SITE CHACTERIZATION SAMPLING
FOR CONTAMINATED MATERIAL MANAGEMENT PURPOSES
PROPOSED FIGHTER ALERT SHELTERS AND APRON REPAIR
TRUAX FIELD
MARCH 10, 2020

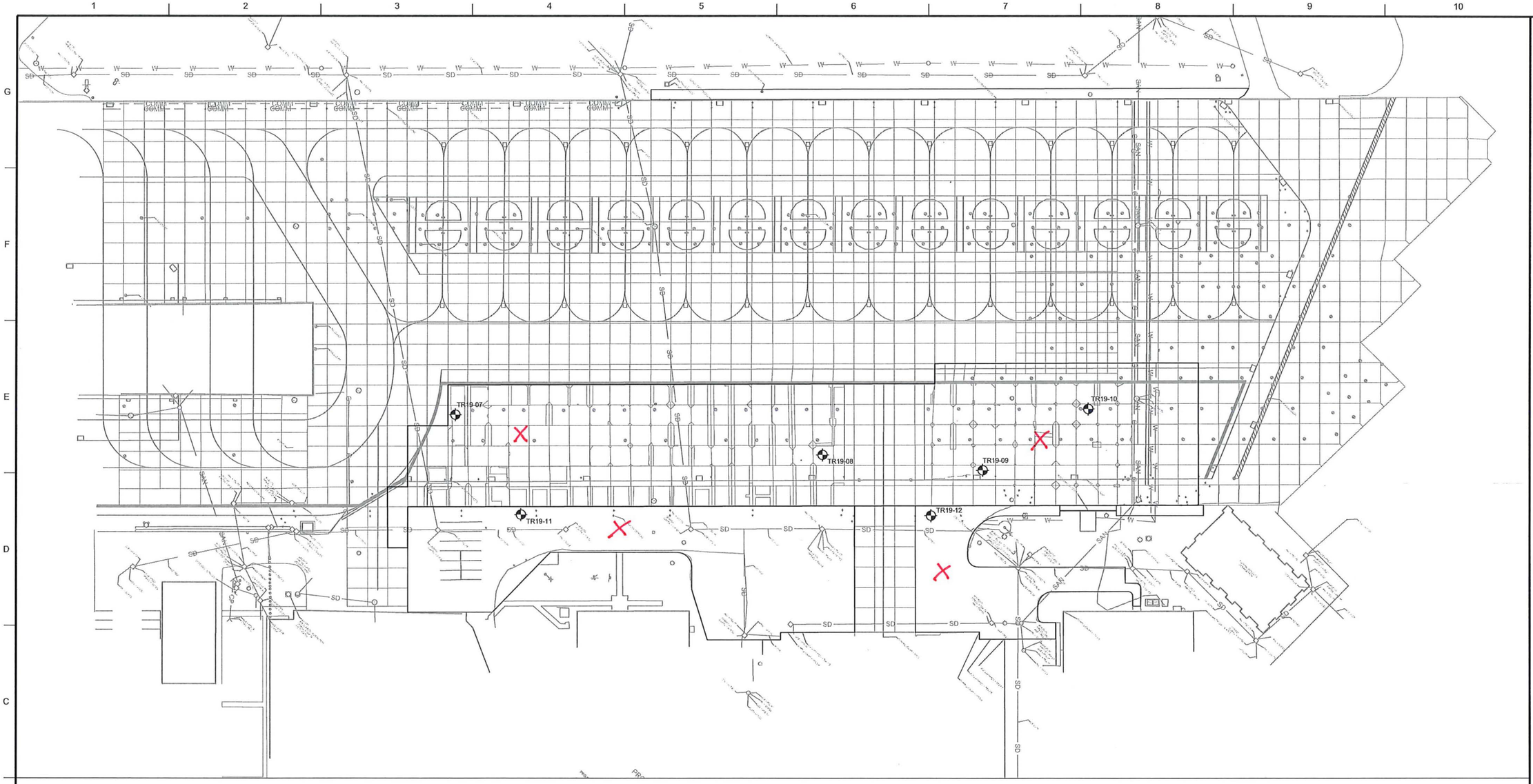
Soil and groundwater samples will be collected at the locations shown on the attached map. All samples will be tested for the full range of volatile organic chemicals and the included list of PFAS compounds. This field information will be used to develop a contaminated materials management plan. The management plan will describe the reuse or disposal of contaminated soil and/or groundwater generated during site preparation and building construction.

Sample locations are designated for the apron repair only. Based on known and expected site characteristics soil and groundwater samples are not required for the new alert shelter location.

SAMPLING:
Two discrete soil samples will be collected from each boring at depths of: 0-2 feet below ground surface and 1 foot above the water table; soil samples will be collected from the areas marked with an X; a total of eight soil samples will be collected

Groundwater samples will be collected from all four proposed borings: samples can be grab samples using a direct push method, permanent wells are not required; a total of four water samples will be collected.

ANALYSIS
All soil and groundwater samples will be analyzed at a lab, approved by the Department, to conduct volatile organic chemical and PFAS analysis. QA/QC requirements will be laboratory specific.



BORING	DEPTH (FT)	NORTHING	EASTING
TR19-07	10.0'	413827.07	2145850.01
TR19-08	10.0'	414046.98	2146140.28
TR19-09	10.0'	414144.57	2146265.49
TR19-10	10.0'	414260.02	2146299.80
TR19-11*	VARIES	413799.92	2145964.47
TR19-12*	VARIES	414077.09	2146259.09

COORDINATE SYSTEM: WISCONSIN SOUTH (4803)

TR 19-01 ⊕ BORING LOCATION AND DESIGNATION

BORINGS MARKED WITH AN ASTERIK WERE CORED TO IDENTIFY EXISTING PAVEMENT THICKNESS AND WERE NOT ADVANCED INTO THE SUBSURFACE.

0 50' 100'
SCALE: 1" = 50' - 0"

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY:	ISSUE DATE:
T. WEIHING	FEBRUARY 2020
DRAWN BY:	SOLICITATION NO.:
T. WEIHING	W9126R-20-XXXX
CHECKED BY:	CONTRACT NO.:
C. FRITZCH	W9126R-21-XXXX
SUBMITTED BY:	FILE NUMBER:
B. FLERE	F113-10-01
SIZE:	FILE NAME:
ANSI D	TX07_B-101.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVENUE
OMAHA, NE 68102

TRUAX FIELD ANGB, WISCONSIN
REPAIR APRON
PN XGFG182005

BORING LOCATION PLAN

SHEET ID

B-101

...\TX\TX07\40000 Design Products\CAD_BIM_Sheets\TX07_B-101
8:40:42 AM 2/13/2020 PD: AEC_pdf.pltcfg DS: AEC_Screen.dscript

CORRECTED FINAL / BCOES REVIEW SET

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
NOTICE OF FINAL GUIDANCE & CERTIFICATION

Pursuant to ch. 227, Wis. Stats., the Wisconsin Department of Natural Resources has finalized and hereby certifies the following guidance document.

DOCUMENT ID

EA-19-0001

DOCUMENT TITLE

Wisconsin PFAS Aqueous (Non-Potable Water) and Non-Aqueous Matrices Method Expectations

PROGRAM/BUREAU

Certification Services / Environmental Analysis & Sustainability

STATUTORY AUTHORITY OR LEGAL CITATION

Wis. Stats. s. 299.11 and Wis. Admin. Code s. NR 149.41 (2)

DATE SENT TO LEGISLATIVE REFERENCE BUREAU (FOR PUBLIC COMMENTS)

9.16.19

DATE FINALIZED

12.16.19

DNR CERTIFICATION

I have reviewed this guidance document or proposed guidance document and I certify that it complies with sections 227.10 and 227.11 of the Wisconsin Statutes. I further certify that the guidance document or proposed guidance document contains no standard, requirement, or threshold that is not explicitly required or explicitly permitted by a statute or a rule that has been lawfully promulgated. I further certify that the guidance document or proposed guidance document contains no standard, requirement, or threshold that is more restrictive than a standard, requirement, or threshold contained in the Wisconsin Statutes.

Signature

Date 12/10/2019

Wisconsin PFAS Aqueous (Non-Potable Water) and Non-Aqueous Matrices Method Expectations

- Version 12.16.2019 -

Per- and Polyfluorinated Alkyl Substances (PFAS) Analysis Using Isotope Dilution by LC/MS/MS

The purpose of this document is to provide the expectations that will help the Program determine if a laboratory's method is considered suitable for analysis of PFAS in aqueous (non-potable water) and non-aqueous matrices for Wisconsin.

The Program has the legal authority under NR 149.41 (2) to determine whether the method selected by a laboratory is suitable for the matrix, type of analyte, expected level of analyte, regulatory limit, and anticipated interferences in the sample, when methods are not prescribed by covered programs under NR 149 or permits issued by the department.

Once the EPA publishes their 1600 series isotope dilution method, the Program will defer to that method for certification.

Potable water samples are analyzed utilizing EPA 537.1.

{F} = when "{F}" is listed after an expectation and the expectation is not met, then qualify the associated results on the test report. The qualifier can refer the data user to the narrative where detail is provided that indicates what the non-conformance was, and if known, the possible effects on the sample results.

Definitions are provided in Section **X, "Definitions,"** of this document.

I. Sample Handling

1. Instruct sample collectors to collect grab samples in high density polyethylene or polypropylene containers. {F} Avoid polytetrafluoroethylene (PTFE) containers and contact with PTFE surfaces.

2. Instruct sample collectors to collect an equipment blank when using equipment in the field to collect samples. {F}

3. Instruct sample collectors not to fill aqueous sample containers completely.

4. There is no chemical preservation necessary, just temperature preservation. Instruct sample collectors to ship aqueous and solid samples at above their freezing point to 6 °C. {F} Instruct sample collectors to ship tissue samples frozen. {F} Measure and document the temperature of aqueous and solid samples at sample receipt. Tissue samples received frozen can be documented as "frozen" at sample receipt.

5. Store aqueous and solid samples at above their freezing point to 6 °C at the laboratory. {F} Store tissue samples at less than or equal to -10 °C at the laboratory. {F} Store all extracts at 0 – 6 °C at the laboratory. {F}

6. Aqueous and solid sample holding times are within 28 days from collection to extraction and within 30 days from extraction to analysis. {F} Tissue sample holding times are within 1 year from collection to extraction and within 30 days from extraction to analysis. {F}

7. Rinse aqueous sample containers and all extract containers after transfers with one or more rinses of polar solvent to remove any PFAS that may have been adsorbed to container walls.

8. Thoroughly vortex or mix extracts and standards before transfer or aliquoting to remove any PFAS that may have been adsorbed to container walls.

9. Thoroughly vortex autosampler vials before loading the autosampler to remove any PFAS that may have adsorbed to container walls.

II. Initial Demonstration of Capability (IDC)

1. All analysts performing testing are expected to pass an IDC. If analysts perform only the extraction steps, then they are expected to pass the extraction portion of an IDC. If analysts perform only the analysis steps, then they are expected to pass the analysis portion of an IDC.

2. Analyze standards of all target (native) analytes and extracted internal standards (EIS) to determine retention times of the linear and branched isomers.

3. Analyze a method blank. The results are expected to be less than one-half the method reporting limit (MRL).

4. Assess precision and recovery by performing the entire procedure on four laboratory control samples (LCS) spiked at a midrange concentration of the initial calibration for each target (native) analyte. The average recovery is expected to be within 65-135%, and the RSD is expected to be less than or equal to 30%.

5. Assess recovery of the extracted internal standards (EIS) in each LCS. Except for FOSA, NMeFOSA, NEtFOSA, NMeFOSE, and NEtFOSE, EIS recoveries are expected to be within 50–150%. For FOSA, NMeFOSA, NEtFOSA, NMeFOSE, and NEtFOSE, EIS recoveries are expected to be within 20 – 150%.

III. Field Quality Control Samples

1. **Equipment blanks** (one per sampling event when equipment is used in the field to collect samples) – The results are expected to be less than the highest of the following {F}:

    a. 1/2 the MRL
    b. 1/10 the sample concentration

    It is not necessary to qualify equipment blank detections between the MDL and one-half the MRL.

2. **Field blanks** (one per sampling event for each sampling site) – The results are expected to be less than the highest of the following {F}:

    a. 1/2 the MRL
    b. 1/10 the sample concentration

    It is not necessary to qualify field blank detections between the MDL and one-half the MRL.

3. **Field duplicates** (one per sampling event for each sampling site) – The RPDs are expected to be less than or equal to 30% when analyte concentrations are greater than twice the MRL. {F} The RPDs are expected to be less than or equal to 50% when analyte concentrations are the MRL and twice the MRL. {F}

IV. Batch Quality Control Samples

1. **Method blank** (one per batch) – The results are expected to be less than the highest of the following {F}:

    a. 1/2 the MRL
    b. 1/10 the sample concentration

    It is not necessary to qualify method blank detections between the MDL and one-half the MRL.

    Method blanks are processed along with and under the same conditions, including all sample preparation steps (i.e. filtering, centrifuging), as the associated samples in the preparation batch.

2. **Laboratory control sample** (one per batch) – Spike with all target (native) analytes.

    Laboratory control samples are processed along with and under the same conditions, including all sample preparation steps (i.e. filtering, centrifuging), as the associated samples in the preparation batch.

    For aqueous and solids batches, spike the LCS at a low range (1 – 2x MRL) in each batch, or the laboratory may rotate spike concentrations between three consecutive batches alternating low range, midrange, and high range. Midrange and high range are relative to the initial calibration range. For aqueous and solid batches, the recoveries are expected to be within 60-135%, except for the low range (1 – 2x MRL) where the recoveries are expected to be within 50-150%. {F}

    For tissue batches, spike the LCS at midrange. For tissue batches the recoveries are expected to be within 60-135% with the following exceptions: for PFHxDA, PFODA, and NMeFOSA, the recoveries are expected to be within 50-135%; for PFDS, PFDoS, and 4:2 FTS, the recoveries are expected to be within 40-135%. {F}

3. **Extracted internal standards (EIS)** – Spike field samples and all quality control samples (preparation and instrument) with internal standards. The recoveries of these internal standards are used to adjust target (native) analyte concentrations. These isotopically labeled internal standards are added to the sample at the very beginning of the procedure, before extraction, centrifuging, filtering or phase separation takes place.

    In order to report quantitative results for the target (native) analytes using the EIS, a minimum signal to noise ratio of 10:1 is expected for each EIS. Do not report results with a qualifier if this minimum is not achieved.

    Except for FOSA, NMeFOSA, NEtFOSA, NMeFOSE, and NEtFOSE, the EIS recoveries are expected to be within 25-150% in samples. For FOSA, NMeFOSA, NEtFOSA, NMeFOSE, and NEtFOSE, these EIS recoveries are expected to be within 10-150% in samples. Once enough data points have been collected, the laboratory may develop their own statistical limits for these five EIS in samples. The statistical limits can be different than 10–150% as long as the expected minimum 10:1 signal to noise ratio is maintained for each EIS.

    If any EIS recoveries are outside of limits in a sample, reinject the sample. If the EIS recovery fails again, the data may be reported with a qualifier. {F}

    Use exact isotopically labeled analogs for the EIS where commercially available. As of December 2019, at least 25 of the 36 PFAS for which Wisconsin is offering certification are available as exact isotopically labeled analogs of the target (native) analytes. As of December 2019, the following 11 PFAS do not have exact isotopically labeled analogs commercially available and are therefore not currently necessary: PFTriA, PFODA, PFPeS, PFHpS, PFNS, PFDS, PFDoS, 10:2 FTSA, DONA, 9Cl-PF3ONS, and 11Cl-PF3OUdS.

For these 11 PFAS without an exact isotopically labeled analog commercially available, use an alternate EIS. The alternate EIS is expected to be isotopically labeled and is expected to be a chemically similar analyte that is close in retention time to the target (native) analyte. The alternate EIS may be from the same functional group as the target (native) analyte or have the same chain length as the target (native) analyte (whichever gives better performance). Typically, the alternate EIS comes from those EIS that are already in use. The same EIS can be used for more than one target (native) analyte.

V. Calibration (Initial and Continuing)

1. Perform initial calibration at setup and after an ICV or CCV standard failure. If an ICV or CCV standard fails, the laboratory may immediately analyze two additional consecutive ICV or CCV standards. If either of the two fails, or if immediate analysis is not possible, it is expected that a new initial calibration is performed. If both pass, then sample analysis can continue without a new initial calibration. If a CCV fails high and there are no detections in the associated samples, then analysis can proceed.

2. Initial calibration functions are expected to be as follows:

    a. Calibration factors have an RSD that is less than or equal to 20%.
    b. Linear regressions have a coefficient of determination that is greater than or equal to 0.99 and use a minimum of five non-zero concentration standards.
    c. Quadratic regressions have a coefficient of determination that is greater than or equal to 0.99 and use a minimum of six non-zero concentration standards.
    d. Do not force linear and quadratic regressions through zero.
    e. For each calibration standard, reprocess the target (native) analyte against the chosen calibration function. The reprocessed recoveries are expected to be within 70–130% of their actual concentrations, except for the lowest concentration standard, whose reprocessed recoveries are expected to be within 50–150% of their actual concentrations.

3. It is expected that sample analysis is not performed if the initial calibration fails.

4. Analyze standards of all target (native) analytes and EIS to determine retention times of the linear and branched isomers. Analyze branched isomers that have commercially available standards. As of December 2019, the following PFAS are commercially available as branched isomer analytical (quantitative) standards: PFHxS, PFOS, NMeFOSAA, and NEtFOSAA. As of December 2019, PFOA is commercially available as a branched isomer technical grade (qualitative) standard.

5. When an initial calibration is performed, it is expected that the midrange standard is used to establish absolute retention times. When an initial calibration is not performed, it is expected that the first CCV is used to establish absolute retention times.

6. Retention times of the target (native) analytes and the EIS are expected to fall within 0.4 minutes of the established absolute retention times. Comparison of the target (native) analyte and EIS retention times can help determine if analyte shifts occurred due to matrix effects.

7. **ICV (2nd source)** – It is expected that the ICV is performed with each new initial calibration before sample analysis. The ICV is analyzed after the ICB. As of December 2019, the following PFAS may be difficult to find as second sources and are therefore not currently necessary: PFHxDA, PFODA, PFDoS, NMeFOSA, NEtFOSA, NMeFOSE, and NEtFOSE. Recoveries in the ICV are expected to be within 70-130%. It is expected that sample analysis is not performed if the ICV fails.

8. **ICB** – It is expected that the ICB is analyzed immediately after the highest standard in the initial calibration and before the ICV to demonstrate the instrument is free from levels of contaminants that would bias results. The results of the ICB are expected to be less than one-half the MRL.

9. **CCV** – It is expected that CCVs are performed at the beginning and end of each analysis batch and after every 10 field samples.

    a. It is expected that the concentrations in the first CCV on non-initial calibration days are at the MRL.
    b. Target (native) analyte recoveries are expected to be within 50-150% for the CCV analyzed at the MRL.
    c. Target (native) analyte recoveries for all other CCVs are expected to be within 70-130%.
    d. It is expected that samples results are only reported when bracketed by passing CCVs unless the recovery failure is high and there are no detections of that analyte in the associated samples.

10. **CCB** – It is expected that the CCB is analyzed immediately after each CCV to demonstrate the instrument is free from levels of contaminants that would bias results. If method blanks or reagent blanks are analyzed after a CCV instead of a CCB, then it is expected that the CCB limits are used for assessment. The results of the CCBs are expected to be less than one-half the MRL.

11. It is expected that the same EIS as those used in samples are added to the initial calibration standards, ICV, CCVs, ICBs, and CCBs at the same concentration used in samples. The calibration standards (initial and continuing) are not extracted like samples. Since there is no matrix effect or extraction performed on these instrument quality control samples, the recoveries of the EIS are expected to be within 50 – 150%.

VI. Aqueous Sample Extraction

1. Extract the entire sample received in the sample container in which it was collected unless the exceptions listed below apply.

    a. Samples received at extremely high PFAS concentrations may be subsampled. {F}
    b. If more sample volume is received than what can be extracted through the solid phase extraction (SPE) cartridge, then subsampling is allowed. {F}

    Adsorption of target (native) analytes to sample collection container walls is known to occur in aqueous samples. Extract the entire aqueous sample volume. Subsampling of aqueous samples from the sample collection container is discouraged and can result in significant loss of longer-chain PFAS (e.g. carboxylic acids ≥ C9, sulfonic acids ≥ C7).

2. Spike the sample in the sample bottle it was received in by adding the EIS. Cap, invert and mix. It is expected that the EIS that are spiked into the sample are provided sufficient time to equilibrate in the sample before further processing. This allows the EIS time to disperse proportionally into the liquid phase and solid phase – same as the target (native) analytes and thereby providing a more accurate result. Add the EIS before any extraction, centrifuging, filtering or phase separation takes place.

    Biphasic and problematic sample matrices may have to use a different spiking procedure. It is best for the laboratory to contact the client prior to spiking and extraction to determine the best course of action to meet their data quality objectives. In these events, include detail in the narrative as to why spiking into the sample bottle was not possible, what was done instead, and if known, the possible effects on the sample results. {F}

3. If particulates in the sample have to be removed before using SPE, centrifuge the sample and take the liquid phase through the SPE. Samples should only be centrifuged when the suspended solids content visually appears to be high enough, by chemist inspection, that it would cause the SPE cartridge to clog.

   The laboratory could consider creating a "percent solids reference sample" that would include the minimum solids the laboratory has tested that would clog the SPE cartridge and use it to compare it to field samples. For reference, the Department of Defense has indicated that samples with percent solids greater than one percent may require centrifuging before performing the SPE procedure. Ideally, the entire sample is extracted, including the suspended solids.

4. If aqueous samples with a solid phase are centrifuged, the solid phase of the sample is expected to be a plug at the bottom of the container. It is expected that the solid phase remains in the container when rinsing the container walls with the polar elution solvent. Rinsing the container walls would therefore also include rinsing of the solids. If the polar elution solvent disrupts the solid phase significantly, the container can be centrifuged again before removing the solvent for use during the elution step of the SPE procedure.

5. If a total sample concentration is needed and there are significant solids in the sample, the initial spike of EIS into the sample container is sufficient for both phases. There is no need to re-spike the solid phase with EIS if it is being extracted separately.

6. Using filters to separate the solid phase from the liquid phase is discouraged unless there is data to demonstrate that the filters used do not result in contamination greater than one-half the MRL.

7. In the cases where a filter is used to separate the solid phase from the liquid phase, it is expected that the filter would also be rinsed to remove any potentially adsorbed PFAS. The filtrate is then added to the SPE cartridge during the elution step.

8. The data quality objectives from the data user should determine whether the solid phase of the sample has to be extracted or not. Not analyzing the solid phase may lead to a low bias in total sample concentration. Analyzing the liquid phase only would provide a liquid sample concentration result. It is expected that the laboratory would make it clear to the data user whether the reported concentrations are a total or liquid concentration sample result.

9. Determine sample volume by marking the sample level on the bottle or by weighing. It is expected that sample volumes would not be measured with a graduated cylinder. Sample volumes are expected to be measured and not assumed by container size.

   When the sample has significant solids, the laboratory should account for the weight or volume displaced by the solids in the initial sample volume determination and include this information in the test report.

10. Use an appropriate SPE cartridge for the target (native) analytes reported. A weak anion exchange cartridge has been shown to work with the PFAS for which Wisconsin is offering certification.

11. One or more rinses of polar solvent can be used for quantitative transfers. Rinse the sample bottle and cap with elution solvent, pour the solvent from each rinse through the SPE cartridge during the elution step, and collect the filtrate for analysis.

12. Bring to a quantitative final volume with the final injection solvent and vortex well.

VII. Non-Aqueous Sample Extraction

1. Homogenize the entire solid sample received in the sample container in which it was collected in by stirring the solids with a clean spatula or other suitable implement. This would help ensure that a representative subsample is taken.

2. For tissues (e.g. fish, wildlife), the target tissue (liver, fillet, whole fish) is isolated from the rest of the tissue sample. The target (isolated) tissue is ground and is typically provided to the analyst as a subsample. At the time of sample preparation, the analyst is to further homogenize the subsample by stirring with a clean spatula or other suitable implement. This would help ensure that a representative subsample is taken.

3. Spike a portion of the homogenized subsample by adding the EIS directly onto the sample. It is expected that the solvent used to carry the EIS spike onto the sample be allowed to evaporate prior to addition of the extraction solution.

4. Extract the PFAS from the non-aqueous samples with an appropriate solution prior to clean-up.

5. Use an appropriate clean-up cartridge (i.e. ENVI-Carb, W-AX, …) to remove the organic analytes extracted from the soil matrix. More than one type of clean-up cartridge can be used.

6. Use a clean-up cartridge on the fish tissue extract to eliminate known interferences with PFOS (e.g. bile acids such as taurodeoxycholic acid (TDCA)).

7. Ensure that all transfers are quantitative by solvent-rinsing with the elution solvent.

8. Bring to a quantitative final volume with the final injection solvent and vortex thoroughly.

VIII. Sample Analysis

1. Use an LC/MS/MS that is capable of negative ion ESI, produces unique product ions within retention time windows, and is able to provide a minimum of 10 scans across each peak.

2. Perform mass calibration such that the range of masses associated with all precursor and product ions are bracketed for both the primary and confirmation transitions. Documentation is expected to be available to demonstrate that the mass calibration covers this range. Calibrate the mass scale using the calibration analytes and procedure from the instrument manufacturer.

3. Analyte identification is performed using retention times, Signal/Noise ratio, Quantitation Parent Ion to Quantitation Daughter Ion (Quantitation Ion Transition), Confirmation Parent Ion to Confirmation Daughter Ion (Confirmation Ion Transition) and the Ion Transition Ratio.

4. Calculate sample results for the target (native) analytes that have exact isotopically labeled standards using isotope dilution (recovery correction using the EIS).

5. Calculate sample results for the target (native) analytes that do not have exact isotopically labeled standards using an alternate extracted isotopically labeled standard and internal standard quantitation recovery correction (recovery correction using the alternate EIS).

6. Use analytical (quantitative) standards containing both branched and linear isomers where commercially available. The analytical branched isomer standards are included in the initial calibration the same as the linear isomer

standards. Branched isomers in samples are quantitated against these analytical branched isomer standards. To calculate the target (native) analyte result, sum the resulting concentrations of all branched and linear isomers that have corresponding analytical standards.

7. Where analytical standards are not available for the branched isomers, use qualitative (technical grade) standards to identify the branched isomer using retention times, transitions, and ion transition ratios. Quantitate target (native) analytes that use qualitative branched isomer standards by integrating the branched and linear isomer peaks and sum the peak areas to get a total area. Calculate the target (native) analyte concentration using the linear isomer.

   Do not include branched isomer peaks in the initial calibration when qualitative standards are used, and do not use calibration functions from the qualitative branched isomer standards to quantitate branch isomer concentrations.

8. It is expected that the target (native) analytes that have exact labeled analogs would elute within 0.1 min of their analogs. {F}

9. Have a written policy on how retention time windows are established.

10. It is expected that the method reporting limit (MRL) concentration would not be below the lowest standard concentration in the initial calibration.

11. The MDL is expected to be less than the MRL.

12. Report sample results and all quality control blank results to the MDL and include the MRL with each result. Qualify results reported between the MDL and MRL as estimated concentrations.

    Example 1: MDL = 0.6, MRL = 2, sample result = 0.4. Report as:

Result	MDL	MRL
<0.6	0.6	2.0

    Example 2: MDL = 0.6, MRL = 2, sample result = 0.8. Report as:

Result	MDL	MRL
0.8 J	0.6	2.0

13. The MDL for PFOS and PFOA in non-potable waters are each expected to be no higher than 2 ng/L.

14. It is expected that high density polyethylene or polypropylene autosampler vials are single injection use only unless they are immediately recapped.

15. It is expected that all sample results are reported from a response that is no higher than the highest response in the initial calibration, except for samples that saturate the instrument. If supplemental EIS is needed to quantitate dilutions, qualify the results that used the supplemental EIS (in this case, true isotope dilution was not achieved).

16. It is expected that sample results that saturate the instrument are reported with “E” flags. {F}

17. For target (native) analytes, the Signal to Noise (S/N) ratio is expected to be greater than or equal to 3:1 for quantitation ions and confirmation ions. If the S/N is not achieved, it is expected that the peak would not be used in any way and the analyte would be reported as “not detected.”

18. All analytes that have two transitions are expected to include two transitions ions in the analysis (precursor ion to quantitation ion and precursor ion to confirmation ion). Use the confirmation ion for positive analyte identification. The department has provided a list of target (native) analytes and confirmation ions in section **XII**, "**Wisconsin Laboratory Accreditation Program PFAS Certification Offerings with Ions,"** of this document.

19. Assess primary and secondary ion transition ratios. It is expected that recoveries be within 50–150% of the value calculated from the midrange standard in the ICAL on ICAL days or from the beginning CCV on non-ICAL days. {F}

    The transition ratio = $\frac{\text{quantitation ion abundance}}{\text{confirmation ion abundance}}$ or $\frac{\text{confirmation ion abundance}}{\text{quantitation ion abundance}}$

    Either ratio protocol presented above can be used, but it is expected that the protocol is consistently used for all analytes.

    When the ion ratio fails, it is expected that the target (native) analytes would still be reported but qualify them as failing the ion ratio. {F} The ion transition ratio can help identify if bias is present. Ratios can be outside of limits due to interferences or the presence of branched isomers that are in the sample but not in the quantitation standards.

20. Document the primary and confirmation transitions and the ion transition ratio.

21. It is expected that the following transitions are used for quantitation of the following analytes [precursor – product] unless a technically justified reason is used and documented:

    a. PFOA 413-369
    b. PFOS 499-80
    c. PFHxS 399-80
    d. PFBS 299-80
    e. 4:2 FTS 327-307
    f. 6:2 FTS 427-407
    g. 8:2 FTS 527-507
    h. NEtFOSAA 584-419
    i. NMeFOSAA 570-419

22. The laboratory is expected to determine at what concentration the instrument has carryover at concentrations greater than one-half the MRL. The laboratory is expected to have a documented procedure to bring the instrument back in control after encountering a sample with carryover. PFAS have demonstrated a delayed release in the system.

23. Report results in acid form.

24. Verify standard purity and ensure that any standards with less than 98% purity are corrected for in the calculations.

25. Mass correct salt content in all calibration standards purchased as salts.

26. Perform a moisture analysis on solid samples (on a subsample different than that used for extraction) and adjust the final concentration of solid samples for the percent moisture.

27. If only the liquid phase of a biphasic sample was extracted, report the results as liquid concentration results instead of total sample concentration results. The lab should report the weight of the solid phase not prepared in this case. This can be detailed in the narrative.

28. If the data quality objective is to obtain a total sample concentration and the sample is biphasic, then extract and analyze both phases.

29. Do not subtract quality control blank values from sample result values.

30. Integrate linear and branched isomers in the samples in the same manner as the standards.

31. Include the following elements in the laboratory SOP:

    a. The extracted internal standards used to calculate the result of each target (native) analyte reported.
    b. The mass used for the precursor ion for each analyte.
    c. The mass used for the product quantitation ion for each analyte.
    d. The mass used for the product confirmation ion for each analyte.
    e. Instructions for conditioning and elution of the SPE cartridge.
    f. Indicate which branched isomers are calculated using the linear isomer standard.

32. PFOA and PFOS WP PT samples are necessary for aqueous (non-potable water) certification of PFOA and PFOS. To obtain the 36-analyte group for aqueous (non-potable water) or non-aqueous from Wisconsin, analyze a PT with a minimum of 6 PFAS that include PFOA and PFOS. It is expected that 80% of the spiked analytes pass.

33. Requirements in NR 149 still apply to this analysis unless otherwise specified in this document.

AS NEW INFORMATION IS PROVIDED BY THE EPA, THIS DOCUMENT WILL BE UPDATED.

IX. Other Considerations

1. Screen a separate aliquot of sample received prior to preparation of a quantitative analysis.
2. Prior to any quantitative analysis, at least one, if not multiple instrument blanks should be analyzed to assess the system for potential contamination. These instrument blanks should include EIS to enable quantitation of the contamination.
3. Evaluate all containers, water, reagents, solvents, materials, SPE cartridges, and equipment as sources of contamination. The lab should be able to demonstrate that these items are not introducing unacceptable positive or negative bias.
4. Supplies should be tested on a lot-by-lot basis.
5. Avoid contact with glassware.
6. Avoid any Teflon including Teflon lined caps.
7. Flush water purification system with 3 liters of reagent water before using.
8. Use LC PEEK tubing and stainless-steel frits.
9. Use polypropylene transfer lines.
10. Replace mobile phase after 48 hours of preparation.
11. Store standards in the containers they were received in and at the storage conditions recommended by the manufacturer.
12. Store solid PFSA standards in a desiccator as they can hydrate over time.
13. PFCA standards in methanol solution may undergo esterification to methyl esters. Ideally, purchase PFCA standard solutions in methanol that contain four mole equivalents of NaOH. Use basic methanol (0.3% NH_4OH v/v in methanol) rather than straight methanol for all standard dilutions to avoid this potential problem.
14. PFSA standards that are ^{18}O-labelled may exchange with water and therefore reducing purity.
15. To establish retention times, analyze individual standards of each analyte. Analyze a mixed standard of all analytes to confirm their separation and identification.
16. Validate each individual standard and labeled standard by analysis to confirm its identity and the absence of significant impurities.
17. Certified standards have been known to vary by as much as 20% between vendors. The laboratory should be able to demonstrate that the standards being used are of known and defensible quality.
18. Some certified standards are less than 90% pure and often contain impurities that are other PFAS being analyzed.
19. EIS should be 96% or greater purity. When the impurity consists of an unlabeled analyte, the EIS can result in a background artifact that is present in every sample, standard, and blank if the EIS is spiked at excessive concentrations.
20. Different certified standards can have different isomer content.
21. Calibration standards are solvent based only. Matrix matched calibration standards (such as those that include sand or fish tissue) should not be used for isotope dilution methods.
22. If the site where samples are being collected is considered a “newer” spill and source apportionment is one of the data quality objectives, ship the samples with dry ice. PFAS transformation can occur if the samples are not frozen.
23. Although matrix spikes and matrix spike duplicates (MS/MSDs) are not necessary, analyzing them would help with assessing measurement bias for those target (native) analytes that do not have exact labeled isotope analogs.
24. Solid samples should not be air dried unless required by a QAPP.
25. Perform solid and fish tissue PT samples.

X. Definitions

Confirmation Ion - one of the fragment ions (product ions) used to help qualitatively confirm presence of the analyte. The product ion chosen is typically one of the remaining ions with high sensitivity and minimum interferences, after the quantitation ion has been chosen. Not all precursor ions provide confirmation ions.

Extraction batch – a set of one to 20 environmental samples of the same certification matrix with a maximum time of 24 hours between the start of processing of the first and last samples in the batch.

Extracted Internal Standards (EIS) - isotopically labeled internal standards that undergo the same extraction and analysis as the other analytes in the sample. The EIS are added to the sample at the very beginning of the procedure before extraction, centrifugation, filtering, or phase separation. Ideally, these are exact isotopically labeled analogs of the target (native) analyte so that identical behavior can be assumed. The recoveries of these standards are used to adjust the target (native) analyte results.

Internal Standard Dilution Quantitation - measurement of native analytes using an alternate analog (surrogate) isotope (one that has the same chemical behavior and is close in retention time to the native analyte) thus providing a close approximation of matrix effects and losses that can occur during the preparatory and analytical procedures. The native analyte concentration is adjusted for the recovery of the alternate analog isotope. An alternate analog isotope is typically used when an exact analog isotope is not available.

Method Detection Limit (MDL) – the minimum measured concentration of a substance that is reported with 99% confidence that the measured concentration is distinguishable from method blank results. The MDL is generated according to the procedure specified in the latest revision of 40 CFR Part 136, Appendix B. The MDL is expected to meet S/N ratio, ion transition ratio, and both quantitation and confirmation ions.

Method Reporting Limit (MRL) – the minimum concentration reported as a quantitative value for a method analyte in a sample following analysis. This defined concentration is expected to be no lower than the concentration of the lowest calibration standard for that analyte and is only used if the recovery in the lowest standard is within 50 – 150%.

Native Analyte - the analyte being tested in the matrix of interest. It is also the analyte for which a result would be reported. It is defined as native to distinguish it from analyte standards added during the test procedure. Native analyte is also referred to as “target analyte” or “reported analyte.”

Precursor Ion – the deprotonated molecule of the analyte. The precursor ion is mass selected and fragmented to produce distinctive product ions of smaller m/z.

Product Ion – one of the fragment ions produced from the precursor ion.

Quantitation Ion – one of the fragment ions (product ions) used to quantitate analyte concentrations. The product ion chosen is typically one of high sensitivity and minimum interferences.

True Isotope Dilution Quantitation – measurement of native analytes using an exact analog (surrogate) isotope of the native analyte thus eliminating differences in chemical behavior. The native analyte concentration is adjusted for the recovery of the exact analog isotope that has been included in the preparatory and analytical procedures.

XI. Wisconsin Laboratory Accreditation Program PFAS Certification Offerings – 5.1.19

#	Acronym	Name	CAS #	# carbons	Acronyms (other)
Carboxylic Acids					
1	PFBA	Perfluorobutanoic acid	375-22-4	4	
2	PFPeA	Perfluoropentanoic acid	2706-90-3	5	
3	PFHxA	Perfluorohexanoic acid	307-24-4	6	
4	PFHpA	Perfluoroheptanoic acid	375-85-9	7	
5	PFOA	Perfluorooctanoic acid	335-67-1	8	
6	PFNA	Perfluorononanoic acid	375-95-1	9	
7	PFDA	Perfluorodecanoic acid	335-76-2	10	
8	PFUnA	Perfluoroundecanoic acid	2058-94-8	11	PFUdA, PFUnDA
9	PFDoA	Perfluorododecanoic acid	307-55-1	12	PFDoDA
10	PFTriA	Perfluorotridecanoic acid	72629-94-8	13	PFTrA, PFTrDA
11	PFTeA	Perfluorotetradecanoic acid	376-06-7	14	PFTeDA
12	PFHxDA	Perfluorohexadecanoic acid	67905-19-5	16	
13	PFODA	Perfluorooctadecanoic acid	16517-11-6	18	
Sulfonic Acids					
14	PFBS	Perfluorobutanesulfonic acid	375-73-5	4	
15	PFPeS	Perfluoropentanesulfonic acid	2706-91-4	5	
16	PFHxS	Perfluorohexanesulfonic acid	355-46-4	6	
17	PFHpS	Perfluoroheptanesulfonic acid	375-92-8	7	
18	PFOS	Perfluorooctanesulfonic acid	1763-23-1	8	
19	PFNS	Perfluorononanesulfonic acid	68259-12-1	9	
20	PFDS	Perfluorodecanesulfonic acid	335-77-3	10	
21	PFDoS	Perfluorododecanesulfonic acid	79780-39-5	12	PFDoDS
22	4:2 FTSA	4:2 Fluorotelomer sulfonic acid	757124-72-4	6	
23	6:2 FTSA	6:2 Fluorotelomer sulfonic acid	27619-97-2	8	
24	8:2 FTSA	8:2 Fluorotelomer sulfonic acid	39108-34-4	10	
25	10:2 FTSA	10:2 Fluorotelomer sulfonic acid	120226-60-0	12	
Sulfonamides, Sulfomidoacetic acids, Sulfonamidoethanols					
26	FOSA	Perfluorooctane sulfonamide	754-91-6	8	PFOSA
27	NMeFOSA	N-Methyl perfluorooctane sulfonamide	31506-32-8	9	MeFOSA
28	NEtFOSA	N-Ethyl perfluorooctane sulfonamide	4151-50-2	10	EtFOSA
29	NMeFOSAA	N-Methyl perfluorooctane sulfonamidoacetic acid	2355-31-9	11	MeFOSAA
30	NEtFOSAA	N-Ethyl perfluorooctane sulfonamidoacetic acid	2991-50-6	12	EtFOSAA

31	NMeFOSE	N-Methyl perfluorooctane sulfonamidoethanol	24448-09-7	11	MeFOSE
32	NEtFOSE	N-Ethyl perfluorooctane sulfonamidoethanol	1691-99-2	12	EtFOSE
Replacement Chemicals					
33	HFPO-DA	Hexafluoropropylene oxide dimer acid [1]	13252-13-6	6	PFPrOPrA
34	DONA	4,8-Dioxa-3H-perfluorononanoic acid [2]	919005-14-4	7	
35	9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid [3]	756426-58-1	8	F-53B Major
36	11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid [4]	763051-92-9	10	F-53B Minor

	1 - Also referred to as "GenX"
	2 - Also available as the ammonium salt = ADONA (Ammonium 4,8-dioxa-3H-perfluorononanoate) # 958445-44-8
	3 - Also available as the potassium salt = Potassium, 9-chlorohexadecafluoro-3-oxanone-1-sulfonate # 73606-19-6
	4 - Also available as the potassium salt = Potassium, 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate # 83329-89-9

XII. Wisconsin Laboratory Accreditation Program PFAS Certification Offerings with Ions – 10.27.19

The masses presented are expected to be used, although if other masses are used for the precursor or product ions, the reason is expected to be documented (such as interferences). If the confirmation ion is weak (S/N < 3), it does not have to be used but instrument optimization can increase the S/N.

#	Acronym	Name	CAS #	Precursor Ion Mass	Primary Product Ion Mass	Suggested Confirmation Product Ion Mass
Carboxylic Acids						
1	PFBA	Perfluorobutanoic acid	375-22-4	**213**	**169**	**None**
2	PFPeA	Perfluoropentanoic acid	2706-90-3	**263**	**219**	**69, None**
3	PFHxA	Perfluorohexanoic acid	307-24-4	**313**	**269**	**119**
4	PFHpA	Perfluoroheptanoic acid	375-85-9	**363**	**319**	**169**
5	PFOA	Perfluorooctanoic acid	335-67-1	**413**	**369**	**169**
6	PFNA	Perfluorononanoic acid	375-95-1	**463**	**419**	**219**
7	PFDA	Perfluorodecanoic acid	335-76-2	**513**	**469**	**219**
8	PFUnA	Perfluoroundecanoic acid	2058-94-8	**563**	**519**	**269**
9	PFDoA	Perfluorododecanoic acid	307-55-1	**613**	**569, 319**	**569, 369, 319, 269, 169**
10	PFTriA	Perfluorotridecanoic acid	72629-94-8	**663**	**619**	**369, 319, 269, 169**
11	PFTeA	Perfluorotetradecanoic acid	376-06-7	**713**	**669**	**369, 319, 269, 169**
12	PFHxDA	Perfluorohexadecanoic acid	67905-19-5	**813**	**769**	**369, 319, 269, 219, 169**
13	PFODA	Perfluorooctadecanoic acid	16517-11-6	**913**	**869**	**369, 319, 269, 219, 169**
Sulfonic Acids						
14	PFBS	Perfluorobutanesulfonic acid	375-73-5	**299**	**80**	**99**
15	PFPeS	Perfluoropentanesulfonic acid	2706-91-4	**349**	**80**	**99**
16	PFHxS	Perfluorohexanesulfonic acid	355-46-4	**399**	**80**	**99**
17	PFHpS	Perfluoroheptanesulfonic acid	375-92-8	**449**	**99, 80**	**99, 80**
18	PFOS	Perfluorooctanesulfonic acid	1763-23-1	**499**	**80**	**99**
19	PFNS	Perfluorononanesulfonic acid	68259-12-1	**549**	**80**	**99**
20	PFDS	Perfluorodecanesulfonic acid	335-77-3	**599**	**99, 80**	**99, 80**
21	PFDoS	Perfluorododecanesulfonic acid	79780-39-5	**699**	**80**	**99, 62**
22	4:2 FTSA	4:2 Fluorotelomer sulfonic acid	757124-72-4	**327**	**307**	**81, 80**
23	6:2 FTSA	6:2 Fluorotelomer sulfonic acid	27619-97-2	**427**	**407**	**81, 80**
24	8:2 FTSA	8:2 Fluorotelomer sulfonic acid	39108-34-4	**527**	**507**	**81, 80**
25	10:2 FTSA	10:2 Fluorotelomer sulfonic acid	120226-60-0	**627**	**607**	**587, 81, 80**

Sulfonamides, Sulfomidoacetic acids, Sulfonamidoethanols						
26	FOSA	Perfluorooctane sulfonamide	754-91-6	**498**	**78**	**478, 169, None**
27	NMeFOSA	N-Methyl perfluorooctane sulfonamide	31506-32-8	**512**	**169**	**219**
28	NEtFOSA	N-Ethyl perfluorooctane sulfonamide	4151-50-2	**526**	**169**	**219**
29	NMeFOSAA	N-Methyl perfluorooctane sulfonamidoacetic acid	2355-31-9	**570**	**419**	**512, 483**
30	NEtFOSAA	N-Ethyl perfluorooctane sulfonamidoacetic acid	2991-50-6	**584**	**419**	**526, 483**
31	NMeFOSE	N-Methyl perfluorooctane sulfonamidoethanol	24448-09-7	**616**	**59**	**122, None**
32	NEtFOSE	N-Ethyl perfluorooctane sulfonamidoethanol	1691-99-2	**630**	**59**	**136, None**
Replacement Chemicals						
33	HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	**329**	**285, 169**	**285, 169, None**
34	DONA	4,8-Dioxa-3H-perfluorononanoic acid	919005-14-4	**377**	**251**	**85, None**
35	9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	756426-58-1	**531**	**351**	**83, None**
36	11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9	**631**	**451**	**99, None**

NOTE: ISO 21675, SW 8327, and Wellington Laboratories provide precursor, product and confirmation ions for many of the extracted internal standards

Mass Source
EPA 537.1
DoD QSM 5.3
Janice Willey
EPA-821-R-11-007, PFAS in Sludge/Biosolids
ISO 21675
SW 8327
Wellington Laboratories
Confirmation mass have multiple sources

US Army Corps
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Omaha District

TRUAX FIELD ANGB, WISCONSIN
FIGHTER ALERT SHELTERS
PN XGFG189004 (FY20)

SOLICITATION NO.:

CONTRACT NO.:

ISSUE DATE: OCTOBER 2019

THIS PROJECT WAS DESIGNED BY THE OMAHA DISTRICT OF THE US ARMY CORPS OF ENGINEERS. THE INITIALS OR SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER 1110-1-8152

SIGNATURES AFFIXED BELOW INDICATE OFFICIAL RECOMMENDATION AND APPROVAL OF DRAWINGS IN THIS SET.

CHIEF, GEOTECHNICAL ENGINEERING & SCIENCES BRANCH DATE	SUBMITTED BY: CHIEF: ARCH. / INTER.	RA SECTION
CHIEF, DAM SAFETY PROD. CENTER DATE	SUBMITTED BY: CHIEF: CIVIL / ENVIR.	PE SECTION
CHIEF, DESIGN BRANCH DATE	SUBMITTED BY: CHIEF: ELEC.	PE SECTION
CHIEF, HYDROLOGIC ENGINEERING BRANCH DATE	SUBMITTED BY: CHIEF: MECH.	PE SECTION
CHIEF, ENGINEERING DIVISION, P.E. DATE	SUBMITTED BY: CHIEF: STRUCT.	PE SECTION
	SUBMITTED BY: CHIEF: GEOT. / DAM SAFETY	PE SECTION
	SUBMITTED BY: CHIEF: FUELS	PE SECTION
	SUBMITTED BY: PROJECT COORD.	CADD

US Army Corps
of Engineers
Omaha District

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: L. CRAIG
DRAWN BY: L. CRAIG
CHECKED BY: L. CRAIG
SUBMITTED BY: L. CRAIG
SIZE: ANSI D
ISSUE DATE: OCTOBER 2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER: F113-40-01
FILENAME: TX05G-001.dgn

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

TRUAX FIELD ANGB, WISCONSIN
FIGHTER ALERT SHELTERS
PN XGFG189004 (FY20)

COVER SHEET

SHEET ID
G-001

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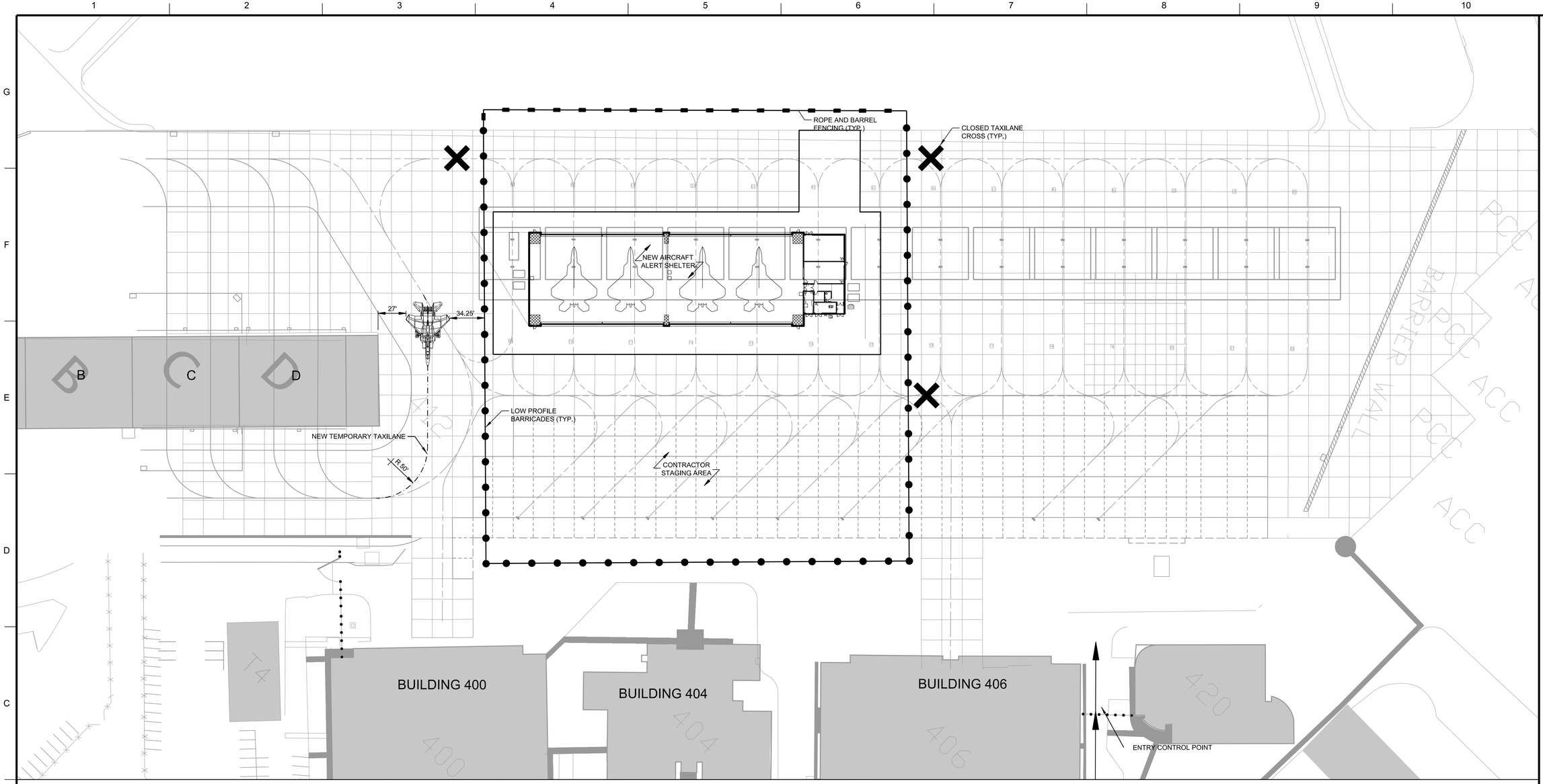

NOTES:

1. SEE SHEET CB100FOR CONTRACTOR STAGING / STORAGE / BATCH PLANT / TRAILER AREA AND HAUL ROUTE REQUIREMENTS.

2. SEE SHEET CB102 FOR LOW PROFILE BARRICADE AND ROPE AND BARREL FENCE DETAILS.

3. CONTRACTOR FREE ZONE TO BE DELINEATED BY A COMBINATION OF LOW PROFILE BARRICADES AND ROPE AND BARREL FENCING. INSTALL LOW PROFILE BARRICADES AT ALL LOCATIONS WHERE FREE ZONE LIMITS CROSS PAVED AIRFIELD PAVEMENTS INCLUDING SHOULDER PAVEMENT. INSTALL ROPE AND BARREL FENCE AT ALL LOCATIONS WHERE FREE ZONE LIMITS CROSS NON-PAVED (TURFED) AREAS.

CONSTRUCTION PHASING NOTES

PHASING, PROVIDED HEREIN, IS ESTABLISHED TO MAINTAIN AIRCRAFT OPERATIONAL CAPABILITY AND CONTINUAL ACCESS TO ANGB FACILITIES DURING CONSTRUCTION. THE CONTRACTOR SHALL BE ALLOWED ACCESS TO A LIMITED NUMBER OF CONSTRUCTION AREA ZONES (CAZ) AT ANY ONE TIME. DO NOT INITIATE WORK UNTIL THE CONTRACTOR'S SCHEDULE DEMONSTRATES THE ABILITY TO COMPLETE THIS WORK WITHIN THE TIME FRAME REQUIRED AND IS APPROVED BY THE CONTRACTING OFFICER. PROVIDE A TWENTY-ONE DAY WRITTEN NOTICE IN ADVANCE, THROUGH THE CONTRACTING OFFICER, COORDINATING WORK WITHIN EACH CONSTRUCTION AREA ZONE.

1. WORK AREA & ACCESS LIMITATIONS

A. ESTABLISH ACCESS TO THE SITE PRIOR TO INITIATING ANY WORK. COORDINATE ACCESS WITH AND OBTAIN APPROVAL BY THE AIRFIELD MANAGER, THROUGH THE CONTRACTING OFFICER. ACCESS TO AND FROM WORK AT THE SITE IS LIMITED TO DAYLIGHT HOURS UNLESS ADDITIONAL HOURS ARE REQUESTED BY THE CONTRACTOR AND APPROVED BY THE CONTRACTING OFFICER. ALL AREAS WITHIN THE AIRFIELD SECURITY FENCE AND ALL HAUL ROUTES SHOWN ON SHEET G-002 ARE CONSIDERED A FREE ZONE, I.E. A GOVERNMENT ESCORT IS NOT REQUIRED.

B. NOTIFY THE AIRFIELD MANAGER, THROUGH THE CONTRACTING OFFICER'S REEPRESENTATIVE, 30 DAYS IN ADVANCE OF INSTALLING TEMPORARY PAVEMENT MARKINGS.

C. INSTALL THE TEMPORARY TAXILANE, AS SHOWN ON THIS SHEET, PRIOR TO BEGINNING ANY WORK ON THE APRON. ALL WORK REQUIRED TO INSTALL THE TEMPORARY TAXILANE WILL OCCUR OUTSIDE OF THE CONSTRUCTION AREA FREE ZONE SHOWN ON THIS SHEET. OBTAIN A GOVERNMENT ESCORT FOR WORK OUTSIDE OF THE CONSTRUCTION AREA FREE ZONE.

D. AT THE COMPLETION OF THE PROJECT, REMOVE THE TEMPORARY PAVEMENT MARKINGS AND INSTALL ALL NEW PAVEMENT MARKINGS AS SHOWN ON SHEET CS101.

2. CONSTRUCTION PHASING

A. NO DEMOLITION OF EXISTING AIRFIELD PAVEMENT UNTIL THE CONTRACTOR HAS AN APPROVED CONCRETE MIX DESIGN CONFORMING TO SPECIFICATION 32 13 14.13 CONCRETE PAVEMENTS FOR AIRFIELDS AND OTHER HEAVY DUTY PAVEMENTS.

B. RE-ESTABLISH EXISTING PAVEMENT MARKINGS AND ALL EXISTING UTILITIES REMOVED OR DAMAGED BY THE CONTRACTOR TO MATCH EXISTING CONDITION PRIOR TO CONSTRUCTION.

3. GENERAL REQUIREMENTS

A. ALL VEHICLES REQUIRE COMPANY MARKINGS, FLASHING BEACONS, AND FLIGHT LINE PASSES DISPLAYED. INSPECT ALL ACTIVE AIRFIELD PAVEMENTS TRAFFICKED BY THE CONTRACTOR'S CONSTRUCTION EQUIPMENT HOURLY BY THE CONTRACTOR TO DETERMINE IF FOREIGN OBJECT DEBRIS (FOD) IS PRESENT. REMOVE ALL FOD FOUND ON AIRFIELD PAVEMENTS WITHIN 1-HOUR OF DISCOVERY. PROVIDE A SELF-CONTAINED PAVEMENT VACUUMING TRUCK WHICH IS SPECIFICALLY MANUFACTURED TO CLEAN AIRFIELD PAVEMENTS. OPERATE THE VACUUM TRUCK CONTINUOUSLY DURING CONTRACTOR HAULING OPERATIONS.

B. AN ESCORT WILL BE REQUIRED FOR ALL PERSONNEL INSTALLING THE TEMPORARY PARKING POSITION AND TAXILANE MARKINGS. AN ESCORT WILL BE REQUIRED FOR ALL PERSONNEL IN CHARGE OF ESTABLISHING THE CONSTRUCTION FREE ZONES AS SHOWN ON THIS SHEET. AFTER THE CONSTRUCTION FREE ZONE HAS BEEN ESTABLISHED THE CONTRACTOR WILL NOT BE REQUIRED TO BE ESCORTED TO THE CONSTRUCTION AREA ZONES.

3. GENERAL REQUIREMENTS (CON'T)

C. CONTINUOUSLY VACCUM SWEEP ALL HAUL ROUTES AND CONSTRUCTION AREA FREE ZONES.

D. RESTORE ALL HAUL ROUTES BACK TO ORIGINAL CONDITION BY REPAIRING POTHOLES, RUTS AND SOFT YIELDING SPOTS.

E. THE HAUL ROUTES WILL BE USED BY THE SECURITY POLICE AND OTHER PERSONNEL DURING CONSTRUCTION.

F. MAINTAIN ALL HAUL ROUTES SO THEY REMAIN PASSABLE AT ALL TIMES.

G. HAVE A PERSON AVAILABLE 24 HOURS A DAY FOR EMERGENCY MAINTENANCE OF LOW PROFILE BARRICADES AND HAZARD LIGHTS AND ROPE AND BARREL FENCING. INITIATE AND COMPLETE REPAIRS OF LOW PROFILE BARRICADES AND HAZARD LIGHTS AND ROPE AND BARREL FENCING WITHIN ONE HOUR OF BEING NOTIFIED BY THE CONTRACTING OFFICER'S REPRESENTATIVE.

H. COORDINATE ALL WORK ON THE AIRFIELD WITH THE AIRFIELD MANAGER AND ANGB BASE OPERATIONS AND THE CONTRACTING OFFICER.

I. ALL CONTRACTOR VEHICLES AND EQUIPMENT WILL BE INSPECTED BY GOVERNMENT SECURITY FORCES PRIOR TO ACCESS TO WISCONSIN ANGB. ONLY ONE SET OF GOVERNMENT SECURITY FORCES WILL BE INSPECTING VEHICLES ONE VEHICLE AT A TIME. THEREFORE, STRATEGICALLY SCHEDULE PERSONNEL ACCESS AND MATERIAL DELIVERIES TO AVOID DELAYS. THE ENTRY CONTROL POINT (ECP), WHICH SHALL BE USED AS THE CONTRACTOR'S ACCESS POINT TO THE CONSTRUCTION SITE, WILL BE MANNED BY GOVERNMENT SECURITY FORCES. THE ECP WILL BE MANNED THE SAME HOURS AS THE MAIN GATE. SEE HAUL ROUTE NOTE 7 ON SHEET G-002 FOR GATE HOURS. FOURTEEN DAYS IN ADVANCE, THE CONTRACTOR MAY REQUEST EXTENDED HOURS OF GATE ACCESS THROUGH THE CONTRACTING OFFICER. GATE HOURS ARE SUBJECT TO CHANGE.

J. DO NOT OPERATE STEEL BUCKET OR BLADE EQUIPMENT WITH THE BUCKET OR BLADE IN DIRECT CONTACT WITH ANY PAVEMENT TO REMAIN AT ANY TIME. STEEL BUCKET OR BLADE EQUIPMENT MAY BE USED TO REMOVE/REPLACE EXISTING BASE AND SUBGRADE MATERIALS.

3. GENERAL REQUIREMENTS (CON'T)

K. STOCKPILING OF BASE COURSE AND SUBGRADE MATERIALS WILL NOT BE ALLOWED ON THE APRON DURING CONSTRUCTION.

L. MAXIMUM EQUIPMENT HEIGHT ALLOWABLE ON THE APRON SHALL NOT EXCEED 20'.

M. COMPLY WITH ALL ASPECTS OF UFC 3-260-01, SECTION 14 CONSTRUCTION PHASING PLAN AND OPERATIONAL SAFETY ON AIRFIELDS DURING CONSTRUCTION AND FAA AC 150 5370-2f OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION. PROVIDE THE AIRFIELD MANAGER ALL INFORMATION REQUIRED FOR HIM TO SUBMIT FAA FROM 7460-1 PRIOR TO CONSTRUCTION.

N. PROTECT ALL EXISTING AIRFIELD LIGHTS AND/OR NAVAIDS DURING CONSTRUCTION, IF AN EXISTING AIRFIELD LIGHTS AND/OR NAVAIDS IS DAMAGED BY THE CONTRACTOR, IMMEDIATELY NOTIFY THE CONTRACTING OFFICER. REPAIR OR REPLACE THE DAMAGED AIRFIELD LIGHTS AND/OR NAVAIDS AT NO ADDITIONAL COST TO THE GOVERNMENT. REPAIR ALL DAMAGES TO THE CONTRACTING OFFICER'S SATISFACTION.

4. SPECIAL REQUIREMENTS

1. COORDINATE AIRCRAFT MOVEMENTS WITH THE AIRFIELD MANAGER, OPERATIONS PERSONNEL AND THE CONTRACTING OFFICER WEEKLY.

LEGEND:

- LOW PROFILE BARRICADES - SEE NOTE 2
- ROPE AND BARREL FENCING - SEE NOTE 2
- CONTRACTOR HAUL ROUTE

N

0 50' 100'

SCALE: 1" = 50' - 0"

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MARK	DESCRIPTION	DATE

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OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

DESIGNED BY:	ISSUE DATE:
B. GOLIBER	10/04/2019
DRAWN BY:	SOLICITATION NO.:
B. GOLIBER	
CHECKED BY:	CONTRACT NO.:
M. HUCKLE	
SUBMITTED BY:	FILE NUMBER:
B. FLERE	F113-40-01
SCALE:	FILENAME:
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TRUAX FIELD ANGB, WISCONSIN
FIGHTER ALERT SHELTERS
PN XGFG168004 (FY20)

PHASING PLAN

SHEET ID

CB101

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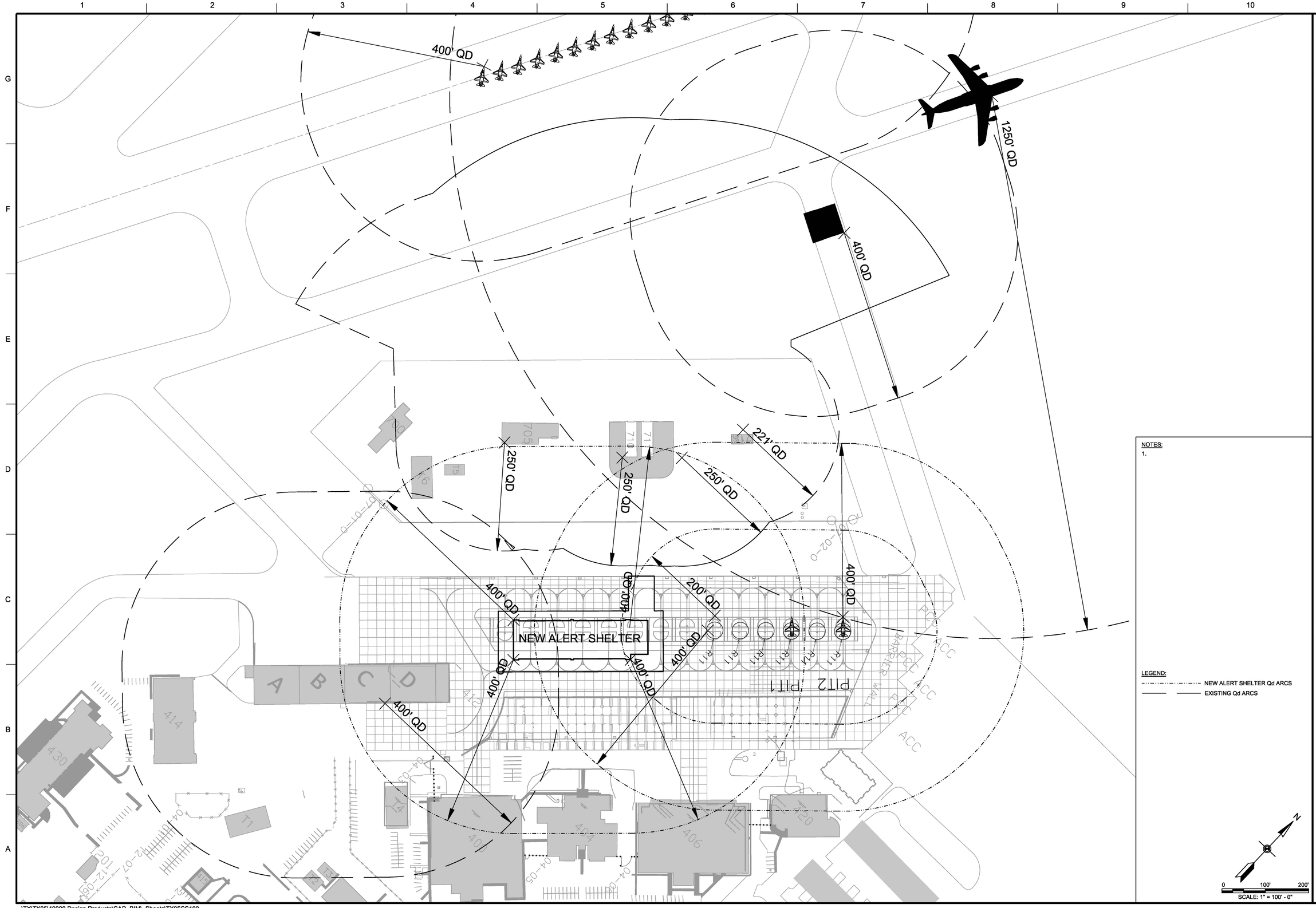

NOTES:
1.

LEGEND:
- NEW ALERT SHELTER Qd ARCS
- EXISTING Qd ARCS

0 100' 200'
SCALE: 1" = 100' - 0"

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MARK	DESCRIPTION	DATE

ISSUE DATE: 10/04/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER: F113-40-01

DESIGNED BY: B. GOLIBER
DRAWN BY: B. GOLIBER
CHECKED BY: M. HUCKLE
SUBMITTED BY: B. FLERE
SIZE: ANSI D
FILENAME: TX05CS100.dwg

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OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

TRUAX FIELD ANGB, WISCONSIN
FIGHTER ALERT SHELTERS
PN XGFG180004 (FY20)

OVERALL SITE PLAN

SHEET ID
CS100

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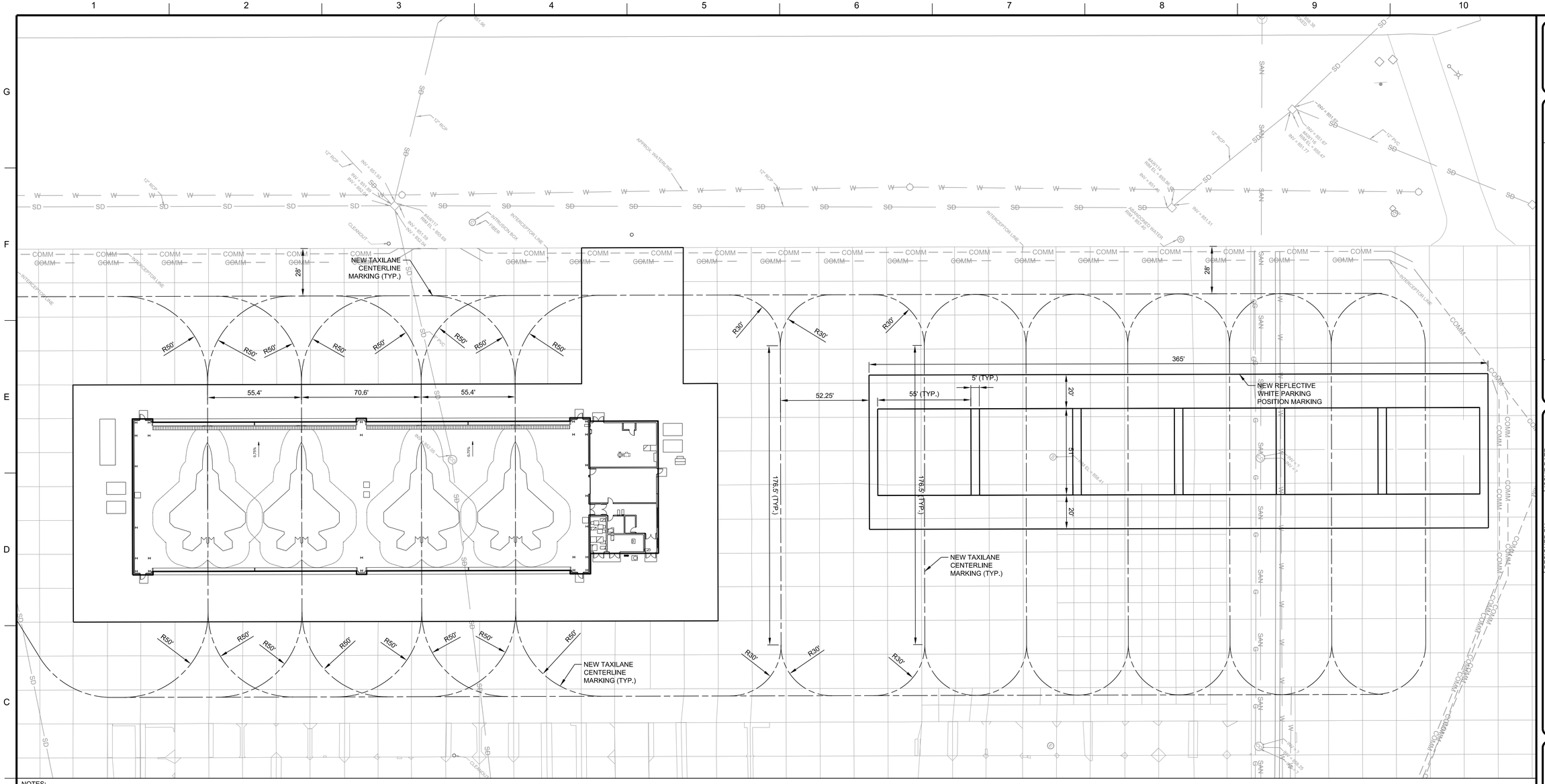

NOTES:

1. SEE SHEET CS501 FOR PAVEMENT MARKING DETAILS.

2. EXISTING PAVEMENT MARKINGS NOT WITHIN THE PAVEMENT REMOVAL AREA, OR INDICATED TO BE REMOVED, THAT ARE MARRED OR REMOVED BY THE CONTRACTOR'S OPERATIONS SHALL BE ENTIRELY REMOVED AND REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE.

0 30' 60'
SCALE: 1" = 30' - 0"

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY:	ISSUE DATE:
B. GOLIBER	10/04/2019
DRAWN BY:	SOLICITATION NO.:
B. GOLIBER	
CHECKED BY:	CONTRACT NO.:
M. HUCKLE	
SUBMITTED BY:	FILE NUMBER:
B. FLERE	F113-40-01
SIZE:	FILENAME:
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U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVE
OMAHA, NE 68102

TRUAX FIELD ANGB, WISCONSIN
FIGHTER ALERT SHELTERS
PN XGFG189004 (FY20)

SITE PLAN

SHEET ID

CS101

CONCEPT DESIGN

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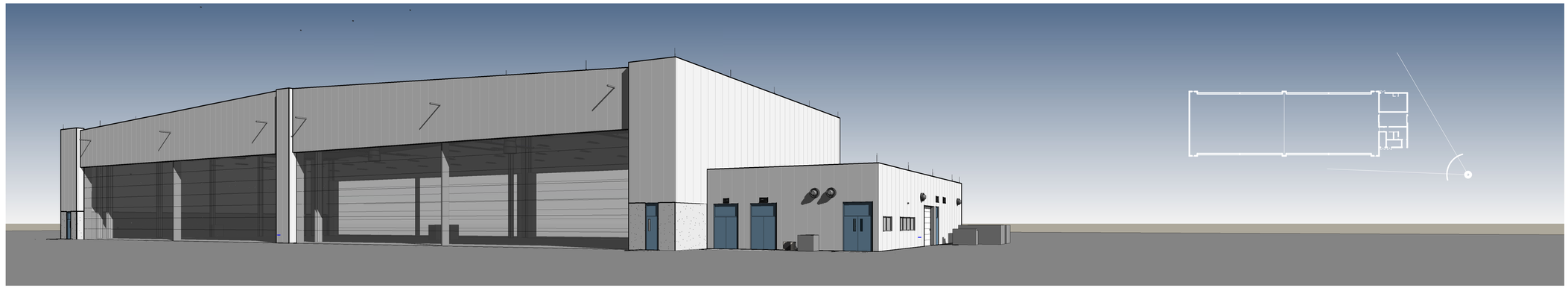
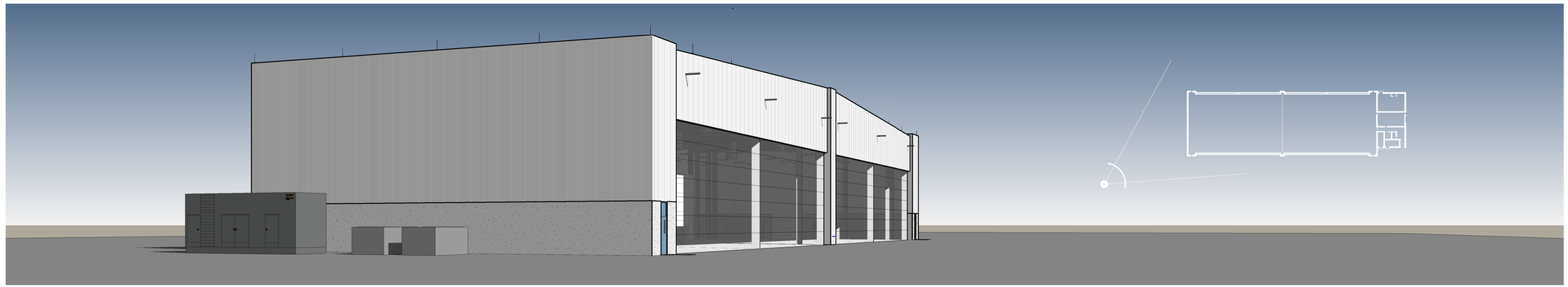
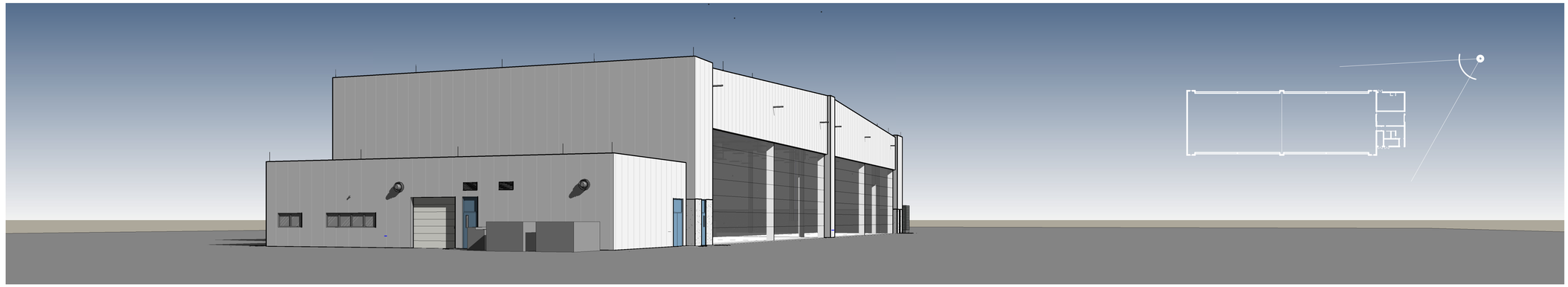


1 PERSPECTIVE - PLAN SOUTHEAST CORNER



2 PERSPECTIVE - PLAN SOUTHWEST CORNER



3 PERSPECTIVE - PLAN NORTHEAST CORNER

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGNED BY: R. AHLERS
DRAWN BY: Author
CHECKED BY: Checker
SUBMITTED BY:
SIZE: ANSI D
ISSUE DATE: 10-04-2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER F113-40-01
FILE NAME TX05_ALRT-SHLTR.RVT

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVENUE
OMAHA, NE 68102

TRUAX FIELD ANGB, WISCONSIN
FIGHTER ALERT SHELTERS
PN XGFG189004 (FY20)

BUILDING PERSPECTIVE

SHEET ID

A-900

US Army Corps of Engineers®
OMAHA DISTRICT

TRUAX FIELD ANGB, WISCONSIN
REPAIR APRON
PN XGFG182005

SOLICITATION NO.: W9128F-R-20-XXXX
CONTRACT NO.: W9128F-C-20-XXXX
ISSUE DATE: FEBRUARY 2020

INDEX

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

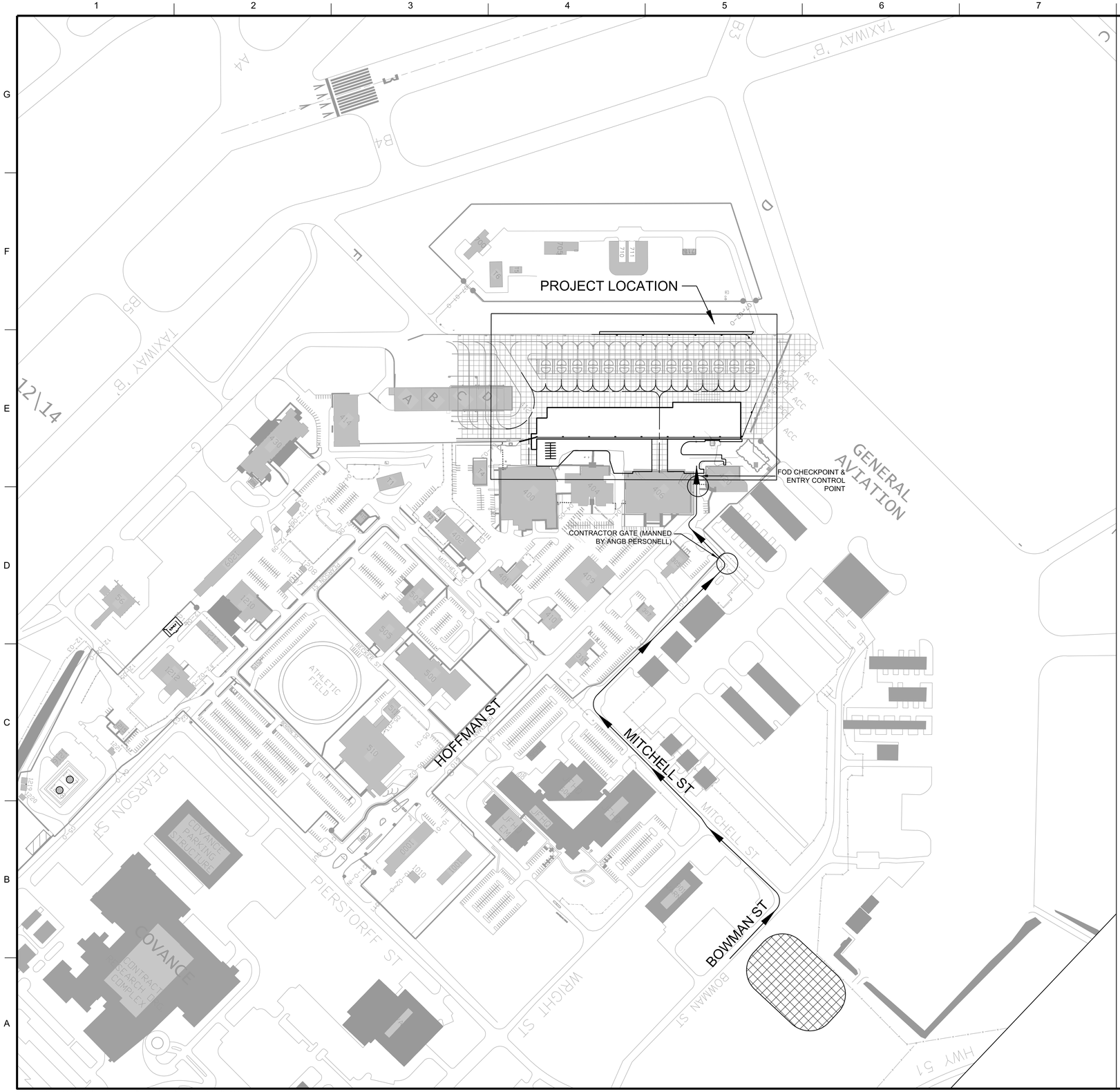
DESIGNED BY: B. GOLIBER
DRAWN BY: B. GOLIBER
CHECKED BY: M. HUCKLE
SUBMITTED BY: B. FLERE
SIZE: ANSI D
ISSUE DATE: FEBRUARY 2020
SOLICITATION NO.: W9128F-R-20-XXXX
CONTRACT NO.: W9128F-C-20-XXXX
FILE NUMBER: F113-10-01
FILE NAME: TX07_G-001.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVENUE
OMAHA, NE 68102

TRUAX FIELD ANGB, WISCONSIN
REPAIR APRON
PN XGFG182005

COVER SHEET

SHEET ID
G-001



BATCH PLANT NOTES:

1. LOCATE THE CONCRETE BATCH PLANT / CONTRACTOR STAGING AREA AT THE LOCATION SHOWN ON THIS SHEET.

2. PERFORM A SITE SURVEY PRIOR TO IMPROVING THE BATCH PLANT / STAGING AREA. INSPECT THE BATCH PLANT / STAGING AREA WITH THE CONTRACTING OFFICER'S REPRESENTATIVE AND WISCONSIN ANGB CIVIL ENGINEERING REPRESENTATIVE TO ESTABLISH THE EXISTING CONDITION. LEVEL THE BATCH PLANT / STAGING AREA IMPROVEMENTS AND GRADE THE SITE TO MATCH THE EXISTING GRADE OUTSIDE OF THE BATCH PLANT / STAGING AREA AT THE COMPLETION OF THE PROJECT, TOPSOIL WITH 4" OF TOPSOIL AND SEED ALL DISTRURBED AREAS.

3. IMPROVE THE BATCH PLANT AREA TO MEET THE CONTRACTOR'S NEEDS. IMPROVEMENTS INCLUDE BUT ARE NOT LIMITED TO GRADING, INSTALLING DRAINAGE SYSTEMS, INSTALLING STORM WATER BEST MANAGEMENT PRACTICES AND IMPORTING AGGREGATE MATERIALS TO PROVIDE A STABLE WORKING PLATFORM.

4. THE CONTRACTOR MAY ELECT TO INSTALL A CHAIN LINK SECURITY FENCE WITH LOCKING GATE AROUND THE PERIMETER OF THE BATCH PLANT AREA FOR SECURITY; NO SECURITY MEASURES ARE PROVIDED BY THE GOVERNMENT. REMOVE THE CHAIN LINK FENCE PRIOR TO CONTRACT COMPLETION.

5. PROVIDE OBSTRUCTION LIGHT FIXTURES (AVIATION RED INCANDESCENT STEADY BURNING FAA AC 150/5345-43, TYPE L-810) FOR THE BATCH PLANT . LED TYPE OBSTRUCTION LIGHT FIXTURES ARE NOT ACCEPTABLE.

6. POWER AVAILABLE FOR CONTRACTOR USE WITHIN THE BATCH PLANT LOCATION SHOWN. CONTRACTOR SHALL INSTALL A METER AND REIMBURSE THE ELECTRICAL UTILITY COMPANY FOR ALL ELECTRICY USED. COORDINATE WITH MG & E (MADISON GAS AND ELECTRIC). CONTRACTOR TO PROVIDE AND CONNECT HIS OWN STEP-DOWN TRANSFORMER TO PROVIDE USABLE POWER FOR THE BATCH PLANT AND OTHER FACILITIES. JACK-AND-BORE THE POWER LINE UNDER ANY ROADS. NOTIFY WISCONSIN ANGB CES, THROUGH THE CONTRACTING OFFICER, 14 DAYS IN ADVANCE OF CONNECTING TO THE POWER SOURCE.

7. WATER AVAILABLE FOR CONTRACTOR USE WITHIN THE BATCH PLANT LOCATION SHOWN. CONTRACTOR TO PROVIDE AND INSTALL A BACKFLOW PREVENTER ADN WATER METER DOWNSTREAM OF THE WATER SUPPLY. CONTRACTOR SHALL REIMBURSE THE CITY OF MADISON FOR ALL WATER USED. CONTRACTOR SHALL COORDINATE WITH THE CITY OF MADISON FOR PAYMENT AND METERING REQUIREMENTS. CONTRACTOR TO PROVIDE OWN CONNECTION AND MEANS OF CONVEYING WATER TO THE BATCH PLANT. NOTIFY WISCONSIN ANGB CES, THROUGH THE CONTRACTING OFFICER, 14 DAYS IN ADVANCE OF CONNECTING TO THE WATER SUPPLY.

HAUL ROUTE NOTES:

1. CONDUCT A SITE SURVEY FOR ALL HAUL ROUTES AND SURROUNDING AREAS PRIOR TO BEGINNING ANY WORK. INSPECT THE HAUL ROUTES PRIOR TO CONTRACTOR TRAFFIC TO ESTABLISH THE EXISTING HAUL ROUTE CONDITION WITH THE CONTRACTOR, CONTRACTING OFFICER'S REPRESENTATIVE AND WISCONSIN ANG BASE CIVIL ENGINEERING REPRESENTATIVE. RESTORE ALL HAUL ROUTES BACK TO THE ORIGINAL CONDITION BY REPAIRING POTHOLES, RUTS AND SOFT YIELDING SPOTS. DOCUMENT THE INSPECTION WITH A DETAILED REPORT AND EITHER VIDEO OR PHOTOGRAPHS AND SUBMITTED TO THE CONTRACTING OFFICER REPRESENTATIVE AS A FORMAL SUBMITTAL. UPON COMPLETION OF THE PROJECT, RESTORE ALL ROADS TO ORIGINAL OR BETTER CONDITION.

2. MAKE ALL ROAD IMPROVEMENTS NECESSARY TO PROVIDE A USEABLE SURFACE FOR CONSTRUCTION TRAFFIC. MAINTAIN ALL ROADS WHILE WORKING ON THE PROJECT. RESTORE THE ROADS TO ORIGINAL PRE-PROJECT CONDITION UPON COMPLETION OF ALL HAULING ACTIVITIES.

3. IMPLEMENT A DUST CONTROL PLAN FOR ALL HAUL ROUTES DURING HAULING OPERATIONS FOR THE ENTIRE DURATION OF THE CONTRACT.

4. MAINTAIN THE HAUL ROUTES SO THEY REMAIN PASSABLE AT ALL TIMES. MAINTAIN THE HAUL ROUTES SO THAT MUD AND/OR OTHER DEBRIS IS NOT PICKED UP BY TRUCK TIRES AND TRAFFICKED ON ANY AIRFIELD PAVEMENTS. SEE SHEET C-001 FOR DAILY FOD CONTROL REQUIREMENTS.

5. SEE SHEET C-001 FOR ADDITIONAL ACCESS, GENERAL NOTES, AND RESTORATION NOTES.

6. ALL CONTRACTOR DELIVERIES AND CONTRACTOR PERSONNEL ARE REQUIRED TO ACCESS THE WISCONSIN ANGB THROUGH THE CONTRACTORS ACCESS GATE. ACCESS THE WORK SITE THROUGH THE ENTRY CONTROL POINT SHOWN ON SHEET C-001.

7. ALL CONTRACTOR VEHICLES AND EQUIPMENT WILL BE INSPECTED BY GOVERNMENT SECURITY FORCES PRIOR TO ACCESS TO WISCONSIN ANGB. THEREFORE, STRATEGICALLY SCHEDULE PERSONNEL ACCESS AND MATERIAL DELIVERIES TO AVOID ACCESS DELAYS. THE CONTRACTOR ACCESS GATE WILL BE MANNED BY GOVERNMENT PERSONNEL DURING THE HOURS LISTED HERE:

MONDAY - FRIDAY: 0630 THRU 1630
SATURDAY, SUNDAY AND GOVERNMENT HOLIDAYS: CLOSED

FOURTEEN DAYS IN ADVANCE, THROUGH THE CONTRACTING OFFICER, THE CONTRACTOR MAY REQUEST EXTENDED HOURS OF GATE ACCESS.

GENERAL NOTE:

1. SEE SHEET C-001 FOR THE LOCATION OF THE CONSTRUCTION FREE ZONE.

LEGEND:

CONTRACTOR BATCH PLANT / STAGING AREA LOCATION

CONTRACTOR HAUL ROUTE

N

0 200' 400'

SCALE: 1" = 200' - 0"

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: B. GOLIBER
DRAWN BY: B. GOLIBER
CHECKED BY: M. HUCKLE
SUBMITTED BY: S. CLERE
SIZE: ANSI D

ISSUE DATE: FEBRUARY 2020
SOLICITATION NO.: W9128F-R-20-XXXX
CONTRACT NO.: W9128F-C-20-XXXX
FILE NUMBER: F113-10-01
FILE NAME: TX07_G-002.dwg

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVENUE
OMAHA, NE 68102

TRUAX FIELD ANGB, WISCONSIN
REPAIR APRON
PN XSFG182005

PROJECT LOCATION PLAN

SHEET ID

G-002

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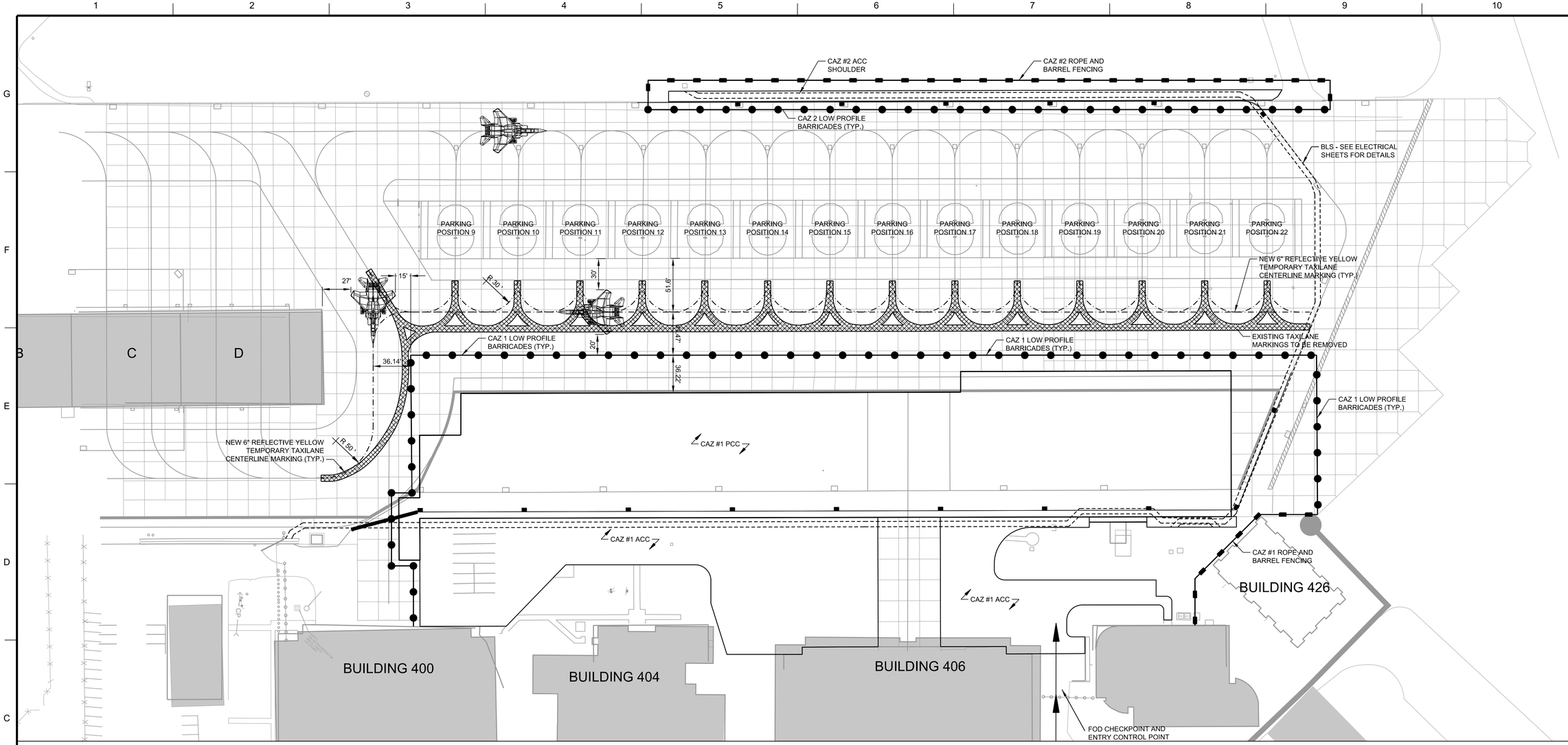

NOTES:

1. SEE SHEET G-002 FOR CONTRACTOR STAGING / STORAGE / BATCH PLANT / TRAILER AREA AND HAUL ROUTE REQUIREMENTS.

2. SEE SHEET C-102 FOR LOW PROFILE BARRICADE AND ROPE AND BARREL FENCE DETAILS.

3. CONTRACTOR FREE ZONE TO BE DELINEATED BY A COMBINATION OF LOW PROFILE BARRICADES AND ROPE AND BARREL FENCING. INSTALL LOW PROFILE BARRICADES AT ALL LOCATIONS WHERE FREE ZONE LIMITS CROSS PAVED AIRFIELD PAVEMENTS INCLUDING SHOULDER PAVEMENT. INSTALL ROPE AND BARREL FENCE AT ALL LOCATIONS WHERE FREE ZONE LIMITS CROSS NON-PAVED (TURFED) AREAS.

CONSTRUCTION PHASING NOTES

PHASING. PROVIDED HEREIN, IS ESTABLISHED TO MAINTAIN AIRCRAFT OPERATIONAL CAPABILITY AND CONTINUAL ACCESS TO ANGB FACILITIES DURING CONSTRUCTION. THE CONTRACTOR SHALL BE ALLOWED ACCESS TO A LIMITED NUMBER OF CONSTRUCTION AREA ZONES (CAZ) AT ANY ONE TIME. DO NOT INITIATE WORK UNTIL THE CONTRACTOR'S SCHEDULE DEMONSTRATES THE ABILITY TO COMPLETE THIS WORK WITHIN THE TIME FRAME REQUIRED AND IS APPROVED BY THE CONTRACTING OFFICER. PROVIDE A TWENTY-ONE DAY WRITTEN NOTICE IN ADVANCE, THROUGH THE CONTRACTING OFFICER, COORDINATING WORK WITHIN EACH CONSTRUCTION AREA ZONE.

1. WORK AREA & ACCESS LIMITATIONS

A. ESTABLISH ACCESS TO THE SITE PRIOR TO INITIATING ANY WORK. COORDINATE ACCESS WITH AND OBTAIN APPROVAL BY THE AIRFIELD MANAGER, THROUGH THE CONTRACTING OFFICER. ACCESS TO AND FROM WORK AT THE SITE IS LIMITED TO DAYLIGHT HOURS UNLESS ADDITIONAL HOURS ARE REQUESTED BY THE CONTRACTOR AND APPROVED BY THE CONTRACTING OFFICER. ALL AREAS WITHIN THE AIRFIELD SECURITY FENCE AND ALL HAUL ROUTES SHOWN ON SHEET G-002 ARE CONSIDERED A FREE ZONE, I.E. A GOVERNMENT ESCORT IS NOT REQUIRED.

B. NOTIFY THE AIRFIELD MANAGER, THROUGH THE CONTRACTING OFFICER'S REEPRESENTATIVE, 30 DAYS IN ADVANCE OF INSTALLING TEMPORARY PAVEMENT MARKINGS.

C. INSTALL THE TEMPORARY PARKING POSITION MARKINGS AND TEMPORARY TAXILANES, AS SHOWN ON THIS SHEET, PRIOR TO BEGINNING ANY WORK ON THE APRON. ALL WORK REQUIRED TO INSTALL THE TEMPORARY PAVEMENT MARKINGS WILL OCCUR OUTSIDE OF THE CONSTRUCTION AREA FREE ZONE SHOWN ON THIS SHEET. OBTAIN A GOVERNMENT ESCORT FOR WORK OUTSIDE OF THE CONSTRUCTION AREA FREE ZONE.

D. AT THE COMPLETION OF THE PROJECT, REMOVE THE TEMPORARY PAVEMENT MARKINGS AND INSTALL ALL NEW PAVEMENT MARKINGS AS SHOWN ON SHEET CP701.

2. CONSTRUCTION PHASING

A. THE CONSTRUCTION OF THE APRON WILL BE IN TWO PHASES (CAZ 1 AND CAZ 2). CAZ 1 WILL BE THE CONSTRUCTION OF THE PCC APRON AND ASSOCIATED ASPHALT. CAZ 2 WILL BE THE CONSTRUCTION OF THE ASPHALT SHOULDER AND THE INSTALLATION OF THE BURIED SENSOR LINE (BSL).

1. CAZ 1 AND CAZ 2 MAY BE CONSTRUCTED CONCURENTLY.
2. ALL CONSTRUCTION OF THE ASPHALT SHOULDER PAVEMENT WITHIN CAZ 2 SHALL BE COMPLETE WITHIN 30 DAYS OF BEGINNING WORK WITHIN THE CAZ 2 AREA.
3. DURING CAZ 2 APRON WORK, THE MAIN TAXILANE WILL BE CLOSED TO AIRCRAFT OPERATION. PARKING SPOTS 13 THRU 22 WILL BE AVAILABLE FOR AIRCRAFT TO USE, BUT AIRCRAFT WILL BE REQUIRED TO BE TOWED IN AND OUT OF THE PARKING SPOTS TO PREVENT JET BLAST FROM AFFECTING THE WORKERS WITHIN CAZ 2.

A. NO DEMOLITION OF EXISTING AIRFIELD PAVEMENT UNTIL THE CONTRACTOR HAS AN APPROVED CONCRETE MIX DESIGN CONFORMING TO SPECIFICATION 32 13 14.13 CONCRETE PAVEMENTS FOR AIRFIELDS AND OTHER HEAVY DUTY PAVEMENTS AND AN APPROVED HMA JOB MIX FORMULA CONFORMING TO 32 12 15.13 HOT-MIX ASPHALT AIRFIELD PAVING.

B. RE-ESTABLISH EXISTING PAVEMENT MARKINGS AND ALL EXISTING UTILITIES REMOVED OR DAMAGED BY THE CONTRACTOR TO MATCH EXISTING CONDITION PRIOR TO CONSTRUCTION.

C. PHASING OF THE APRON MARKING IS REQUIRED. SEE SHEETS CP700 THRU CP702 FOR APRON PAVEMENT MARKING PHASING PLANS.

3. GENERAL REQUIREMENTS

A. ALL VEHICLES REQUIRE COMPANY MARKINGS, FLASHING BEACONS, AND FLIGHT LINE PASSES DISPLAYED. INSPECT ALL ACTIVE AIRFIELD PAVEMENTS TRAFFICKED BY THE CONTRACTOR'S CONSTRUCTION EQUIPMENT HOURLY BY THE CONTRACTOR TO DETERMINE IF FOREIGN OBJECT DEBRIS (FOD) IS PRESENT. REMOVE ALL FOD FOUND ON AIRFIELD PAVEMENTS WITHIN 1-HOUR OF DISCOVERY. PROVIDE A SELF-CONTAINED PAVEMENT VACUUMING TRUCK WHICH IS SPECIFICALLY MANUFACTURED TO CLEAN AIRFIELD PAVEMENTS. OPERATE THE VACUUM TRUCK CONTINUOUSLY DURING CONTRACTOR HAULING OPERATIONS.

B. AN ESCORT WILL BE REQUIRED FOR ALL PERSONNEL INSTALLING THE TEMPORARY PARKING POSITION AND TAXILANE MARKINGS. AN ESCORT WILL BE REQUIRED FOR ALL PERSONNEL IN CHARGE OF ESTABLISHING THE CONSTRUCTION FREE ZONES AS SHOWN ON THIS SHEET. AFTER THE CONSTRUCTION FREE ZONE HAS BEEN ESTABLISHED THE CONTRACTOR WILL NOT BE REQUIRED TO BE ESCORTED TO THE CONSTRUCTION AREA ZONES.

3. GENERAL REQUIREMENTS (CON'T)

C. CONTINUOUSLY VACCUM SWEEP ALL HAUL ROUTES AND CONSTRUCTION AREA FREE ZONES.

D. RESTORE ALL HAUL ROUTES BACK TO ORIGINAL CONDITION BY REPAIRING POTHOLES, RUTS AND SOFT YIELDING SPOTS.

E. THE HAUL ROUTES WILL BE USED BY THE SECURITY POLICE AND OTHER PERSONNEL DURING CONSTRUCTION.

F. MAINTAIN ALL HAUL ROUTES SO THEY REMAIN PASSABLE AT ALL TIMES.

G. HAVE A PERSON AVAILABLE 24 HOURS A DAY FOR EMERGENCY MAINTENANCE OF LOW PROFILE BARRICADES AND HAZARD LIGHTS AND ROPE AND BARREL FENCING. INITIATE AND COMPLETE REPAIRS OF LOW PROFILE BARRICADES AND HAZARD LIGHTS AND ROPE AND BARREL FENCING WITHIN ONE HOUR OF BEING NOTIFIED BY THE CONTRACTING OFFICER'S REPRESENTATIVE.

H. COORDINATE ALL WORK ON THE AIRFIELD WITH THE AIRFIELD MANAGER AND ANGB BASE OPERATIONS AND THE CONTRACTING OFFICER.

I. ALL CONTRACTOR VEHICLES AND EQUIPMENT WILL BE INSPECTED BY GOVERNMENT SECURITY FORCES PRIOR TO ACCESS TO WISCONSIN ANGB. ONLY ONE SET OF GOVERNMENT SECURITY FORCES WILL BE INSPECTING VEHICLES ONE VEHICLE AT A TIME. THEREFORE, STRATEGICALLY SCHEDULE PERSONNEL ACCESS AND MATERIAL DELIVERIES TO AVOID DELAYS. THE ENTRY CONTROL POINT (ECP), WHICH SHALL BE USED AS THE CONTRACTOR'S ACCESS POINT TO THE CONSTRUCTION SITE, WILL BE MANNED BY GOVERNMENT SECURITY FORCES. THE ECP WILL BE MANNED THE SAME HOURS AS THE MAIN GATE. SEE HAUL ROUTE NOTE 7 ON SHEET G-002 FOR GATE HOURS. FOURTEEN DAYS IN ADVANCE, THE CONTRACTOR MAY REQUEST EXTENDED HOURS OF GATE ACCESS THROUGH THE CONTRACTING OFFICER. GATE HOURS ARE SUBJECT TO CHANGE.

J. DO NOT OPERATE STEEL BUCKET OR BLADE EQUIPMENT WITH THE BUCKET OR BLADE IN DIRECT CONTACT WITH ANY PAVEMENT TO REMAIN AT ANY TIME. STEEL BUCKET OR BLADE EQUIPMENT MAY BE USED TO REMOVE/REPLACE EXISTING BASE AND SUBGRADE MATERIALS.

K. STOCKPILING OF BASE COURSE AND SUBGRADE MATERIALS WILL NOT BE ALLOWED ON THE APRON DURING CONSTRUCTION.

L. MAXIMUM EQUIPMENT HEIGHT ALLOWABLE ON THE APRON SHALL NOT EXCEED 20'.

3. GENERAL REQUIREMENTS (CON'T)

M. COMPLY WITH ALL ASPECTS OF UFC 3-260-01, SECTION 14 CONSTRUCTION PHASING PLAN AND OPERATIONAL SAFETY ON AIRFIELDS DURING CONSTRUCTION AND FAA AC 150 5370-2f OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION. PROVIDE THE AIRFIELD MANAGER ALL INFORMATION REQUIRED FOR HIM TO SUBMIT FAA FROM 7460-1 SIXTY (60) DAYS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES.

N. PROTECT ALL EXISTING AIRFIELD LIGHTS AND/OR NAVAIDS DURING CONSTRUCTION. IF AN EXISTING AIRFIELD LIGHTS AND/OR NAVAIDS IS DAMAGED BY THE CONTRACTOR, IMMEDIATELY NOTIFY THE CONTRACTING OFFICER. REPAIR OR REPLACE THE DAMAGED AIRFIELD LIGHTS AND/OR NAVAIDS AT NO ADDITIONAL COST TO THE GOVERNMENT. REPAIR ALL DAMAGES TO THE CONTRACTING OFFICER'S SATISFACTION.

4. SPECIAL REQUIREMENTS

A. CONTRACTOR AND AIRCRAFT OPERATIONS SHALL COORDINATE AIRCRAFT ACCESS TO BUILDING 400. WHEN AIRCRAFT MUST ACCESS BUILDING 400, THE CONTRACTOR SHALL VACCUM THE ACCESS APRON WITH THE SELF CONTAINED VACUUMING TRUCK AND MOVE EQUIPMENT, AS REQUIRED, TO ALLOW SAFE PASSAGE OF AIRCRAFT FROM THE PARKING APRON TO THE BUILDINGS.

B. CONTRACTOR AND AIRCRAFT OPERATIONS SHALL COORDINATE AIRCRAFT ACCESS TO BUILDING 426. BASE PERSONELL WILL REQUIRE DAILY ACCESS TO BUILDING 426. COORDINATE ACCESS TO BUILDING 426 DAILY.

C. COORDINATE AIRCRAFT MOVEMENTS WITH THE AIRFIELD MANAGER, OPERATIONS PERSONNEL AND THE CONTRACTING OFFICER WEEKLY.

LEGEND:

LOW PROFILE BARRICADES - SEE NOTE 2

ROPE AND BARREL FENCING - SEE NOTE 2

CONTRACTOR HAUL ROUTE

N

0 50' 100'

SCALE: 1" = 50' - 0"

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
1616 CAPITOL AVENUE
OMAHA, NE 68102

ISSUE DATE:	FEBRUARY 2020
SOLICITATION NO.:	W9128F-R-20-XXXX
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TRUAX FIELD ANGB, WISCONSIN
REPAIR APRON
PN XGFC182005

PHASING PLAN & NOTES

SHEET ID

C-001

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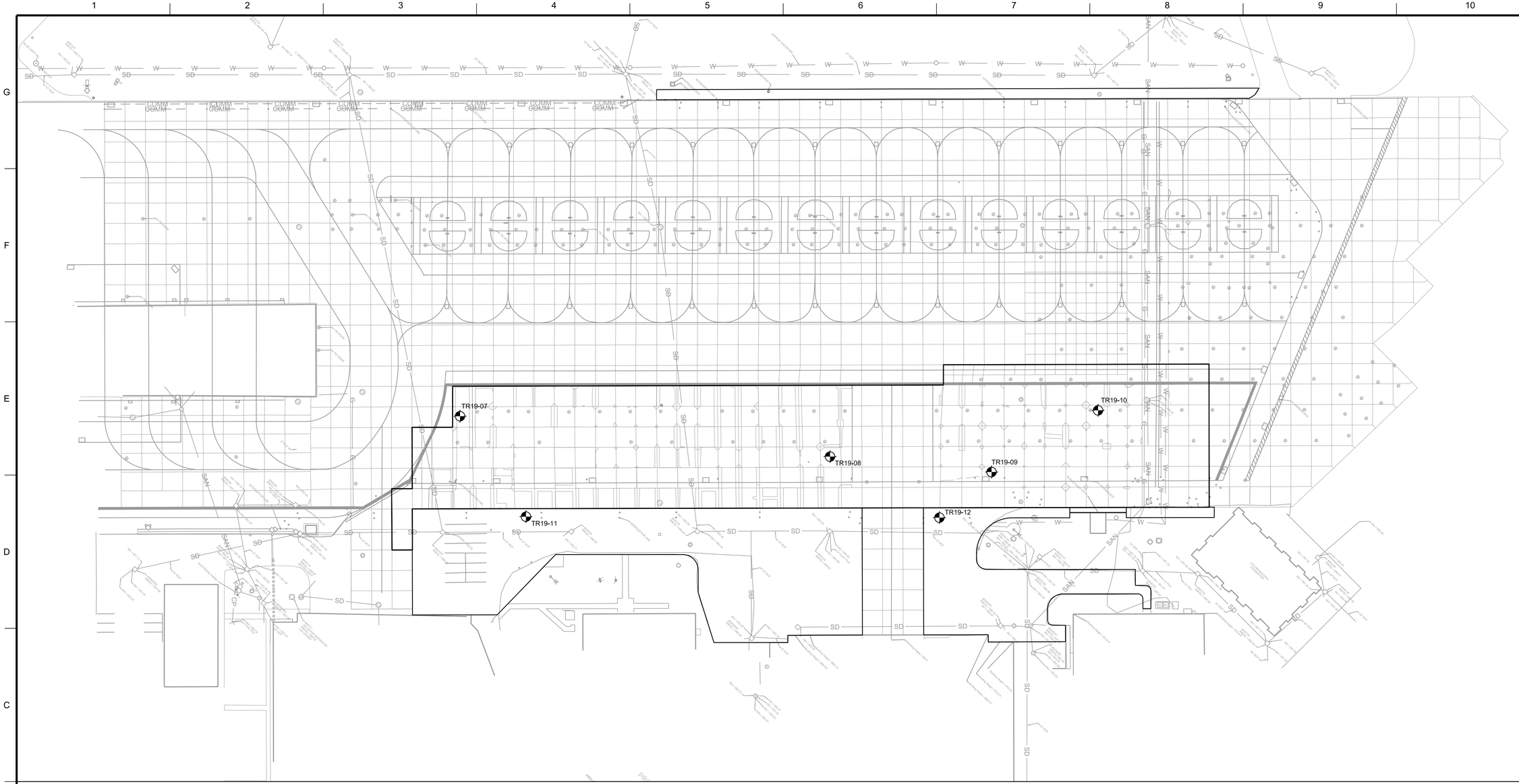

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TR19-09	10.0'	414144.57	2146265.49
TR19-10	10.0'	414260.02	2146299.80
TR19-11*	VARIES	413799.92	2145964.47
TR19-12*	VARIES	414077.09	2146259.09

COORDINATE SYSTEM: WISCONSIN SOUTH (4803)

TR 19-01 BORING LOCATION AND DESIGNATION

BORINGS MARKED WITH AN ASTERIK WERE CORED TO IDENTIFY EXISTING PAVEMENT THICKNESS AND WERE NOT ADVANCED INTO THE SUBSURFACE.

0 50' 100'
SCALE: 1" = 50' - 0"

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY:	ISSUE DATE:
T. WEHRING	FEBRUARY 2020
DRAWN BY:	SOLICITATION NO.:
T. WEHRING	W9128F-R-20-XXXX
CHECKED BY:	CONTRACT NO.:
C. FRITZCH	W9128F-C-20-XXXX
SUBMITTED BY:	FILE NUMBER:
B. FLERE	F113-10-01
SCALE:	FILE NAME:
ANSI D	TX07_B-101.dwg

U.S. ARMY CORPS OF ENGINEERS
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1616 CAPITOL AVENUE
OMAHA, NE 68102

TRUAX FIELD ANGB, WISCONSIN
REPAIR APRON
PN XGFG182005

BORING LOCATION PLAN

SHEET ID

B-101

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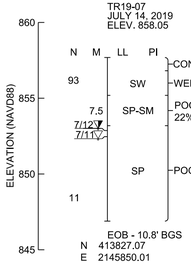

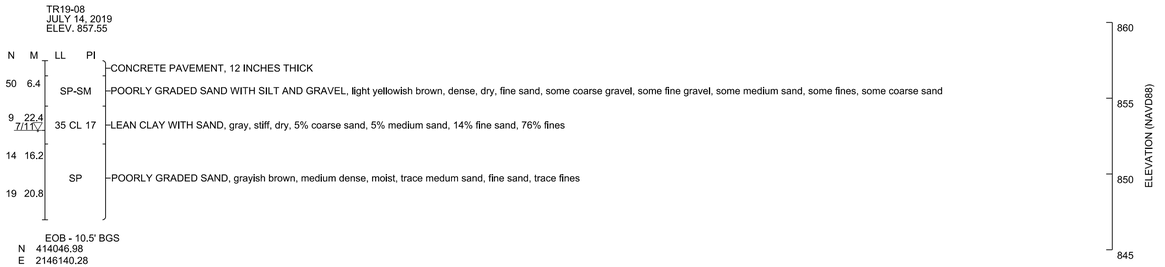

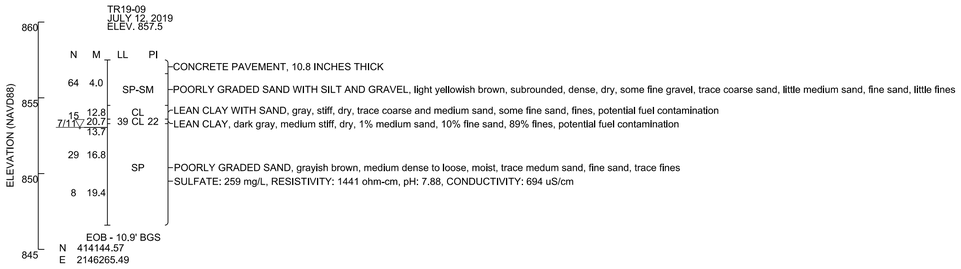

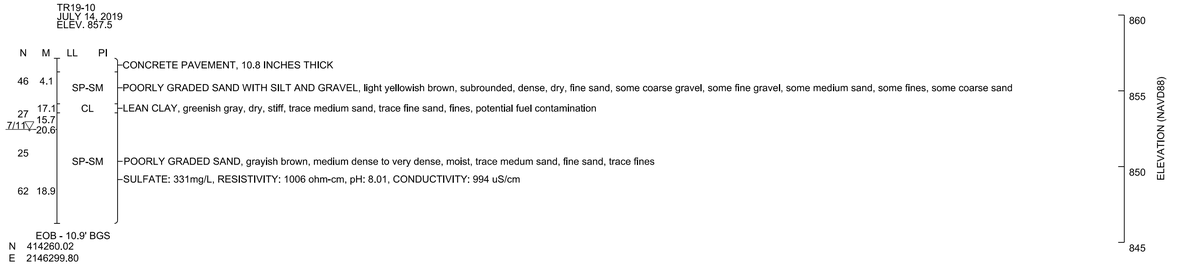

ACC CORE THICKNESS

CORE HOLE ID	NORTHING	EASTING	ACC THICKNESS (IN)
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TR19-12	414077.09	2146259.09	5.40

BORING LEGEND

TR19-01	DRILL HOLE NUMBER
JULY 12, 2019	DATE BORING COMPLETED
ELEV. 857.5	TOP OF PAVEMENT ELEVATION AT BORING LOCATION IN FEET (NAVD88)
M	NATURAL MOISTURE CONTENT IN PERCENT
LL	LIQUID LIMIT
PI	PLASTICITY INDEX
N	STANDARD PENETRATION BLOW COUNT. NUMBER OF BLOWS FOR A 140-POUND WEIGHT DROPPING 30 INCHES, TO DRIVE A 2-INCH OUTSIDE DIAMETER SAMPLER, 1 FOOT.
% fines	PERCENT OF SOIL BY DRY WEIGHT PASSING THE NO.200 SIEVE
7/01▽	GROUNDWATER DEPTH AND DATE MEASURED
7/01▼	24 HOUR GROUNDWATER DEPTH AND DATE MEASURED
G.W.T. N.E.	GROUNDWATER TABLE NOT ENCOUNTERED
FL	SOIL CLASSIFICATION BASED ON FIELD LOGS
LEAN CLAY	SOIL CLASSIFCATION BASED ON LABORATORY TESTING AND LABORATORY VISUAL DECRIPTIONS

BORING NOTES

1. THE DESCRIPTIONS AT THE RIGHT OF THE LOGS ARE THE RESULTS OF FIELD AND LABORATORY DATA. THE TERMS "DRY", "MOIST", "WET", ETC., ARE FIELD DESCRIPTIONS MADE BY THE INSPECTOR IN THE FIELD AT THE TIME OF DRILLING. SEE "M" ON THE CONDENSED LOG OF BORINGS FOR LABORATORY DETERMINATION OF MOISTURE CONTENTS FOR THE SOIL. LABORATORY CLASSIFICATIONS ARE IN ACCORDANCE WITH ASTM D 2487.

2. THE LOGS FURNISHED REPRESENT THE TYPES OF SOIL ENCOUNTERED AT THEIR RESPECTIVE LOCATIONS AND THE WATER LEVEL ENCOUNTERED AT THAT TIME. THE BORING LOGS ARE CONSIDERED REPRESENTATIVE OF THE SOILS WHICH WERE ENOUNTERED AT THAT LOCATION: HOWEVER, THE WATER LEVEL RECORDED CAN FLUCTUATE APPRECIABLY AT DIFFERENT SEASONS OF THE YEAR OR FROM YEAR TO YEAR DEPENDING LARGELY ON CLIMATIC CONDITIONS. THE CONTRACTOR SHOULD IDENTIFY GROUND WATER CONDITIONS PRIOR TO THE TIME OF CONSTRUCTION.

3. REFUSAL (N=60+) IS DEFINED AS A CUMULATIVE BLOW COUNT EXCEEDING 60 IN ANY SIX INCH INTERVAL OF THE STANDARD PENETRATION TEST (SPT). ONCE REFUSAL IS ENCOUNTERED, THE SPT IS DISCONTINUED.

4. NOTE THAT BORING LOGS INDICATE THAT VERY DENSE SOILS AND SPT VALUES EXCEEDING 60 WERE ENCOUNTERED.

5. ASPHALT (ACC) CORE THICKNESS IS EXPRESSED IN INCHES

6. FOR SOIL BORING LOCATIONS, SEE SHEET B-101.

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T. WEIHING	FEBRUARY 2020
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C. FRITZCH	W9128F-C-20-XXXX
SUBMITTED BY:	FILE NUMBER:
B. PLEKE	F113-10-01
SIZE:	FILE NAME:
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OMAHA DISTRICT
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OMAHA, NE 68102

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BORING LOGS

SHEET ID

B-301

...\TX\TX07\40000 Design Products\CAD_BIM_Sheets\BORING LOGS
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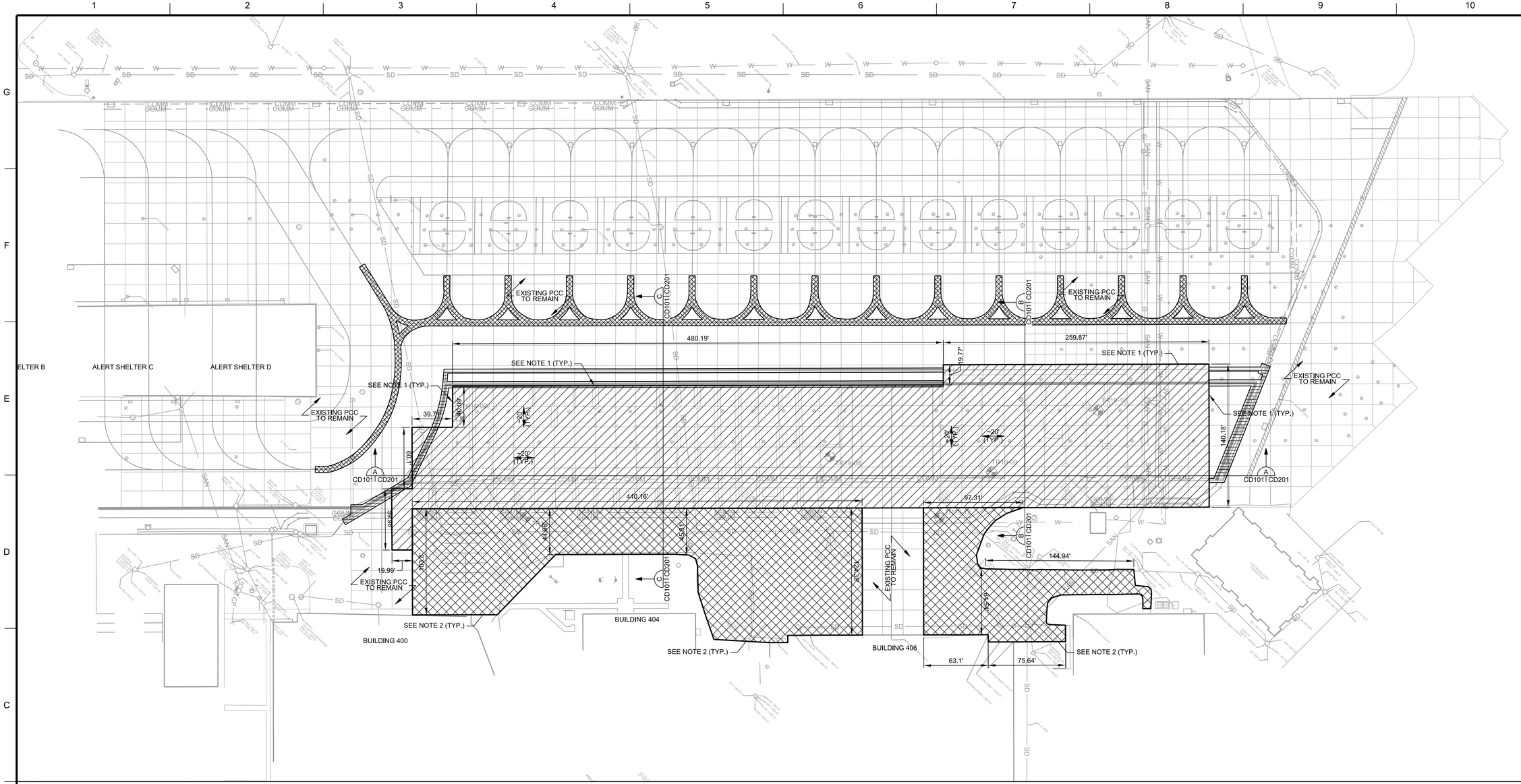

LEGEND:

- 11.25" PCC / RIGID BASE COURSE AS NECESSARY TO BE REMOVED
- 4" ACC / BASE COURSE AS NECESSARY TO BE REMOVED
- PAVEMENT MARKINGS TO BE REMOVED - SEE NOTE 8
- PAVEMENT MARKINGS TO BE REMOVED - SEE NOTE 9

NOTES:

1. ALL PCC PAVEMENT REMOVALS SHALL BE INITIATED WITH A DOUBLE FULL DEPTH OR TRIPLE FULL DEPTH, VERTICAL SAWCUT. SEE SHEET CD201 FOR DETAILS.

2. ALL ACC PAVEMENT REMOVALS SHALL BE INITIATED WITH A SINGLE FULL DEPTH, VERTICAL SAWCUT. ALL ACC SHALL BE REMOVED OFF OF GOVERNMENT CONTROLLED LANDS.

3. SEE SHEETS CD201 AND SHEET CP201 FOR PAVEMENT REMOVAL AND PAVEMENT REPLACEMENT SECTIONS, RESPECTIVELY.

4. IN AREAS WHERE THE NEW PAVEMENT THICKNESS IS GREATER THAN THE EXISTING PAVEMENT REMOVED, REMOVE EXISTING SUBGRADE MATERIAL AS NECESSARY TO CONSTRUCT THE NEW PAVEMENT SECTION. IN AREAS WHERE THE NEW PAVEMENT SECTION IS LESS THAN THE EXISTING PAVEMENT SECTION REMOVED, PLACE AND COMPACT SUBBASE COURSE MATERIAL AS NECESSARY.

5. ALL ODD-SHAPED SLABS AND SLABS WITH STRUCTURAL PENETRATIONS ARE REINFORCED WITH 0.05% STEEL DEFORMED BARS IN BOTH DIRECTIONS.

6. EXISTING PAVEMENT MARKINGS NOT WITHIN THE PAVEMENT REMOVAL AREA, OR INDICATED TO BE REMOVED, THAT ARE MARRED OR REMOVED BY THE CONTRACTOR'S OPERATIONS SHALL BE ENTIRELY REMOVED AND REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE.

7. AT LOCATIONS OF THICKENED EDGE EXPANSION JOINTS, THE CONTRACTOR SHALL ASSUME THAT THE PAVEMENT AT THAT LOCATION IS 1.3 TIMES THE THICKNESS OF THE SURROUNDING PAVEMENT. THE CONTRACTOR SHALL ASSUME THAT A THICKENED EDGE EXPANSION JOINT EXISTS AT THE FOLLOWING LOCATIONS:
   - THE JOINT ADJACENT TO STRUCTURES.
   - THE JOINT BETWEEN SLABS OF DIFFERENT SIZES.

8. PRIOR TO INITIATING WORK WITHIN CAZ #1 (PHASE 1) REMOVE PAVEMENT MARKINGS AND INSTALL THE NEW TEMPORARY TAXILANE TO BE USED BY AIRCRAFT DURING CONSTRUCITON. TEMPORARY TAXILANE MARKING TO BE REMOVED PRIOR TO MARKING THE APRON THE WITH PERMANENT MARKINGS. SEE SHEET CP701 FOR THE PAVEMENT MARKING PLAN.

9. AFTER COMPLETING ALL WORK WITHIN BOTH CAZ #1 AND CAZ #2, REMOVE PAVEMENT MARKINGS PRIOR TO INSTALLING THE PERMANENT MARKINGS. SEE SHEET CP701 FOR THE PAVEMENT MARKING PLAN.

0 50' 100'
SCALE: 1" = 50' - 0"

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M. HUCKLE	W9128F-C-20-XXXX
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B. FLERE	F113-10-01
SIZE:	FILE NAME:
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OMAHA DISTRICT
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OMAHA, NE 68102

TRUAX FIELD ANGB, WISCONSIN
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REMOVAL PLAN

SHEET ID

CD101

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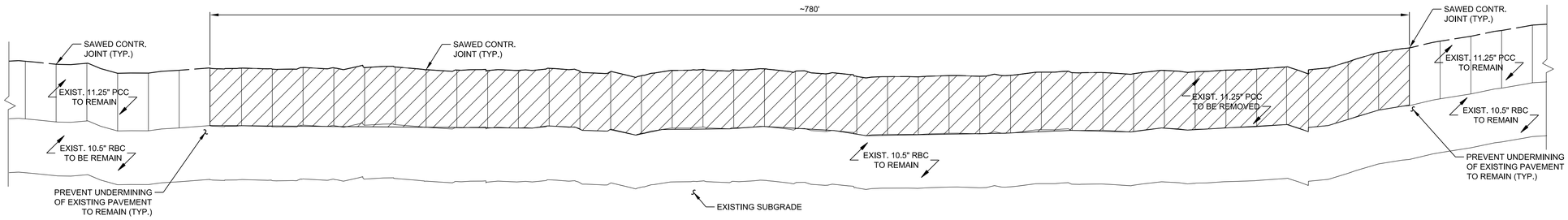
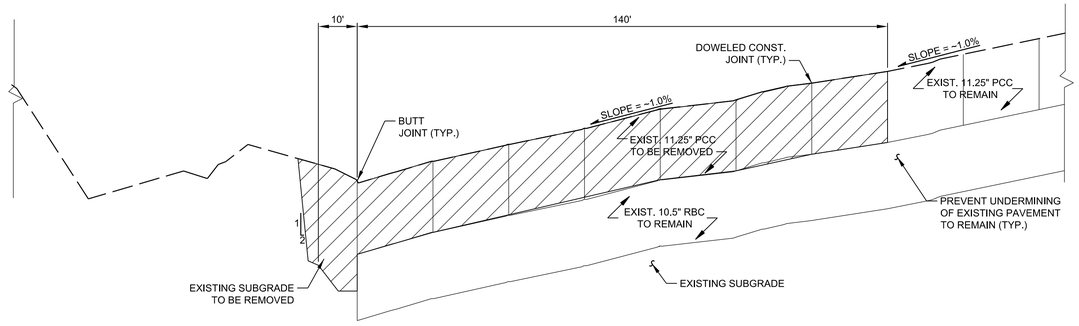


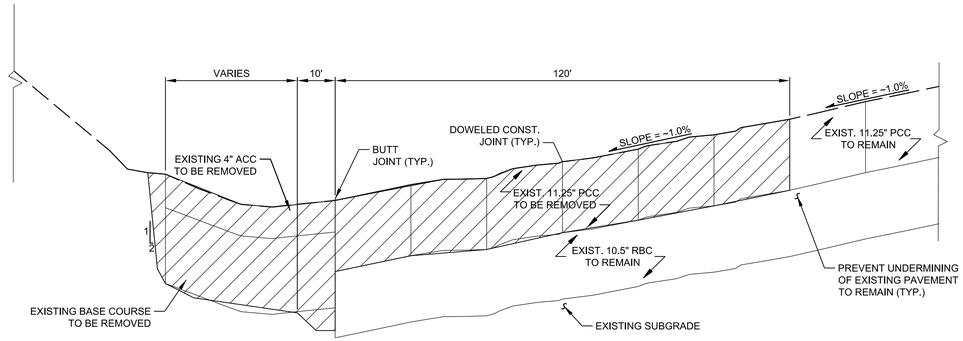
APRON REMOVAL SECTION (A)

NOT TO SCALE — CD101 | CD201



APRON REMOVAL SECTION (B)

NOT TO SCALE — CD101 | CD201



APRON REMOVAL SECTION (C)

NOT TO SCALE — CD101 | CD201

NOTE:

1. REMOVE EXISTING MATERIALS TO THE DEPTH NECESSARY TO INSTALL THE NEW PAVEMENT REPLACEMENT SECTION AS SHOWN ON SHEET CP201.

2. SEE SHEET CD101 FOR EXISTING PAVEMENT THICKNESSES.

3. IN AREAS WHERE THE NEW PAVEMENT THICKNESS IS GREATER THAN THE EXISTING PAVEMENT REMOVED, REMOVE EXISTING BASE COURSE, SUBBASE COURSE AND/OR SUBGRADE AS NECESSARY TO CONSTRUCT THE THICKER NEW PAVEMENT SECTION.

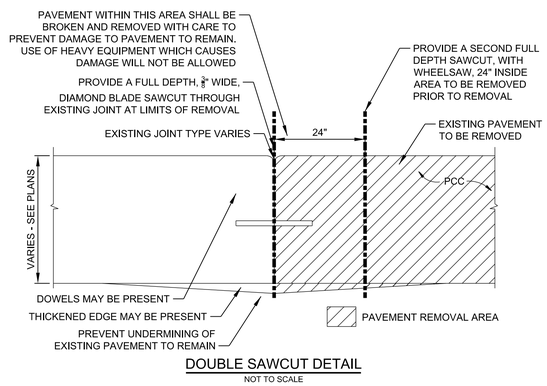
4. IN AREAS WHERE THE NEW PAVEMENT THICKNESS IS LESS THAN THE EXISTING PAVEMENT REMOVED, PLACE AND COMPACT NEW AGGREGATE BASE COURSE MATERIAL.

5. PREVENT UNDERMINING OF EXISTING PAVEMENT TO REMAIN.

6. AT LOCATIONS OF THICKENED EDGE EXPANSION JOINTS, THE CONTRACTOR SHALL ASSUME THAT THE PAVEMENT AT THAT LOCATION IS 1.3 TIMES THE THICKNESS OF THE SURROUNDING PAVEMENT. THE CONTRACTOR SHALL ASSUME THAT A THICKENED EDGE EXPANSION JOINT EXISTS AT THE FOLLOWING LOCATIONS:
   - EXISTING PAVEMENT JOINTS ABUTTING EXISTING STRUCTURES.
   - THE JOINT BETWEEN SLABS OF DIFFERENT SIZES.

LEGEND:

	REMOVAL AREA - SEE SHEET CP201 FOR PAVEMENT REPLACEMENT SECTIONS
PCC	PORTLAND CEMENT CONCRETE
ACC	ASPHALT CEMENT CONCRETE



DOUBLE SAWCUT DETAIL

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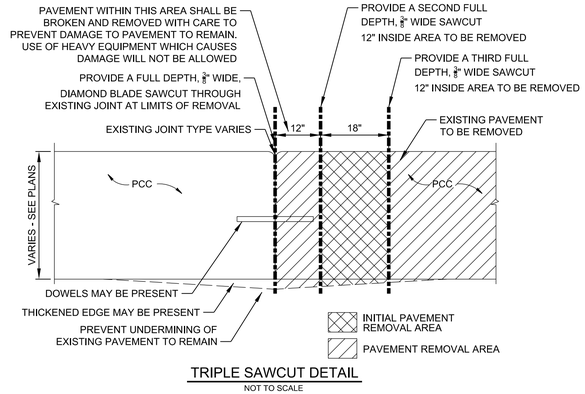

TRIPLE SAWCUT DETAIL

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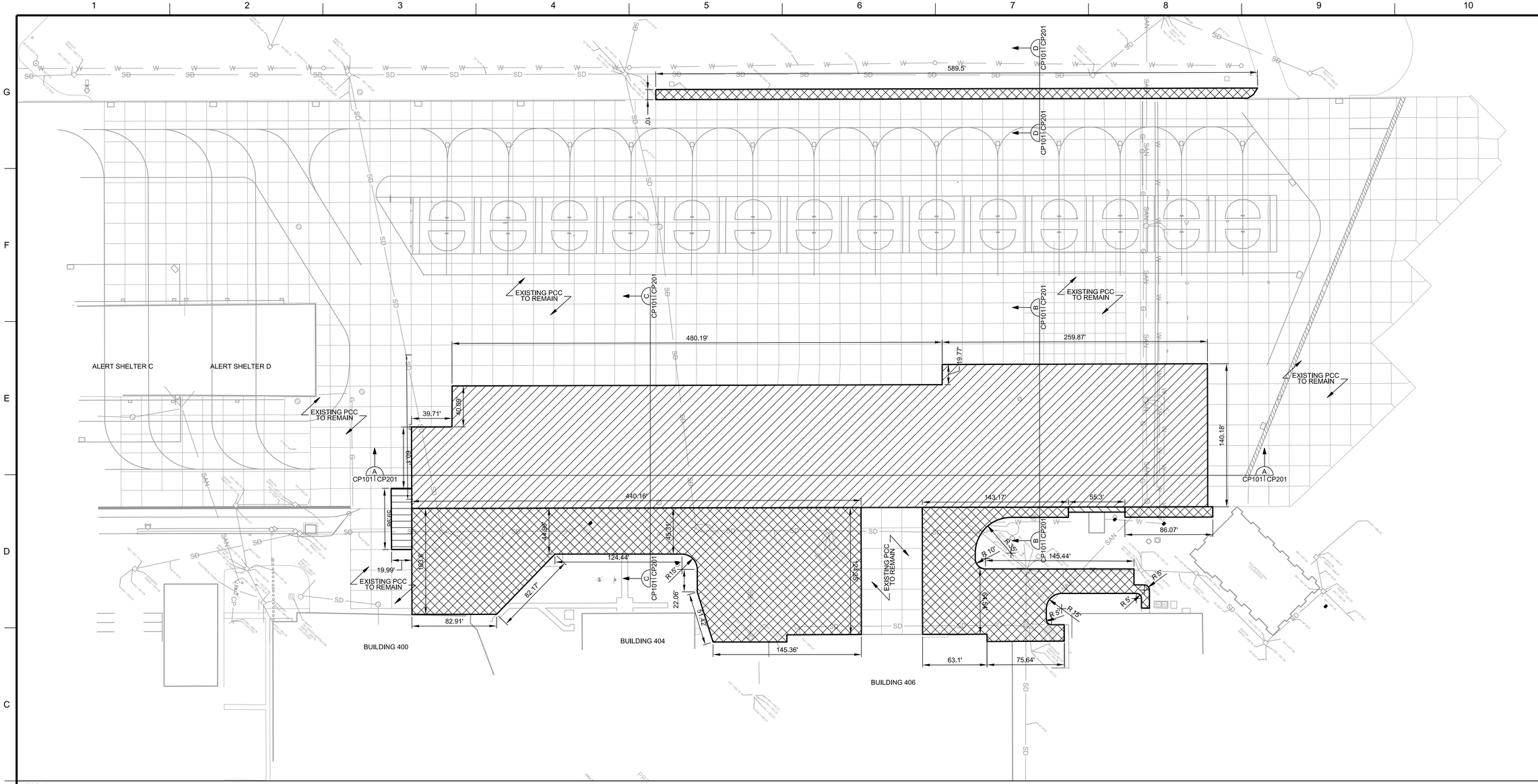
PAVEMENT REMOVAL SECTIONS

SHEET ID

CD201



LEGEND:

NEW 4" ACC / 6" AGGREGATE BASE COURSE / 6" SUBBASE COURSE

NEW 14" PCC / SCARIFY AND RECOMPACT 6" EXISTING BASE COURSE

NOTES:

1. SEE SHEET CP201 FOR NEW PAVEMENT SECTIONS.

SCALE: 1" = 50' - 0"

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CHECKED BY: M. HUCKLE
SUBMITTED BY: B. FLEKE
QA/QC: ANS LD

ISSUE DATE: FEBRUARY 2020
SOLICITATION NO.: W9128F-R-20-XXXX
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PAVING PLAN

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CP101

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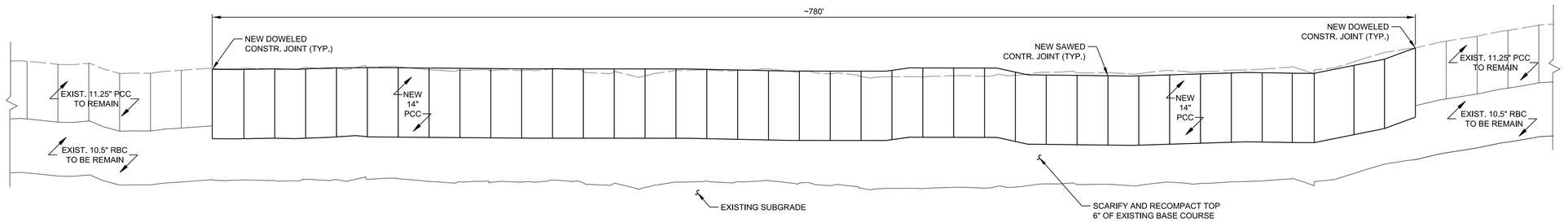
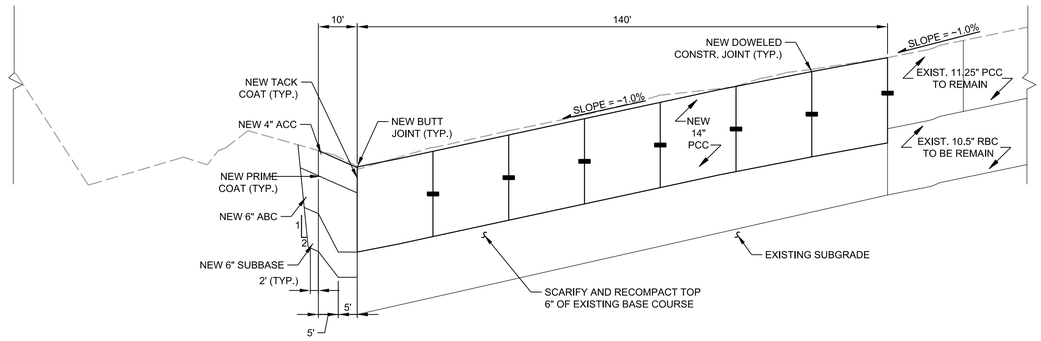
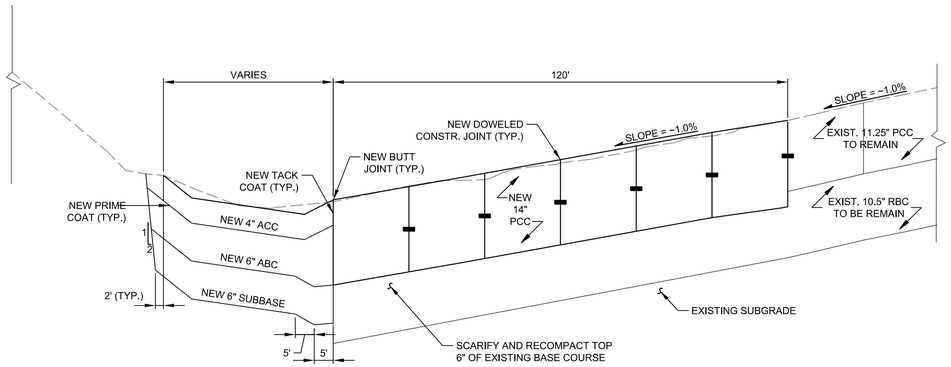


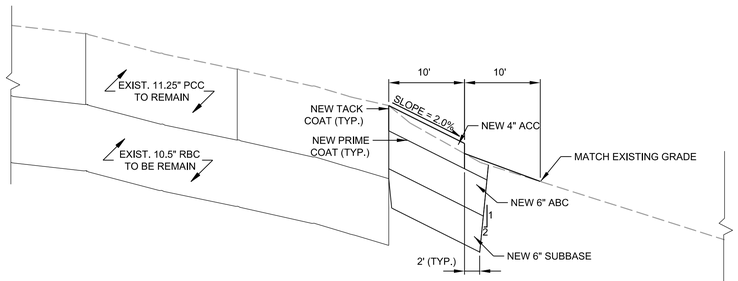
APRON REPLACEMENT SECTION (A)
NOT TO SCALE
CP101 | CP201



APRON REPLACEMENT SECTION (B)
NOT TO SCALE
CP101 | CP201



APRON REPLACEMENT SECTION (C)
NOT TO SCALE
CP101 | CP201



NEW ACC PAVEMENT SECTION (D)
NOT TO SCALE
CP101 | CP201

GENERAL NOTES:

1. IN AREAS WHERE THE NEW PAVEMENT THICKNESS IS GREATER THAN THE EXISTING PAVEMENT REMOVED, REMOVE EXISTING MATERIAL AS NECESSARY TO CONSTRUCT THE NEW PAVEMENT SECTION.

2. IN AREAS WHERE THE NEW PAVEMENT THICKNESS IS LESS THAN THE EXISTING PAVEMENT REMOVED, PLACE AND COMPACT AGGREGATE BASE COURSE MATERIAL .

3. ALL DISTURBED AREAS NOT TO BE PAVED, TO BE TOPSOILED WITH 4" OF TOPSOIL AND SEEDED.

4. PRIME COAT REQUIRED ON AGGREGATE BASE COURSE.

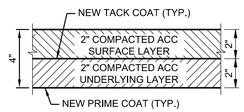
5. NEW 4-INCH THICK COMPACTED ASPHALT PAVEMENT AREAS SHALL BE CONSTRUCTED WITH TWO LIFTS OF COMPACTED ASPHALT AS SHOWN ON DETAIL 1 ON THIS SHEET. THE INITIAL UNDERLYING LAYER SHALL HAVE A COMPACTED LIFT THICKNESS OF 2-INCHES. THE TOP WEARING SURFACE LAYER SHALL HAVE A COMPACTED LIFT THICKNESS OF 2-INCHES.

6. REFERENCE SPECIFICATION 31 00 00 EARTHWORK FOR SUBGRADE COMPACTION REQUIREMENTS BENEATH THE NEW PAVEMENT SECTIONS.

LEGEND:

ACC ASPHALT CEMENT CONCRETE

ABC AGGREGATE BASE COURSE



DETAIL 1

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SUBMITTED BY:	B. FLERE
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PAVEMENT REPLACEMENT SECTIONS

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