0.005	0.001		
Chloromethane	74-87-3	< MDL	mg/Kg	1	0.005	0.001		
cis-1,2-Dichloroethylene	156-59-2	< MDL	mg/Kg	1	0.005	0.001		

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method :** SW-846 8260C **Reporting Units :** mg/Kg

QC Batch ID : Qb17052904 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051752.01,02,04,05

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
cis-1,3-Dichloropropene	10061-01-5	< MDL	mg/Kg	1	0.005	0.0004		
Dibromochloromethane	124-48-1	< MDL	mg/Kg	1	0.005	0.001		
Dibromomethane	74-95-3	< MDL	mg/Kg	1	0.005	0.001		
Dichlorodifluoromethane	75-71-8	< MDL	mg/Kg	1	0.005	0.002		
Ethylbenzene	100-41-4	< MDL	mg/Kg	1	0.005	0.001		
Isopropylbenzene	98-82-8	< MDL	mg/Kg	1	0.005	0.001		
m- & p-Xylenes	108-38-3&106-42-3	< MDL	mg/Kg	1	0.01	0.001		
MEK	78-93-3	< MDL	mg/Kg	1	0.005	0.002		
Methylene chloride	75-09-2	< MDL	mg/Kg	1	0.005	0.001		
MTBE	1634-04-4	< MDL	mg/Kg	1	0.005	0.003		
Naphthalene	91-20-3	< MDL	mg/Kg	1	0.005	0.0004		
n-Butylbenzene	104-51-8	< MDL	mg/Kg	1	0.005	0.001		
n-Propylbenzene	103-65-1	< MDL	mg/Kg	1	0.005	0.001		
o-Xylene	95-47-6	< MDL	mg/Kg	1	0.005	0.001		
sec-Butylbenzene	135-98-8	< MDL	mg/Kg	1	0.005	0.001		
Styrene	100-42-5	< MDL	mg/Kg	1	0.005	0.001		
t-butylbenzene	98-06-6	< MDL	mg/Kg	1	0.005	0.001		
Tetrachloroethylene	127-18-4	< MDL	mg/Kg	1	0.005	0.001		
Toluene	108-88-3	< MDL	mg/Kg	1	0.005	0.001		
trans-1,2-Dichloroethylene	156-60-5	< MDL	mg/Kg	1	0.005	0.001		
trans-1,3-Dichloropropene	10061-02-6	< MDL	mg/Kg	1	0.005	0.0004		
Trichloroethylene	79-01-6	< MDL	mg/Kg	1	0.005	0.001		
Trichlorofluoromethane	75-69-4	< MDL	mg/Kg	1	0.005	0.001		
Vinyl Chloride	75-01-4	< MDL	mg/Kg	1	0.005	0.001		
Xylenes	1330-20-7	< MDL	mg/Kg	1	0.005	0.001		
Dibromofluoromethane(surr	1868-53-7	97.6	%	1				
1,2-Dichloroethane-d4(surr	17060-07-0	103	%	1				
Toluene-d8(surr)	2037-26-5	97.5	%	1				
p-Bromofluorobenzene(surr	460-00-4	98.9	%	1				

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
1,1,1,2-Tetrachloroethane	0.02	0.021	105	0.02	0.022	110	4.7	30	71.4-131	
1,1,1-Trichloroethane	0.02	0.021	105	0.02	0.021	105	0.0	30	69.6-140	
1,1,2,2-Tetrachloroethane	0.02	0.021	105	0.02	0.021	105	0.0	30	66.6-128	
1,1,2-Trichloroethane	0.02	0.021	105	0.02	0.021	105	0.0	30	72.8-125	
1,1-Dichloroethane	0.02	0.02	100	0.02	0.021	105	4.9	30	72.7-129	
1,1-Dichloroethylene	0.02	0.014	70	0.02	0.014	70	0.0	30	71.4-131	L2

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/Kg**

QC Batch ID : Qb17052904 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051752.01,02,04,05

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
1,1-Dichloropropene	0.02	0.02	100	0.02	0.02	100	0.0	30	75.9-132	
1,2,3-trichlorobenzene	0.02	0.023	115	0.02	0.023	115	0.0	30	56.7-153	
1,2,3-Trichloropropane	0.02	0.02	100	0.02	0.02	100	0.0	30	61.6-138	
1,2,4-Trichlorobenzene	0.02	0.023	115	0.02	0.023	115	0.0	30	55.9-150	
1,2,4-Trimethylbenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	71.1-131	
1,2-Dibromo-3-chloropropa	0.02	0.022	110	0.02	0.022	110	0.0	30	52.4-150	
1,2-Dibromoethane	0.02	0.022	110	0.02	0.022	110	0.0	30	72.9-125	
1,2-Dichlorobenzene	0.02	0.022	110	0.02	0.022	110	0.0	30	76.1-126	
1,2-Dichloroethane	0.02	0.022	110	0.02	0.021	105	4.7	30	66.4-134	
1,2-Dichloropropane	0.02	0.021	105	0.02	0.021	105	0.0	30	70.2-128	
1,3,5-Trimethylbenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	75.1-127	
1,3-Dichlorobenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	73.9-126	
1,3-Dichloropropane	0.02	0.02	100	0.02	0.021	105	4.9	30	68.3-124	
1,4-Dichlorobenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	72.3-127	
1,4-Dioxane	0.64	0.705	110	0.64	0.695	109	1.4	30	80-120	
2,2-Dichloropropane	0.02	0.022	110	0.02	0.022	110	0.0	30	68.5-138	
2-Chlorotoluene	0.02	0.02	100	0.02	0.02	100	0.0	30	71.7-128	
4-Chlorotoluene	0.02	0.021	105	0.02	0.021	105	0.0	30	72.2-126	
4-Isopropyltoluene	0.02	0.022	110	0.02	0.022	110	0.0	30	77.5-125	
Benzene	0.02	0.021	105	0.02	0.02	100	4.9	30	74-126	
Bromobenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	73.3-129	
Bromochloromethane	0.02	0.02	100	0.02	0.02	100	0.0	30	68.8-131	
Bromodichloromethane	0.02	0.021	105	0.02	0.022	110	4.7	30	69-135	
Bromoform	0.02	0.022	110	0.02	0.022	110	0.0	30	62-146	
Bromomethane	0.02	0.02	100	0.02	0.02	100	0.0	30	58.7-139	
Carbon disulfide	0.02	0.013	65	0.02	0.013	65	0.0	30	80-120	L2
Carbon tetrachloride	0.02	0.021	105	0.02	0.021	105	0.0	30	68.7-135	
Chlorobenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	73.3-129	
Chloroethane	0.02	0.019	95	0.02	0.02	100	5.1	30	66.2-129	
Chloroform	0.02	0.021	105	0.02	0.021	105	0.0	30	73.7-134	
Chloromethane	0.02	0.017	85	0.02	0.018	90	5.7	30	51.4-135	
cis-1,2-Dichloroethylene	0.02	0.02	100	0.02	0.02	100	0.0	30	72.4-132	
cis-1,3-Dichloropropene	0.02	0.022	110	0.02	0.022	110	0.0	30	67.7-134	
Dibromochloromethane	0.02	0.021	105	0.02	0.022	110	4.7	30	73.2-126	
Dibromomethane	0.02	0.022	110	0.02	0.022	110	0.0	30	69.9-134	
Dichlorodifluoromethane	0.02	0.019	95	0.02	0.019	95	0.0	30	36.8-144	
Ethylbenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	72.2-128	
Isopropylbenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	71.2-131	
m- & p-Xylenes	0.04	0.042	105	0.04	0.042	105	0.0	30	70.7-131	
MEK	0.02	0.02	100	0.02	0.021	105	4.9	30	52.5-152	
Methylene chloride	0.02	0.019	95	0.02	0.02	100	5.1	30	70.6-129	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/Kg**

QC Batch ID : Qb17052904 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051752.01,02,04,05

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
MTBE	0.02	0.021	105	0.02	0.022	110	4.7	30	80-120	
Naphthalene	0.02	0.022	110	0.02	0.023	115	4.4	30	60.7-145	
n-Butylbenzene	0.02	0.021	105	0.02	0.02	100	4.9	30	66.5-136	
n-Propylbenzene	0.02	0.02	100	0.02	0.02	100	0.0	30	73.3-126	
o-Xylene	0.02	0.021	105	0.02	0.021	105	0.0	30	71.6-130	
sec-Butylbenzene	0.02	0.021	105	0.02	0.02	100	4.9	30	77.9-124	
Styrene	0.02	0.022	110	0.02	0.022	110	0.0	30	71.1-131	
t-butylbenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	74.4-130	
Tetrachloroethylene	0.02	0.022	110	0.02	0.022	110	0.0	30	62.6-157	
Toluene	0.02	0.021	105	0.02	0.021	105	0.0	30	73.3-127	
trans-1,2-Dichloroethylene	0.02	0.02	100	0.02	0.02	100	0.0	30	80-120	
trans-1,3-Dichloropropene	0.02	0.022	110	0.02	0.022	110	0.0	30	71.5-124	
Trichloroethylene	0.02	0.022	110	0.02	0.022	110	0.0	30	69.2-133	
Trichlorofluoromethane	0.02	0.013	65	0.02	0.014	70	7.4	30	63.9-140	
Vinyl Chloride	0.02	0.019	95	0.02	0.019	95	0.0	30	40.9-159	
Xylenes	0.06	0.063	105	0.06	0.063	105	0.0	30	69.2-133	

QC Type: MS and MSD
QC Sample ID: 17051699.01

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
1,1,1,2-Tetrachloroethane	BRL	0.019	0.021	111						71.4-131	
1,1,1-Trichloroethane	BRL	0.019	0.021	111						69.6-140	
1,1,2,2-Tetrachloroethane	BRL	0.019	0.02	105						66.6-128	
1,1,2-Trichloroethane	BRL	0.019	0.02	105						72.8-125	
1,1-Dichloroethane	BRL	0.019	0.02	105						72.7-129	
1,1-Dichloroethylene	BRL	0.019	0.014	73.7						71.4-131	
1,1-Dichloropropene	BRL	0.019	0.019	100						75.9-132	
1,2,3-trichlorobenzene	BRL	0.019	0.019	100						56.7-153	
1,2,3-Trichloropropane	BRL	0.019	0.02	105						61.6-138	
1,2,4-Trichlorobenzene	BRL	0.019	0.018	94.7						55.9-150	
1,2,4-Trimethylbenzene	BRL	0.019	0.018	94.7						71.1-131	
1,2-Dibromo-3-chloropropa	BRL	0.019	0.021	111						52.4-150	
1,2-Dibromoethane	BRL	0.019	0.02	105						72.9-125	
1,2-Dichlorobenzene	BRL	0.019	0.019	100						76.1-126	
1,2-Dichloroethane	BRL	0.019	0.023	121						66.4-134	
1,2-Dichloropropane	BRL	0.019	0.02	105						70.2-128	
1,3,5-Trimethylbenzene	BRL	0.019	0.018	94.7						75.1-127	
1,3-Dichlorobenzene	BRL	0.019	0.018	94.7						73.9-126	
1,3-Dichloropropane	BRL	0.019	0.021	111						68.3-124	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/Kg**

QC Batch ID : Qb17052904 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051752.01,02,04,05

QC Type: MS and MSD
QC Sample ID: 17051699.01

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
1,4-Dichlorobenzene	BRL	0.019	0.018	94.7						72.3-127	
1,4-Dioxane	BRL	0.60	0.771	129						70-130	
2,2-Dichloropropane	BRL	0.019	0.016	84.2						68.5-138	
2-Chlorotoluene	BRL	0.019	0.018	94.7						71.7-128	
4-Chlorotoluene	BRL	0.019	0.018	94.7						72.2-126	
4-Isopropyltoluene	BRL	0.019	0.018	94.7						77.5-125	
Benzene	BRL	0.019	0.019	100						74-126	
Bromobenzene	BRL	0.019	0.019	100						73.3-129	
Bromochloromethane	BRL	0.019	0.02	105						68.8-131	
Bromodichloromethane	BRL	0.019	0.022	116						69-135	
Bromoform	BRL	0.019	0.023	121						62-146	
Bromomethane	BRL	0.019	0.017	89.5						58.7-139	
Carbon disulfide	BRL	0.019	0.013	68.4						70-130	M9
Carbon tetrachloride	BRL	0.019	0.022	116						68.7-135	
Chlorobenzene	BRL	0.019	0.019	100						73.3-129	
Chloroethane	BRL	0.019	0.02	105						66.2-129	
Chloroform	BRL	0.019	0.021	111						73.7-134	
Chloromethane	BRL	0.019	0.015	78.9						51.4-135	
cis-1,2-Dichloroethylene	BRL	0.019	0.019	100						72.4-132	
cis-1,3-Dichloropropene	BRL	0.019	0.018	94.7						67.7-134	
Dibromochloromethane	BRL	0.019	0.021	111						73.2-126	
Dibromomethane	BRL	0.019	0.022	116						69.9-134	
Dichlorodifluoromethane	BRL	0.019	0.019	100						36.8-144	
Ethylbenzene	BRL	0.019	0.019	100						72.2-128	
Isopropylbenzene	BRL	0.019	0.019	100						71.2-131	
m- & p-Xylenes	BRL	0.037	0.039	105						70.7-131	
MEK	BRL	0.019	0.02	105						52.5-152	
Methylene chloride	BRL	0.019	0.019	100						70.6-129	
MTBE	BRL	0.019	0.021	111						70-130	
Naphthalene	BRL	0.019	0.02	105						60.7-145	
n-Butylbenzene	BRL	0.019	0.017	89.5						66.5-136	
n-Propylbenzene	BRL	0.019	0.018	94.7						73.3-126	
o-Xylene	BRL	0.019	0.02	105						71.6-130	
sec-Butylbenzene	BRL	0.019	0.018	94.7						77.9-124	
Styrene	BRL	0.019	0.019	100						71.1-131	
t-butylbenzene	BRL	0.019	0.018	94.7						74.4-130	
Tetrachloroethylene	BRL	0.019	0.024	126						62.6-157	
Toluene	BRL	0.019	0.019	91.6						73.3-127	
trans-1,2-Dichloroethylene	BRL	0.019	0.019	100						70-130	
trans-1,3-Dichloropropene	BRL	0.019	0.017	89.5						71.5-124	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/Kg**

QC Batch ID : Qb17052904 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051752.01,02,04,05

QC Type: MS and MSD
QC Sample ID: 17051699.01

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
Trichloroethylene	BRL	0.019	0.02	105						69.2-133	
Trichlorofluoromethane	BRL	0.019	0.011	57.9						63.9-140	M9
Vinyl Chloride	BRL	0.019	0.018	94.7						40.9-159	
Xylenes	BRL	0.056	0.059	105						69.2-133	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : Total Petroleum Hydrocarbons **Method :** TX 1005 **Reporting Units :** mg/L

QC Batch ID : Qb17053056 **Created Date :** 05/26/17 **Created By :** VNair

Samples in This QC Batch : 17051752.03

Sample Preparation : PB17053066 **Prep Method :** TX 1005 **Prep Date :** 05/26/17 14:00 **Prep By :** VNair

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
C6-C12	TPH-1005-1	< MDL	mg/L	1	1.5	0.66		
>C12-C28	TPH-1005-2	< MDL	mg/L	1	1.5	0.86		
>C28-C35	TPH-1005-4	< MDL	mg/L	1	1.5	0.75		
Total C6-C35		< MDL	mg/L	1	----			
1-Chlorooctane(surr)	111-85-3	68.4	%	1				
Chlorooctadecane(surr)	3386-33-2	75.8	%	1				

QC Type: Duplicate

QC Sample ID: 17051602.03

Parameter	QCSample Result	Sample Result	Units	RPD	RPD CtrlLimit		Qual
>C12-C28	BRL	BRL	mg/L		30		
>C28-C35	BRL	BRL	mg/L		30		
C6-C12	BRL	BRL	mg/L		30		
Total C6-C35	BRL	BRL	mg/L		30		

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
C6-C12	30	32.3	108	30	35.6	119	9.7	20	75-125	
>C12-C28	30	32.7	109	30	34	113	3.9	20	75-125	
>C28-C35	30	34.9	116	30	34.9	116	0	20	75-125	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : Total Petroleum Hydrocarbons **Method : TX 1005** **Reporting Units : mg/Kg**

QC Batch ID : Qb17053109 **Created Date :** 05/27/17 **Created By :** VNair

Samples in This QC Batch : 17051752.01,02,04,05

Sample Preparation : PB17053110 **Prep Method :** TX 1005 **Prep Date :** 05/27/17 08:00 **Prep By :** VNair

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
C6-C12	TPH-1005-1	< MDL	mg/Kg	1	25	23.7		
>C12-C28	TPH-1005-2	< MDL	mg/Kg	1	25	20.3		
>C28-C35	TPH-1005-4	< MDL	mg/Kg	1	25	17.7		
Total C6-C35		< MDL	mg/Kg	1	----			
Chlorooctadecane(surr)	3386-33-2	105	%	1				
1-Chlorooctane(surr)	111-85-3	106	%	1				

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
C6-C12	500	606	121	500	623	125	2.8	20	75-125	
>C12-C28	500	584	117	500	585	117	0.2	20	75-125	
>C28-C35	500	575	115	500	579	116	0.7	20	75-125	

QC Type: MS and MSD
QC Sample ID: 17051692.01

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
C6-C12	BRL	500	604	121	500	579	116	4.2	20	75-125	
>C12-C28	BRL	500	593	119	500	598	120	0.8	20	75-125	
>C28-C35	BRL	500	569	114	500	552	110	3	20	75-125	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method :** SW-846 8260C **Reporting Units :** mg/L

QC Batch ID : Qb17053157 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051752.03

Sample Preparation : PB17053147 **Prep Method :** SW-846 5030C **Prep Date :** 05/26/17 16:00 **Prep By :** Jdongre

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
1,1,1,2-Tetrachloroethane	630-20-6	< MDL	mg/L	1	0.005	0.001		
1,1,1-Trichloroethane	71-55-6	< MDL	mg/L	1	0.005	0.001		
1,1,2,2-Tetrachloroethane	79-34-5	< MDL	mg/L	1	0.005	0.001		
1,1,2-Trichloroethane	79-00-5	< MDL	mg/L	1	0.005	0.001		
1,1-Dichloroethane	75-34-3	< MDL	mg/L	1	0.005	0.001		
1,1-Dichloroethylene	75-35-4	< MDL	mg/L	1	0.005	0.001		
1,1-Dichloropropene	563-58-6	< MDL	mg/L	1	0.005	0.001		
1,2,3-trichlorobenzene	87-61-6	< MDL	mg/L	1	0.005	0.001		
1,2,3-Trichloropropane	96-18-4	< MDL	mg/L	1	0.005	0.001		
1,2,4-Trichlorobenzene	120-82-1	< MDL	mg/L	1	0.005	0.001		
1,2,4-Trimethylbenzene	95-63-6	< MDL	mg/L	1	0.005	0.001		
1,2-Dibromo-3-chloropropa	96-12-8	< MDL	mg/L	1	0.005	0.001		
1,2-Dibromoethane	106-93-4	< MDL	mg/L	1	0.005	0.001		
1,2-Dichlorobenzene	95-50-1	< MDL	mg/L	1	0.005	0.001		
1,2-Dichloroethane	107-06-2	< MDL	mg/L	1	0.005	0.001		
1,2-Dichloropropane	78-87-5	< MDL	mg/L	1	0.005	0.001		
1,3,5-Trimethylbenzene	108-67-8	< MDL	mg/L	1	0.005	0.001		
1,3-Dichlorobenzene	541-73-1	< MDL	mg/L	1	0.005	0.001		
1,3-Dichloropropane	142-28-9	< MDL	mg/L	1	0.005	0.001		
1,4-Dichlorobenzene	106-46-7	< MDL	mg/L	1	0.005	0.001		
1,4-Dioxane	123-91-1	< MDL	mg/L	1	0.32	0.084		
2,2-Dichloropropane	594-20-7	< MDL	mg/L	1	0.005	0.001		
2-Chlorotoluene	95-49-8	< MDL	mg/L	1	0.005	0.001		
4-Chlorotoluene	106-43-4	< MDL	mg/L	1	0.005	0.001		
4-Isopropyltoluene	99-87-6	< MDL	mg/L	1	0.005	0.003		
Benzene	71-43-2	< MDL	mg/L	1	0.005	0.001		
Bromobenzene	108-86-1	< MDL	mg/L	1	0.005	0.001		
Bromochloromethane	74-97-5	< MDL	mg/L	1	0.005	0.001		
Bromodichloromethane	75-27-4	< MDL	mg/L	1	0.005	0.001		
Bromoform	75-25-2	< MDL	mg/L	1	0.005	0.001		
Bromomethane	74-83-9	< MDL	mg/L	1	0.005	0.002		
Carbon disulfide	75-15-0	< MDL	mg/L	1	0.005	0.001		
Carbon tetrachloride	56-23-5	< MDL	mg/L	1	0.005	0.001		
Chlorobenzene	108-90-7	< MDL	mg/L	1	0.005	0.001		
Chloroethane	75-00-3	< MDL	mg/L	1	0.005	0.001		
Chloroform	67-66-3	< MDL	mg/L	1	0.005	0.001		
Chloromethane	74-87-3	< MDL	mg/L	1	0.005	0.001		
cis-1,2-Dichloroethylene	156-59-2	< MDL	mg/L	1	0.005	0.001		

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/L**

QC Batch ID : Qb17053157 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051752.03

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL	Qual
cis-1,3-Dichloropropene	10061-01-5	< MDL	mg/L	1	0.005	0.001	
Dibromochloromethane	124-48-1	< MDL	mg/L	1	0.005	0.001	
Dibromomethane	74-95-3	< MDL	mg/L	1	0.005	0.001	
Dichlorodifluoromethane	75-71-8	< MDL	mg/L	1	0.005	0.003	
Ethylbenzene	100-41-4	< MDL	mg/L	1	0.005	0.001	
Isopropylbenzene	98-82-8	< MDL	mg/L	1	0.005	0.001	
m- & p-Xylenes	108-38-3&106-42-3	< MDL	mg/L	1	0.01	0.002	
MEK	78-93-3	< MDL	mg/L	1	0.005	0.001	
Methylene chloride	75-09-2	< MDL	mg/L	1	0.005	0.001	
MTBE	1634-04-4	< MDL	mg/L	1	0.005	0.001	
Naphthalene	91-20-3	< MDL	mg/L	1	0.005	0.002	
n-Butylbenzene	104-51-8	< MDL	mg/L	1	0.005	0.001	
n-Propylbenzene	103-65-1	< MDL	mg/L	1	0.005	0.001	
o-Xylene	95-47-6	< MDL	mg/L	1	0.005	0.001	
sec-Butylbenzene	135-98-8	< MDL	mg/L	1	0.005	0.001	
Styrene	100-42-5	< MDL	mg/L	1	0.005	0.001	
t-butylbenzene	98-06-6	< MDL	mg/L	1	0.005	0.001	
Tetrachloroethylene	127-18-4	< MDL	mg/L	1	0.005	0.001	
Toluene	108-88-3	< MDL	mg/L	1	0.005	0.001	
trans-1,2-Dichloroethylene	156-60-5	< MDL	mg/L	1	0.005	0.001	
trans-1,3-Dichloropropene	10061-02-6	< MDL	mg/L	1	0.005	0.001	
Trichloroethylene	79-01-6	< MDL	mg/L	1	0.005	0.001	
Trichlorofluoromethane	75-69-4	< MDL	mg/L	1	0.005	0.001	
Vinyl Chloride	75-01-4	< MDL	mg/L	1	0.005	0.001	
Xylenes	1330-20-7	< MDL	mg/L	1	0.015	0.002	
Dibromofluoromethane(surr	1868-53-7	122	%	1			
1,2-Dichloroethane-d4(surr	17060-07-0	110	%	1			
Toluene-d8(surr)	2037-26-5	98.3	%	1			
p-Bromofluorobenzene(surr	460-00-4	106	%	1			

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
1,1,1,2-Tetrachloroethane	0.02	0.022	110	0.02	0.019	95	14.6	12	82.6-121	R1
1,1,1-Trichloroethane	0.02	0.023	115	0.02	0.02	100	14	13	82.8-123	R1
1,1,2,2-Tetrachloroethane	0.02	0.022	110	0.02	0.02	100	9.5	20	77.5-122	
1,1,2-Trichloroethane	0.02	0.021	105	0.02	0.02	100	4.9	14	81.1-119	
1,1-Dichloroethane	0.02	0.022	110	0.02	0.019	95	14.6	12	74.5-125	R1
1,1-Dichloroethylene	0.02	0.028	140	0.02	0.02	100	33.3	12	75.4-124	L1,R1

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/L**

QC Batch ID : Qb17053157 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051752.03

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
1,1-Dichloropropene	0.02	0.022	110	0.02	0.019	95	14.6	12	76.9-125	R1
1,2,3-trichlorobenzene	0.02	0.023	115	0.02	0.021	105	9.1	20	70.8-125	
1,2,3-Trichloropropane	0.02	0.023	115	0.02	0.02	100	14	22	69.6-126	
1,2,4-Trichlorobenzene	0.02	0.024	120	0.02	0.02	100	18.2	16	74.8-121	R1
1,2,4-Trimethylbenzene	0.02	0.024	120	0.02	0.02	100	18.2	12	80.4-114	L1,R1
1,2-Dibromo-3-chloropropa	0.02	0.021	105	0.02	0.02	100	4.9	27	61.7-140	
1,2-Dibromoethane	0.02	0.022	110	0.02	0.02	100	9.5	15	80.6-118	
1,2-Dichlorobenzene	0.02	0.023	115	0.02	0.02	100	14	11	82.6-113	L1,R1
1,2-Dichloroethane	0.02	0.023	115	0.02	0.019	95	19	14	72.8-126	R1
1,2-Dichloropropane	0.02	0.023	115	0.02	0.019	95	19	13	82.4-120	R1
1,3,5-Trimethylbenzene	0.02	0.023	115	0.02	0.02	100	14	10	81.3-114	L1,R1
1,3-Dichlorobenzene	0.02	0.022	110	0.02	0.02	100	9.5	11	83.4-113	
1,3-Dichloropropane	0.02	0.021	105	0.02	0.019	95	10	16	79.8-115	
1,4-Dichlorobenzene	0.02	0.022	110	0.02	0.02	100	9.5	11	82.6-113	
1,4-Dioxane	0.64	0.606	94.7	0.64	0.562	87.8	7.5	30	70-130	
2,2-Dichloropropane	0.02	0.022	110	0.02	0.019	95	14.6	15	69.4-131	R1
2-Chlorotoluene	0.02	0.023	115	0.02	0.02	100	14	17	77.8-118	
4-Chlorotoluene	0.02	0.022	110	0.02	0.02	100	9.5	15	78.8-117	
4-Isopropyltoluene	0.02	0.023	115	0.02	0.02	100	14	11	80.9-114	L1,R1
Benzene	0.02	0.023	115	0.02	0.019	95	19	11	84.1-118	R1
Bromobenzene	0.02	0.022	110	0.02	0.02	100	9.5	12	82.8-116	
Bromochloromethane	0.02	0.022	110	0.02	0.02	100	9.5	15	70.7-131	
Bromodichloromethane	0.02	0.024	120	0.02	0.02	100	18.2	12	83.1-119	L1,R1
Bromoform	0.02	0.021	105	0.02	0.018	90	15.4	20	70.3-136	
Bromomethane	0.02	0.027	135	0.02	0.022	110	20.4	23	59-134	L1
Carbon disulfide	0.02	0.023	115	0.02	0.021	105	9.1	30	70-130	
Carbon tetrachloride	0.02	0.024	120	0.02	0.02	100	18.2	13	74.6-129	R1
Chlorobenzene	0.02	0.021	105	0.02	0.019	95	10	11	87.8-110	R1
Chloroethane	0.02	0.024	120	0.02	0.019	95	23.3	13	73.7-124	R1
Chloroform	0.02	0.022	110	0.02	0.02	100	9.5	10	76.4-124	
Chloromethane	0.02	0.023	115	0.02	0.019	95	19	15	59.4-138	R1
cis-1,2-Dichloroethylene	0.02	0.022	110	0.02	0.019	95	14.6	15	74.3-124	
cis-1,3-Dichloropropene	0.02	0.023	115	0.02	0.019	95	19	11	84.6-117	R
Dibromochloromethane	0.02	0.023	115	0.02	0.02	100	14	13	80.3-122	R1
Dibromomethane	0.02	0.022	110	0.02	0.019	95	14.6	16	75.8-126	R1
Dichlorodifluoromethane	0.02	0.025	125	0.02	0.021	105	17.4	15	44.4-149	R1
Ethylbenzene	0.02	0.021	105	0.02	0.019	95	10	12	82.8-114	
Isopropylbenzene	0.02	0.022	110	0.02	0.02	100	9.5	11	86.8-113	
m- & p-Xylenes	0.04	0.043	108	0.04	0.038	95	12.3	10	76.9-122	R1
MEK	0.02	0.022	110	0.02	0.017	85	25.6	42	44.9-154	
Methylene chloride	0.02	0.019	95	0.02	0.016	80	17.1	13	67.3-130	R1

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/L**

QC Batch ID : Qb17053157 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051752.03

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
MTBE	0.02	0.018	90	0.02	0.017	85	5.7	30	70-130	
Naphthalene	0.02	0.021	105	0.02	0.021	105	0.0	27	55.8-136	
n-Butylbenzene	0.02	0.024	120	0.02	0.02	100	18.2	20	74.1-120	R1
n-Propylbenzene	0.02	0.022	110	0.02	0.02	100	9.5	12	78.9-115	
o-Xylene	0.02	0.022	110	0.02	0.019	95	14.6	11	86-111	R1
sec-Butylbenzene	0.02	0.023	115	0.02	0.02	100	14	12	80.2-115	R1
Styrene	0.02	0.021	105	0.02	0.019	95	10	12	86.7-111	
t-butylbenzene	0.02	0.023	115	0.02	0.021	105	9.1	14	80.7-116	
Tetrachloroethylene	0.02	0.021	105	0.02	0.019	95	10	27	64.2-140	
Toluene	0.02	0.021	105	0.02	0.019	95	10	12	85.9-110	
trans-1,2-Dichloroethylene	0.02	0.022	110	0.02	0.02	100	9.5	12	73.7-124	
trans-1,3-Dichloropropene	0.02	0.019	95	0.02	0.017	85	11.1	14	83-114	
Trichloroethylene	0.02	0.024	120	0.02	0.02	100	18.2	12	85.4-114	L1,R1
Trichlorofluoromethane	0.02	0.024	120	0.02	0.02	100	18.2	12	74.3-126	R1
Vinyl Chloride	0.02	0.024	120	0.02	0.02	100	18.2	17	61.8-142	R1
Xylenes	0.06	0.065	108	0.06	0.057	95	13.1	9	81.2-117	R1

QC Type: MS and MSD
QC Sample ID: 17051761.02

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
1,1,1,2-Tetrachloroethane	BRL	0.02	0.018	90						72-139	
1,1,1-Trichloroethane	BRL	0.02	0.018	90						70.6-135	
1,1,2,2-Tetrachloroethane	BRL	0.02	0.02	100						55-149	
1,1,2-Trichloroethane	BRL	0.02	0.019	95						68-139	
1,1-Dichloroethane	BRL	0.02	0.018	90						78-134	
1,1-Dichloroethylene	BRL	0.02	0.018	90						65-141	
1,1-Dichloropropene	BRL	0.02	0.017	85						79-136	
1,2,3-trichlorobenzene	BRL	0.02	0.017	85						54-144	
1,2,3-Trichloropropane	BRL	0.02	0.019	95						58-156	
1,2,4-Trichlorobenzene	BRL	0.02	0.015	75						69-127	
1,2,4-Trimethylbenzene	BRL	0.02	0.016	80						80-131	
1,2-Dibromo-3-chloropropa	BRL	0.02	0.019	95						61-145	
1,2-Dibromoethane	BRL	0.02	0.019	95						68-140	
1,2-Dichlorobenzene	BRL	0.02	0.018	90						70-138	
1,2-Dichloroethane	BRL	0.02	0.018	90						67-152	
1,2-Dichloropropane	BRL	0.02	0.018	90						79-135	
1,3,5-Trimethylbenzene	BRL	0.02	0.016	80						79-133	
1,3-Dichlorobenzene	BRL	0.02	0.016	80						79-128	
1,3-Dichloropropane	BRL	0.02	0.018	90						70-147	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method :** SW-846 8260C **Reporting Units :** mg/L

QC Batch ID : Qb17053157 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051752.03

QC Type: MS and MSD
QC Sample ID: 17051761.02

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
1,4-Dichlorobenzene	BRL	0.02	0.016	80						76-127	
1,4-Dioxane	BRL	0.64	0.61	95.3						70-125	
2,2-Dichloropropane	BRL	0.02	0.013	65						60-129	
2-Chlorotoluene	BRL	0.02	0.016	80						83-130	M9
4-Chlorotoluene	BRL	0.02	0.016	80						82-129	M9
4-Isopropyltoluene	BRL	0.02	0.016	80						78-129	
Benzene	BRL	0.02	0.017	85						73-129	
Bromobenzene	BRL	0.02	0.017	85						76-132	
Bromochloromethane	BRL	0.02	0.02	100						76-135	
Bromodichloromethane	BRL	0.02	0.018	90						80-136	
Bromoform	BRL	0.02	0.018	90						65-139	
Bromomethane	BRL	0.02	0.019	95						65-150	
Carbon disulfide	BRL	0.02	0.019	95						70-125	
Carbon tetrachloride	BRL	0.02	0.016	80						70-136	
Chlorobenzene	BRL	0.02	0.017	85						69-123	
Chloroethane	BRL	0.02	0.019	95						74-145	
Chloroform	BRL	0.02	0.019	95						41.8-164	
Chloromethane	BRL	0.02	0.02	100						42.2-160	
cis-1,2-Dichloroethylene	BRL	0.02	0.018	90						71-134	
cis-1,3-Dichloropropene	BRL	0.02	0.015	75						74-128	
Dibromochloromethane	BRL	0.02	0.018	90						67-141	
Dibromomethane	BRL	0.02	0.02	100						63.1-135	
Dichlorodifluoromethane	BRL	0.02	0.02	100						62-146	
Ethylbenzene	BRL	0.02	0.016	80						80-132	
Isopropylbenzene	BRL	0.02	0.016	80						78-137	
m- & p-Xylenes	BRL	0.04	0.033	82.5						74-127	
MEK	BRL	0.02	0.018	90						52-148	
Methylene chloride	BRL	0.02	0.019	95						68-131	
MTBE	BRL	0.02	0.018	90						70-130	
Naphthalene	BRL	0.02	0.019	95						61-116	
n-Butylbenzene	BRL	0.02	0.015	75						73-140	
n-Propylbenzene	BRL	0.02	0.016	80						75-127	
o-Xylene	BRL	0.02	0.017	85						74-126	
sec-Butylbenzene	BRL	0.02	0.016	80						75-129	
Styrene	BRL	0.02	0.017	85						77-123	
t-butylbenzene	BRL	0.02	0.016	80						75-126	
Tetrachloroethylene	BRL	0.02	0.018	90						27.6-194	
Toluene	BRL	0.02	0.017	85						72-121	
trans-1,2-Dichloroethylene	BRL	0.02	0.018	90						73-138	
trans-1,3-Dichloropropene	BRL	0.02	0.014	70						66-131	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/L**

QC Batch ID : Qb17053157 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051752.03

QC Type: MS and MSD
QC Sample ID: 17051761.02

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
Trichloroethylene	BRL	0.02	0.017	85						6-138	
Trichlorofluoromethane	BRL	0.02	0.019	95						67-148	
Vinyl Chloride	BRL	0.02	0.021	105						59.4-140	
Xylenes	BRL	0.06	0.05	83.3						73-127	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051752 **Date :** 6/5/2017

Analysis : % Moisture **Method : SM 2540G** **Reporting Units : %**

QC Batch ID : Qb17060177 **Created Date :** 06/01/17 **Created By :** SRGade

Samples in This QC Batch : 17051752.01,02,04,05

Sample Preparation : PB17060156 **Prep Method :** SM 2540G **Prep Date :** 06/01/17 11:45 **Prep By :** SRGade

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
% Moisture		< MDL	%	1	----			

QC Type: Duplicate

QC Sample ID: 17051720.02

Parameter	QCSample Result	Sample Result	Units	RPD	RPD CtrlLimit		Qual
% Moisture	BRL	BRL	%		20		

Refer to the Definition page for terms.

LABORATORY TERM AND QUALIFIER DEFINITION REPORT

Job ID : 17051752

Date: 6/5/2017

General Term Definition

Back-Wt	Back Weight	Post-Wt	Post Weight
BRL	Below Reporting Limit	ppm	parts per million
cfu	colony-forming units	Pre-Wt	Previous Weight
Conc.	Concentration	Q	Qualifier
D.F.	Dilution Factor	RegLimit	Regulatory Limit
Front-Wt	Front Weight	RPD	Relative Percent Difference
LCS	Laboratory Check Standard	RptLimit	Reporting Limit
LCSD	Laboratory Check Standard Duplicate	SDL	Sample Detection Limit
MS	Matrix Spike	surr	Surrogate
MSD	Matrix Spike Duplicate	T	Time
MW	Molecular Weight	TNTC	Too numerous to count
J	Estimation. Below calibration range but above MDL		

Qualifier Definition

J	Estimation. Below calibration range but above MDL.
L1	Associated LCS and/or LCSD recovery is above acceptance limits for flagged analyte. Bias may be high.
L2	Associated LCS and/or LCSD recovery is below acceptance limits for flagged analyte. Bias may be low.
M9	Matrix Spike and/or Matrix Spike Duplicate recovery is below laboratory control limits.
R1	RPD exceeds control limits.
S1	Surrogate recovery is above control limit. Results may be biased high.
S2	Surrogate recovery is below control limit. Results may be biased low.
U	Undetected at SDL (Sample Detection Limit).
V11	CCV recovery is below acceptance limits.

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1. REPORT TO: (AEC)
Company: Aviles Engineering Corp
Address: 5790 W. Alfen, Houston, TX 77041
Contact: Robert J Metzger
Phone: 281-793-8352
Fax: ☐ —
E-mail: ☑ RMetzger@avilesengineering.com

2. INVOICE TO:
Company: AS ; w Box 1
Address:
Contact:
Phone:
Fax: ☐
E-mail: ☐

3. PO #
3a. A&B Quote #
4. Turnaround Time (Business Days)
☐ 1 Day* ☐ Other:
☐ 2 Days*
☐ 3 Days* *Surcharge applies
☑ 7 Days - Standard

A&B JOB ID # 1705175
5. Project # E101-17

6. Project Name/Location: Memorial Reconstruction, Houston

7. Reporting Requirement:
☐ TRRP Limits only ☐ TRRP Rpt. Package ☐ See Attached ☐ Standard Level II ☐ PST ☐ MDL ☐ EDD

8. Sampler's Name & Company (PLEASE PRINT): Robert J Metzger AEC
Sampler's Signature & Date: 5/24/17

LAB USE ONLY	9. Sample ID and Description	10. Sampling Date	Time 24hr	11. Comp.	11. Grab	12. Matrix: Water	Soil	Sludge	Oil	Drinking Water	Air	Other	13. No. of Containers	Analyses/Methods	14. Containers*	15. Preservatives**	16. PH-Lab Only	17.	18. REMARKS
01A-G	B-1 14-15	5/25/17	10:10		✓		✓						7	BTEX MTBE ABC	VOA	c/H			
	B-2 ~~21-22~~	~~5/25/17~~	~~12:04~~		✓		✓						7	TPH 1005 DEF	VOA	c/H			Sign 5/25/17
03A-G	B-2 23-24	5/25/17	13:45		✓		✓						7	VOCs + MTBE ABC	VOA	c/H			
03B-AF	B-2 water	5/25/17	14:00		✓	✓							6	% moisture G	4oz	2			
04A-G	B 3 21-22	5/25/17	12:04		✓		✓						7						
05A-G	B-4 25-26	5/25/17	16:00		✓		✓						7						

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19. RELINQUISHED BY	DATE	TIME	20. RECEIVED BY	DATE	TIME
1	5/26/17	11:40		5/26/17	11:40
2 (AEC)	5-26-17	12:45		5/26/17	1245
3					

21. KNOWN HAZARDS/COMMENTS

Temperature: 28.5-2.3 °C
Thermometer ID: 140539631
Intact: Y or N Initials:

A&B cannot accept verbal changes
Please FAX written changes to 713-453-6091

Samples will be disposed of after 30 days

*Containers: VOA - 40 ml vial; 4 oz/8 oz - glass wide mouth; A/G - Amber/Glass 1 Liter; P/O - Plastic/other

**Preservatives: C - Cool; H - HCl; N - HNO_3; S - H_2SO_4; OH - NaOH; T - $NA_2S_2O_3$; X - Other

METHOD OF SHIPMENT

BILL OF LADING/TRACKING #

LAB USE ONLY SAMPLING RENTAL P/U Supplies Field Work

Sample Condition Checklist

A&B JobID : **17051752**	Date Received : **05/26/2017**	Time Received : **12:45PM**
Client Name : **Aviles Engineering**		
Temperature : **2.8-0.5cf=2.3°C**	Sample pH : **NA**	
Thermometer ID : **140539631**	pH Paper ID : **NA**	

	Check Points	Yes	No	N/A
1.	**Cooler seal present and signed.**		X	
2.	**Sample(s) in a cooler.**	X		
3.	**If yes, ice in cooler.**	X		
4.	**Sample(s) received with chain-of-custody.**	X		
5.	**C-O-C signed and dated.**	X		
6.	**Sample(s) received with signed sample custody seal.**		X	
7.	**Sample containers arrived intact. (If no comment).**	X		
8.	**Matrix :** Water ☑ Soil ☑ Liquid ☐ Sludge ☐ Solid ☐ Cassette ☐ Tube ☐ Bulk ☐ Badge ☐ Food ☐ Other ☐			
9.	**Sample(s) were received in appropriate container(s).**	X		
10.	**Sample(s) were received with proper preservative**	X		
11.	**All samples were logged or labeled.**	X		
12.	**Sample ID labels match C-O-C ID's**	X		
13.	**Bottle count on C-O-C matches bottles found.**	X		
14.	**Sample volume is sufficient for analyses requested.**	X		
15.	**Samples were received within the hold time.**	X		
16.	**VOA vials completely filled.**	X		
17.	**Sample accepted.**	X		
18	**Has client been contacted about sub-out**			X

Comments : Include actions taken to resolve discrepancies/problem:

Samples 01, 02, 04, 05 are Soils. Sample 03 is Water. All soil samples were received with two sets of pre-weighed vials and a 4oz bulk. The water sample was received with three 40mL vials and three 60mL vials. AS 5/26/17

Received by : Ashute

Check in by/date : Ashute / 05/26/2017

Laboratory Analysis Report

Total Number of Pages: 30

Job ID : 17051761

10100 East Freeway, Suite 100, Houston, TX 77029 tel: 713-453-6060, fax: 713-453-6091, http://www.ablabs.com

Client Project Name :
E101-17 / Memorial Drive Reconstruction, Houston, TX

Report To :

Client Name: Aviles Engineering
Attn: Bob Metzger
Client Address: 5790 Windfern
City, State, Zip: Houston, Texas, 77041

P.O.#.:
Sample Collected By: Robert J. Metzger
Date Collected: 05/26/17

A&B Labs has analyzed the following samples...

Client Sample ID	Matrix	A&B Sample ID
B-5 20-21	Soil	17051761.01
B-5 Water	Water	17051761.02
B-6 20-22	Soil	17051761.03

Shantall Carpenter

Released By: Shantall Carpenter
Title: Senior Project Manager
Date: 6/5/2017

This Laboratory is NELAP (T104704213-17-16) accredited. Effective: 4/1/2017; Expires: 3/31/2018
Scope: Non-Potable Water, Drinking Water, Air, Solid, Biological Tissue, Hazardous Waste

I am the laboratory manager, or his/her designee, and I am responsible for the release of this data package. This laboratory data package has been reviewed and is complete and technically compliant with the requirements of the methods used, except where noted in the attached exception reports. I affirm, to the best of my knowledge that all problems/anomalies observed by this laboratory (and if applicable, any and all laboratories subcontracted through this laboratory) that might affect the quality of the data, have been identified in the Laboratory Review Checklist, and that no information or data have been knowingly withheld that would affect the quality of the data.

Date Received : 05/26/2017 13:43

LABORATORY TEST RESULTS

Client Sample ID: B-5 20-21
A&B Job Sample ID: 17051761.01
Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Bob Metzger
Project Name: E101-17 / Memorial Drive Reconstruction, Houston, TX

Test Description:	**% Moisture**	Sample Matrix	Soil
Analytical Method:	SM 2540G	Date Collected	05/26/2017 10:10
QC Batch ID:	Qb17060180	Date Received	05/26/2017 13:43
Prep Method:	SM 2540G	Date Prepared	06/01/2017 11:45
Prepared By:	SRGade		
Prep Batch ID	PB17060156		
Analyst Initial	SRG	% Moisture	12.2

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture[1]	12.2					----	----	%	1	06/01/17 11:50

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-5 20-21 Date: 6/5/2017
A&B Job Sample ID: 17051761.01

Client Name: Aviles Engineering Attn: Bob Metzger
Project Name: E101-17 / Memorial Drive Reconstruction, Houston, TX

Test Description:		Sample Matrix	Soil
Analytical Method:	SW-846 8260C	Date Collected	05/26/2017 10:10
QC Batch ID:	Qb17052904	Date Received	05/26/2017 13:43
Prep Method:	SW-846 5035A	Date Prepared	05/26/2017 15:30
Prepared By:	Jdongre		
Prep Batch ID	PB17052910		
Analyst Initial	JKD	% Moisture	12.2

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
630-20-6	1,1,1,2-Tetrachloroet	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
71-55-6	1,1,1-Trichloroethane	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
79-34-5	1,1,2,2-Tetrachloroet	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
79-00-5	1,1,2-Trichloroethane	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
75-34-3	1,1-Dichloroethane	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
75-35-4	1,1-Dichloroethylene	< 0.002	U,V11	0.002	0.004	0.002	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
563-58-6	1,1-Dichloropropene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
87-61-6	1,2,3-trichlorobenzen	< 0.002	U	0.002	0.004	0.002	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
96-18-4	1,2,3-Trichloropropan	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
120-82-1	1,2,4-Trichlorobenzen	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
95-63-6	1,2,4-Trimethylbenze	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
96-12-8	1,2-Dibromo-3-chloro	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
106-93-4	1,2-Dibromoethane	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
95-50-1	1,2-Dichlorobenzene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
107-06-2	1,2-Dichloroethane	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
78-87-5	1,2-Dichloropropane	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
108-67-8	1,3,5-Trimethylbenze	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
541-73-1	1,3-Dichlorobenzene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
142-28-9	1,3-Dichloropropane	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
106-46-7	1,4-Dichlorobenzene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
123-91-1	1,4-Dioxane	< 0.067	U	0.067	0.288	0.075	0.32	1.6	mg/Kg	0.79	05/27/17 03:24
594-20-7	2,2-Dichloropropane	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
95-49-8	2-Chlorotoluene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
106-43-4	4-Chlorotoluene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
99-87-6	4-Isopropyltoluene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
71-43-2	Benzene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
108-86-1	Bromobenzene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
74-97-5	Bromochloromethane	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
75-27-4	Bromodichloromethan	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
75-25-2	Bromoform	< 0.00045	U	0.00045	0.004	0.0005	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
74-83-9	Bromomethane	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
75-15-0	Carbon disulfide	< 0.002	U,V11	0.002	0.004	0.002	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
56-23-5	Carbon tetrachloride	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
108-90-7	Chlorobenzene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
75-00-3	Chloroethane	< 0.003	U	0.003	0.004	0.003	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
67-66-3	Chloroform	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-5 20-21
A&B Job Sample ID: 17051761.01
Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Bob Metzger
Project Name: E101-17 / Memorial Drive Reconstruction, Houston, TX

Test Description:		Sample Matrix	Soil
Analytical Method:	SW-846 8260C	Date Collected	05/26/2017 10:10
QC Batch ID:	Qb17052904	Date Received	05/26/2017 13:43
Prep Method:	SW-846 5035A	Date Prepared	05/26/2017 15:30
Prepared By:	Jdongre		
Prep Batch ID	PB17052910		
Analyst Initial	JKD	% Moisture	12.2

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
74-87-3	Chloromethane	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
156-59-2	cis-1,2-Dichloroethyle	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
10061-01-5	cis-1,3-Dichloroprope	< 0.00036	U	0.00036	0.004	0.0004	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
124-48-1	Dibromochloromethan	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
74-95-3	Dibromomethane	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
75-71-8	Dichlorodifluorometha	< 0.002	U	0.002	0.004	0.002	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
100-41-4	Ethylbenzene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
98-82-8	Isopropylbenzene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
108-38-3&106-4	m- & p-Xylenes	< 0.0009	U	0.0009	0.009	0.001	0.01	0.1	mg/Kg	0.79	05/27/17 03:24
78-93-3	MEK	< 0.002	U	0.002	0.004	0.002	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
75-09-2	Methylene chloride	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
1634-04-4	MTBE	< 0.003	U	0.003	0.004	0.003	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
91-20-3	Naphthalene	< 0.00036	U	0.00036	0.004	0.0004	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
104-51-8	n-Butylbenzene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
103-65-1	n-Propylbenzene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
95-47-6	o-Xylene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
135-98-8	sec-Butylbenzene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
100-42-5	Styrene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
98-06-6	t-butylbenzene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
127-18-4	Tetrachloroethylene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
108-88-3	Toluene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
156-60-5	trans-1,2-Dichloroethy	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
10061-02-6	trans-1,3-Dichloropro	< 0.00036	U	0.00036	0.004	0.0004	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
79-01-6	Trichloroethylene	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
75-69-4	Trichlorofluoromethan	< 0.0009	U,V11	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
75-01-4	Vinyl Chloride	< 0.0009	U	0.0009	0.004	0.001	0.005	0.05	mg/Kg	0.79	05/27/17 03:24
1330-20-7	Xylenes	< 0.0009	U	0.0009	0.004	0.001	0.005	0.15	mg/Kg	0.79	05/27/17 03:24
17060-07-0	1,2-Dichloroethane-d4	128					70	130	%	0.79	05/27/17 03:24
1868-53-7	Dibromofluoromethan	105					70	130	%	0.79	05/27/17 03:24
2037-26-5	Toluene-d8(surr)	96					70	130	%	0.79	05/27/17 03:24
460-00-4	p-Bromofluorobenzen	102					70	130	%	0.79	05/27/17 03:24

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-5 20-21
A&B Job Sample ID: 17051761.01
Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Bob Metzger
Project Name: E101-17 / Memorial Drive Reconstruction, Houston, TX

Test Description:	**Total Petroleum Hydrocarbons**	Sample Matrix	Soil
Analytical Method:	TX 1005	Date Collected	05/26/2017 10:10
QC Batch ID:	Qb17060139	Date Received	05/26/2017 13:43
Prep Method:	TX 1005	Date Prepared	05/31/2017 14:00
Prepared By:	VNair		
Prep Batch ID	PB17060129		
Analyst Initial	VMN	% Moisture	12.2

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12[1]	< 27	U	27	28.5	23.7	25	1000	mg/Kg	1	05/31/17 19:01
TPH-1005-2	>C12-C28[1]	< 23.1	U	23.1	28.5	20.3	25	1000	mg/Kg	1	05/31/17 19:01
TPH-1005-4	>C28-C35[1]	< 20.2	U	20.2	28.5	17.7	25	1000	mg/Kg	1	05/31/17 19:01
	Total C6-C35	<					----	----	mg/Kg	1	05/31/17 19:01
111-85-3	1-Chlorooctane(surr)	130					60	143	%	1	05/31/17 19:01
3386-33-2	Chlorooctadecane(sur	127					60	150	%	1	05/31/17 19:01

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-5 Water
A&B Job Sample ID: 17051761.02
Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Bob Metzger
Project Name: E101-17 / Memorial Drive Reconstruction, Houston, TX

Test Description:	**Volatile Organic Compounds**	Sample Matrix	Water
Analytical Method:	SW-846 8260C	Date Collected	05/26/2017 10:45
QC Batch ID:	Qb17053157	Date Received	05/26/2017 13:43
Prep Method:	SW-846 5030C	Date Prepared	05/26/2017 15:00
Prepared By:	Jdongre		
Prep Batch ID	PB17053143		
Analyst Initial	JKD	% Moisture	

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
630-20-6	1,1,1,2-Tetrachloroet	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
71-55-6	1,1,1-Trichloroethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
79-34-5	1,1,2,2-Tetrachloroet	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
79-00-5	1,1,2-Trichloroethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
75-34-3	1,1-Dichloroethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
75-35-4	1,1-Dichloroethylene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
563-58-6	1,1-Dichloropropene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
87-61-6	1,2,3-trichlorobenzen	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
96-18-4	1,2,3-Trichloropropan	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
120-82-1	1,2,4-Trichlorobenzen	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
95-63-6	1,2,4-Trimethylbenze	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
96-12-8	1,2-Dibromo-3-chloro	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
106-93-4	1,2-Dibromoethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
95-50-1	1,2-Dichlorobenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
107-06-2	1,2-Dichloroethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
78-87-5	1,2-Dichloropropane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
108-67-8	1,3,5-Trimethylbenze	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
541-73-1	1,3-Dichlorobenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
142-28-9	1,3-Dichloropropane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
106-46-7	1,4-Dichlorobenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
123-91-1	1,4-Dioxane	< 0.084	U	0.084	0.320	0.084	0.32	1.6	mg/L	1	05/26/17 23:30
594-20-7	2,2-Dichloropropane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
95-49-8	2-Chlorotoluene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
106-43-4	4-Chlorotoluene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
99-87-6	4-Isopropyltoluene	< 0.003	U	0.003	0.005	0.003	0.005	0.05	mg/L	1	05/26/17 23:30
71-43-2	Benzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
108-86-1	Bromobenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
74-97-5	Bromochloromethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
75-27-4	Bromodichloromethan	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
75-25-2	Bromoform	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
74-83-9	Bromomethane	< 0.002	U	0.002	0.005	0.002	0.005	0.05	mg/L	1	05/26/17 23:30
75-15-0	Carbon disulfide	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
56-23-5	Carbon tetrachloride	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
108-90-7	Chlorobenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
75-00-3	Chloroethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
67-66-3	Chloroform	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-5 Water
A&B Job Sample ID: 17051761.02
Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Bob Metzger
Project Name: E101-17 / Memorial Drive Reconstruction, Houston, TX

Test Description:	**Volatile Organic Compounds**	Sample Matrix	Water
Analytical Method:	SW-846 8260C	Date Collected	05/26/2017 10:45
QC Batch ID:	Qb17053157	Date Received	05/26/2017 13:43
Prep Method:	SW-846 5030C	Date Prepared	05/26/2017 15:00
Prepared By:	Jdongre		
Prep Batch ID	PB17053143		
Analyst Initial	JKD	% Moisture	

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
74-87-3	Chloromethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
156-59-2	cis-1,2-Dichloroethyle	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
10061-01-5	cis-1,3-Dichloroprope	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
124-48-1	Dibromochloromethan	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
74-95-3	Dibromomethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
75-71-8	Dichlorodifluorometha	< 0.003	U	0.003	0.005	0.003	0.005	0.05	mg/L	1	05/26/17 23:30
100-41-4	Ethylbenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
98-82-8	Isopropylbenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
108-38-3&106-4	m- & p-Xylenes	< 0.002	U	0.002	0.01	0.002	0.01	0.1	mg/L	1	05/26/17 23:30
78-93-3	MEK	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
75-09-2	Methylene chloride	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
1634-04-4	MTBE	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
91-20-3	Naphthalene	< 0.002	U	0.002	0.005	0.002	0.005	0.05	mg/L	1	05/26/17 23:30
104-51-8	n-Butylbenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
103-65-1	n-Propylbenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
95-47-6	o-Xylene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
135-98-8	sec-Butylbenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
100-42-5	Styrene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
98-06-6	t-butylbenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
127-18-4	Tetrachloroethylene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
108-88-3	Toluene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
156-60-5	trans-1,2-Dichloroethy	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
10061-02-6	trans-1,3-Dichloropro	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
79-01-6	Trichloroethylene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
75-69-4	Trichlorofluoromethan	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
75-01-4	Vinyl Chloride	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/L	1	05/26/17 23:30
1330-20-7	Xylenes	< 0.002	U	0.002	0.015	0.002	0.015	0.15	mg/L	1	05/26/17 23:30
17060-07-0	1,2-Dichloroethane-d4	99.6					70	130	%	1	05/26/17 23:30
1868-53-7	Dibromofluoromethan	111					70	130	%	1	05/26/17 23:30
2037-26-5	Toluene-d8(surr)	96.8					70	130	%	1	05/26/17 23:30
460-00-4	p-Bromofluorobenzen	102					70	130	%	1	05/26/17 23:30

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-5 Water
A&B Job Sample ID: 17051761.02
Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Bob Metzger
Project Name: E101-17 / Memorial Drive Reconstruction, Houston, TX

Test Description:	**Total Petroleum Hydrocarbons**	Sample Matrix	Water
Analytical Method:	TX 1005	Date Collected	05/26/2017 10:45
QC Batch ID:	Qb17053042	Date Received	05/26/2017 13:43
Prep Method:	TX 1005	Date Prepared	05/26/2017 16:00
Prepared By:	VNair		
Prep Batch ID	PB17053048		
Analyst Initial	VMN	% Moisture	

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12[1]	< 0.618	U	0.618	1.40	0.66	1.5	60	mg/L	0.936	05/27/17 01:32
TPH-1005-2	>C12-C28[1]	< 0.805	U	0.805	1.40	0.86	1.5	60	mg/L	0.936	05/27/17 01:32
TPH-1005-4	>C28-C35[1]	< 0.702	U	0.702	1.40	0.75	1.5	60	mg/L	0.936	05/27/17 01:32
	Total C6-C35	<					----	----	mg/L	0.936	05/27/17 01:32
111-85-3	1-Chlorooctane(surr)	94.6					59	122	%	0.936	05/27/17 01:32
3386-33-2	Chlorooctadecane(sur	114					48	123	%	0.936	05/27/17 01:32

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-6 20-22
A&B Job Sample ID: 17051761.03

Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Bob Metzger

Project Name: E101-17 / Memorial Drive Reconstruction, Houston, TX

Test Description:	**% Moisture**	Sample Matrix	Soil
Analytical Method:	SM 2540G	Date Collected	05/26/2017 12:25
QC Batch ID:	Qb17060180	Date Received	05/26/2017 13:43
Prep Method:	SM 2540G	Date Prepared	06/01/2017 11:45
Prepared By:	SRGade		
Prep Batch ID	PB17060156		
Analyst Initial	SRG	% Moisture	13.4

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture[1]	13.4					----	----	%	1	06/01/17 11:50

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-6 20-22 Date: 6/5/2017

A&B Job Sample ID: 17051761.03

Client Name: Aviles Engineering Attn: Bob Metzger

Project Name: E101-17 / Memorial Drive Reconstruction, Houston, TX

Test Description:		Sample Matrix	Soil
Analytical Method:	SW-846 8260C	Date Collected	05/26/2017 12:25
QC Batch ID:	Qb17052904	Date Received	05/26/2017 13:43
Prep Method:	SW-846 5035A	Date Prepared	05/26/2017 15:30
Prepared By:	Jdongre		
Prep Batch ID	PB17052910		
Analyst Initial	JKD	% Moisture	13.4

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
630-20-6	1,1,1,2-Tetrachloroet	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
71-55-6	1,1,1-Trichloroethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
79-34-5	1,1,2,2-Tetrachloroet	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
79-00-5	1,1,2-Trichloroethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
75-34-3	1,1-Dichloroethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
75-35-4	1,1-Dichloroethylene	< 0.002	U,V11	0.002	0.005	0.002	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
563-58-6	1,1-Dichloropropene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
87-61-6	1,2,3-trichlorobenzen	< 0.002	U	0.002	0.005	0.002	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
96-18-4	1,2,3-Trichloropropan	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
120-82-1	1,2,4-Trichlorobenzen	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
95-63-6	1,2,4-Trimethylbenze	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
96-12-8	1,2-Dibromo-3-chloro	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
106-93-4	1,2-Dibromoethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
95-50-1	1,2-Dichlorobenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
107-06-2	1,2-Dichloroethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
78-87-5	1,2-Dichloropropane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
108-67-8	1,3,5-Trimethylbenze	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
541-73-1	1,3-Dichlorobenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
142-28-9	1,3-Dichloropropane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
106-46-7	1,4-Dichlorobenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
123-91-1	1,4-Dioxane	< 0.081	U	0.081	0.344	0.075	0.32	1.6	mg/Kg	0.93	05/27/17 03:58
594-20-7	2,2-Dichloropropane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
95-49-8	2-Chlorotoluene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
106-43-4	4-Chlorotoluene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
99-87-6	4-Isopropyltoluene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
71-43-2	Benzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
108-86-1	Bromobenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
74-97-5	Bromochloromethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
75-27-4	Bromodichloromethan	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
75-25-2	Bromoform	< 0.00054	U	0.00054	0.005	0.0005	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
74-83-9	Bromomethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
75-15-0	Carbon disulfide	< 0.002	U,V11	0.002	0.005	0.002	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
56-23-5	Carbon tetrachloride	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
108-90-7	Chlorobenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
75-00-3	Chloroethane	< 0.003	U	0.003	0.005	0.003	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
67-66-3	Chloroform	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-6 20-22 Date: 6/5/2017

A&B Job Sample ID: 17051761.03

Client Name: Aviles Engineering Attn: Bob Metzger

Project Name: E101-17 / Memorial Drive Reconstruction, Houston, TX

Test Description:		Sample Matrix	Soil
Analytical Method:	SW-846 8260C	Date Collected	05/26/2017 12:25
QC Batch ID:	Qb17052904	Date Received	05/26/2017 13:43
Prep Method:	SW-846 5035A	Date Prepared	05/26/2017 15:30
Prepared By:	Jdongre		
Prep Batch ID	PB17052910		
Analyst Initial	JKD	% Moisture	13.4

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
74-87-3	Chloromethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
156-59-2	cis-1,2-Dichloroethyle	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
10061-01-5	cis-1,3-Dichloroprope	< 0.00043	U	0.00043	0.005	0.0004	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
124-48-1	Dibromochloromethan	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
74-95-3	Dibromomethane	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
75-71-8	Dichlorodifluorometha	< 0.002	U	0.002	0.005	0.002	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
100-41-4	Ethylbenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
98-82-8	Isopropylbenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
108-38-3&106-4	m- & p-Xylenes	< 0.001	U	0.001	0.011	0.001	0.01	0.1	mg/Kg	0.93	05/27/17 03:58
78-93-3	MEK	< 0.002	U	0.002	0.005	0.002	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
75-09-2	Methylene chloride	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
1634-04-4	MTBE	< 0.003	U	0.003	0.005	0.003	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
91-20-3	Naphthalene	< 0.00043	U	0.00043	0.005	0.0004	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
104-51-8	n-Butylbenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
103-65-1	n-Propylbenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
95-47-6	o-Xylene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
135-98-8	sec-Butylbenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
100-42-5	Styrene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
98-06-6	t-butylbenzene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
127-18-4	Tetrachloroethylene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
108-88-3	Toluene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
156-60-5	trans-1,2-Dichloroethy	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
10061-02-6	trans-1,3-Dichloropro	< 0.00043	U	0.00043	0.005	0.0004	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
79-01-6	Trichloroethylene	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
75-69-4	Trichlorofluoromethan	< 0.001	U,V11	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
75-01-4	Vinyl Chloride	< 0.001	U	0.001	0.005	0.001	0.005	0.05	mg/Kg	0.93	05/27/17 03:58
1330-20-7	Xylenes	< 0.001	U	0.001	0.005	0.001	0.005	0.15	mg/Kg	0.93	05/27/17 03:58
17060-07-0	1,2-Dichloroethane-d4	127					70	130	%	0.93	05/27/17 03:58
1868-53-7	Dibromofluoromethan	108					70	130	%	0.93	05/27/17 03:58
2037-26-5	Toluene-d8(surr)	96.4					70	130	%	0.93	05/27/17 03:58
460-00-4	p-Bromofluorobenzen	102					70	130	%	0.93	05/27/17 03:58

Soil results reported on dry weight basis

LABORATORY TEST RESULTS

Client Sample ID: B-6 20-22
A&B Job Sample ID: 17051761.03
Date: 6/5/2017

Client Name: Aviles Engineering
Attn: Bob Metzger
Project Name: E101-17 / Memorial Drive Reconstruction, Houston, TX

Test Description:	**Total Petroleum Hydrocarbons**	Sample Matrix	Soil
Analytical Method:	TX 1005	Date Collected	05/26/2017 12:25
QC Batch ID:	Qb17060139	Date Received	05/26/2017 13:43
Prep Method:	TX 1005	Date Prepared	05/31/2017 14:00
Prepared By:	VNair		
Prep Batch ID	PB17060129		
Analyst Initial	VMN	% Moisture	13.4

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12[1]	< 27.4	U	27.4	28.9	23.7	25	1000	mg/Kg	1	05/31/17 19:33
TPH-1005-2	>C12-C28[1]	< 23.4	U	23.4	28.9	20.3	25	1000	mg/Kg	1	05/31/17 19:33
TPH-1005-4	>C28-C35[1]	< 20.4	U	20.4	28.9	17.7	25	1000	mg/Kg	1	05/31/17 19:33
	Total C6-C35	<					----	----	mg/Kg	1	05/31/17 19:33
111-85-3	1-Chlorooctane(surr)	105					60	143	%	1	05/31/17 19:33
3386-33-2	Chlorooctadecane(sur	102					60	150	%	1	05/31/17 19:33

Soil results reported on dry weight basis
[1]-Parameter not available for accreditation

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method :** SW-846 8260C **Reporting Units :** mg/Kg

QC Batch ID : Qb17052904 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051761.01,03

Sample Preparation : PB17052910 **Prep Method :** SW-846 5035A **Prep Date :** 05/26/17 15:30 **Prep By :** Jdongre

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
1,1,1,2-Tetrachloroethane	630-20-6	< MDL	mg/Kg	1	0.005	0.001		
1,1,1-Trichloroethane	71-55-6	< MDL	mg/Kg	1	0.005	0.001		
1,1,2,2-Tetrachloroethane	79-34-5	< MDL	mg/Kg	1	0.005	0.001		
1,1,2-Trichloroethane	79-00-5	< MDL	mg/Kg	1	0.005	0.001		
1,1-Dichloroethane	75-34-3	< MDL	mg/Kg	1	0.005	0.001		
1,1-Dichloroethylene	75-35-4	< MDL	mg/Kg	1	0.005	0.002		
1,1-Dichloropropene	563-58-6	< MDL	mg/Kg	1	0.005	0.001		
1,2,3-trichlorobenzene	87-61-6	< MDL	mg/Kg	1	0.005	0.002		
1,2,3-Trichloropropane	96-18-4	< MDL	mg/Kg	1	0.005	0.001		
1,2,4-Trichlorobenzene	120-82-1	< MDL	mg/Kg	1	0.005	0.001		
1,2,4-Trimethylbenzene	95-63-6	< MDL	mg/Kg	1	0.005	0.001		
1,2-Dibromo-3-chloropropa	96-12-8	< MDL	mg/Kg	1	0.005	0.001		
1,2-Dibromoethane	106-93-4	< MDL	mg/Kg	1	0.005	0.001		
1,2-Dichlorobenzene	95-50-1	< MDL	mg/Kg	1	0.005	0.001		
1,2-Dichloroethane	107-06-2	< MDL	mg/Kg	1	0.005	0.001		
1,2-Dichloropropane	78-87-5	< MDL	mg/Kg	1	0.005	0.001		
1,3,5-Trimethylbenzene	108-67-8	< MDL	mg/Kg	1	0.005	0.001		
1,3-Dichlorobenzene	541-73-1	< MDL	mg/Kg	1	0.005	0.001		
1,3-Dichloropropane	142-28-9	< MDL	mg/Kg	1	0.005	0.001		
1,4-Dichlorobenzene	106-46-7	< MDL	mg/Kg	1	0.005	0.001		
1,4-Dioxane	123-91-1	< MDL	mg/Kg	1	0.32	0.075		
2,2-Dichloropropane	594-20-7	< MDL	mg/Kg	1	0.005	0.001		
2-Chlorotoluene	95-49-8	< MDL	mg/Kg	1	0.005	0.001		
4-Chlorotoluene	106-43-4	< MDL	mg/Kg	1	0.005	0.001		
4-Isopropyltoluene	99-87-6	< MDL	mg/Kg	1	0.005	0.001		
Benzene	71-43-2	< MDL	mg/Kg	1	0.005	0.001		
Bromobenzene	108-86-1	< MDL	mg/Kg	1	0.005	0.001		
Bromochloromethane	74-97-5	< MDL	mg/Kg	1	0.005	0.001		
Bromodichloromethane	75-27-4	< MDL	mg/Kg	1	0.005	0.001		
Bromoform	75-25-2	< MDL	mg/Kg	1	0.005	0.0005		
Bromomethane	74-83-9	< MDL	mg/Kg	1	0.005	0.001		
Carbon disulfide	75-15-0	< MDL	mg/Kg	1	0.005	0.002		
Carbon tetrachloride	56-23-5	< MDL	mg/Kg	1	0.005	0.001		
Chlorobenzene	108-90-7	< MDL	mg/Kg	1	0.005	0.001		
Chloroethane	75-00-3	< MDL	mg/Kg	1	0.005	0.003		
Chloroform	67-66-3	< MDL	mg/Kg	1	0.005	0.001		
Chloromethane	74-87-3	< MDL	mg/Kg	1	0.005	0.001		
cis-1,2-Dichloroethylene	156-59-2	< MDL	mg/Kg	1	0.005	0.001		

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method :** SW-846 8260C **Reporting Units :** mg/Kg

QC Batch ID : Qb17052904 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051761.01,03

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
cis-1,3-Dichloropropene	10061-01-5	< MDL	mg/Kg	1	0.005	0.0004		
Dibromochloromethane	124-48-1	< MDL	mg/Kg	1	0.005	0.001		
Dibromomethane	74-95-3	< MDL	mg/Kg	1	0.005	0.001		
Dichlorodifluoromethane	75-71-8	< MDL	mg/Kg	1	0.005	0.002		
Ethylbenzene	100-41-4	< MDL	mg/Kg	1	0.005	0.001		
Isopropylbenzene	98-82-8	< MDL	mg/Kg	1	0.005	0.001		
m- & p-Xylenes	108-38-3&106-42-3	< MDL	mg/Kg	1	0.01	0.001		
MEK	78-93-3	< MDL	mg/Kg	1	0.005	0.002		
Methylene chloride	75-09-2	< MDL	mg/Kg	1	0.005	0.001		
MTBE	1634-04-4	< MDL	mg/Kg	1	0.005	0.003		
Naphthalene	91-20-3	< MDL	mg/Kg	1	0.005	0.0004		
n-Butylbenzene	104-51-8	< MDL	mg/Kg	1	0.005	0.001		
n-Propylbenzene	103-65-1	< MDL	mg/Kg	1	0.005	0.001		
o-Xylene	95-47-6	< MDL	mg/Kg	1	0.005	0.001		
sec-Butylbenzene	135-98-8	< MDL	mg/Kg	1	0.005	0.001		
Styrene	100-42-5	< MDL	mg/Kg	1	0.005	0.001		
t-butylbenzene	98-06-6	< MDL	mg/Kg	1	0.005	0.001		
Tetrachloroethylene	127-18-4	< MDL	mg/Kg	1	0.005	0.001		
Toluene	108-88-3	< MDL	mg/Kg	1	0.005	0.001		
trans-1,2-Dichloroethylene	156-60-5	< MDL	mg/Kg	1	0.005	0.001		
trans-1,3-Dichloropropene	10061-02-6	< MDL	mg/Kg	1	0.005	0.0004		
Trichloroethylene	79-01-6	< MDL	mg/Kg	1	0.005	0.001		
Trichlorofluoromethane	75-69-4	< MDL	mg/Kg	1	0.005	0.001		
Vinyl Chloride	75-01-4	< MDL	mg/Kg	1	0.005	0.001		
Xylenes	1330-20-7	< MDL	mg/Kg	1	0.005	0.001		
Dibromofluoromethane(surr	1868-53-7	97.6	%	1				
1,2-Dichloroethane-d4(surr	17060-07-0	103	%	1				
Toluene-d8(surr)	2037-26-5	97.5	%	1				
p-Bromofluorobenzene(surr	460-00-4	98.9	%	1				

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
1,1,1,2-Tetrachloroethane	0.02	0.021	105	0.02	0.022	110	4.7	30	71.4-131	
1,1,1-Trichloroethane	0.02	0.021	105	0.02	0.021	105	0.0	30	69.6-140	
1,1,2,2-Tetrachloroethane	0.02	0.021	105	0.02	0.021	105	0.0	30	66.6-128	
1,1,2-Trichloroethane	0.02	0.021	105	0.02	0.021	105	0.0	30	72.8-125	
1,1-Dichloroethane	0.02	0.02	100	0.02	0.021	105	4.9	30	72.7-129	
1,1-Dichloroethylene	0.02	0.014	70	0.02	0.014	70	0.0	30	71.4-131	L2

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/Kg**

QC Batch ID : Qb17052904 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051761.01,03

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
1,1-Dichloropropene	0.02	0.02	100	0.02	0.02	100	0.0	30	75.9-132	
1,2,3-trichlorobenzene	0.02	0.023	115	0.02	0.023	115	0.0	30	56.7-153	
1,2,3-Trichloropropane	0.02	0.02	100	0.02	0.02	100	0.0	30	61.6-138	
1,2,4-Trichlorobenzene	0.02	0.023	115	0.02	0.023	115	0.0	30	55.9-150	
1,2,4-Trimethylbenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	71.1-131	
1,2-Dibromo-3-chloropropa	0.02	0.022	110	0.02	0.022	110	0.0	30	52.4-150	
1,2-Dibromoethane	0.02	0.022	110	0.02	0.022	110	0.0	30	72.9-125	
1,2-Dichlorobenzene	0.02	0.022	110	0.02	0.022	110	0.0	30	76.1-126	
1,2-Dichloroethane	0.02	0.022	110	0.02	0.021	105	4.7	30	66.4-134	
1,2-Dichloropropane	0.02	0.021	105	0.02	0.021	105	0.0	30	70.2-128	
1,3,5-Trimethylbenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	75.1-127	
1,3-Dichlorobenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	73.9-126	
1,3-Dichloropropane	0.02	0.02	100	0.02	0.021	105	4.9	30	68.3-124	
1,4-Dichlorobenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	72.3-127	
1,4-Dioxane	0.64	0.705	110	0.64	0.695	109	1.4	30	80-120	
2,2-Dichloropropane	0.02	0.022	110	0.02	0.022	110	0.0	30	68.5-138	
2-Chlorotoluene	0.02	0.02	100	0.02	0.02	100	0.0	30	71.7-128	
4-Chlorotoluene	0.02	0.021	105	0.02	0.021	105	0.0	30	72.2-126	
4-Isopropyltoluene	0.02	0.022	110	0.02	0.022	110	0.0	30	77.5-125	
Benzene	0.02	0.021	105	0.02	0.02	100	4.9	30	74-126	
Bromobenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	73.3-129	
Bromochloromethane	0.02	0.02	100	0.02	0.02	100	0.0	30	68.8-131	
Bromodichloromethane	0.02	0.021	105	0.02	0.022	110	4.7	30	69-135	
Bromoform	0.02	0.022	110	0.02	0.022	110	0.0	30	62-146	
Bromomethane	0.02	0.02	100	0.02	0.02	100	0.0	30	58.7-139	
Carbon disulfide	0.02	0.013	65	0.02	0.013	65	0.0	30	80-120	L2
Carbon tetrachloride	0.02	0.021	105	0.02	0.021	105	0.0	30	68.7-135	
Chlorobenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	73.3-129	
Chloroethane	0.02	0.019	95	0.02	0.02	100	5.1	30	66.2-129	
Chloroform	0.02	0.021	105	0.02	0.021	105	0.0	30	73.7-134	
Chloromethane	0.02	0.017	85	0.02	0.018	90	5.7	30	51.4-135	
cis-1,2-Dichloroethylene	0.02	0.02	100	0.02	0.02	100	0.0	30	72.4-132	
cis-1,3-Dichloropropene	0.02	0.022	110	0.02	0.022	110	0.0	30	67.7-134	
Dibromochloromethane	0.02	0.021	105	0.02	0.022	110	4.7	30	73.2-126	
Dibromomethane	0.02	0.022	110	0.02	0.022	110	0.0	30	69.9-134	
Dichlorodifluoromethane	0.02	0.019	95	0.02	0.019	95	0.0	30	36.8-144	
Ethylbenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	72.2-128	
Isopropylbenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	71.2-131	
m- & p-Xylenes	0.04	0.042	105	0.04	0.042	105	0.0	30	70.7-131	
MEK	0.02	0.02	100	0.02	0.021	105	4.9	30	52.5-152	
Methylene chloride	0.02	0.019	95	0.02	0.02	100	5.1	30	70.6-129	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/Kg**

QC Batch ID : Qb17052904 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051761.01,03

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
MTBE	0.02	0.021	105	0.02	0.022	110	4.7	30	80-120	
Naphthalene	0.02	0.022	110	0.02	0.023	115	4.4	30	60.7-145	
n-Butylbenzene	0.02	0.021	105	0.02	0.02	100	4.9	30	66.5-136	
n-Propylbenzene	0.02	0.02	100	0.02	0.02	100	0.0	30	73.3-126	
o-Xylene	0.02	0.021	105	0.02	0.021	105	0.0	30	71.6-130	
sec-Butylbenzene	0.02	0.021	105	0.02	0.02	100	4.9	30	77.9-124	
Styrene	0.02	0.022	110	0.02	0.022	110	0.0	30	71.1-131	
t-butylbenzene	0.02	0.021	105	0.02	0.021	105	0.0	30	74.4-130	
Tetrachloroethylene	0.02	0.022	110	0.02	0.022	110	0.0	30	62.6-157	
Toluene	0.02	0.021	105	0.02	0.021	105	0.0	30	73.3-127	
trans-1,2-Dichloroethylene	0.02	0.02	100	0.02	0.02	100	0.0	30	80-120	
trans-1,3-Dichloropropene	0.02	0.022	110	0.02	0.022	110	0.0	30	71.5-124	
Trichloroethylene	0.02	0.022	110	0.02	0.022	110	0.0	30	69.2-133	
Trichlorofluoromethane	0.02	0.013	65	0.02	0.014	70	7.4	30	63.9-140	
Vinyl Chloride	0.02	0.019	95	0.02	0.019	95	0.0	30	40.9-159	
Xylenes	0.06	0.063	105	0.06	0.063	105	0.0	30	69.2-133	

QC Type: MS and MSD
QC Sample ID: 17051699.01

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
1,1,1,2-Tetrachloroethane	BRL	0.019	0.021	111						71.4-131	
1,1,1-Trichloroethane	BRL	0.019	0.021	111						69.6-140	
1,1,2,2-Tetrachloroethane	BRL	0.019	0.02	105						66.6-128	
1,1,2-Trichloroethane	BRL	0.019	0.02	105						72.8-125	
1,1-Dichloroethane	BRL	0.019	0.02	105						72.7-129	
1,1-Dichloroethylene	BRL	0.019	0.014	73.7						71.4-131	
1,1-Dichloropropene	BRL	0.019	0.019	100						75.9-132	
1,2,3-trichlorobenzene	BRL	0.019	0.019	100						56.7-153	
1,2,3-Trichloropropane	BRL	0.019	0.02	105						61.6-138	
1,2,4-Trichlorobenzene	BRL	0.019	0.018	94.7						55.9-150	
1,2,4-Trimethylbenzene	BRL	0.019	0.018	94.7						71.1-131	
1,2-Dibromo-3-chloropropa	BRL	0.019	0.021	111						52.4-150	
1,2-Dibromoethane	BRL	0.019	0.02	105						72.9-125	
1,2-Dichlorobenzene	BRL	0.019	0.019	100						76.1-126	
1,2-Dichloroethane	BRL	0.019	0.023	121						66.4-134	
1,2-Dichloropropane	BRL	0.019	0.02	105						70.2-128	
1,3,5-Trimethylbenzene	BRL	0.019	0.018	94.7						75.1-127	
1,3-Dichlorobenzene	BRL	0.019	0.018	94.7						73.9-126	
1,3-Dichloropropane	BRL	0.019	0.021	111						68.3-124	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method :** SW-846 8260C **Reporting Units :** mg/Kg

QC Batch ID : Qb17052904 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051761.01,03

QC Type: MS and MSD
QC Sample ID: 17051699.01

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
1,4-Dichlorobenzene	BRL	0.019	0.018	94.7						72.3-127	
1,4-Dioxane	BRL	0.60	0.771	129						70-130	
2,2-Dichloropropane	BRL	0.019	0.016	84.2						68.5-138	
2-Chlorotoluene	BRL	0.019	0.018	94.7						71.7-128	
4-Chlorotoluene	BRL	0.019	0.018	94.7						72.2-126	
4-Isopropyltoluene	BRL	0.019	0.018	94.7						77.5-125	
Benzene	BRL	0.019	0.019	100						74-126	
Bromobenzene	BRL	0.019	0.019	100						73.3-129	
Bromochloromethane	BRL	0.019	0.02	105						68.8-131	
Bromodichloromethane	BRL	0.019	0.022	116						69-135	
Bromoform	BRL	0.019	0.023	121						62-146	
Bromomethane	BRL	0.019	0.017	89.5						58.7-139	
Carbon disulfide	BRL	0.019	0.013	68.4						70-130	M9
Carbon tetrachloride	BRL	0.019	0.022	116						68.7-135	
Chlorobenzene	BRL	0.019	0.019	100						73.3-129	
Chloroethane	BRL	0.019	0.02	105						66.2-129	
Chloroform	BRL	0.019	0.021	111						73.7-134	
Chloromethane	BRL	0.019	0.015	78.9						51.4-135	
cis-1,2-Dichloroethylene	BRL	0.019	0.019	100						72.4-132	
cis-1,3-Dichloropropene	BRL	0.019	0.018	94.7						67.7-134	
Dibromochloromethane	BRL	0.019	0.021	111						73.2-126	
Dibromomethane	BRL	0.019	0.022	116						69.9-134	
Dichlorodifluoromethane	BRL	0.019	0.019	100						36.8-144	
Ethylbenzene	BRL	0.019	0.019	100						72.2-128	
Isopropylbenzene	BRL	0.019	0.019	100						71.2-131	
m- & p-Xylenes	BRL	0.037	0.039	105						70.7-131	
MEK	BRL	0.019	0.02	105						52.5-152	
Methylene chloride	BRL	0.019	0.019	100						70.6-129	
MTBE	BRL	0.019	0.021	111						70-130	
Naphthalene	BRL	0.019	0.02	105						60.7-145	
n-Butylbenzene	BRL	0.019	0.017	89.5						66.5-136	
n-Propylbenzene	BRL	0.019	0.018	94.7						73.3-126	
o-Xylene	BRL	0.019	0.02	105						71.6-130	
sec-Butylbenzene	BRL	0.019	0.018	94.7						77.9-124	
Styrene	BRL	0.019	0.019	100						71.1-131	
t-butylbenzene	BRL	0.019	0.018	94.7						74.4-130	
Tetrachloroethylene	BRL	0.019	0.024	126						62.6-157	
Toluene	BRL	0.019	0.019	91.6						73.3-127	
trans-1,2-Dichloroethylene	BRL	0.019	0.019	100						70-130	
trans-1,3-Dichloropropene	BRL	0.019	0.017	89.5						71.5-124	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : **Volatile Organic Compounds** **Method :** **SW-846 8260C** **Reporting Units :** **mg/Kg**

QC Batch ID : Qb17052904 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051761.01,03

QC Type: MS and MSD
QC Sample ID: 17051699.01

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
Trichloroethylene	BRL	0.019	0.02	105						69.2-133	
Trichlorofluoromethane	BRL	0.019	0.011	57.9						63.9-140	M9
Vinyl Chloride	BRL	0.019	0.018	94.7						40.9-159	
Xylenes	BRL	0.056	0.059	105						69.2-133	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : Total Petroleum Hydrocarbons **Method : TX 1005** **Reporting Units : mg/L**

QC Batch ID : Qb17053042 **Created Date :** 05/26/17 **Created By :** VNair

Samples in This QC Batch : 17051761.02

Sample Preparation : PB17053048 **Prep Method :** TX 1005 **Prep Date :** 05/26/17 16:00 **Prep By :** VNair

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
C6-C12	TPH-1005-1	< MDL	mg/L	1	1.5	0.66		
>C12-C28	TPH-1005-2	< MDL	mg/L	1	1.5	0.86		
>C28-C35	TPH-1005-4	< MDL	mg/L	1	1.5	0.75		
Total C6-C35		< MDL	mg/L	1	----			
1-Chlorooctane(surr)	111-85-3	97.4	%	1				
Chlorooctadecane(surr)	3386-33-2	98.7	%	1				

QC Type: Duplicate

QC Sample ID: 17051761.02

Parameter	QCSample Result	Sample Result	Units	RPD	RPD CtrlLimit		Qual
>C12-C28	BRL	BRL	mg/L		30		
>C28-C35	BRL	BRL	mg/L		30		
C6-C12	BRL	BRL	mg/L		30		
Total C6-C35	BRL	BRL	mg/L		30		

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
C6-C12	30	35.9	120	30	36	120	0.3	20	75-125	
>C12-C28	30	33.4	111	30	34.1	114	2.1	20	75-125	
>C28-C35	30	33.8	113	30	35.3	118	4.3	20	75-125	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/L**

QC Batch ID : Qb17053157 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051761.02

Sample Preparation : PB17053143 **Prep Method :** SW-846 5030C **Prep Date :** 05/26/17 15:00 **Prep By :** Jdongre

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
1,1,1,2-Tetrachloroethane	630-20-6	< MDL	mg/L	1	0.005	0.001		
1,1,1-Trichloroethane	71-55-6	< MDL	mg/L	1	0.005	0.001		
1,1,2,2-Tetrachloroethane	79-34-5	< MDL	mg/L	1	0.005	0.001		
1,1,2-Trichloroethane	79-00-5	< MDL	mg/L	1	0.005	0.001		
1,1-Dichloroethane	75-34-3	< MDL	mg/L	1	0.005	0.001		
1,1-Dichloroethylene	75-35-4	< MDL	mg/L	1	0.005	0.001		
1,1-Dichloropropene	563-58-6	< MDL	mg/L	1	0.005	0.001		
1,2,3-trichlorobenzene	87-61-6	< MDL	mg/L	1	0.005	0.001		
1,2,3-Trichloropropane	96-18-4	< MDL	mg/L	1	0.005	0.001		
1,2,4-Trichlorobenzene	120-82-1	< MDL	mg/L	1	0.005	0.001		
1,2,4-Trimethylbenzene	95-63-6	< MDL	mg/L	1	0.005	0.001		
1,2-Dibromo-3-chloropropa	96-12-8	< MDL	mg/L	1	0.005	0.001		
1,2-Dibromoethane	106-93-4	< MDL	mg/L	1	0.005	0.001		
1,2-Dichlorobenzene	95-50-1	< MDL	mg/L	1	0.005	0.001		
1,2-Dichloroethane	107-06-2	< MDL	mg/L	1	0.005	0.001		
1,2-Dichloropropane	78-87-5	< MDL	mg/L	1	0.005	0.001		
1,3,5-Trimethylbenzene	108-67-8	< MDL	mg/L	1	0.005	0.001		
1,3-Dichlorobenzene	541-73-1	< MDL	mg/L	1	0.005	0.001		
1,3-Dichloropropane	142-28-9	< MDL	mg/L	1	0.005	0.001		
1,4-Dichlorobenzene	106-46-7	< MDL	mg/L	1	0.005	0.001		
1,4-Dioxane	123-91-1	< MDL	mg/L	1	0.32	0.084		
2,2-Dichloropropane	594-20-7	< MDL	mg/L	1	0.005	0.001		
2-Chlorotoluene	95-49-8	< MDL	mg/L	1	0.005	0.001		
4-Chlorotoluene	106-43-4	< MDL	mg/L	1	0.005	0.001		
4-Isopropyltoluene	99-87-6	< MDL	mg/L	1	0.005	0.003		
Benzene	71-43-2	< MDL	mg/L	1	0.005	0.001		
Bromobenzene	108-86-1	< MDL	mg/L	1	0.005	0.001		
Bromochloromethane	74-97-5	< MDL	mg/L	1	0.005	0.001		
Bromodichloromethane	75-27-4	< MDL	mg/L	1	0.005	0.001		
Bromoform	75-25-2	< MDL	mg/L	1	0.005	0.001		
Bromomethane	74-83-9	< MDL	mg/L	1	0.005	0.002		
Carbon disulfide	75-15-0	< MDL	mg/L	1	0.005	0.001		
Carbon tetrachloride	56-23-5	< MDL	mg/L	1	0.005	0.001		
Chlorobenzene	108-90-7	< MDL	mg/L	1	0.005	0.001		
Chloroethane	75-00-3	< MDL	mg/L	1	0.005	0.001		
Chloroform	67-66-3	< MDL	mg/L	1	0.005	0.001		
Chloromethane	74-87-3	< MDL	mg/L	1	0.005	0.001		
cis-1,2-Dichloroethylene	156-59-2	< MDL	mg/L	1	0.005	0.001		

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/L**

QC Batch ID : Qb17053157 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051761.02

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
cis-1,3-Dichloropropene	10061-01-5	< MDL	mg/L	1	0.005	0.001		
Dibromochloromethane	124-48-1	< MDL	mg/L	1	0.005	0.001		
Dibromomethane	74-95-3	< MDL	mg/L	1	0.005	0.001		
Dichlorodifluoromethane	75-71-8	< MDL	mg/L	1	0.005	0.003		
Ethylbenzene	100-41-4	< MDL	mg/L	1	0.005	0.001		
Isopropylbenzene	98-82-8	< MDL	mg/L	1	0.005	0.001		
m- & p-Xylenes	108-38-3&106-42-3	< MDL	mg/L	1	0.01	0.002		
MEK	78-93-3	< MDL	mg/L	1	0.005	0.001		
Methylene chloride	75-09-2	< MDL	mg/L	1	0.005	0.001		
MTBE	1634-04-4	< MDL	mg/L	1	0.005	0.001		
Naphthalene	91-20-3	< MDL	mg/L	1	0.005	0.002		
n-Butylbenzene	104-51-8	< MDL	mg/L	1	0.005	0.001		
n-Propylbenzene	103-65-1	< MDL	mg/L	1	0.005	0.001		
o-Xylene	95-47-6	< MDL	mg/L	1	0.005	0.001		
sec-Butylbenzene	135-98-8	< MDL	mg/L	1	0.005	0.001		
Styrene	100-42-5	< MDL	mg/L	1	0.005	0.001		
t-butylbenzene	98-06-6	< MDL	mg/L	1	0.005	0.001		
Tetrachloroethylene	127-18-4	< MDL	mg/L	1	0.005	0.001		
Toluene	108-88-3	< MDL	mg/L	1	0.005	0.001		
trans-1,2-Dichloroethylene	156-60-5	< MDL	mg/L	1	0.005	0.001		
trans-1,3-Dichloropropene	10061-02-6	< MDL	mg/L	1	0.005	0.001		
Trichloroethylene	79-01-6	< MDL	mg/L	1	0.005	0.001		
Trichlorofluoromethane	75-69-4	< MDL	mg/L	1	0.005	0.001		
Vinyl Chloride	75-01-4	< MDL	mg/L	1	0.005	0.001		
Xylenes	1330-20-7	< MDL	mg/L	1	0.015	0.002		
Dibromofluoromethane(surr	1868-53-7	122	%	1				
1,2-Dichloroethane-d4(surr	17060-07-0	110	%	1				
Toluene-d8(surr)	2037-26-5	98.3	%	1				
p-Bromofluorobenzene(surr	460-00-4	106	%	1				

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
1,1,1,2-Tetrachloroethane	0.02	0.022	110	0.02	0.019	95	14.6	12	82.6-121	R1
1,1,1-Trichloroethane	0.02	0.023	115	0.02	0.02	100	14	13	82.8-123	R1
1,1,2,2-Tetrachloroethane	0.02	0.022	110	0.02	0.02	100	9.5	20	77.5-122	
1,1,2-Trichloroethane	0.02	0.021	105	0.02	0.02	100	4.9	14	81.1-119	
1,1-Dichloroethane	0.02	0.022	110	0.02	0.019	95	14.6	12	74.5-125	R1
1,1-Dichloroethylene	0.02	0.028	140	0.02	0.02	100	33.3	12	75.4-124	L1,R1

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/L**

QC Batch ID : Qb17053157 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051761.02

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
1,1-Dichloropropene	0.02	0.022	110	0.02	0.019	95	14.6	12	76.9-125	R1
1,2,3-trichlorobenzene	0.02	0.023	115	0.02	0.021	105	9.1	20	70.8-125	
1,2,3-Trichloropropane	0.02	0.023	115	0.02	0.02	100	14	22	69.6-126	
1,2,4-Trichlorobenzene	0.02	0.024	120	0.02	0.02	100	18.2	16	74.8-121	R1
1,2,4-Trimethylbenzene	0.02	0.024	120	0.02	0.02	100	18.2	12	80.4-114	L1,R1
1,2-Dibromo-3-chloropropa	0.02	0.021	105	0.02	0.02	100	4.9	27	61.7-140	
1,2-Dibromoethane	0.02	0.022	110	0.02	0.02	100	9.5	15	80.6-118	
1,2-Dichlorobenzene	0.02	0.023	115	0.02	0.02	100	14	11	82.6-113	L1,R1
1,2-Dichloroethane	0.02	0.023	115	0.02	0.019	95	19	14	72.8-126	R1
1,2-Dichloropropane	0.02	0.023	115	0.02	0.019	95	19	13	82.4-120	R1
1,3,5-Trimethylbenzene	0.02	0.023	115	0.02	0.02	100	14	10	81.3-114	L1,R1
1,3-Dichlorobenzene	0.02	0.022	110	0.02	0.02	100	9.5	11	83.4-113	
1,3-Dichloropropane	0.02	0.021	105	0.02	0.019	95	10	16	79.8-115	
1,4-Dichlorobenzene	0.02	0.022	110	0.02	0.02	100	9.5	11	82.6-113	
1,4-Dioxane	0.64	0.606	94.7	0.64	0.562	87.8	7.5	30	70-130	
2,2-Dichloropropane	0.02	0.022	110	0.02	0.019	95	14.6	15	69.4-131	R1
2-Chlorotoluene	0.02	0.023	115	0.02	0.02	100	14	17	77.8-118	
4-Chlorotoluene	0.02	0.022	110	0.02	0.02	100	9.5	15	78.8-117	
4-Isopropyltoluene	0.02	0.023	115	0.02	0.02	100	14	11	80.9-114	L1,R1
Benzene	0.02	0.023	115	0.02	0.019	95	19	11	84.1-118	R1
Bromobenzene	0.02	0.022	110	0.02	0.02	100	9.5	12	82.8-116	
Bromochloromethane	0.02	0.022	110	0.02	0.02	100	9.5	15	70.7-131	
Bromodichloromethane	0.02	0.024	120	0.02	0.02	100	18.2	12	83.1-119	L1,R1
Bromoform	0.02	0.021	105	0.02	0.018	90	15.4	20	70.3-136	
Bromomethane	0.02	0.027	135	0.02	0.022	110	20.4	23	59-134	L1
Carbon disulfide	0.02	0.023	115	0.02	0.021	105	9.1	30	70-130	
Carbon tetrachloride	0.02	0.024	120	0.02	0.02	100	18.2	13	74.6-129	R1
Chlorobenzene	0.02	0.021	105	0.02	0.019	95	10	11	87.8-110	R1
Chloroethane	0.02	0.024	120	0.02	0.019	95	23.3	13	73.7-124	R1
Chloroform	0.02	0.022	110	0.02	0.02	100	9.5	10	76.4-124	
Chloromethane	0.02	0.023	115	0.02	0.019	95	19	15	59.4-138	R1
cis-1,2-Dichloroethylene	0.02	0.022	110	0.02	0.019	95	14.6	15	74.3-124	
cis-1,3-Dichloropropene	0.02	0.023	115	0.02	0.019	95	19	11	84.6-117	R
Dibromochloromethane	0.02	0.023	115	0.02	0.02	100	14	13	80.3-122	R1
Dibromomethane	0.02	0.022	110	0.02	0.019	95	14.6	16	75.8-126	R1
Dichlorodifluoromethane	0.02	0.025	125	0.02	0.021	105	17.4	15	44.4-149	R1
Ethylbenzene	0.02	0.021	105	0.02	0.019	95	10	12	82.8-114	
Isopropylbenzene	0.02	0.022	110	0.02	0.02	100	9.5	11	86.8-113	
m- & p-Xylenes	0.04	0.043	108	0.04	0.038	95	12.3	10	76.9-122	R1
MEK	0.02	0.022	110	0.02	0.017	85	25.6	42	44.9-154	
Methylene chloride	0.02	0.019	95	0.02	0.016	80	17.1	13	67.3-130	R1

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/L**

QC Batch ID : Qb17053157 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051761.02

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
MTBE	0.02	0.018	90	0.02	0.017	85	5.7	30	70-130	
Naphthalene	0.02	0.021	105	0.02	0.021	105	0.0	27	55.8-136	
n-Butylbenzene	0.02	0.024	120	0.02	0.02	100	18.2	20	74.1-120	R1
n-Propylbenzene	0.02	0.022	110	0.02	0.02	100	9.5	12	78.9-115	
o-Xylene	0.02	0.022	110	0.02	0.019	95	14.6	11	86-111	R1
sec-Butylbenzene	0.02	0.023	115	0.02	0.02	100	14	12	80.2-115	R1
Styrene	0.02	0.021	105	0.02	0.019	95	10	12	86.7-111	
t-butylbenzene	0.02	0.023	115	0.02	0.021	105	9.1	14	80.7-116	
Tetrachloroethylene	0.02	0.021	105	0.02	0.019	95	10	27	64.2-140	
Toluene	0.02	0.021	105	0.02	0.019	95	10	12	85.9-110	
trans-1,2-Dichloroethylene	0.02	0.022	110	0.02	0.02	100	9.5	12	73.7-124	
trans-1,3-Dichloropropene	0.02	0.019	95	0.02	0.017	85	11.1	14	83-114	
Trichloroethylene	0.02	0.024	120	0.02	0.02	100	18.2	12	85.4-114	L1,R1
Trichlorofluoromethane	0.02	0.024	120	0.02	0.02	100	18.2	12	74.3-126	R1
Vinyl Chloride	0.02	0.024	120	0.02	0.02	100	18.2	17	61.8-142	R1
Xylenes	0.06	0.065	108	0.06	0.057	95	13.1	9	81.2-117	R1

QC Type: MS and MSD
QC Sample ID: 17051761.02

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
1,1,1,2-Tetrachloroethane	BRL	0.02	0.018	90						72-139	
1,1,1-Trichloroethane	BRL	0.02	0.018	90						70.6-135	
1,1,2,2-Tetrachloroethane	BRL	0.02	0.02	100						55-149	
1,1,2-Trichloroethane	BRL	0.02	0.019	95						68-139	
1,1-Dichloroethane	BRL	0.02	0.018	90						78-134	
1,1-Dichloroethylene	BRL	0.02	0.018	90						65-141	
1,1-Dichloropropene	BRL	0.02	0.017	85						79-136	
1,2,3-trichlorobenzene	BRL	0.02	0.017	85						54-144	
1,2,3-Trichloropropane	BRL	0.02	0.019	95						58-156	
1,2,4-Trichlorobenzene	BRL	0.02	0.015	75						69-127	
1,2,4-Trimethylbenzene	BRL	0.02	0.016	80						80-131	
1,2-Dibromo-3-chloropropa	BRL	0.02	0.019	95						61-145	
1,2-Dibromoethane	BRL	0.02	0.019	95						68-140	
1,2-Dichlorobenzene	BRL	0.02	0.018	90						70-138	
1,2-Dichloroethane	BRL	0.02	0.018	90						67-152	
1,2-Dichloropropane	BRL	0.02	0.018	90						79-135	
1,3,5-Trimethylbenzene	BRL	0.02	0.016	80						79-133	
1,3-Dichlorobenzene	BRL	0.02	0.016	80						79-128	
1,3-Dichloropropane	BRL	0.02	0.018	90						70-147	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/L**

QC Batch ID : Qb17053157 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051761.02

QC Type: MS and MSD
QC Sample ID: 17051761.02

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
1,4-Dichlorobenzene	BRL	0.02	0.016	80						76-127	
1,4-Dioxane	BRL	0.64	0.61	95.3						70-125	
2,2-Dichloropropane	BRL	0.02	0.013	65						60-129	
2-Chlorotoluene	BRL	0.02	0.016	80						83-130	M9
4-Chlorotoluene	BRL	0.02	0.016	80						82-129	M9
4-Isopropyltoluene	BRL	0.02	0.016	80						78-129	
Benzene	BRL	0.02	0.017	85						73-129	
Bromobenzene	BRL	0.02	0.017	85						76-132	
Bromochloromethane	BRL	0.02	0.02	100						76-135	
Bromodichloromethane	BRL	0.02	0.018	90						80-136	
Bromoform	BRL	0.02	0.018	90						65-139	
Bromomethane	BRL	0.02	0.019	95						65-150	
Carbon disulfide	BRL	0.02	0.019	95						70-125	
Carbon tetrachloride	BRL	0.02	0.016	80						70-136	
Chlorobenzene	BRL	0.02	0.017	85						69-123	
Chloroethane	BRL	0.02	0.019	95						74-145	
Chloroform	BRL	0.02	0.019	95						41.8-164	
Chloromethane	BRL	0.02	0.02	100						42.2-160	
cis-1,2-Dichloroethylene	BRL	0.02	0.018	90						71-134	
cis-1,3-Dichloropropene	BRL	0.02	0.015	75						74-128	
Dibromochloromethane	BRL	0.02	0.018	90						67-141	
Dibromomethane	BRL	0.02	0.02	100						63.1-135	
Dichlorodifluoromethane	BRL	0.02	0.02	100						62-146	
Ethylbenzene	BRL	0.02	0.016	80						80-132	
Isopropylbenzene	BRL	0.02	0.016	80						78-137	
m- & p-Xylenes	BRL	0.04	0.033	82.5						74-127	
MEK	BRL	0.02	0.018	90						52-148	
Methylene chloride	BRL	0.02	0.019	95						68-131	
MTBE	BRL	0.02	0.018	90						70-130	
Naphthalene	BRL	0.02	0.019	95						61-116	
n-Butylbenzene	BRL	0.02	0.015	75						73-140	
n-Propylbenzene	BRL	0.02	0.016	80						75-127	
o-Xylene	BRL	0.02	0.017	85						74-126	
sec-Butylbenzene	BRL	0.02	0.016	80						75-129	
Styrene	BRL	0.02	0.017	85						77-123	
t-butylbenzene	BRL	0.02	0.016	80						75-126	
Tetrachloroethylene	BRL	0.02	0.018	90						27.6-194	
Toluene	BRL	0.02	0.017	85						72-121	
trans-1,2-Dichloroethylene	BRL	0.02	0.018	90						73-138	
trans-1,3-Dichloropropene	BRL	0.02	0.014	70						66-131	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : Volatile Organic Compounds **Method : SW-846 8260C** **Reporting Units : mg/L**

QC Batch ID : Qb17053157 **Created Date :** 05/26/17 **Created By :** Jdongre

Samples in This QC Batch : 17051761.02

QC Type: MS and MSD
QC Sample ID: 17051761.02

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
Trichloroethylene	BRL	0.02	0.017	85						6-138	
Trichlorofluoromethane	BRL	0.02	0.019	95						67-148	
Vinyl Chloride	BRL	0.02	0.021	105						59.4-140	
Xylenes	BRL	0.06	0.05	83.3						73-127	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : Total Petroleum Hydrocarbons **Method : TX 1005** **Reporting Units : mg/Kg**

QC Batch ID : Qb17060139 **Created Date :** 05/31/17 **Created By :** VNair

Samples in This QC Batch : 17051761.01,03

Sample Preparation : PB17060129 **Prep Method :** TX 1005 **Prep Date :** 05/31/17 14:00 **Prep By :** VNair

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
C6-C12	TPH-1005-1	< MDL	mg/Kg	1	25	23.7		
>C12-C28	TPH-1005-2	< MDL	mg/Kg	1	25	20.3		
>C28-C35	TPH-1005-4	< MDL	mg/Kg	1	25	17.7		
Total C6-C35		< MDL	mg/Kg	1	----			
Chlorooctadecane(surr)	3386-33-2	87	%	1				
1-Chlorooctane(surr)	111-85-3	82.4	%	1				

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
C6-C12	500	573	115	500	618	124	7.6	20	75-125	
>C12-C28	500	600	120	500	591	118	1.5	20	75-125	
>C28-C35	500	568	114	500	545	109	4.1	20	75-125	

QC Type: MS and MSD
QC Sample ID: 17051832.02

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
C6-C12	BRL	500	503	101	500	515	103	2.4	20	75-125	
>C12-C28	BRL	500	543	109	500	560	112	3.1	20	75-125	
>C28-C35	BRL	500	512	102	500	525	105	2.5	20	75-125	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE

Job ID : 17051761 **Date :** 6/5/2017

Analysis : % Moisture **Method : SM 2540G** **Reporting Units : %**

QC Batch ID : Qb17060180 **Created Date :** 06/01/17 **Created By :** SRGade

Samples in This QC Batch : 17051761.01,03

Sample Preparation : PB17060156 **Prep Method :** SM 2540G **Prep Date :** 06/01/17 11:45 **Prep By :** SRGade

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
% Moisture		0.174	%	1	----			B3

QC Type: Duplicate

QC Sample ID: 17051761.01

Parameter	QCSample Result	Sample Result	Units	RPD	RPD CtrlLimit		Qual
% Moisture	12.7	12.2	%	4	20		

Refer to the Definition page for terms.

LABORATORY TERM AND QUALIFIER DEFINITION REPORT

Job ID : 17051761

Date: 6/5/2017

General Term Definition

Back-Wt	Back Weight	Post-Wt	Post Weight
BRL	Below Reporting Limit	ppm	parts per million
cfu	colony-forming units	Pre-Wt	Previous Weight
Conc.	Concentration	Q	Qualifier
D.F.	Dilution Factor	RegLimit	Regulatory Limit
Front-Wt	Front Weight	RPD	Relative Percent Difference
LCS	Laboratory Check Standard	RptLimit	Reporting Limit
LCSD	Laboratory Check Standard Duplicate	SDL	Sample Detection Limit
MS	Matrix Spike	surr	Surrogate
MSD	Matrix Spike Duplicate	T	Time
MW	Molecular Weight	TNTC	Too numerous to count
J	Estimation. Below calibration range but above MDL		

Qualifier Definition

B3	Target analyte detected in method blank at or above the MDL or reporting limit. However, concentration found in the sample was >/= 10 times the concentration found in the blank.
L1	Associated LCS and/or LCSD recovery is above acceptance limits for flagged analyte. Bias may be high.
L2	Associated LCS and/or LCSD recovery is below acceptance limits for flagged analyte. Bias may be low.
M9	Matrix Spike and/or Matrix Spike Duplicate recovery is below laboratory control limits.
R1	RPD exceeds control limits.
U	Undetected at SDL (Sample Detection Limit).
V11	CCV recovery is below acceptance limits.

A&B Labs — Chain of Custody

The Chain of Custody is a Legal Document

A&B Labs
10100 East Fwy (I-10)
Suite 100
Houston, TX 77029
713-453-6060
1-877-478-6060 Toll Free
713-453-6091 Fax
ablabs.com

A&B JOB ID # 1705176 1

5. Project # E101-17

1. REPORT TO:
Company: Aviles Engineering Corp (AEC)
Address: 5790 Windfern
Houston, TX 77041
Contact: Bob Metzger
Phone: 281-793-8352
Fax:
E-mail: RMetzger@avilesengineering.com

2. INVOICE TO:
Company: As in Box 1
Address:
Contact:
Phone:
Fax:
E-mail:

3. PO #
3a. A&B Quote #
4. Turnaround Time (Business Days)
☐ 1 Day* ☐ Other:
☐ 2 Days*
☐ 3 Days* *Surcharge applies
☑ 7 Days - Standard

6. Project Name/Location
Memorial Drive Reconstruction, Houston, TX

7. Reporting Requirement:
☐ TRRP Limits only ☐ TRRP Rpt. Package ☐ See Attached ☐ Standard Level II ☐ PST ☐ MDL ☐ EDD

8. Sampler's Name & Company (PLEASE PRINT): Robert J Metzger AEC
Sampler's Signature & Date: 5/26/17

LAB USE ONLY	9. Sample ID and Description	10. Sampling Date	Time 24hr	11. Comp.	12. Matrix: Grab	Water	Soil	Sludge	Oil	Drinking Water	Air	Other	No. of Containers	Analyses/Methods: VOCs + mTBE	TPH 1005	% moisture	18. REMARKS
05A16	B-5 20-21	5/26/17	10:10		✓		✓						7	✓	✓	✓	
05A1F	B-5 Water	5/26/17	10:45		✓	✓							6	✓	✓		
05A1G	5-6 20-22	5/26/17	12:25		✓		✓						7	✓	✓	✓	

13. 14. Containers* V V 40z C
15. Preservatives** C/H C/H C
16. PH-Lab Only
17.

19. RELINQUISHED BY	DATE	TIME	20. RECEIVED BY	DATE	TIME
1	5/26/17	13:43		5/26	13:43
2					
3					

21. KNOWN HAZARDS/COMMENTS
140539631
Temperature: 3.2 - 0.5 = 2.7
Thermometer ID
Intact: Y or N Initials KA
A&B cannot accept verbal changes
Please FAX written changes to 713-453-6091

*Containers: VOA - 40 ml vial; A/G - Amber/Glass 1 Liter; 4 oz/8 oz - glass wide mouth; P/O - Plastic/other
**Preservatives: C - Cool; H - HCl; N - HNO_3; S - H_2SO_4; OH - NaOH; T - $NA_2S_2O_3$; X - Other

METHOD OF SHIPMENT
BILL OF LADING/TRACKING #

LAB USE ONLY SAMPLING RENTAL P/U Supplies Field Work

Samples will be disposed of after 30 day
A&B reserves the right to return sample

Sample Condition Checklist

A&B JobID : **17051761**	Date Received : **05/26/2017**	Time Received : **1:43PM**
Client Name : **Aviles Engineering**		
Temperature : **3.2-0.5CF=2.7°C**	Sample pH : **N/A**	
Thermometer ID : **140539631**	pH Paper ID : **N/A**	

	Check Points	Yes	No	N/A
1.	**Cooler seal present and signed.**		X	
2.	**Sample(s) in a cooler.**	X		
3.	**If yes, ice in cooler.**	X		
4.	**Sample(s) received with chain-of-custody.**	X		
5.	**C-O-C signed and dated.**	X		
6.	**Sample(s) received with signed sample custody seal.**		X	
7.	**Sample containers arrived intact. (If no comment).**	X		
8.	**Matrix :** **Water** ☑ **Soil** ☑ **Liquid** ☐ **Sludge** ☐ **Solid** ☐ **Cassette** ☐ **Tube** ☐ **Bulk** ☐ **Badge** ☐ **Food** ☐ **Other** ☐			
9.	**Sample(s) were received in appropriate container(s).**	X		
10.	**Sample(s) were received with proper preservative**	X		
11.	**All samples were logged or labeled.**	X		
12.	**Sample ID labels match C-O-C ID's**	X		
13.	**Bottle count on C-O-C matches bottles found.**	X		
14.	**Sample volume is sufficient for analyses requested.**	X		
15.	**Samples were received within the hold time.**	X		
16.	**VOA vials completely filled.**			X
17.	**Sample accepted.**	X		
18	**Has client been contacted about sub-out**			X

Comments : Include actions taken to resolve discrepancies/problem:

Soi: 01&03. Water: 02. Received 6 pre-weighed vials and 1 bulk jar for each soil sample. TPH in 60mL. -ANH 5-26-17. Per email from Robert Metzger, Sample 03 / Boring S-6 should be labeled "B-6". AS 5/31/17

Received by : AHall

Check in by/date : AHall / 05/26/2017

APPENDIX F

WASTE DISPOSAL MANIFEST

rint:4

597637-17

5721A

2848848

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
CESQG	1	(877) 577-2669	009799129 FLE

GENERATOR

5. Generator's Name and Mailing Address
LOCKWOOD, ANDREWS, & NEWNAM
2925 BRIARPARK DRIVE
HOUSTON TX 77002
Generator's Phone: (713)821-0440

Generator's Site Address (if different than mailing address)
LOCKWOOD, ANDREWS, AND NEWNAM
2925 BRIARPARK DR.
HOUSTON TX 77002

6. Transporter 1 Company Name
PHILIP RECLAMATION SERVICES-HOUSTON LLC
U.S. EPA ID Number
TXD074196338

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

8. Designated Facility Name and Site Address
PHILIP RECLAMATION SERVICES HOUSTON, LLC
4050 Homestead Road
HOUSTON, TX 77028 (713) 679-2300
Facility's Phone:
U.S. EPA ID Number
TXD074196338

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
	1. NON-DOT/NON-RCRA REGULATED MATERIAL	1	DF	20	P	CESQ	1191	
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
(1) 860668-00 - ENVIRONMENTAL DRILLI
Pickup address: 5790 Windfern, Houston, TX 77041

15. 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. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Robert J Metzger 3rd party authorized for LAN
Signature:
Month: 7 Day: 21 Year: 17

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: [illegible]
Signature:
Month: 7 Day: 21 Year: 17
Transporter 2 Printed/Typed Name:
Signature:
Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H141 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Jesse Williams
Signature:
Month: 7 Day: 28 Year: 17

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

APPENDIX G

RESUME

AVILES
ENGINEERING CORP.

ROBERT J. METZGER, PG, CAPM

POSITION

Senior Geologist for 15 years
Aviles Engineering Corporation, Houston, Texas

EDUCATION

Bowling Green State University, Bachelor of Science in Education - Earth and Biological Sciences

Bowling Green State University, Master of Science – Geology

REGISTRATIONS

Texas Registered Professional Geoscientist License No. 1133

Texas Commission on Environmental Quality Corrective Action Project Manager No. 01418

Certified with 40-Hour OSHA Hazardous Material Health and Safety Training and 8-Hour Refresher

EXPERIENCE

Conducted Phase I and Phase II ESAs for the City of Houston Department of Public Works and Engineering Projects:

- Houston Avenue Paving and Drainage Project ESAs I and II
- ESAs I and II, 24-Inch Water Line Replacement along West Airport Boulevard
- ESA-I: Proposed 72-inch Diameter Water Line From Dowling to Tuam along Polk, Hutchins, Clay, Chenevert, Hadley, and Crawford, Contract 9E
- 66-Inch Storm Water Repair ESA-I
- TIRZ 17 Reconstruction of Memorial Drive Between West Sam Houston Parkway and Tallowood Road
- Riverwood Estates No. 1 Lift Station and Force Main
- Harvey Wilson Drive and Armour Drive Reconstruction
- Jensen Drive Pump Station Valve Box and Pipeline
- Polk Street Underpass Storm Water Inlet Replacement
- Park Row Road from State Highway 6 to Eldridge Parkway
- Heights Area Waterline Replacement
- West Little York Street Reconstruction from Deep Forest Drive to TC Jester Boulevard
- Bastrop Street Sanitary Sewer Line
- Northgate Regional Lift Station and Force Main
- Westheimer North Water Main Replacement
- Lockwood Street Paving from Bennington Boulevard to Tidwell Road
- McCarty #1 Lift Station and Force Main Replacement

Phase II Environmental Site Assessment: Toyota Center, Houston, Texas: Conducted comprehensive Phase II ESA of a six-block site to assess and delineate contaminated soil and groundwater prior to construction of the Toyota Center.

EXPERIENCE, continued

Houston Airport Systems Hobby Airport Taxiway H Phase II Environmental Site Assessment: Conducted Phase II ESA for expansion of Taxiway H at Hobby Airport, which included advancement of soil borings, installation of temporary groundwater monitoring wells and soil and groundwater sampling. Prepared Phase II ESA report.

Elnvironmental Sampling and Analysis during Geotechnical Investigation for Proposed United Airlines Terminal C Ramp and Apron BIAH Airport: Two soil samples were collected from each of 20 boreholes for environmental analysis during geotechnical field work. Samples were also collected in bags for photoionization detector (PID) readings of organic vapors. Prepared and edited letter report.

Environmental Soil Sampling and Analysis Woodhouse Paving Phase I and II Project Areas at Port of Houston Authority: During the Phase I Project, surface concrete was cored, a soil boring was conducted from the soil surface to 18 inches below the surface, and a soil sample was collected from each boring at 20 locations. During the Phase II Project, six soil borings were drilled to 4 feet below the ground surface (bgs), two borings were drilled to 10 feet bgs, and two borings were drilled to 30 feet bgs. One to two soil samples were collected from each boring for a total of 14 samples. Each of the soil samples collected during Phase I and Phase II was submitted to a commercial laboratory for analyses of the following potential environmental contaminants:

- Total petroleum hydrocarbons
- Total RCRA metals
- Volatile and semi volatile organic compounds
- Polychlorinated biphenyls (PCBs)
- Herbicides and Pesticides

Following analysis, a report was prepared for each project area describing the soil boring and sampling procedures, and the results of the laboratory analyses. Concentrations of contaminant in the soil samples were compared to applicable TCEQ standards.

Additional Phase II Environmental Site Assessments

- City of Pasadena Strawberry Road Improvements from Cherrybrook Lane to Spencer Highway.
- City of Pasadena Strawberry Road Improvements from State Highway 225 to Harris Avenue.
- Property at 44 Aldine Bender Road impacted by adjoining leaking underground storage tank site.