DEPARTMENT OF MILITARY - STATE OF SOUTH DAKOTA

DRAINAGE INSTALL BETWEEN RAMPS AND HANGARS RAPID CITY AASF

PROJECT NO.: CFMO #467074

ISSUE DATE: 2/12/2024

SHEET INDEX

GENERAL

G-001	COVER SHEET
G-002	GENERAL ABBREVIATIONS
G-003	GENERAL LEGEND

CIVIL

C-001	CIVIL NOTES
C-002	CIVIL NOTES
C-101	EXISTING SITE
C-102	EROSION CONTROL
C-103	SITE DEMOLITION
C-104	SITE LAYOUT & ALIGNMENT DATA
C-105	CONSTRUCTION PHASING
C-106	STORM SEWER PLAN & PROFILE
C-107	STORM SEWER PLAN & PROFILE
C-501	STANDARD DETAILS
C-502	STANDARD DETAILS
C-503	STANDARD DETAILS
C-504	STANDARD DETAILS

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 11323
CHRISTOPHER M. BAILEY
SOUTH DAKOTA
2-13-24

MARK	DESCRIPTION	DATE
	ISSUED FOR BID	2/12/24

DESIGNED BY: LINDSAY SHAGLA
DRAWN BY: LINDSAY SHAGLA
CHECKED BY: CHRIS BAILEY
SUBMITTED BY: CHRIS BAILEY
SIZE: ANSI D
TITLE NAME: G-001.DWG
ISSUE DATE: FEBRUARY 2024
CFMO NO.: 467074
PROJECT NO.: 10382814
SCALE: NO SCALE

South Dakota Army National Guard
Rapid City Army Aviation Support Facility
Rapid City, South Dakota

703 Main St Suite 200
Rapid City, South Dakota 57701

Rapid City Army Aviation Support Facility
Drainage Install Between Ramps and Hangars Rapid City AASF
Department of Military - State of South Dakota
CFMO #467074

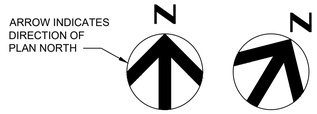
COVER SHEET

SHEET ID
G-001

MATERIALS IN PLAN/SECTION

- ACOUSTICAL CEILING TILE (SECTION)
- ASPHALT (PLAN OR SMALL-SCALE SECTION)
- ASPHALT (LARGE-SCALE SECTION)
- BATT INSULATION (SECTION)
- BRICK MASONRY (PLAN AND/OR SECTION)
- CHECKERED PLATE (PLAN)
- CONCRETE (PLAN AND/OR SECTION)
- CONCRETE MASONRY (PLAN AND/OR SECTION)
- DEMOLITION (PLAN AND/OR SECTION)
- EARTH (SECTION)
- FILTER POINT MAT (PLAN)
- FINISHED WOOD (SECTION)
- GLULAM LUMBER (SECTION)
- GRANULAR FILL (SECTION)
- GRATING (SECTION)
- GRATING (PLAN)
- GROUT (SECTION)
- GYPSUM BOARD (SECTION)
- METAL (SECTION)
- ORIENTED STRAND BOARD (SECTION)
- PARTICLE BOARD (SECTION)
- PLYWOOD (LARGE-SCALE SECTION)
- PLYWOOD (SMALL-SCALE SECTION)
- PRECAST CONCRETE (PLAN AND/OR SECTION)
- RIGID INSULATION (SECTION)
- RIPRAP (PLAN AND/OR SECTION)
- SAND (SECTION)
- SOD (SECTION)
- WEEP JOINT MORTAR PROTECTION SYSTEM (SECTION)
- WOOD - CONTINUOUS (SECTION)
- WOOD BLOCKING (SECTION)

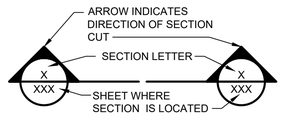
GENERAL SYMBOLOGY



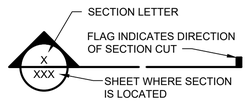
NORTH ARROW

PLAN
1/4" = 1'-0"

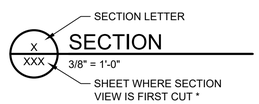
PLAN TITLE



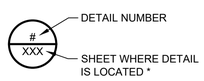
FULL BUILDING SECTION CUT MARKER



SECTION CUT MARKER



SECTION TITLE

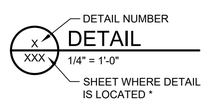


DETAIL MARKER

FOR REFERENCING DETAILS INCLUDED IN DRAWING SET.

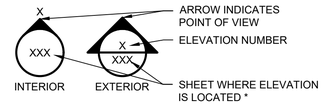
DETAIL MARKER

FOR REFERENCING DETAILS BOUND IN SPECIFICATIONS OR SEPARATE VOLUME.

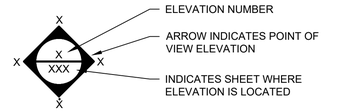


DETAIL TITLE

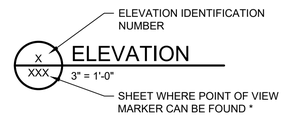
* EXCEPTIONS WHERE THE SHEET NUMBER IS REPLACED BY A DASH (-).
1) FOR COMMON DETAILS, SECTIONS, ELEVATIONS OR DETAILS THAT ARE CUT OR CALLED OUT ON MULTIPLE SHEETS.
2) SECTIONS, ELEVATIONS OR DETAILS THAT ARE LOCATED ON THE SAME SHEET THEY ARE CUT OR CALLED OUT ON.



SINGLE ELEVATION OR PHOTO MARKER

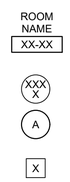


MULTIPLE ELEVATION OR PHOTO MARKER

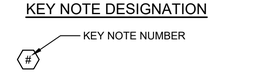


ELEVATION TITLE

ARCHITECTURAL



KEY NOTE DESIGNATION

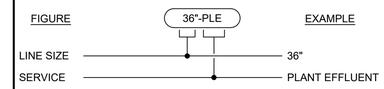


GENERAL LINE SYMBOLOGY

COLUMN GRID LINE/CENTERLINE

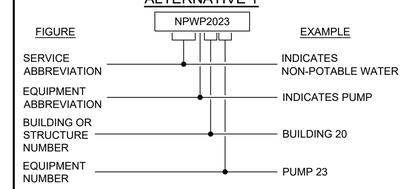
IDENTIFICATION SYMBOLOGY

PIPING

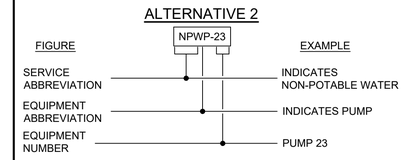


EQUIPMENT IDENTIFICATION

ALTERNATIVE 1



ALTERNATIVE 2



SHEET NAMING CONVENTION

AREA DESIGNATION

TO BE EDITED ON AN A PROJECT BASIS. TO BE DETERMINED BY THE PROJECT MANAGER, THEN ADDED TO THE GENERAL LEGEND.

EXAMPLE:
01 BUILDING OR AREA NAME
02 BUILDING OR AREA NAME
03 BUILDING OR AREA NAME

DISCIPLINE DESIGNATOR & DISCIPLINE ORDER

G	GENERAL
V	SURVEYING/MAPPING
X	DEMOLITION
C	CIVIL
L	LANDSCAPING
U	MULTI-DISCIPLINE
S	STRUCTURAL
A	ARCHITECTURAL
D	PROCESS
M	MECHANICAL (HVAC)
P	PLUMBING
F	FIRE PROTECTION
E	ELECTRICAL
Y	INSTRUMENTATION

DRAWING TYPE DESIGNATOR

0	GENERAL (SYMBOLS, LEGENDS)
1	PLANS
2	ELEVATIONS
3	SECTIONS
4	LARGE SCALE VIEWS
5	DETAILS
6	SCHEDULES AND DIAGRAMS
8	PROFILES
9	3D REPRESENTATIONS

EXAMPLE

GRAVITY THICKENER ARCHITECTURAL SECTION, SHEET 01

0	2					AREA 02
AREA DESIGNATION						
		A				ARCHITECTURAL DISCIPLINE
DISCIPLINE DESIGNATOR						
			3			SECTION SHEET TYPE
SHEET TYPE DESIGNATOR						
				0	1	SHEET NUMBER 01
SHEET NUMBER						
0	2	A	3	0	1	
SAMPLE SHEET NUMBER						

GENERAL NOTES:

1. THIS IS A STANDARD SHEET SHOWING COMMON SYMBOLOGY. ALL SYMBOLS ARE NOT NECESSARILY USED ON THIS PROJECT.
2. SCREENING OR SHADING OF WORK IS USED TO INDICATE EXISTING COMPONENTS OR TO DE-EMPHASIZE PROPOSED IMPROVEMENTS TO HIGHLIGHT SELECTED TRADE WORK. REFER TO CONTEXT OF EACH SHEET FOR USAGE.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 11323
CHRISTOPHER M. BAILEY
SOUTH DAKOTA
2-13-24

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SIZE: ANSI D
ISSUE DATE: FEBRUARY 2024
CFMO NO.: 467074
PROJECT NO.: 10382814
SCALE: NO SCALE
FILE NAME: G-003.DWG

South Dakota Army National Guard
Rapid City Army Aviation Support Facility
Rapid City, South Dakota

703 Main St Suite 200
Rapid City, South Dakota 57701

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Drainage Install Between Ramps and Hangars Rapid City AASF
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CFMO #467074

GENERAL LEGEND

SHEET ID
G-003

STANDARD SPECIFICATIONS

Standard Specifications for this project shall be the City of Rapid City Standard Specifications for Public Works Construction, 2022 Edition, hereinafter referred to as the Standard Specifications.

The Contractor shall notify the Engineer of conflicts between the Standards Specifications and required provisions, supplemental specifications and special provisions as included in the proposal. The more strict interpretation will be used to resolve the conflict.

PROJECT SEQUENCING

The Contractor shall use the drawings for project sequencing guidance.

1. Implement approved traffic control plan.
2. Install erosion control BMPs prior to topsoil stripping or any excavation.
3. Perform work in the phases outlined in the plans.
4. The Contractor is responsible for scheduling of erosion control, seeding and mulching to comply with erosion control plan and storm water permit. The Contractor shall perform final restoration and erosion control installation immediately following trenching work.
5. Complete site restoration, ditch grading, topsoil placement, compost mixing, seeding, fertilizing, mulching, erosion control matting and wattles.
6. Remove silt fence upon request of Engineer.
7. Remove traffic control.

The Contractor shall develop a construction schedule and sequence to meet the general intent. Contractor shall refer to the traffic control plan for general phasing requirements.

Scheduling of erosion control, seeding, and mulching shall be scheduled in conjunction with the work to avoid erosion of the work area.

PRECONSTRUCTION MEETING AND COORDINATION MEETINGS

A preconstruction meeting will be conducted in accordance with the Standard Specifications. The Contractor will be required to attend this and other periodic meetings with Owner personnel and affected utilities owners for the purpose of scheduling and coordination during the course of construction. The Contractor shall also be required to coordinate with the Owner for any temporary shut off services. The Contractor/Owner will establish frequency, time, and location of the periodic meetings.

Not less than (7) working days prior to pre-construction meeting, the Contractor shall submit the following:
Project schedule
Preconstruction submittals
Traffic control plan
Erosion and sediment control plan
Subcontractor and supplier listing
Key personnel list
Equipment and labor rates
Material submittals

SUBMITTALS

Submittals shall be made in accordance with the Standard Specifications at least seven (7) working days before their need for approval. Submittals will be accepted only from the Prime Contractor. Any work done prior to approval shall be at the Contractor's own expense.

The log of construction submittals shall include but is not limited to the table below:

Construction Schedule	Subcontractor & Supplier List
Key Personnel	Storm Water Plan
Inlet Protection	PCC Concrete Mix Design
Silicone Seal	Erosion Control Plan
Aggregate Base Course	Concrete Manholes
Precast Drop Inlets	Water Main Insulation
Silt Fence	Wattles
Inlet Filter	Other Submittals
Other Erosion control items	

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
11323
CHRISTOPHER M. BAILEY
SOUTH DAKOTA
2-13-24

EROSION, SEDIMENT, AND WATER POLLUTION CONTROL

A state permit is not required for this project. The Contractor shall provide an erosion and water pollution control plan that complies with the current edition of the City of Rapid City Storm Water Quality Manual.

The Contractor is advised that several agencies have the authority to "Stop Work" if the pollution prevention control is not implemented or is not effective. No compensation will be forthcoming for "Time Lost" due to a "Stop Work" order.

Maintenance and repair of erosion control devices shall be the responsibility of the Contractor. Inspect erosion control devices at least once a week and after each rainfall. Maintenance and repair of the erosion control devices shall be incidental to the unit price bid for the appropriate bid item.

As construction may deviate from the design plan, additional erosion and sediment control shall be used to prevent sediment from being transported from the disturbed construction areas. The Contractor shall have personnel on-site during rain events to monitor the effectiveness of the project best management practices (BMPs).

All sediment from construction activities shall be removed from the surrounding streets within 24 hours of deposit.

Erosion & sediment control devices shall be submitted to the project manager as shop drawings for approval.

The Contractor shall be responsible for removing erosion control devices when directed by the Engineer.

SWEEPING

Sweeping shall be conducted with a vacuum sweeper style truck. Contractor shall vacuum the project area twice daily, midday and at the end of the day, and additionally as directed by the Owner.

TRAFFIC CONTROL

The Contractor is required to maintain traffic control in accordance with the Manual of Uniform Traffic Control Devices (MUTCD) and as shown on the traffic control plan (TCP). All traffic control shall conform to the latest version of the MUTCD.

Not less than seven (7) working days prior to preconstruction meeting the Contractor shall submit a TCP to the Engineer for the proposed construction that accommodates vehicle, pedestrian, and bicycle traffic. The TCP shall be prepared by persons regularly involved in preparation of TCPs, shall conform to the latest revision of the MUTCD, and shall be drawn to scale with dimensions shown for placement of all traffic control devices. TCPs shall be submitted for each phase or project sequence and TCP shall demonstrate changes in the TCP from one phase to the next.

The Contractor is required to have a person available 24 hours a day, 7 days a week to maintain traffic control devices. The name and telephone number of this person shall be given to the Engineer at the pre-construction meeting.

CONCRETE WASHOUT AREA

If the concrete supplier intends to wash out on site, the Contractor shall construct and maintain a minimum of one (1) concrete washout area. The concrete washout area shall be fully contained and not connected hydraulically to the storm sewer network. The Contractor shall direct the concrete supplier in the location of and use of the concrete washout area. A detail for the construction of the concrete washout area is included in this plan set, see detail sheets. No separate payment shall be made for construction and maintenance of the concrete washout area, it shall be incidental to the various concrete bid items.

CONSTRUCTION LIMITS

In general, the construction limits for the project shall be defined as follows:

Property lines, right-of-way lines, existing utility easement lines, and temporary construction easement lines shall be the construction limits unless indicated otherwise on the drawings or further defined herein.

Construction activities shall be restricted to the construction limits unless prior approval is received from the Engineer. The Contractor shall not operate or place equipment, materials, or stockpiles on private property without the property owner's written consent. The Contractor shall furnish a copy of owner's written consent to the Engineer.

Temporary construction easements are to be utilized only when work is being completed for that specific portion of the project. The temporary easements shall not be utilized for the storage of materials or equipment until adjacent work within a permanent easement or public ROW is under construction.

Use of National Guard lands for staging areas, material storage, sedimentation ponds, dewatering, and/or topsoil stockpiling shall only be with prior approval from the Engineer. Any damages and restoration outside the construction limits shall be at the Contractor's expense.

UTILITY COMPANY NOTIFICATION

The Contractor shall utilize the South Dakota one call notification process to provide advance notice of at least 48 hours, excluding weekends and holidays, to inform all South Dakota underground facility operators of intended excavation. The Contractor shall contact all utility companies before work has commenced.

South Dakota 811 (One call)
1-800-781-7474 or 811

If utility locations are sufficiently identified within the time frame required any excavator damaging or injuring the underground facilities is strictly liable for damages to the utility.

If in the course of excavation, the excavator is unable to locate the underground facility or discovers that the operator of the underground facility has incorrectly located the underground facility, he shall promptly notify the utility operator, or, if the utility operator is unknown, the one-call notification center. The Contractor shall also notify the Engineer.

EXISTING UTILITIES

Location of existing utilities shown on these drawings are approximate and were taken from available records. Prior to excavation, the Contractor shall field verify exact location of all utilities whether or not shown on these drawings. Contractor shall protect all utilities during construction. Excavators shall maintain a minimum horizontal clearance of eighteen inches between a marked underground facility and the cutting edge of any mechanical equipment. If excavation is required within eighteen inches, horizontally, the excavator shall expose the facility with hand tools or approved noninvasive methods and shall protect and support the facility prior to further excavation with mechanical equipment.

Unless explicitly otherwise noted, any disturbance or replacement of existing utilities shall be incidental to the project. If required, the Contractor shall coordinate relocation of utility with the utility owner. All utilities are to be adjusted and/or relocated by the respective utility companies unless other provisions are explicitly called for within these drawings.

EXISTING UTILITY CROSSINGS

Refer to specifications for crossing of existing storm sewers, sanitary sewers, water mains, and water main lowerings. At all locations where the proposed utility improvement crosses or is adjacent to existing storm sewers, sanitary sewers or water mains, the Contractor shall be responsible for safeguarding the existing utilities to ensure that they are not disturbed during the work. Temporary structural support for the utilities may be required. No separate payment shall be made for crossed utility protection. Any repair work necessary to a crossed utility resulting from the Contractor's activity shall be at the Contractor's expense.

WASTE DISPOSAL

The Contractor will be responsible for all waste disposal on the project. The Contractor shall furnish the disposal site for this work and the location must be approved by the Engineer. No waste disposal is allowed within right of way or easements. No payment will be made for waste disposal.

If contaminated material is encountered on the project the Contractor shall immediately notify the Engineer.

All material generated by this project must be disposed of in accordance with the SD DANR solid waste regulations. Depending on what material is generated and whether it is contaminated or uncontaminated will determine which permitted facility can accept it. Permitted facilities include construction and demolition debris sites, restricted use sites, and regional landfills. Contact SD DANR Waste Management Program at 605-773-3153 to identify locally permitted disposal sites for various categories of contaminated and uncontaminated materials.

SAW CUTTING PAVEMENT

Saw cutting shall be in accordance with the Standard Specifications. Areas to be removed are shown on the drawings. These areas represent the final saw cut and removal limits. The first saw cut shall be made at least 6 inches inside of the lines shown. Saw cutting shall be considered as incidental to the appropriate bid item used in replacement, i.e. concrete pavement, concrete sidewalk, asphalt pavement, etc.

ASPHALT REMOVAL

The Contractor shall remove and dispose of the existing asphalt pavement as noted on the plans. Asphalt shall be disposed of by the Contractor. During construction, the Engineer may direct a lesser or greater removal limit due to the proximity of joints, cracks or other conditions. Removal and replacement beyond the limits shown may be at the Contractor's expense unless approved by the Engineer. The asphalt shall be separated from the base course and dirt as much as reasonably possible. The asphalt between the first and second saw cut shall not be removed until immediately before the patching operation begins so as to protect the edge from breaking.

CONCRETE REMOVAL

The Contractor shall remove and dispose of the existing concrete as noted on the plans. Concrete removed shall be disposed of by the Contractor. During construction, the Engineer may direct a lesser or greater removal limit due to the proximity of joints, cracks or other conditions. Removal and replacement beyond the limits shown may be at the Contractor's expense unless approved by the Engineer. The concrete between the first and second saw cut shall not be removed until immediately before the concrete placement begins so as to protect the edge from breaking.

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SIZE: ANSI D	FILE NAME 467074C001.DWG

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Rapid City Army Aviation Support Facility
Rapid City, South Dakota

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CIVIL NOTES

SHEET ID
C-001

REINFORCED CONCRETE PIPE (RCP) FOR STORM SEWER

Gasketed joints shall be required for RCP up to and including 36" diameter.

STORM SEWER GRATES

All storm sewer grates and frames for 3' x 4' Type C drop inlets shall be Neenah Foundry R-3475-F or approved equal. All grates shall be bolt down style. All inlets shall have FloGard FG-M3648 (or approved equal) catch basin insert filters installed.

All trench drains shall have Neenah Foundry R-4999-CS Type Q grates with Type B frame, or approved equal. Grates shall be bolt down style. All trench drains shall have FloGard FG-TDOF12 (or approved equal) filters installed. The Pipe filter type shall be used.

STORM SEWER PIPE CONNECTIONS

A concrete collar shall be required when a normal male/female joint cannot be provided in a pipe segment. The concrete collar shall consist of a minimum 2' wide by 6" thick M6 concrete collar around the outside of the connection. The concrete collar shall be reinforced with 6" x 6", W2.9 / W2.9 wire mesh.

All storm sewer pipe connections to new precast inlets, precast manholes, and precast junction boxes shall have a concrete collar installed at the pipe penetration outside the structure. The collar shall be the same as described above, and shall be incidental to the price of the precast structure.

TRENCH EXCAVATION AND BACKFILL

The Contractor shall be responsible for maintaining a safe excavation complying with applicable state and federal regulations. Special foundations may be required to provide adequate support for the pipe. Such foundations will consist of sub-excavation to a depth as required by the Engineer and placement of Type 3 or Type 4 foundation material.

No gypsum larger than one (1) inch in nominal size shall be placed in the backfill. The contractor shall screen all gypsum fragments greater than one (1) inch in nominal size from the backfill material prior to placement.

TOPSOIL

The topsoil shall be stripped to depths necessary to provide a depth of four (4) inches of topsoil at completion.

CONTRACTOR PROVIDED WATER

There will be no separate payment for water. The Contractor shall be responsible for providing water for compaction of earthen and granular materials used for, but not limited to, grading, subgrade preparation, and trench backfill. Water needed for sod and seed irrigation, street cleaning, and other miscellaneous items shall also be provided by the Contractor at no cost to the Owner. The costs for purchasing, loading, transporting and applying/incorporating water shall be incidental to the various items where water is required.

SUBGRADE MAINTENANCE

The Contractor shall maintain the completed compacted subgrade, gravel cushion, and aggregate base course. The Engineer may direct the Contractor to scarify the surface, reshape, and recompact the material to required density prior to further construction if the area is disturbed by construction operations or adverse weather. This applies to completed subgrade, gravel cushion, and base course areas.

CONCRETE SIDEWALK

New concrete sidewalk shall be placed on 2" gravel cushion. The Contractor shall document the quantity of gravel cushion used by submitting weight tickets to the inspector.

SUBGRADE CHECK

Prior to beginning base course placement operations, the Contractor shall schedule a meeting to check the earthen subgrade. See Section 12 of the Standard Specifications for proof-rolling requirements. The Contractor's superintendent, Engineer, Owner and testing firm representative shall participate. The Owner shall be notified at least 2 working days in advance of the subgrade check.

BASE COURSE

Contractor shall not furnish base course prior to Engineer's subgrade approval.

PRE-PAVING MEETING AND BASE COURSE CHECK

Prior to beginning placement of final surfacing, the Contractor shall schedule a meeting to check the base course and coordinate a pre-paving meeting. The Contractor's superintendent, Engineer, Owner, testing firm representative, paving Contractor's superintendent, paving foreman prior to initiating paving activities.

During the meeting the following shall be verified: a check of the base course for soft spots, final adjustments to manholes and valve boxes, and base course placed to final blue top elevation and cross section. The Contractor shall furnish a loaded water truck or loaded tandem axle end dump to proof roll the base course.

It is the paving Contractor superintendent's responsibility to confirm paving requirements including but not limited to truck schedules, delivery schedules and routes, tonnage of material to be placed by lift, actions to be taken in the event of paving interruptions, maximum paver stoppage permitted for mix and smoothness, laydown temperature, testing requirements, compaction, etc. These items shall be presented in writing, distributed, and reviewed at this meeting. The Owner shall be notified at least 2 working days in advance of the pre-paving and base course check.

AC PAVEMENT

The asphalt pavement shall be of Class E, Type 1 Asphalt Concrete. The asphalt binder shall be PG 64-22. A maximum of 15% recycled asphalt pavement (RAP) may be used in lower lifts, but shall not be used in the top lift of pavement.

PAVEMENT MARKING PAINT

Contractor shall replace pavement marking in all areas where existing pavement marking is removed, the anticipated pavement marking shall be in front of the hangers and the parking stalls in the parking lot. Contractor shall coordinate exact locations with Owner prior to applying paint.

Paint shall be Solvent-Base: A-A-2886B, Type II, Yellow: 33538 or 33655 and A-A-2886B, Type II, White: 37925. Marking 12-inch gore lines will require the use of 3 spray nozzles to achieve the required width. Application rate shall be 115 ft^2/gal.

Painting shall only be performed when the surface is dry, and the ambient temperature and the pavement surface temperature meet the manufacturer's recommendations. Painting operations shall be discontinued when the ambient or surface temperatures does not meet the manufacturer's recommendations. Markings shall not be applied when the wind speed exceeds 10 mph unless windscreens are used to shroud the material guns. Markings shall not be applied when weather conditions are forecasts to not be within the manufacturers' recommendations for application and dry time.

RETROREFLECTIVITY FOR PAVEMENT MARKING PAINT

The Owner may take retroreflectivity readings on the pavement marking lines after 2 days and within 30 days of the line application using either a portable or mobile retroreflectometer that conforms to 30-meter geometry. If the Owner chooses to take retroreflectivity readings, three retroreflectivity readings will be taken on each line at each test location. The three readings will be averaged and become the reading for that test location.

If the Owner chooses to take retroreflectivity readings, three readings will be taken on the edge lines and lane lines in the direction of application. For combination solid yellow and skip yellow lines for turn lanes and for centerline markings on two-way roadways, three readings will be taken in one direction, the reflectometer will be turned 180 degrees and three more readings will be taken. The six readings for the centerline markings will be averaged and become the test reading for that test location.

If the Owner chooses to take readings, the minimum retroreflectivity values will be 170 mc/m^2/lux for yellow.

Type III glass beads shall be distributed upon all marked apron areas immediately after application of the paint. A dispenser shall be furnished by Contractor that is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Glass beads shall be applied at the rate 10 lb/gal.

Glass beads will not be required in the parking lot.

REESTABLISHING PROPERTY CORNERS

The Contractor shall reestablish all property corners that are disturbed during construction under the direction of a registered land surveyor. All property corners along the project that were found during the topographic survey are shown on the plans. Any corners that are disturbed shall be reestablished by the Contractor.

AS BUILT PLANS

The Contractor shall measure and record any horizontal or vertical deviations from the contract drawings. The changes shall be recorded in an accurate, neat fashion on the drawings and furnished to the Engineer upon completion of the project. The as-built drawings shall be on-site and available for review by the Engineer upon request.

WARRANTY PERIOD

The warranty period for this project shall start when the project is complete and accepted and shall not be based on completion of different phases or completion dates of the project.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 11323
CHRISTOPHER M. BAILEY
SOUTH DAKOTA
2-13-24

MARK	DESCRIPTION	DATE
	ISSUED FOR BID	2/12/24

DESIGNED BY: LINDSAY SHAGLA
DRAWN BY: LINDSAY SHAGLA
CHECKED BY: CHRIS BAILEY
SUBMITTED BY: CHRIS BAILEY
SIZE: ANSI D
FILE NAME 467074C002.DWG
ISSUE DATE: FEBRUARY 2024
CFMO NO.: 467074
PROJECT NO.: 103828.14
SCALE: NA

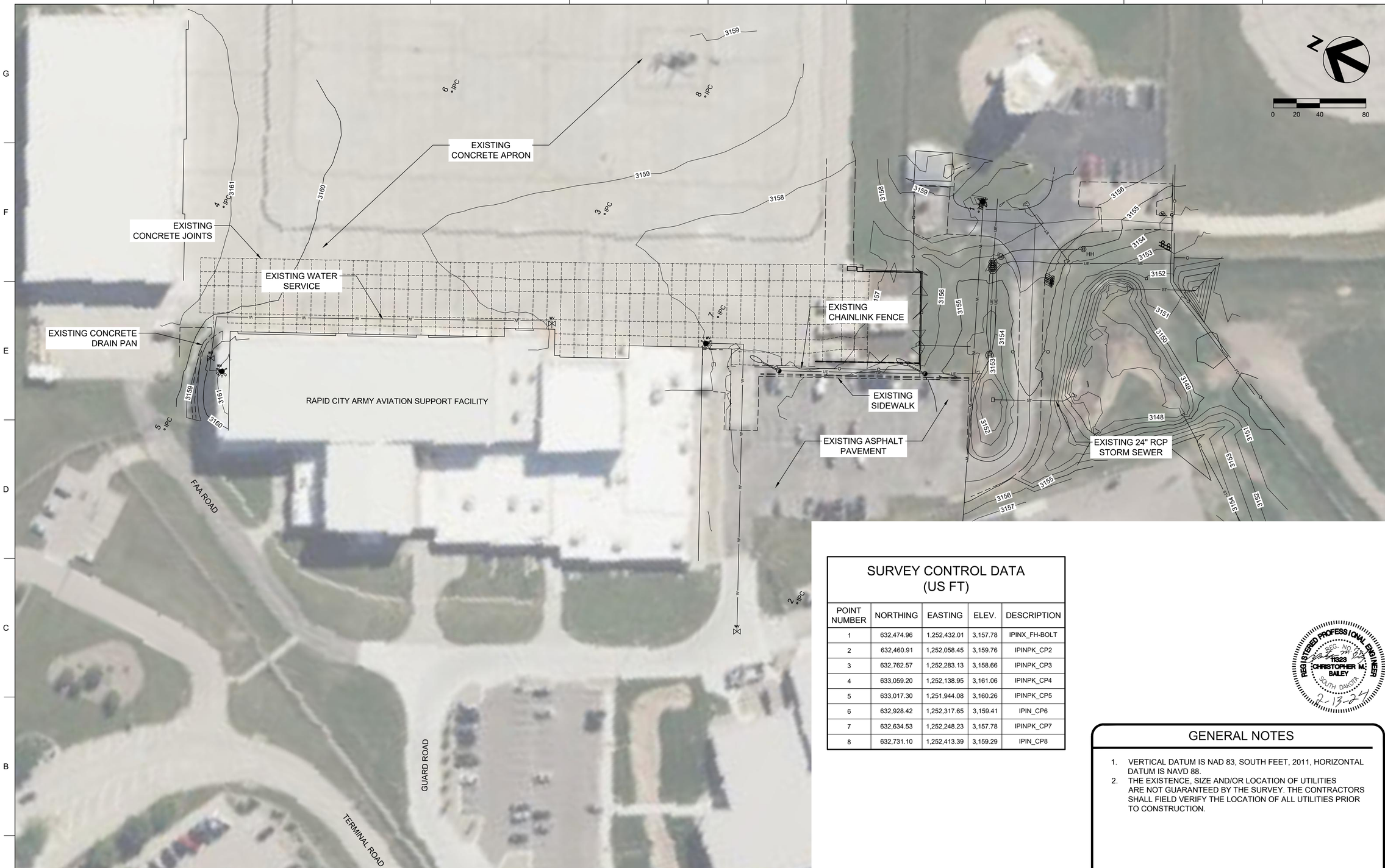
South Dakota Army National Guard
Rapid City Army Aviation Support Facility
Rapid City, South Dakota

HDR
703 Main St Suite 200
Rapid City, South Dakota 57701

Rapid City Army Aviation Support Facility
Drainage Install Between Hangars and Hangars Rapid City AASF
South Dakota Army National Guard
CFMO #467074

CIVIL NOTES

SHEET ID
C-002



SURVEY CONTROL DATA (US FT)

POINT NUMBER	NORTHING	EASTING	ELEV.	DESCRIPTION
1	632,474.96	1,252,432.01	3,157.78	IPINX_FH-BOLT
2	632,460.91	1,252,058.45	3,159.76	IPINPK_CP2
3	632,762.57	1,252,283.13	3,158.66	IPINPK_CP3
4	633,059.20	1,252,138.95	3,161.06	IPINPK_CP4
5	633,017.30	1,251,944.08	3,160.26	IPINPK_CP5
6	632,928.42	1,252,317.65	3,159.41	IPIN_CP6
7	632,634.53	1,252,248.23	3,157.78	IPINPK_CP7
8	632,731.10	1,252,413.39	3,159.29	IPIN_CP8

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 11323
CHRISTOPHER M. BAILEY
SOUTH DAKOTA
2-13-24

GENERAL NOTES

1. VERTICAL DATUM IS NAD 83, SOUTH FEET, 2011, HORIZONTAL DATUM IS NAVD 88.
2. THE EXISTENCE, SIZE AND/OR LOCATION OF UTILITIES ARE NOT GUARANTEED BY THE SURVEY. THE CONTRACTORS SHALL FIELD VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

EXISTING SITE

1:40

MARK	DESCRIPTION	DATE
	ISSUED FOR BID	2/12/24

DESIGNED BY: LINDSAY SHAGLA
DRAWN BY: LINDSAY SHAGLA
CHECKED BY: CHRIS BAILEY
SUBMITTED BY: CHRIS BAILEY
SIZE: ANSI D
FILE NAME 467074C101.DWG
ISSUE DATE: FEBRUARY 2024
CFMO NO.: 467074
PROJECT NO.: 10382814
SCALE: 1" = 40'

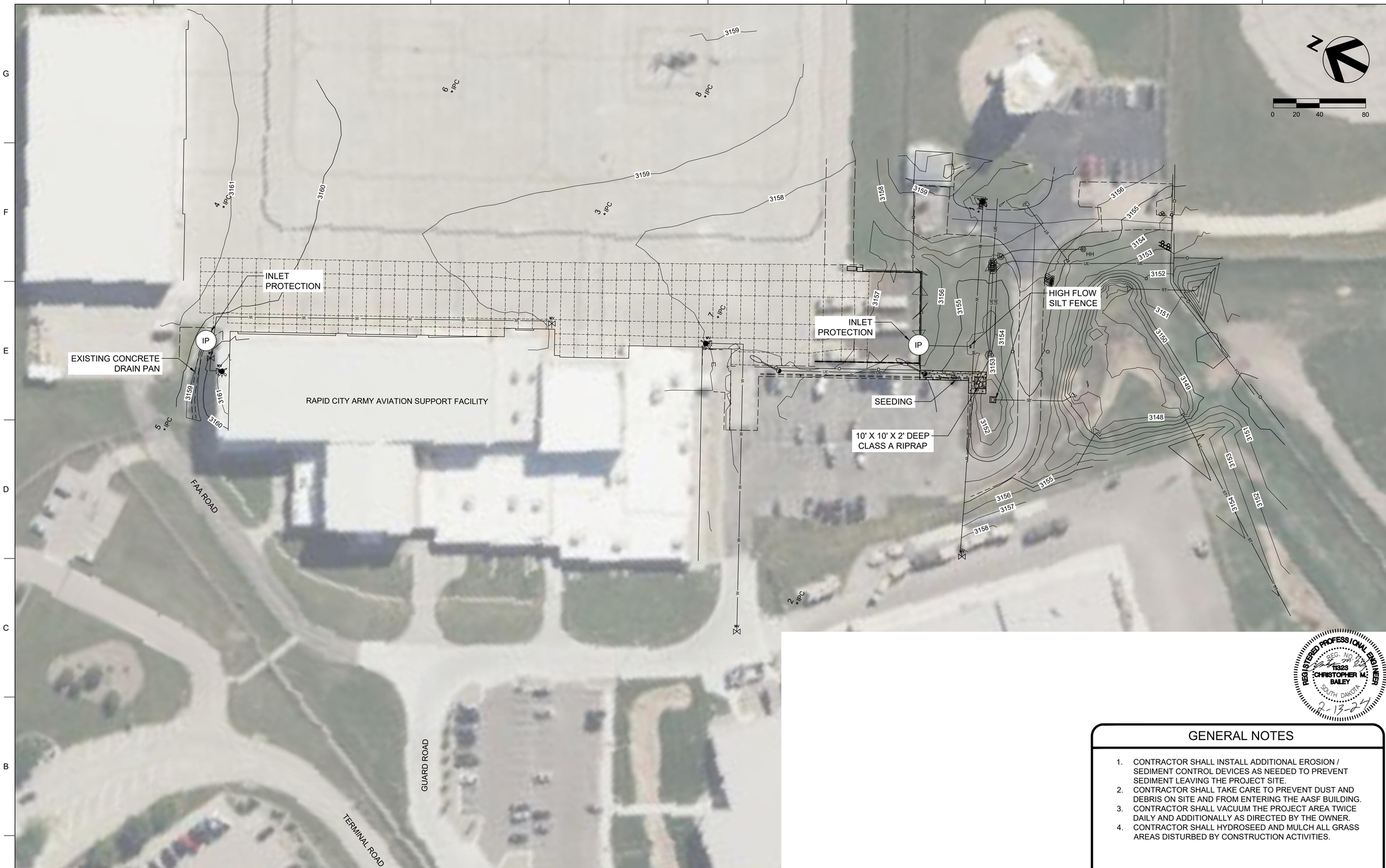
South Dakota Army National Guard
Rapid City Army Aviation Support Facility
Rapid City, South Dakota

HDR
703 Main St Suite 200
Rapid City, South Dakota 57701

Rapid City Army Aviation Support Facility
Drainage Install Between Ramps and Hangars Rapid City AASF
South Dakota Army National Guard
CFMO #467074

EXISTING SITE

SHEET ID
C-101



EROSION CONTROL

1:40

GENERAL NOTES

1. CONTRACTOR SHALL INSTALL ADDITIONAL EROSION / SEDIMENT CONTROL DEVICES AS NEEDED TO PREVENT SEDIMENT LEAVING THE PROJECT SITE.
2. CONTRACTOR SHALL TAKE CARE TO PREVENT DUST AND DEBRIS ON SITE AND FROM ENTERING THE AASF BUILDING.
3. CONTRACTOR SHALL VACUUM THE PROJECT AREA TWICE DAILY AND ADDITIONALLY AS DIRECTED BY THE OWNER.
4. CONTRACTOR SHALL HYDROSEED AND MULCH ALL GRASS AREAS DISTURBED BY CONSTRUCTION ACTIVITIES.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 11323
CHRISTOPHER M. BAILEY
SOUTH DAKOTA
2-13-24

MARK	DESCRIPTION	DATE
	ISSUED FOR BID	2/12/24

DESIGNED BY: LINDSAY SHAGLA	ISSUE DATE: FEBRUARY 2024
DRAWN BY: LINDSAY SHAGLA	CFMO NO.: 467074
CHECKED BY: CHRIS BAILEY	PROJECT NO.: 10382814
SUBMITTED BY: CHRIS BAILEY	SCALE: 1" = 40'
SIZE: ANSI D	FILE NAME 467074C102.DWG

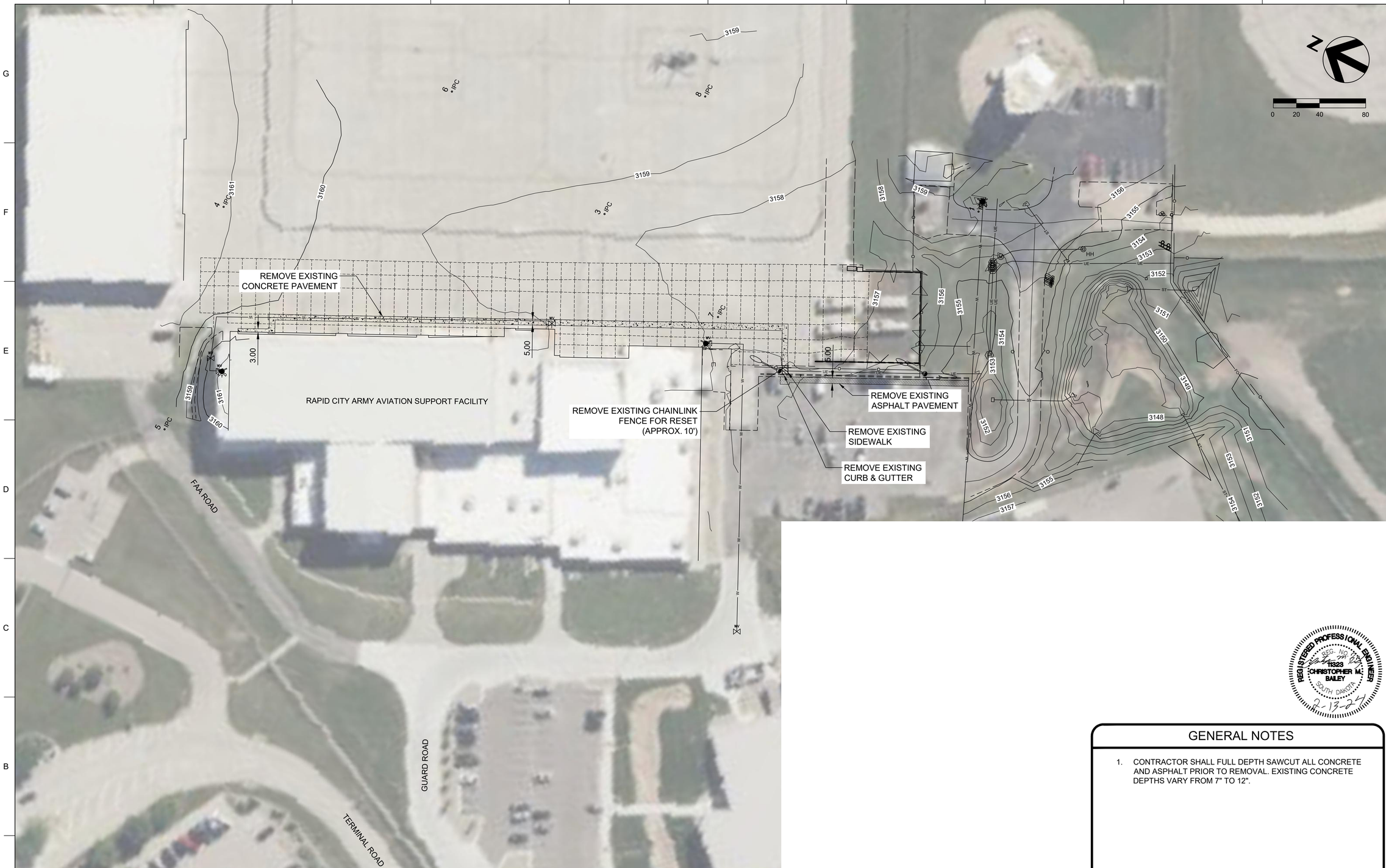
South Dakota Army National Guard
Rapid City Army Aviation Support Facility
Rapid City, South Dakota

HDR
703 Main St Suite 200
Rapid City, South Dakota 57701

Rapid City Army Aviation Support Facility
Drainage Install Between Ramps and Hangars Rapid City AASF
South Dakota Army National Guard
CFMO #467074

EROSION CONTROL

SHEET ID
C-102



SITE DEMOLITION

1:40

GENERAL NOTES

1. CONTRACTOR SHALL FULL DEPTH SAWCUT ALL CONCRETE AND ASPHALT PRIOR TO REMOVAL. EXISTING CONCRETE DEPTHS VARY FROM 7" TO 12".

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 11323
CHRISTOPHER M. BAILEY
SOUTH DAKOTA
2-13-24

MARK	DESCRIPTION	DATE
	ISSUED FOR BID	2/12/24

DESIGNED BY: LINDSAY SHAGLA
DRAWN BY: LINDSAY SHAGLA
CHECKED BY: CHRIS BAILEY
SUBMITTED BY: CHRIS BAILEY
SIZE: ANSI D
FILE NAME 467074C103.DWG
ISSUE DATE: FEBRUARY 2024
CFMO NO.: 467074
PROJECT NO.: 10382814
SCALE: 1" = 20'

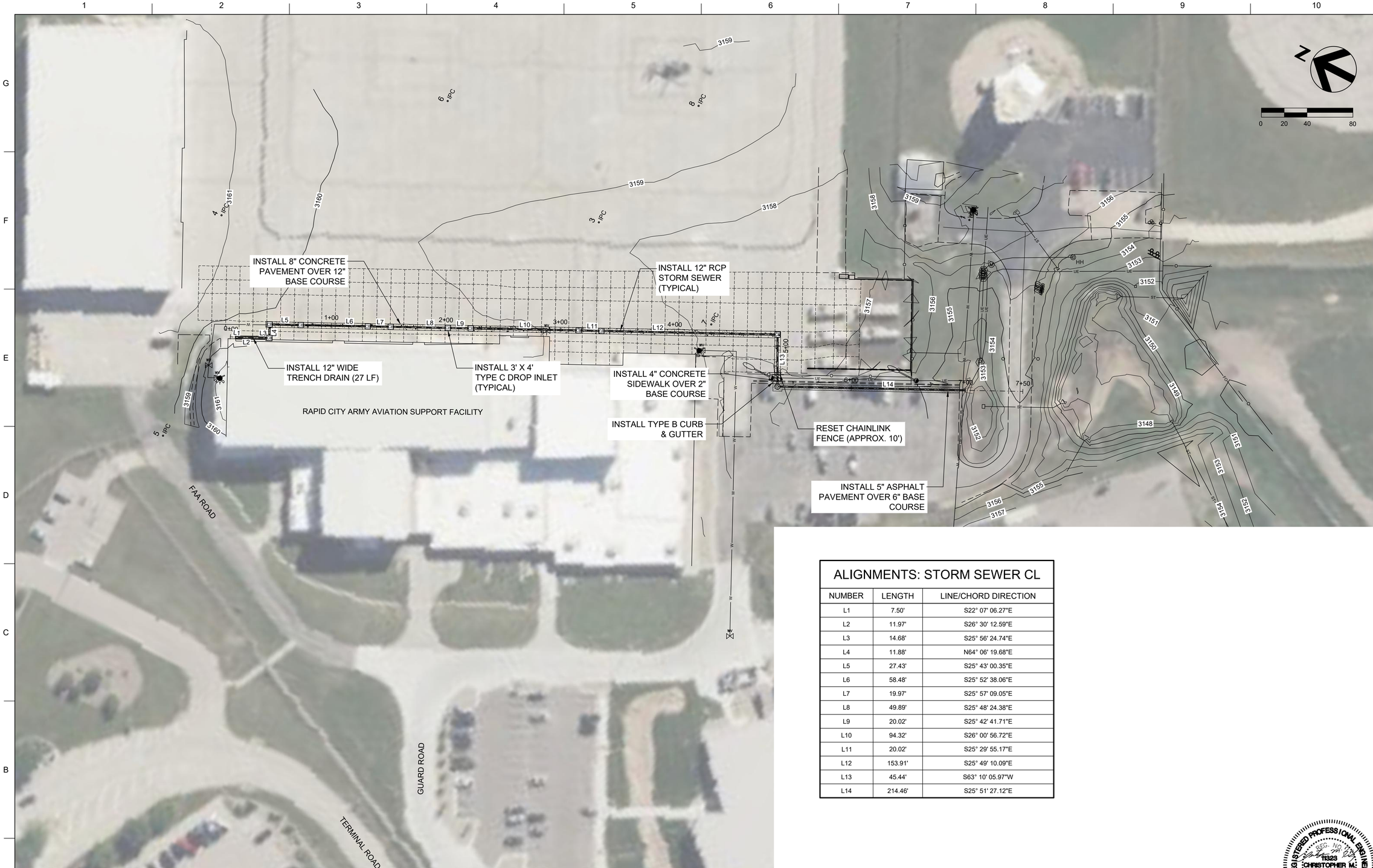
South Dakota Army National Guard
Rapid City Army Aviation Support Facility
Rapid City, South Dakota

HDR
703 Main St Suite 200
Rapid City, South Dakota 57701

Rapid City Army Aviation Support Facility
Drainage Install Between Apron and Hangars Rapid City AASF
South Dakota Army National Guard
CFMO #467074

SITE DEMOLITION

SHEET ID
C-103



ALIGNMENTS: STORM SEWER CL		
NUMBER	LENGTH	LINE/CHORD DIRECTION
L1	7.50'	S22° 07' 06.27"E
L2	11.97'	S26° 30' 12.59"E
L3	14.68'	S25° 56' 24.74"E
L4	11.88'	N64° 06' 19.68"E
L5	27.43'	S25° 43' 00.35"E
L6	58.48'	S25° 52' 38.06"E
L7	19.97'	S25° 57' 09.05"E
L8	49.89'	S25° 48' 24.38"E
L9	20.02'	S25° 42' 41.71"E
L10	94.32'	S26° 00' 56.72"E
L11	20.02'	S25° 29' 55.17"E
L12	153.91'	S25° 49' 10.09"E
L13	45.44'	S63° 10' 05.97"W
L14	214.46'	S25° 51' 27.12"E

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 11323
CHRISTOPHER M. BAILEY
SOUTH DAKOTA
2-13-24

SITE LAYOUT & ALIGNMENT DATA

1:40

MARK	DESCRIPTION	DATE
	ISSUED FOR BID	2/12/24

DESIGNED BY: LINDSAY SHAGLA
DRAWN BY: LINDSAY SHAGLA
CHECKED BY: CHRIS BAILEY
SUBMITTED BY: CHRIS BAILEY
SIZE: ANSI D
FILE NAME 467074C104.DWG
ISSUE DATE: FEBRUARY 2024
CFMO NO.: 467074
PROJECT NO.: 10382814
SCALE: 1" = 20'

South Dakota Army National Guard
Rapid City Army Aviation Support Facility
Rapid City, South Dakota

HDR
703 Main St Suite 200
Rapid City, South Dakota 57701

Rapid City Army Aviation Support Facility
Drainage Install Between Ramps and Hangars Rapid City AASF
South Dakota Army National Guard
CFMO #467074

SITE LAYOUT & ALIGNMENT DATA

SHEET ID
C-104

CONSTRUCTION PHASING

1:40

GENERAL NOTES

1. CONTRACTOR SHALL ONLY CLOSE ONE HANGER AT A TIME.
2. PHASE 1 IS STATION 2+90 TO 7+14.
   2.1. CONTRACTOR SHALL MINIMIZE THE AMOUNT OF TIME THE FENCE IS TAKEN DOWN. WHILE THE FENCE IS REMOVED CONTRACTOR WILL NEED TO TEMPORARILY SECURE THE SITE AT THE END OF EVERYDAY.
3. PHASE 2 IS STATION 1+81 TO 2+90.
4. PHASE 3 IS STATION 1+08 TO 1+81.
5. PHASE 4 IS STATION 0+00 TO 1+08.
6. CONTRACTOR SHALL FULLY COMPLETE ONE PHASE BEFORE STARTING WORK ON THE NEXT PHASE.
7. CONTRACTOR SHALL PLACE TRAFFIC CONTROL CONES SPACED 10' APART AROUND THE BOUNDARY OF THE PHASE UNDER CONSTRUCTION AS WELL AS PLACING TYPE III BARRICADES AT THE CLOSED HANGER DOOR.
8. CONSTRUCTION AREA SHALL BE SWEPT TWICE DAILY, MIDDAY & AT THE END OF THE WORK DAY. ALL DEBRIS SHALL BE CLEANED UP AT THE END OF THE WORK DAY.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
13323
CHRISTOPHER M. BAILEY
SOUTH DAKOTA
2-13-24

MARK	DESCRIPTION	DATE
	ISSUED FOR BID	2/12/24

DESIGNED BY: LINDSAY SHAGLA
DRAWN BY: LINDSAY SHAGLA
CHECKED BY: CHRIS BAILEY
SUBMITTED BY: CHRIS BAILEY
SIZE: ANSI D
FILE NAME 467074C105.DWG
ISSUE DATE: FEBRUARY 2024
CFMO NO.: 467074
PROJECT NO.: 10382814
SCALE: 1" = 20'

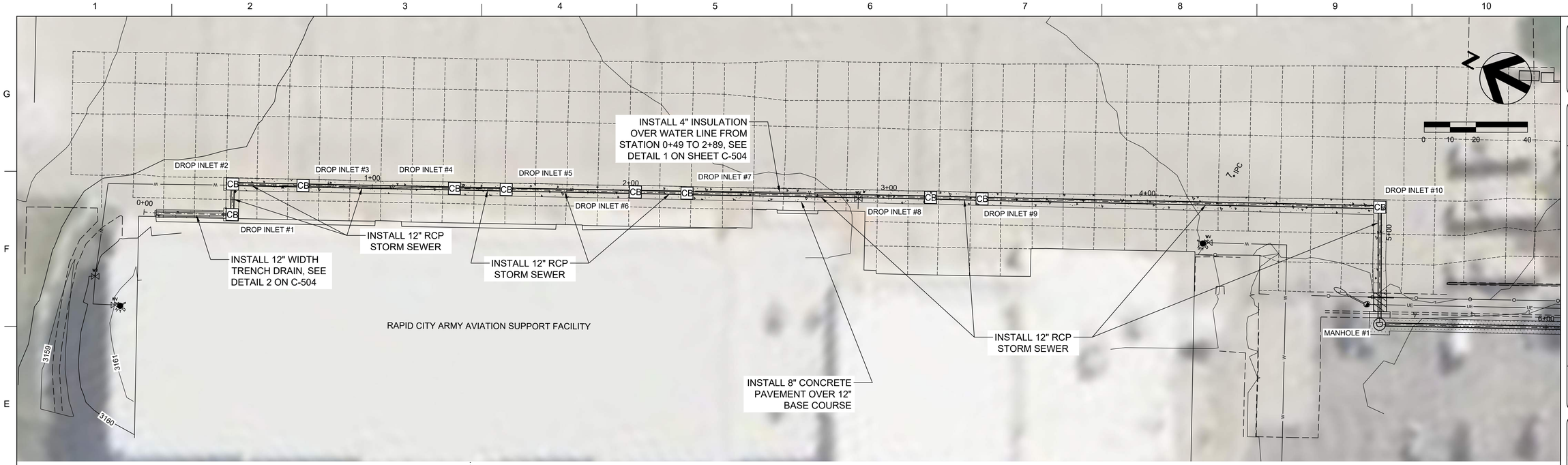
South Dakota Army National Guard
Rapid City Army Aviation Support Facility
Rapid City, South Dakota

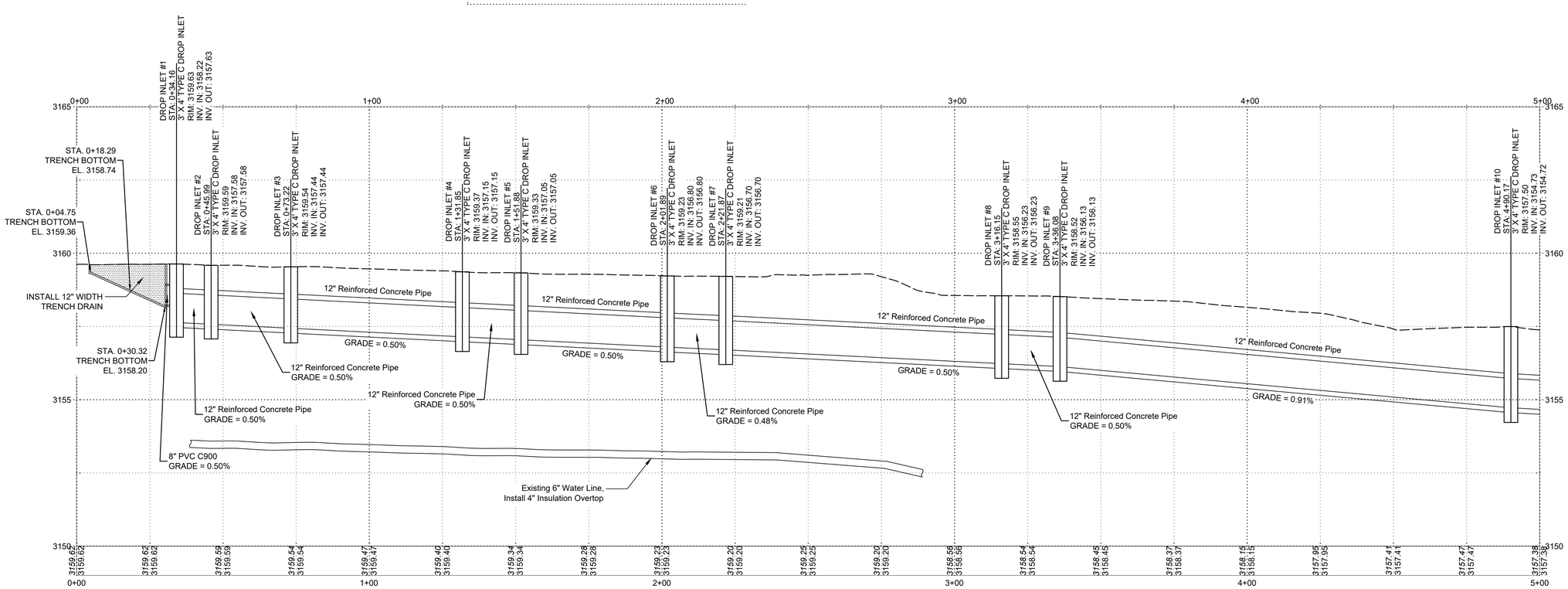
HDR
703 Main St Suite 200
Rapid City, South Dakota 57701

Rapid City Army Aviation Support Facility
Drainage Install Between Ramps and Hangars Rapid City AASF
South Dakota Army National Guard
CFMO #467074

CONSTRUCTION PHASING

SHEET ID
C-105





STORM SEWER PLAN & PROFILE

1:20

REGISTERED PROFESSIONAL ENGINEER
11323
CHRISTOPHER M. BAILEY
SOUTH DAKOTA
2-13-24

MARK	DESCRIPTION	DATE
	ISSUED FOR BID	2/12/24

DESIGNED BY: LINDSAY SHAGLA	ISSUE DATE: FEBRUARY 2024
DRAWN BY: LINDSAY SHAGLA	CFMO NO.: 467074
CHECKED BY: CHRIS BAILEY	PROJECT NO.: 10382814
SUBMITTED BY: CHRIS BAILEY	SCALE: 1" = 20'
SIZE: ANSI D	FILE NAME 467074C106.DWG

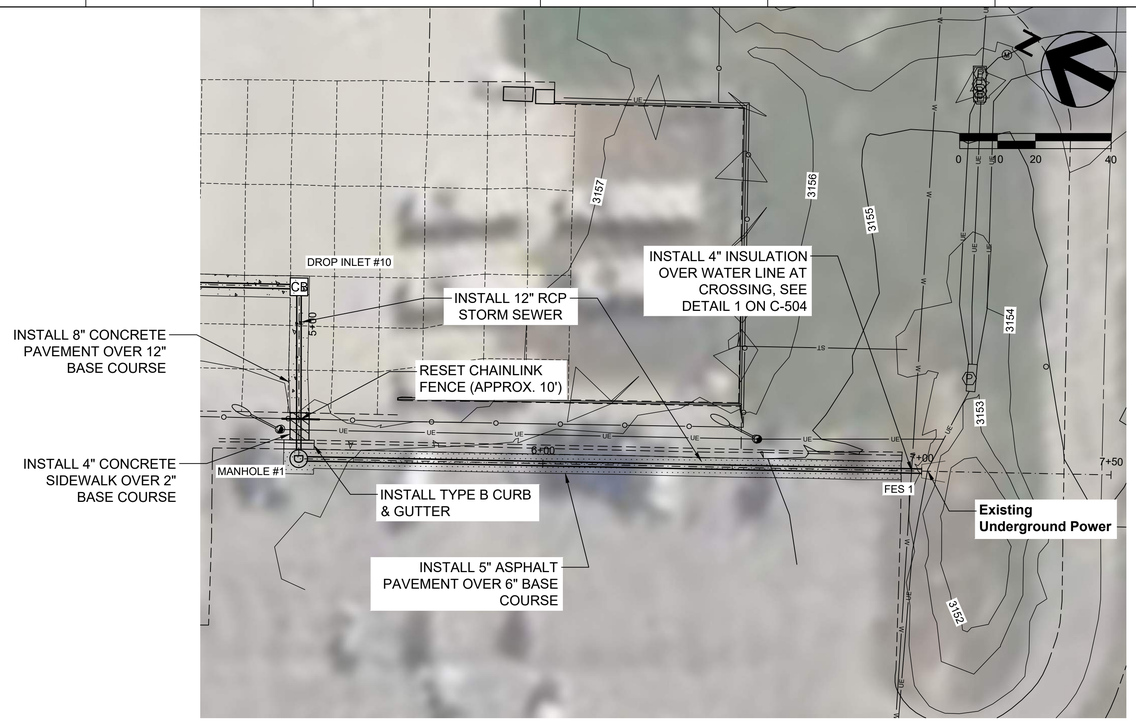
South Dakota Army National Guard
Rapid City Army Aviation Support Facility
Rapid City, South Dakota

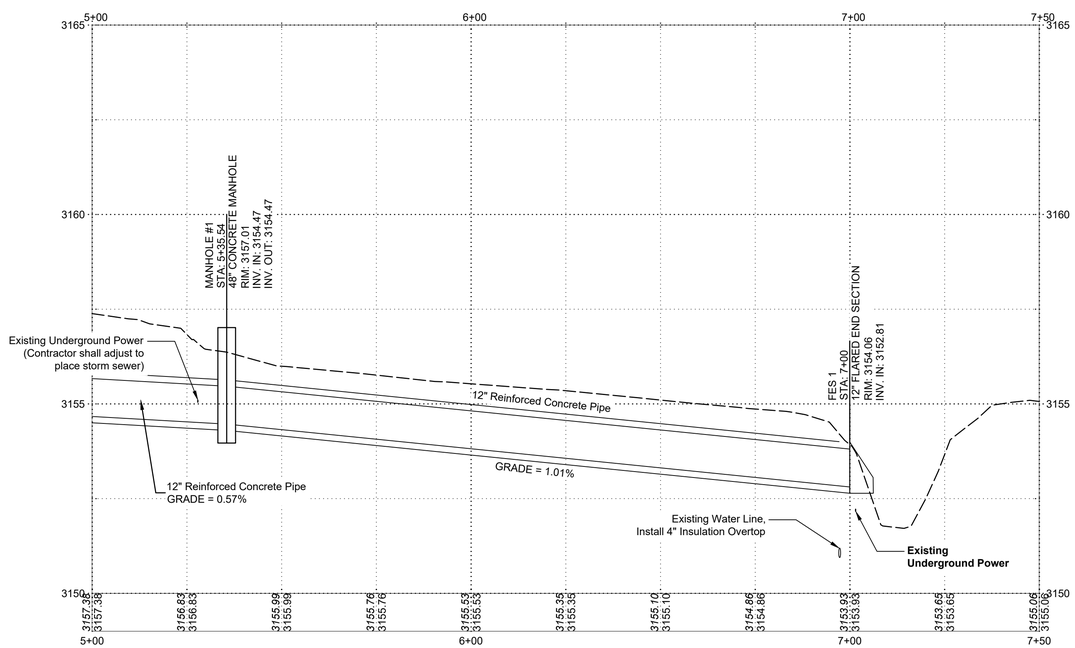
HDR
703 Main St Suite 200
Rapid City, South Dakota 57701

Rapid City Army Aviation Support Facility
Drainage Install Between Ramps and Hangars Rapid City AASF
South Dakota Army National Guard
CFMO #467074

STORM SEWER PLAN & PROFILE

SHEET ID
C-106





STORM SEWER PLAN & PROFILE

1:20

GENERAL NOTES

1. CONTRACTOR TO FIELD VERIFY DEPTH OF EXISTING POWER LINE AT FES. THIS IS A CRITICAL SUPPLY LINE & MUST REMAIN IN SERVICE.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 11323
CHRISTOPHER M. BAILEY
SOUTH DAKOTA
2-13-24

MARK	DESCRIPTION	DATE
	ISSUED FOR BID	2/12/24

DESIGNED BY: LINDSAY SHAGLA
DRAWN BY: LINDSAY SHAGLA
CHECKED BY: CHRIS BAILEY
SUBMITTED BY: CHRIS BAILEY
SIZE: ANSI D
FILE NAME 467074C107.DWG
ISSUE DATE: FEBRUARY 2024
CFMO NO.: 467074
PROJECT NO.: 103828.14
SCALE: 1" = 20'

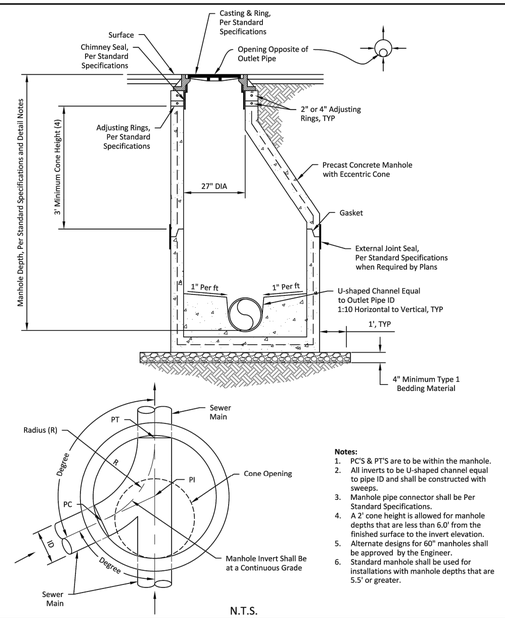
South Dakota Army National Guard
Rapid City Army Aviation Support Facility
Rapid City, South Dakota

703 Main St Suite 200
Rapid City, South Dakota 57701

Rapid City Army Aviation Support Facility
Drainage Install Between Pumps and Hangars Rapid City AASF
South Dakota Army National Guard
CFMO #467074

STORM SEWER PLAN & PROFILE

SHEET ID
C-107



Notes:
1. PC'S & PT'S are to be within the manhole.
2. All inverts to be U-shaped channel equal to pipe ID and shall be constructed with sweeps.
3. Manhole pipe connector shall be Per Standard Specifications.
4. A 2' cone height is allowed for manhole depths that are less than 6.0' from the finished surface to the invert elevation.
5. Alternate designs for 60" manholes shall be approved by the Engineer.
6. Standard manhole shall be used for installations with manhole depths that are 5.5' or greater.

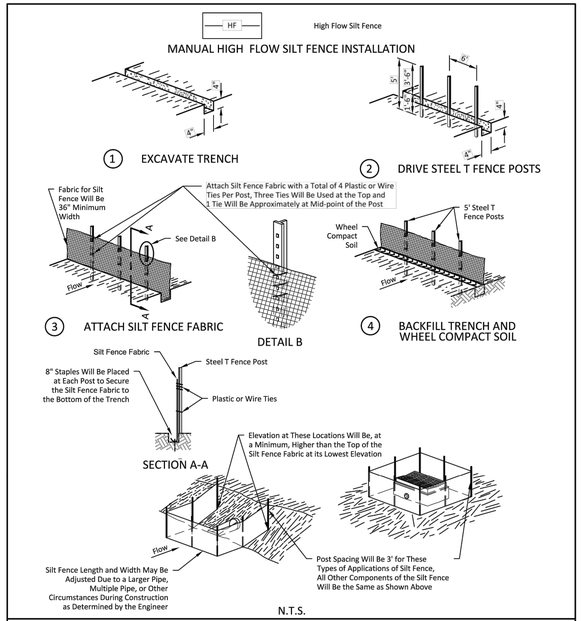
N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

STANDARD MANHOLE DETAIL WITH MONOLITHIC BASE (48" & 60")

DATE: 8-19-22

Sec. - Sht. 9-1



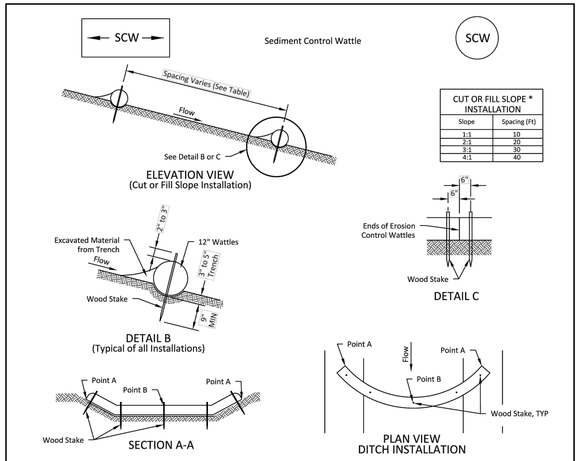
N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

HIGH FLOW SILT FENCE

DATE: 8-19-22

Sec. - Sht. 18-3a



CUT OR FILL SLOPE * INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40

DITCH INSTALLATION	
Grade	Spacing (Ft)
2%	150
3%	100
4%	75
5%	50

Notes:
1. At cut or fill slope installations, wattles shall be installed along the contour and perpendicular to the water flow.
2. At ditch installations, Point A must be higher than Point B to ensure that water flows over the wattle and not around the ends.
3. The Contractor shall dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side, see Detail B.
4. The stakes shall be 1"x2" or 2"x2" wood stakes, the stakes shall be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles shall be 3' to 4' or per manufacturer spacing.
5. Where installing running lengths of wattles, the contractor shall butt the second wattle tightly against the first and shall not overlap the ends, see Detail C.
6. The Contractor and Engineer will inspect the erosion control wattles in accordance with the permit the Contractor will remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

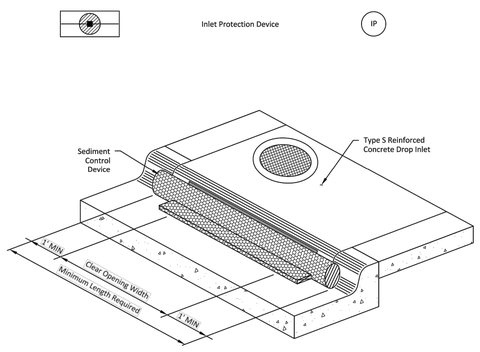
N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

SEDIMENT CONTROL WATTLE

DATE: 8-19-22

Sec. - Sht. 18-5



ISOMETRIC VIEW

Notes:
1. The type of sediment control device shown is for illustrative purposes only.
2. The type of sediment control device used shall be one of the types as specified in the plans.
3. The sediment control device shall be placed at the drop inlets according to the manufactures' installation instructions.
4. The sediment control device shall be secured so that it remains in the inlet opening.
5. The sediment control at inlet for Type S reinforced concrete drop inlet shall be placed at locations stated in the plans or at locations determined by the Engineer.
6. The Contractor will maintain the sediment control device by removing the device, removing accumulated sediment, and resetting the device. The removed sediment will be placed at a location away from the drop inlet where the sediment will not be washed back into the drop inlet or other storm sewer system.

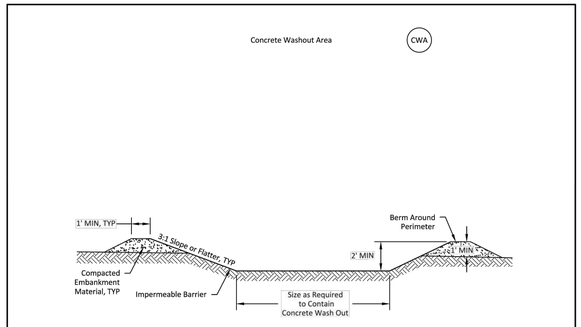
N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

SEDIMENT CONTROL FOR TYPE S INLETS

DATE: 8-19-22

Sec. - Sht. 18-7



CROSS SECTIONAL VIEW

Notes:
1. Concrete washout area shall be installed prior to any concrete placement on site. The concrete washout area must be self-contained and not connected to any storm water outlet of the site.
2. The concrete washout area shall be sized as necessary to adequately contain the concrete washout from the project. The concrete washout area shall be maintained during the entire project.
3. At the end of construction, all concrete shall be removed from the site and disposed of at an approved waste site.
4. When the concrete washout area is removed, the disturbed area shall be restored to original grade, seeded and mulched or otherwise stabilized as approved by the Engineer.

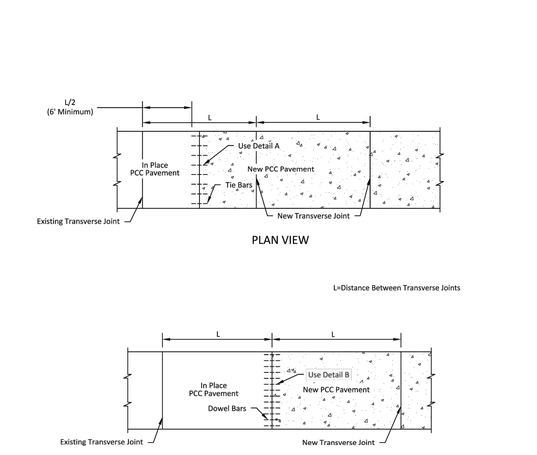
N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

CONCRETE WASHOUT AREA

DATE: 8-19-22

Sec. - Sht. 18-12



Note:
Transverse joints shall match existing joints in adjacent lanes of paving.

N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS

DATE: 8-19-22

Sec. - Sht. 40-1a

MARK	DESCRIPTION	DATE
	ISSUED FOR BID	2/12/24

DESIGNED BY: LINDSAY SHAGLA
DRAWN BY: LINDSAY SHAGLA
CHECKED BY: CHRIS BAILEY
QUALITY CHECKED BY: CHRIS BAILEY
SIZE: ANSI D
ISSUE DATE: FEBRUARY 2024
CFMO NO.: 467074
PROJECT NO.: 103828.14
SCALE: NA
FILE NAME 467074C501.DWG

South Dakota Army National Guard
Rapid City Army Aviation Support Facility
Rapid City, South Dakota

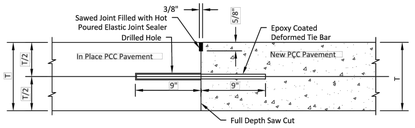
703 Main St Suite 200
Rapid City, South Dakota 57701

Rapid City Army Aviation Support Facility
Drainage Install Between Ramps and Hangars Rapid City AASF
South Dakota Army National Guard
CFMO #467074

STANDARD DETAILS

SHEET ID
C-501

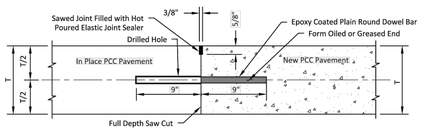
DETAIL A
TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS



T=In Place PCC Pavement and New PCC Pavement Thickness

Notes:
1. The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project.
2. The tie bars will be embedded a minimum depth of 9" into the in place PCC pavement and anchored with an epoxy resin adhesive.
3. No. 8 epoxy coated deformed tie bars shall be used in 7" to 7 1/2" thick PCC pavement, No. 9 epoxy coated deformed tie bars will be used in 8" to 10" thick PCC pavement and No. 10 epoxy coated deformed tie bars will be used in 10 1/2" thick and greater PCC pavement. The tie bar spacing will be 18" center to center and will be a minimum of 3" and a maximum of 9" from the pavement edges.

DETAIL B
TRANSVERSE CONSTRUCTION JOINT WITH DOWEL BARS



T=In Place PCC Pavement and New PCC Pavement Thickness

Notes:
1. The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project or current project.
2. The plain round dowel bars will be embedded a minimum depth of 9" into the in place PCC pavement and anchored with an epoxy resin adhesive.
3. The epoxy coated plain round dowel bar size, number, and spacing will be the same as detailed on the corresponding dowel bar assembly, see Detail 40-6. The epoxy coated plain round dowel bars will be a minimum of 3" and a maximum of 6" from the pavement edges.

N.T.S.

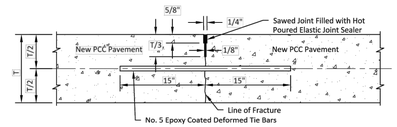
CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS

DATE: 8-19-22

Sec. - Sht. 40-1b

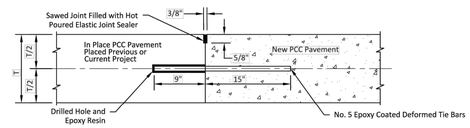
SAWED LONGITUDINAL JOINT WITH TIE BARS
(Poured Monolithically)



Notes:
1. Tie bar spacing shall be 48" center to center and shall be supported so the tie bar remains in place as detailed during paving operations.
2. The first saw cut to control cracking will be a minimum of 1/3 the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the hot poured elastic joint sealer is necessary.

T=Pavement Thickness

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS



Note:
The No. 5 epoxy coated tie bars shall be embedded a minimum of 9" into the in place PCC pavement and anchored with an epoxy resin adhesive. Tie bar spacing shall be 30" center to center when no keyway is present.

N.T.S.

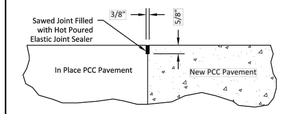
CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS

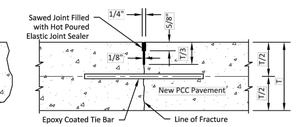
DATE: 8-19-22

Sec. - Sht. 40-3a

LONGITUDINAL CONSTRUCTION JOINT

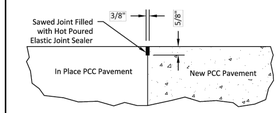


SAWED LONGITUDINAL JOINT

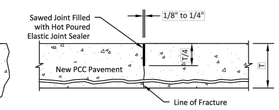


T=Pavement Thickness

TRANSVERSE CONSTRUCTION JOINT



SAWED TRANSVERSE CONTRACTION JOINT



Notes:
1. The term "In Place PCC Pavement" in the above drawing indicates that the pavement was placed on the current project or was placed on a previous project and is being tied to on the current project.
2. The first cut to control cracking for a sawed longitudinal joint shall be a minimum of 1/3 the thickness of the pavement. Additional sawing for widening the saw cut to provide for the installation of the hot poured elastic joint sealer is necessary.
3. The first cut to control cracking for a sawed transverse joint shall be a minimum of 1/4 the thickness of the pavement.
4. Transverse construction joints shall only be made at planned joint locations. Mid panel transverse construction joints shall not be constructed.
5. All hot pour elastic joint sealer material spilled on the surface of the concrete pavement shall be removed as soon as the material has cooled. The extent of the removal shall be to the satisfaction of the Engineer. All costs for removal of spilled joint sealer shall be borne by the Contractor.

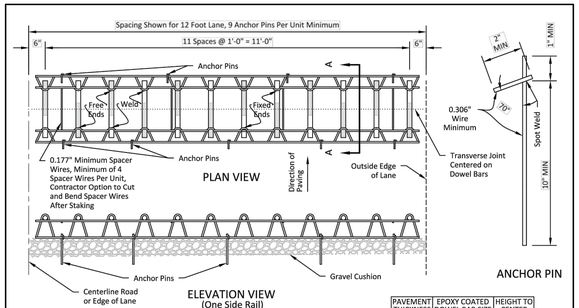
N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

PCC PAVEMENT JOINT DETAILS

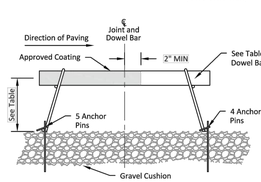
DATE: 8-19-22

Sec. - Sht. 40-5

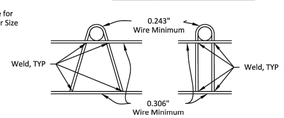


ANCHOR PIN

PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7 1/2"	1" x 18"	3.0"
8" to 10"	1 1/4" x 18"	4.0"
10 1/2" to 13"	1 1/2" x 18"	5.0"



SECTION A-A



Loops may be installed on either inside or outside of rails.

SIDE RAIL OPTIONS

Notes:
1. Longitudinal joint tie bars will be placed a minimum of 15" from the transverse contraction joints.
2. Centerline of individual dowel bars will be parallel to top of subgrade +/- 1/8" in 18" and to all other dowel bars in the assembly by +/- 1/16" in 18 ".
3. Centerline of individual dowel bars will be parallel to the centerline of the roadway to +/- 1/2" in 18".
4. The transverse contraction joints shall be sawed perpendicular to the centerline of the roadway and the dowel bars shall be centered on the sawed joint +/- 1".
5. Supporting devices as shown on this sheet, or equivalent as approved by the Engineer, will be used to maintain proper horizontal and vertical alignment of the dowel bars.

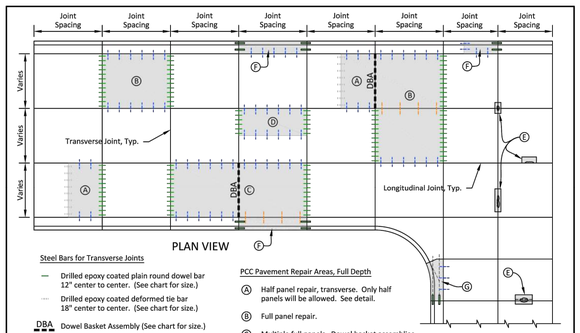
N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

PCC PAVEMENT DOWEL BARS

DATE: 8-19-22

Sec. - Sht. 40-6



Steel Bars for Transverse Joints

- Drilled epoxy coated plain round dowel bar 12" center to center. (See chart for size.)
- Drilled epoxy coated deformed tie bar 18" center to center. (See chart for size.)
- DBA Dowel Basket Assembly (See chart for size.)

Steel Bars for Longitudinal Joints

- No. 5 x 30" epoxy coated deformed tie bars. Placed in monolithic pavement centered on joint - spaced 48" center to center.
- No. 5 x 24" epoxy coated deformed tie bars. Drilled and epoxied 9" minimum depth into existing concrete - spaced 30" center to center.

Steel Bars for Curb and Gutter and Concrete Fillets

- No. 5 x 24" epoxy coated deformed tie bars. Drilled and epoxied 9" minimum depth into existing curb and gutter.
- No. 5 x 24" epoxy coated smooth dowel bars. Drilled and epoxied 9" minimum depth into existing curb and gutter.
- No. 5 x 30" epoxy coated deformed tie bars. Placed in monolithic pavement centered on joint - spaced 48" center to center.
- No. 5 x 24" epoxy coated deformed tie bars. Drilled and epoxied 9" minimum depth into existing concrete - spaced 30" center to center.
- No. 4 x 24" epoxy rebar. Drilled and epoxy 9" minimum depth into existing concrete. See Section 60 details for spacing.

PCC Pavement Repair Areas, Full Depth

- (A) Half panel repair, transverse. Only half panels will be allowed. See detail.
- (B) Full panel repair.
- (C) Multiple full panels. Dowel basket assemblies shall be used for new transverse joints.
- (D) Half panel repair, longitudinal. Only half panels will be allowed.

PCC Pavement Spall Repair Areas, Partial Depth

- (E) Spall repair areas. See detail.

Curb and Gutter and Concrete Fillet

- (F)(G) See Section 60 details.

PAVEMENT THICKNESS	EPOXY COATED BAR SIZE
7" to 7 1/2"	1" x 18" Smooth Bar or No. 8 Deformed Bar
8" to 10"	1 1/4" x 18" Smooth Bar or No. 9 Deformed Bar
10 1/2" to 13"	1 1/2" x 18" Smooth Bar or No. 10 Deformed Bar

Notes:
1. Concrete shall be sawed full depth. Final removal limits are shown. A second saw cut is required for all concrete removals.
2. Joints, both transverse and longitudinal, shall be constructed to match existing joints unless directed by the Engineer.
3. Joints shall be sawed and sealed as per details.

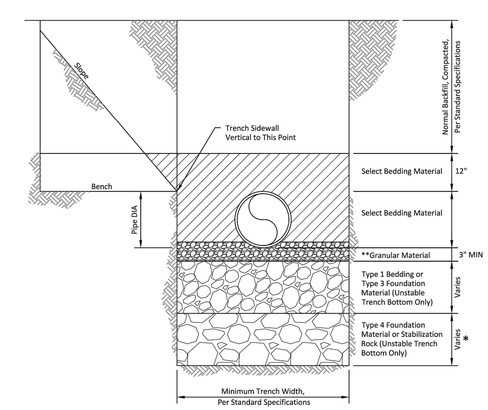
N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

CONCRETE PAVING REPAIR

DATE: 8-19-22

Sec. - Sht. 40-8



* In some circumstances, larger foundation material may be necessary and in these cases Type 4 foundation material or stabilization rock maybe used per Standard Specifications, Section 112. If Type 4 foundation material or stabilization rock is used, then a minimum 6" of Type 3 foundation material shall be placed directly above the material and prior to the placement of the granular material.

** Granular material shall be per Standard Specifications, Section 112. Bedding thickness below the pipe in inches shall be the outer pipe diameter (OD) in inches divided by 24 (OD/24) and no less than 3". Bedding beneath the pipe shall be in contact with the pipe for a distance no less than 1/3 the outer diameter (OD/3). The bedding shall extend the full width of the trench. Compaction above the bedding shall be per Standard Specifications, Section 11.

N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

TRENCH DETAIL FOR RCP STORM SEWER MAINS

DATE: 8-19-22

Sec. - Sht. 54-1

MARK	DESCRIPTION	DATE
	ISSUED FOR BID	2/12/24

DESIGNED BY: LINDSAY SHAGLA
DRAWN BY: LINDSAY SHAGLA
CHECKED BY: CHRIS BAILEY
SUBMITTED BY: CHRIS BAILEY
SIZE: ANSI D
ISSUE DATE: FEBRUARY 2024
CFMO NO.: 467074
PROJECT NO.: 103828.14
SCALE: NA
FILE NAME 467074C502.DWG

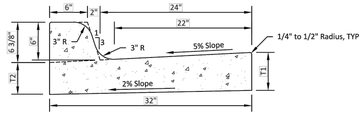
South Dakota Army National Guard
Rapid City Army Aviation Support Facility
Rapid City, South Dakota

703 Main St Suite 200
Rapid City, South Dakota 57701

Rapid City Army Aviation Support Facility
Drainage Install Bank Ramps and Hangars Rapid City AASF
South Dakota Army National Guard
CFMO #467074

STANDARD DETAILS

SHEET ID
C-502



TRANSVERSE SECTION

TYPE B CONCRETE CURB AND GUTTER				
Type	T1 (Inches)	T2 (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
B66	6	5 1/16	0.057	17.7
B67	7	6 1/16	0.065	15.4
B68	8	7 1/16	0.073	13.7
B68.5	8.5	7 9/16	0.077	13.0
B69	9	8 1/16	0.081	12.3
B69.5	9.5	8 9/16	0.085	11.7
B610	10	9 1/16	0.090	11.2
B610.5	10.5	9 9/16	0.094	10.7
B611	11	10 1/16	0.098	10.2
B611.5	11.5	10 9/16	0.102	9.8
B612	12	11 1/16	0.106	9.4

Notes:
1. T_1 is equal to pavement thickness, in no case shall T_1 be less than 6".
2. All design elevations are top of curb elevations unless otherwise indicated on the plans.
3. A 1/2-inch preformed expansion joint filler will be placed transversely in the curb and gutter as per Detail 60-7a.
4. Transverse contraction joints shall be placed in the curb and gutter at 10' maximum intervals. Curb joints adjacent to PCC pavement shall match PCC pavement joints and shall be sawed and sealed the same as the mainline PCC pavement joints.
5. No. 5 smooth epoxy coated bars and installed as per Detail 60-7b.
6. Road subgrade cross slope shall continue to a point one foot behind the curb and gutter section. Minimum depth of granular material placed under curb and gutter shall be 4".

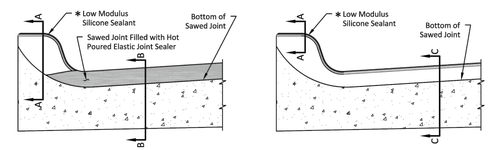
N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

TYPE B CONCRETE CURB AND GUTTER

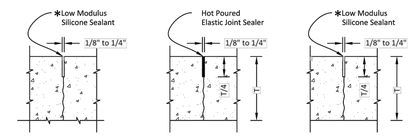
DATE: 8-19-22

Sec. - Sht. 60-2a



SECTIONAL VIEW
Curb and Gutter Placed Monolithic with Adjacent Mainline PCC Pavement

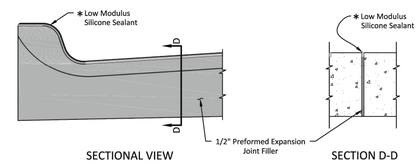
SECTIONAL VIEW
Curb and Gutter not Placed with Adjacent Mainline PCC Pavement



SECTION A-A

SECTION B-B

SECTION C-C



SECTIONAL VIEW
Curb and Gutter at 1/2" Preformed Expansion Joint Filler Location

SECTION D-D

∗ The silicone sealant will be placed such that it completely seals the joint and is bonded to the sides of the clean joint as approved by the Public Works Director.

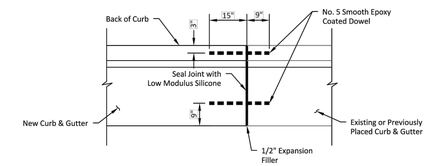
N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

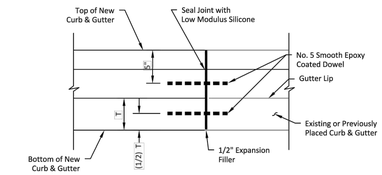
JOINTS IN CONCRETE CURB & GUTTER

DATE: 8-19-22

Sec. - Sht. 60-7a



PLAN



PROFILE

Notes:
1. For illustrative reason, only the Type B curb and gutter is shown.
2. A 1/2-inch preformed expansion joint filler will be placed transversely in the curb and gutter at the following locations:
   a. At both ends of intersection radii curb and gutter, and transition points where curb and gutter is not parallel to the project centerline.
   b. At each junction between new curb and gutter and existing curb and gutter. Existing curb and gutter includes curb and gutter previously placed on the same project.
3. Transverse contraction joints shall be placed in the curb and gutter at 10' maximum intervals. Curb joints adjacent to PCC pavement shall match PCC pavement joints and shall be sawed and sealed the same as the mainline PCC pavement joints. Curb joints adjacent to curbside sidewalk shall match the sidewalk joints.
4. When concrete curb and gutter is not placed monolithically with the mainline PCC pavement or when the adjacent mainline surfacing is not PCC concrete, the transverse contraction joints in the concrete curb and gutter will be 11/2 inches deep if formed in the fresh concrete using a suitable grooving tool. If a saw is used to cut the contraction joints, then the depth of the joint will be at least 1/4 the thickness of the concrete and the joint will be sealed in accordance with the details shown above.
5. Curb and gutter contraction joints adjacent to asphalt pavement shall not be sealed. Expansion joints in curb and gutter adjacent to asphalt pavement shall be sealed in accordance with the details shown above.

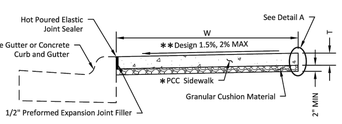
N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

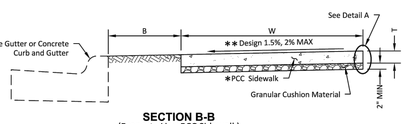
JOINTS IN CONCRETE CURB & GUTTER

DATE: 8-19-22

Sec. - Sht. 60-7b

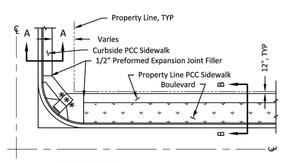


SECTION A-A
(Curbside PCC Sidewalk)



SECTION B-B
(Property Line PCC Sidewalk)

B=Width of Boulevard, Per Plans
T=Thickness of PCC Sidewalk, Per Plans
W=Width of PCC Sidewalk, Per Plans
∗=Type, Per Plans



PLAN VIEW

Notes:
1. The PCC sidewalk will be constructed in accordance per Standard Specifications, Section 61.
∗∗ The cross slope of the sidewalk is designed at 1.5% and the maximum slope allowed is 2% unless specified otherwise in the plans.
2. An expansion joint in the PCC sidewalk will consist of a 1/2 -inch thick preformed expansion joint filler material placed full depth and width of the PCC sidewalk. The maximum length between expansion joints in the PCC sidewalk is 100'.
∗∗∗ For curb ramps with detectable warning surfaces see Details 61-2, 61-3, 61-4.
3. Sidewalks adjacent to driveways shall be 5' wide minimum through the entire width of the driveway opening.
4. Tooled or sawed joints spaced to match sidewalk width. Curb side sidewalk joints to match curb and gutter joints where possible.

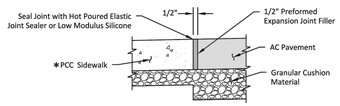
N.T.S.

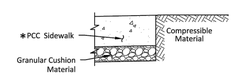
CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

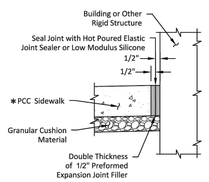
SIDEWALKS

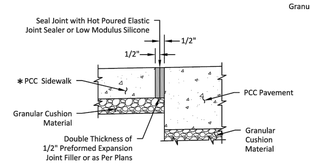
DATE: 8-19-22

Sec. - Sht. 61-1a









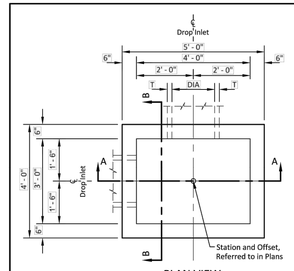
N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

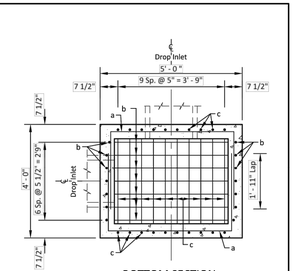
SIDEWALKS

DATE: 8-19-22

Sec. - Sht. 61-1b



PLAN VIEW



BOTTOM SECTION

ESTIMATED QUANTITIES			
Item	Unit	Constant Quantity	Variable Quantity
Class M6 Concrete	Cu. Yd.	0.43	0.30H
Reinforcing Steel	Lb.	90.90	40.53H
Frame and Grate Assembly	Each	1	———

DROP INLETS FOR 12" TO 36" DIAMETER PIPE

Specifications:
1. Design Specifications: AASHTO LRFD Bridge Design Specifications 2012 Edition.
2. Construction Specifications: City of Rapid City Standard Specifications, Current Edition.

Notes:
1. Design Live Load: HL-93 loading. No construction loading in excess of legal load was considered.
2. Inlet may be precast. If precast inlet is used, and details differ from that shown, the precast inlet shall receive prior approval by the City.
3. To qualify for alternate design approval, submit: prior SDDOT approval, checked design by a South Dakota Registered Professional Engineer, and shop plans to the City of Rapid City. Design shall be in accordance with the current edition of the AASHTO LRFD Bridge Design Specifications.
4. Inlets shown may be modified by the addition or omission of connecting pipes as shown on the layouts. Connecting pipes shall not enter the inlet through the corners.
5. Maximum R.C. pipe diameter shall not exceed 24" (24" for R. C. arch pipe) on the 3' wide side and shall not exceed 36" (30" for R.C. arch pipe) on the 4' wide side of the drop inlet.
6. Reinforcing steel shall conform to ASTM A615 grade 60. The d bars shall be lapped 12" with the b and c bars. Cut and bend reinforcing steel as required to place pipe(s) through the drop inlet wall.
7. Use minimum 2 1/2" clear cover on all reinforcing steel unless otherwise noted.
8. The dimension of H is in feet. Maximum H is 10 feet.

PIPE DISPLACEMENT REDUCTIONS			
	Diameter (Inches)	Wall T (Inches)	Class M6 Concrete (Cu. Yd.)
R.C.P.	12	2	0.03
	15	2 1/4	0.04
	18	2 1/2	0.05
	24	3	0.09
	30	3 1/2	0.14
	36	4	0.20
R.C. Arch	18	2 1/2	0.05
	24	3 1/2	0.09
	30	4	0.14

N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

3' x 4' TYPE C REINFORCED CONCRETE DROP INLET

DATE: 8-19-22

Sec. - Sht. 62-8a

MARK	DESCRIPTION	DATE
	ISSUED FOR BID	2/12/24

DESIGNED BY: LINDSAY SHAGLA
DRAWN BY: LINDSAY SHAGLA
CHECKED BY: CHRIS BAILEY
SUBMITTED BY: CHRIS BAILEY
SIZE: ANSI D
ISSUE DATE: FEBRUARY 2024
CFMO NO.: 467074
PROJECT NO.: 103828.14
SCALE: NA
FILE NAME: 4670740C503.DWG

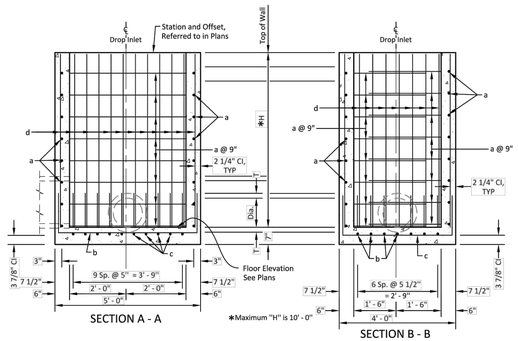
South Dakota Army National Guard
Rapid City Army Aviation Support Facility
Rapid City, South Dakota

703 Main St Suite 200
Rapid City, South Dakota 57701

Rapid City Army Aviation Support Facility
Drainage Inlet Between Hangars Rapid City AASF
South Dakota Army National Guard
CFMO #467074

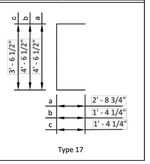
STANDARD DETAILS

SHEET ID
C-503



REINFORCING SCHEDULE					
Mk.	No.	Size	Length	Type	Bending Details
a	2.67H	4	10' - 0"	17	
b	7	5	7' - 3"	17	
c	10	4	6' - 3"	17	
d	34	4	H - 2"	Str	

Note:
All dimensions are out to out of bars.



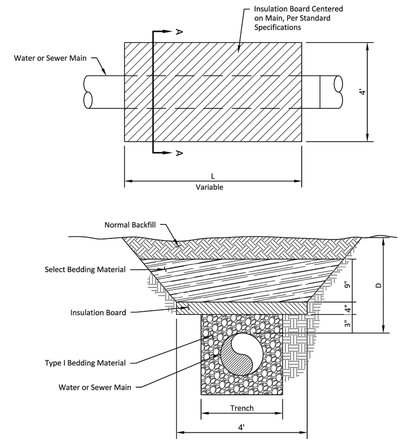
N.T.S.

CITY OF RAPID CITY — PUBLIC WORKS DEPARTMENT

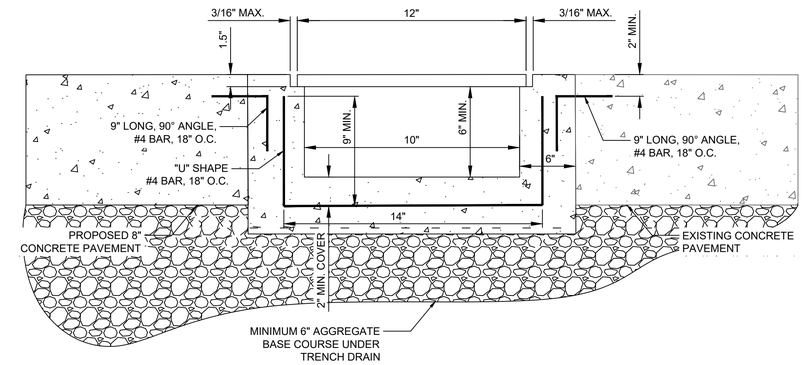
3' x 4' TYPE C REINFORCED CONCRETE DROP INLET

DATE: 8-19-22

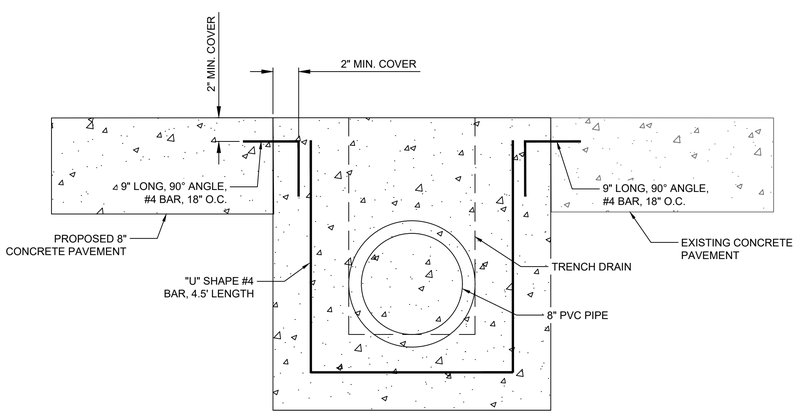
Sec. - Sht. 62-8b



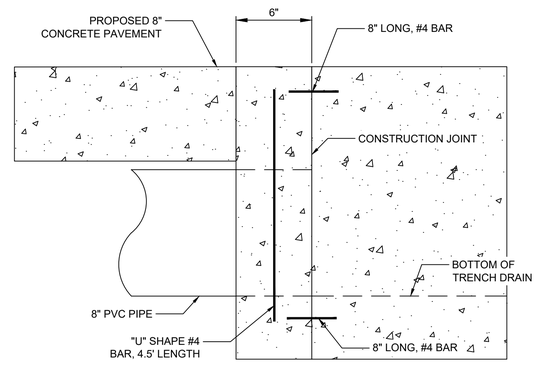
1 WATER MAIN INSULATION
NOT TO SCALE



2 12" TRENCH DRAIN
NOT TO SCALE



FRONT VIEW



SIDE VIEW

3 TRENCH DRAIN PIPE CONNECTION
NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 7323
CHRISTOPHER M. BAILEY
SOUTH DAKOTA
2-13-24

MARK	DESCRIPTION	DATE
	ISSUED FOR BID	2/12/24

DESIGNED BY: LINDSAY SHAGLA
DRAWN BY: LINDSAY SHAGLA
CHECKED BY: CHRIS BAILEY
SUBMITTED BY: CHRIS BAILEY
SIZE: ANSI D
ISSUE DATE: FEBRUARY 2024
CFMO NO.: 467074
PROJECT NO.: 10382814
SCALE: NA
FILE NAME 467074C504.DWG

South Dakota Army National Guard
Rapid City Army Aviation Support Facility
Rapid City, South Dakota

703 Main St Suite 200
Rapid City, South Dakota 57701

Rapid City Army Aviation Support Facility
Drainage Inlet Between Runways and Hangars Rapid City AASF
South Dakota Army National Guard
CFMO #467074

STANDARD DETAILS

SHEET ID
C-504