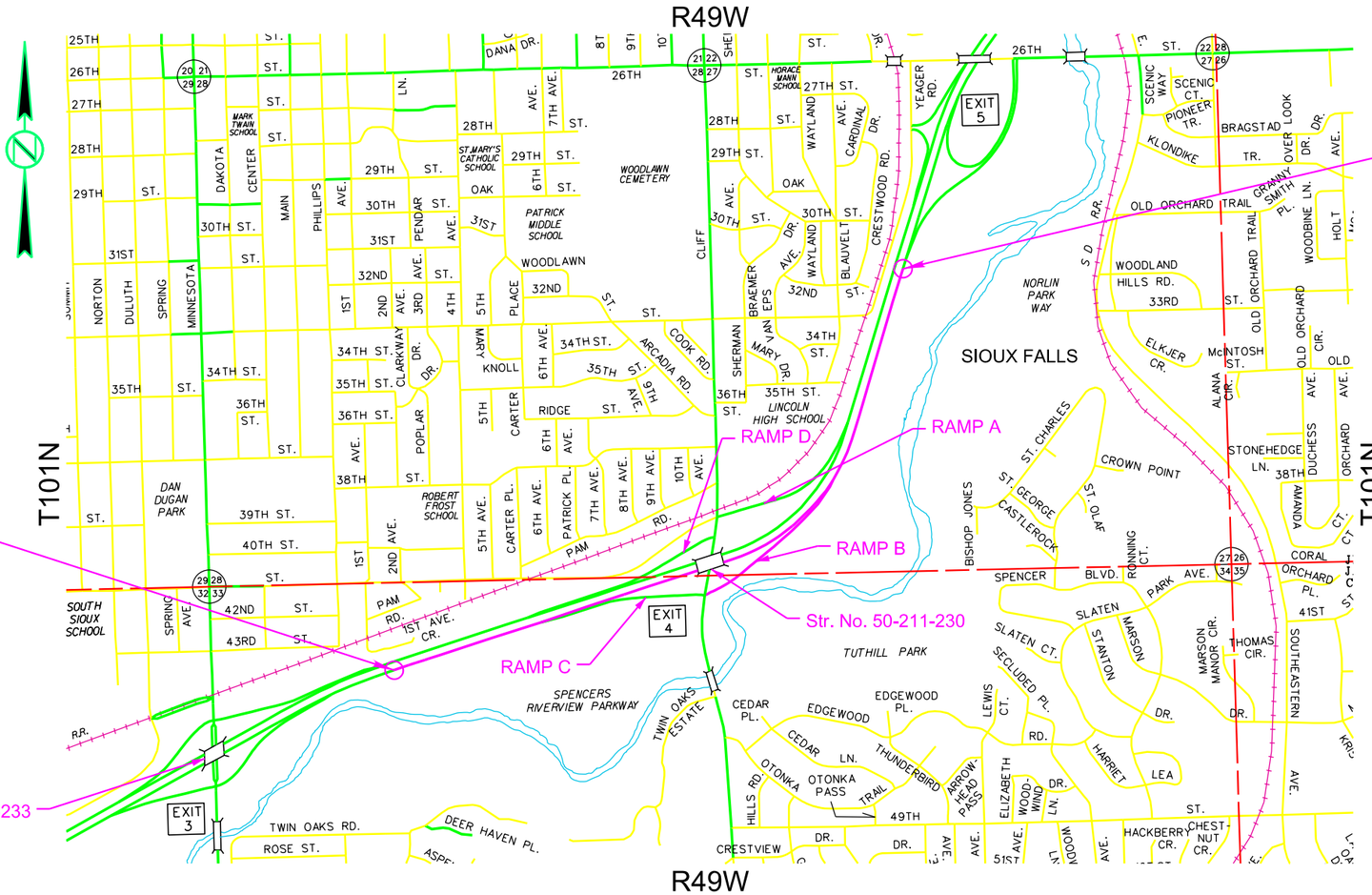
SECTION C: TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C1	C66

Plotting Date: 03/01/2024

INDEX OF SHEETS



SECTION C ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
628E0200	Remove and Reset Crash Cushion	5	Each
628E1500	Concrete Barrier End Protection	4	Each
633E0030	Cold Applied Plastic Pavement Marking, 24"	60	Ft
633E0040	Cold Applied Plastic Pavement Marking, Arrow	6	Each
634E0110	Traffic Control Signs	2,240.7	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	15	Each
634E0380	Tubular Marker	194	Each
634E0390	Replace Tubular Marker	19	Each
634E0420	Type C Advance Warning Arrow Board	3	Each
634E0525	Linear Delineation System Panel, Barrier Mounted	479	Each
634E0560	Remove Pavement Marking, 4" or Equivalent	2,200	Ft
634E0565	Remove Pavement Marking, Arrow	8	Each
634E0575	Remove Pavement Marking, Area	200.0	SqFt
634E0640	Temporary Pavement Marking	22,343	Ft
634E0702	Contractor Supplied Traffic Control Movable Concrete Barrier	479	Each
634E0705	Remove and Reset Traffic Control Movable Concrete Barrier	3	Each
634E0750	Temporary Concrete Barrier End Protection	5	Each
634E0755	Remove and Reset Temporary Concrete Barrier End Protection	5	Each
634E0760	Temporary Concrete Barrier End Protection Module Set or Repair Kit	1	Each
634E1215	Contractor Furnished Portable Changeable Message Sign	2	Each
634E1235	Queue Detection System	9.0	Mth
634E1245	Maintenance of Queue Detection System	104	Hour
634E2000	Longitudinal Pedestrian Barricade	8	Ft
634E2020	Temporary Curb Ramp	2	Each
634E2025	Longitudinal Pedestrian Barrier	300	Ft

SEQUENCE OF OPERATIONS

Contractor requests to deviate from the sequence of operations will be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work. An alternate sequence will be submitted for review a minimum of one week prior to potential implementation.

- **Phase 1a (NB I-229 Inside Widening)**
  - Closure of inside lane on NB I-229
  - Remove waste material
  - Grading to widen inside shoulder
- **Phase 1b (Exit 3 – Exit 4 Milling and Widening)**
  - Closure of inside lane on NB I-229 and inside lane on SB I-229
  - Mill existing crossover asphalt
  - Crossover grading and widening
  - Crossover repavement
  - Extend crossover pipe culvert
- **Phase 1c (Exit 4 – Exit 5 Widening)**
  - Close inside lane on NB I-229
  - Grading and widening of crossover
  - Paving crossover
- **Phase 2a (I-229 Widening and Diversion)**
  - Close outside lane on NB I-229
  - Remove waste material
  - Install guardrail
- **Phase 2b (Ramp B)**
  - Close outside lane on NB I-229
  - Ramp closure
  - Grading and surfacing
  - Install ramp retaining wall
- **Phase 2c (Ramp C)**
  - Close outside lane on NB I-229
  - Ramp closure
  - Grading and surfacing
- **Phase 3a**
  - Close existing southbound Cliff Ave traffic
  - Install temporary retaining wall
  - Grade embankment and install abutment
  - Install drainage pipe extensions
- **Phase 3b**
  - Close existing northbound Cliff Ave traffic
  - Install sidewalk detour
  - Grade embankment and install abutment
  - Install drainage pipe extensions
- **Phase 3c**
  - Close Cliff Ave
  - Install temporary bridge structure
- **Phase 4**
  - Installation of concrete barrier

Notes:

- Installation of temporary bridge structure during Phase 3c is anticipated to be (1) overnight road closure of Cliff Ave.
- Refer to Section S for permanent signage on temporary diversion closure.

COORDINATION BETWEEN CONTRACTORS

A separate contract for PCN 07CV has been awarded and will be constructed in 2024 to another Contractor for work at I-229 and 26th Street. The involved work will be approach slab repair, polymer chip seal, and crash wall construction adjacent to this project (PCN 07CY).

Conflicting traffic control devices between projects may need to be temporarily adjusted or removed as directed by the Engineer and at no additional cost to the contract.

GENERAL TRAFFIC CONTROL

Existing guide, route, informational logo, regulatory, and warning signs will be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging, and resetting of existing traffic control devices, including delineation, will be the responsibility of the Contractor. Cost for this work will be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost will be replaced by the Contractor at no cost to the State.

All temporary traffic control sign locations will be set in the field by the Contractor and verified by the Engineer prior to installation.

All temporary speed limit signs will have a minimum mounting height of 5 feet in rural locations, even when mounted on portable supports.

Portable sign supports will not be located on sidewalks, bicycle facilities, or other areas designated for pedestrian or bicycle traffic.

All construction operations will be conducted in the general direction of traffic movement.

If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD, whichever is more stringent will be used, as determined by the Engineer.

Fixed location signing placed more than 4 calendar days prior to the start of construction will be covered or laid down until the time of construction. The covers must be approved by the Engineer prior to installation. The cost of materials, labor, and equipment necessary to complete this work will be incidental to other contract items. No separate payment will be made.

All fixed location signs, sign posts, and breakaway bases will be removed within 7 calendar days following pavement marking.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3/19/24

GENERAL TRAFFIC CONTROL (cont'd)

All haul trucks will be equipped with an additional flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights will be incidental to the various related contract items.

At no time will a vertical drop-off of greater than 3 inches be left overnight adjacent to the traveled way. The Contractor will utilize embankment material to ensure a 3-inch vertical drop-off is not exceeded. The slope of the embankment material will not be steeper than a 4:1 within 30 feet of the traveled way.

The Contractor will furnish, install, maintain, and remove TRUCK CROSSING (W8-6) signs daily. The TRUCK CROSSING signs will be displayed always when haul vehicles are hauling material. When hauling conditions no longer exist, the signs will be covered or removed from view. The exact number and location will be determined during construction. Payment for additional signs will be based on the contract unit price per square foot for "Traffic Control Signs".

The Contractor will notify businesses/homeowners a minimum of two weeks prior to construction to inform them of upcoming construction and again a minimum of 48 hours prior to any blocked access to make appropriate arrangements.

If inappropriate or conflicting pavement markings exist, the markings will be removed and replaced with applicable temporary pavement markings when the work duration is more than 3 days. When the work duration is less than 3 days, the channelizing devices in the area where the pavement markings conflict will be placed at one-half of the normal channelizing device spacing. Pavement marking removals will be incidental to the contract unit price per foot for "Remove Pavement Marking, 4" or equivalent". Temporary pavement marking will be paid for at the contract unit price per foot for "Temporary Pavement Marking". The additional channelizing devices will be incidental to the contract lump sum price for "Traffic Control, Miscellaneous".

A Type 3 Barricade will be installed at the end of a lane closure taper as detailed in these plans. Additional Type 3 Barricades will be installed facing traffic within the closed lane at a spacing of ¼ mile.

Construction vehicles will exit or enter the construction work zone at locations identified by the Engineer. At no time will construction vehicles utilize the maintenance crossovers or the Interstate median to exit or enter Interstate traffic.

On Interstate projects with more than one construction site, slow moving equipment that operates at a speed less than 40 MPH may mobilize between sites if the equipment travels on the shoulder. The slow-moving equipment will also display a flashing amber light and a slow-moving sign.

LANE CLOSURES

Interstate lane closures shorter than 5 miles will be used if 5 miles is greater than the length of work that can be accomplished in one day's production. More than one lane closure may be permitted; however, there will be a minimum of a three-mile section between lane closures, excluding the tapers.

Interstate lane closures will be removed when work will not be occurring for a period of 3 or more calendar days. Activities that do not involve workers being present, such as curing time for concrete, constitute work. Lane closures will not be set up on a Friday if no work will be occurring on Saturday or Sunday. In these cases, the lane closure will be installed on Monday.

WORK ZONE SPEED REDUCTION

The Department is required to obtain a speed reduction resolution prior to the installation of any SPEED LIMIT (R2-1) signs shown on standard plate 634.63 or as shown in the plans. To provide adequate time for the resolution to be enacted, the Contractor will inform the Engineer a minimum of 3 weeks prior to the scheduled installation of any work zone speed reduction signs on the project. The information provided by the Contractor will include the anticipated date of sign installation, the newly reduced speed limit, the location of the work zone, and the anticipated completion date of work requiring the speed reduction.

CONTACTOR FURNISHED PORTABLE CHANGEABLE MESSAGE SIGN

One week prior to starting work affecting the traveling public, portable changeable message signs (PCMS) will be installed at locations detailed in the plans to notify drivers of the upcoming construction. The Contractor will program the portable changeable message signs with the following message, at the locations noted on the plans.

CLIFF AVE
CLOSED AT
I-229

9PM-5AM
XX/XX
USE ALT RTE

When work begins that will affect traffic patterns, the Contractor will re-program the PCMS with the messages as detailed in the plans.

INCIDENTS

An incident is an emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic such as a crash, hazardous materials spill, or other event.

The Contractor will set up a meeting prior to start of work to plan and coordinate responses to an incident. The Contractor will invite the Department of Transportation, the South Dakota Highway Patrol, the Minnehaha County Sheriff and local emergency response entities to the meeting.

The Contractor will assist to maintain traffic as required by these plan notes and as agreed to at that meeting.

Emergency vehicle access through the project will be considered and discussed at the meeting.

The Contractor may be required to modify messages on portable changeable message signs or relocate portable changeable message signs, and to provide flaggers to direct or detour traffic. The Contractor should be prepared to relocate advance warning signs if determined to be necessary for a major traffic incident lasting more than two hours. Fixed location ground mounted signs may be covered and additional portable signs provided.

No additional payment will be made for the modification of portable changeable message sign messages or the relocation of portable changeable message signs. Cost for the relocation of an advance warning sign due to an incident will be 50% of the designated sign rate. Flaggers will be paid for at the contract unit price per hour for "Flagging".

PRESS RELEASE ANNOUNCEMENTS

The SDDOT will prepare a press release to be released 5 days prior to any phase change or any other major change that affects traffic flow. The SDDOT will be responsible to keep law enforcement, emergency services, and the traveling public notified of changes in project access. The Contractor will provide the Engineer with pertinent information 7 days prior to any phase change or any other major change that affects traffic flow.

TUBULAR MARKERS

The color of the tubular markers on centerline will be predominately orange. The color of the tubular markers installed on the shoulders will be predominately white. The white tubular markers will be installed 2.0 feet from the existing edge line at intervals of approximately 480 feet.

All tubular markers will be a minimum of 28 inches in height. The base of the tubular marker should be attached to the roadway surface with a flexible non-permanent bituminous adhesive capable of being removed from the roadway surface after use. The pin used to connect the marker to the base will be of a type that will not puncture a vehicle tire if it should become dislodged from the base.

All costs for furnishing, installing, maintaining, and removing the tubular markers will be incidental to the contract unit price per each for "Tubular Marker".

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3/19/24

LIGHTING FOR NIGHTTIME WORK

Flagger stations, working construction equipment, and active workspaces will be lighted between sunset and sunrise. Non-glare light sources will be provided.

Light levels are as defined in Section 2.9.2 of NCHRP 476.

- Light in conformance with Level I will be provided at the active workspaces.
- Light in conformance with Level II will be provided at the locations of working construction equipment.
- Light in conformance with Level III is to be provided where labor intensive work is being completed such as during hand work, pavement sawing, project inspection, materials testing, and flagging.

Acceptable light sources will be Contractor furnished stand-alone lights or vehicle/equipment mounted lights. Stand-alone units will be marked with a minimum of two reflectorized drums on an approaching traffic side.

Cost for this lighting will be included in the contract lump sum price for “Traffic Control, Miscellaneous”.

Activities for nighttime work will be as follows:

- Installation of temporary bridge structure under Phase 3c.

HIGHWAY WORKERS GIVE ‘EM A BRAKE SIGNS

One fixed location ground mounted HIGHWAY WORKERS GIVE ‘EM A BRAKE sign will be installed 2000 feet in advance of the ROAD WORK NEXT XX MILES signs for northbound and southbound directions of travel. The signs will be mounted to the right of the roadway, a minimum of 16 feet from the edge of the shoulder to the inside edge of the sign.

The Contractor will furnish a sign design detail for the HIGHWAY WORKERS GIVE ‘EM A BRAKE sign for Engineer review and approval.

TEMPORARY PEDESTRIAN ACCESS ROUTE

A Temporary Pedestrian Access Route (TPAR) will be provided when crosswalks, sidewalks, or other pedestrian facilities are blocked, closed, or relocated. A TPAR may consist of a combination of existing and/or temporary pedestrian facilities. The TPAR will be kept free of any obstructions and hazards, such as holes, debris, mud, snow, construction equipment, traffic control signing, stored materials, etc.

The Contractor will notify the Engineer at least 72 hours prior to start of any construction operation that will necessitate a change in pedestrian access. Pedestrian traffic signal displays controlling a crosswalk that is closed will be covered or removed. Any changes to Temporary Pedestrian Access Routes will be coordinated with and approved by the City of Sioux Falls prior to implementation.

TEMPORARY CURB RAMP

Temporary curb ramps should be firm, stable, and have a non-slip surface. They will not warp or buckle, and should be made of materials strong enough to support a weight of 800 pounds. Temporary curb ramps will be yellow or color contrasting and contain marked edges, so they are noticeable by pedestrians who have visual impairments. Lateral joints or gaps between surfaces will be a maximum of 0.5 inches in width. Temporary curb ramps will include detectable warning panels.

Temporary curb ramps will be the same width as the temporary pedestrian access route, with a recommended width of 60 inches and a minimum width of 48 inches. Temporary curb ramps will have a maximum slope of 8.3% and have free draining surfaces with a maximum cross slope of 2%. Handrails on temporary curb ramps are not required unless the curb ramp has a rise exceeding 6 inches and a length exceeding 72 inches.

All costs will be incidental to the contract unit price per each for “Temporary Curb Ramp”.

LONGITUDINAL PEDESTRIAN BARRICADE

Longitudinal pedestrian barricades should not be used to provide positive protection for pedestrians.

To prevent any tripping hazard to pedestrians, ballast will be located behind or internal to the device.

When longitudinal pedestrian barricades are combined in a series, the maximum gap between devices that do not interlock will be one inch. Joints between devices that do interlock will be closed and flush to prevent canes or small wheels from being trapped and to facilitate safe hand trailing. When used as a sidewalk closure mechanism, longitudinal pedestrian barricade must run the entire width of the sidewalk. Longitudinal pedestrian barricade should provide a color contrasting pattern. Black should not be used to color any base on a device. The devices should comply with the general color and stripe pattern requirements of Section 6F.68 of the MUTCD.

Longitudinal pedestrian barricade will have continuous bottom and top surfaces. The top surface will be smooth to allow safe hand trailing. Both upper and lower surfaces will share a common vertical plane.

All costs will be incidental to the contract unit price per foot for “Longitudinal Pedestrian Barricade”.

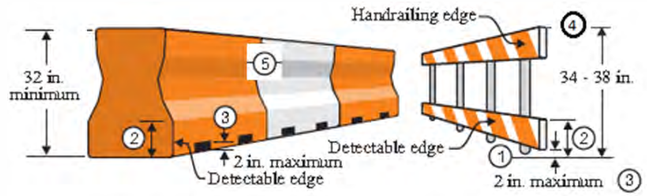
When used to separate pedestrians from vehicular traffic for TPARs in the roadway, longitudinal pedestrian barrier must meet or exceed the crashworthy requirements of NCHRP 350 or MASH Test Level 1. The bottom and top surfaces of the traffic side of devices will have retroreflective sheeting or delineation for improved nighttime visibility.

When longitudinal pedestrian barriers are combined in a series, the maximum gap between devices that do not interlock will be one inch. Joints between devices that do interlock should be closed and flush to prevent canes or small wheels from being trapped and to facilitate safe hand trailing. Channelizing devices should provide a color contrasting pattern. Black should not be used to color any base on a device. The devices should comply with the general color and stripe pattern requirements of Chapter 6F of the MUTCD.

Longitudinal pedestrian barriers will have continuous bottom and top surfaces. The top surface will be smooth to allow safe hand trailing.

All costs will be incidental to the contract unit price per foot for “Longitudinal Pedestrian Barrier”.

PEDESTRIAN CHANNELIZING DEVICE DETAILS



Longitudinal Pedestrian Barrier Longitudinal Pedestrian Barricade

1. Barricade rail supports may not extend into the pedestrian walkway more than 4 inches from the face of the barricade.

2. The top edge of the bottom portion will be a minimum of 8 inches above the walkway.

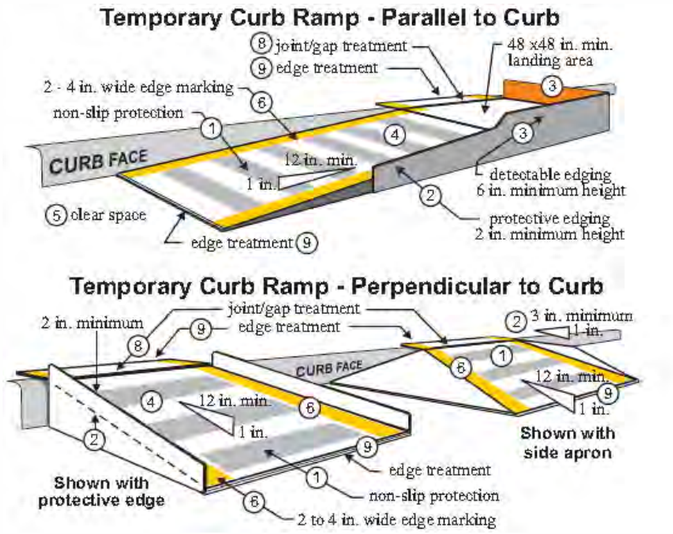
3. Devices will not block water drainage from the walkway. A gap height or opening from the walkway surface up to a maximum of 2 inches in height is allowed for drainage purposes.

4. The top edge of the longitudinal pedestrian barricade is to be used as a guiderail to provide visual and tactile guidance to pedestrians along a designated route. The top surface should have a minimum width of 0.5 inches to allow the hand to feel the surface. The surface should be smooth and free of any sharp or abrasive elements to allow safe hand trailing.

5. Longitudinal pedestrian barrier used to provide positive protection from traffic to pedestrians should be crashworthy.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3/19/24

TEMPORARY CURB RAMP DETAILS



1. Curb ramps will be 48-inch minimum width with a firm, stable, and non-slip surface.

2. Protective edging with a 2-inch minimum height will be installed when the curb ramp or landing platform has a vertical drop of 6 inches or greater or has a side apron slope steeper than 33:1 (33%). Protective edging should be considered when curb ramps or landing platforms have a vertical drop of 3 inches or more.
3. Detectable edging with 6 inches minimum height and contrasting color will be installed on all curb ramp landings where the walkway changes direction (turns).

4. Curb ramps and landings should have a 50:1 (2%) maximum cross slope.

5. A minimum clear space of 48 inch x 48 inch minimum will be provided above and below the curb ramp, with a 60 inch x 60 inch clear space preferred.

6. The curb ramp walkway edge will be marked with a contrasting color 2 to 4 inch wide marking. The marking is optional where color contrasting edging is used.

7. Water flow in the gutter system will have minimal restriction.

8. Lateral joints or gaps between surfaces will be less than 0.5 inches in width.

9. Changes between surface heights should not exceed 0.5 inches. Lateral edges between 0.25 inches and 0.5 inches in height, should be vertical up to 0.25 inches in height and beveled at 2:1 between 0.25 inches and 0.5 inches in height.

CONTRACTOR SUPPLIED TRAFFIC CONTROL MOVABLE CONCRETE BARRIERS

The Contractor will be required to furnish and install Moveable F Shape Concrete Barriers as noted on the plans. Concrete barrier sections will be placed as depicted on the plans, with the exact location of the barriers being determined by the Engineer upon construction. The Contractor will be responsible for the requirements of Traffic Control Moveable Concrete Barriers per SD DOT standard plate 628.01.

Phase 1

- Concrete barrier will be required on the shoulder closure for both the Northbound and Southbound direction of traffic on I-229.
- Concrete barrier will be required on the inside shoulder for Northbound traffic on I-229

Phase 2a

- Concrete barrier will be required on the outside shoulder closure for Northbound traffic on I-229

Phase 2b

- Concrete barrier will be required on the outside shoulder closure for Northbound traffic and the Ramp B closure of I-229.

Phase 2c

- Concrete barrier will be required on the outside shoulder closure for Northbound traffic and the Ramp C closure of I-229.

Phase 3a

- Concrete barrier will be required on the lane closure for Southbound traffic on Cliff Ave.

Phase 3b

- Concrete barrier will be required on the lane closure for Northbound traffic on Cliff Ave.

Phase 3c

- Concrete barrier will be required Cliff Ave for the installation of the Temporary Bridge structure.

Phase 4

- Permanent concrete barrier will be required on the outside shoulder for Northbound traffic. Coordination will be required for Contractors between projects PCN 07CY and PCN 05HN.

All costs associated with furnishing, installing, and maintaining the connecting pins and concrete barriers will be incidental to the contract unit price per each for “Contractor Supplied Traffic Control Movable Concrete Barrier”.

After the initial placement, the concrete barriers may need to be adjusted. Adjustment of the barriers, where they do not need to be loaded on a truck for transport, will be incidental to the contract unit price per each for “Contractor Supplied Traffic Control Movable Concrete Barrier”. All costs associated with removing, loading, unloading, and resetting of the barriers at a new site, will be incidental to the contract unit price per each for “Remove and Reset Traffic Control Movable Concrete Barrier”. No additional payment will be made for barriers that are not immediately reset at a new location on the project and stored on-site until they are reset.

TEMPORARY CONCRETE BARRIER END PROTECTION

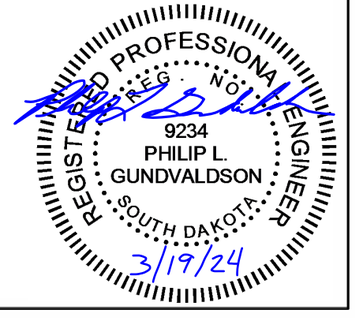
Crash attenuators meeting the requirements of NCHRP 350 or MASH TL-3 will be furnished and installed by the Contractor. Attachment of the attenuators to the concrete barriers will be by approved methods.

All costs associated with furnishing, transporting, initial setup, connecting, maintaining, and removing the crash attenuators will be incidental to the contract unit price per each for Temporary Concrete Barrier End Protection.

All costs associated with moving and resetting crash attenuators to accommodate traffic flows after initial set-up will be paid for at the contract unit price per each for Remove & Reset Temporary Concrete Barrier End Protection. All costs associated with removing from initial placement and resetting at a new location will be incidental to the contract unit price per each. No additional payment will be made for crash attenuators that are not

immediately reset at a new location on the project and stored on-site until they are either reset or removed from the project as determined by the Engineer. No additional payment will be made for minor adjustments.

The Contractor will have replacement hardware available so that in the event the crash attenuator is hit and made unusable, the crash attenuator can be made functional within 24 hours. The cost of replacement will be incidental to the contract unit price per each for “Temporary Concrete Barrier Module Set or Repair Kit”. No payment will be made for the Temporary Concrete Barrier Module Set or Repair Kit if no repairs are necessary. Upon completion of the project, crash attenuators will remain the property of the Contractor.



BARRIER MOUNTED LINEAR DELINEATION SYSTEM PANELS

A linear delineation system (LDS) panel will be attached to each barrier section. The color will be the same as the nearest pavement marking, white along outside edgelines or yellow for the left side on one way traffic sections. The LDS will be 34 inches long and 6 inches in height and be constructed of aluminum formed into a shape to provide retroreflective properties across a wide range of angles. It will be sheeted with sheeting meeting the requirements of ASTM D4956 Type XI. The panels will be evenly spaced, with the top of the panel 4 inches below the top of the barrier. Installation will be as per the manufacturer's recommendations. This will allow for easy removal for replacement of damaged panels or to replace with an alternate color. The Contractor will furnish and install one panel along each side of the barrier if any panels are missing from the barriers. Replacement of damaged linear delineation system panels will be furnished and replaced by the Contractor. All costs associated with furnishing, installing, and replacing, if needed, will be incidental to the contract unit price per each for Linear Delineation System Panel, Barrier Mounted.

All LDS panels will remain attached to the barrier sections and will become the property of the State of South Dakota upon completion of the project.

The Contractor will verify the number of LDS panels that will need to be installed or replaced on the Traffic Control Movable Concrete Barriers. The contract amount of LDS panels is an estimate and the full contract amount may not be needed.

Maintaining the linear delineation system, including moving LDS panels from one side of the barrier to the other side of the barrier to match the applicable color of the nearest pavement marking will be incidental to the contract lump sum price for "Traffic Control, Miscellaneous".

PERMANENT CONCRETE BARRIER END PROTECTION

The Contractor will provide a permanent concrete barrier end protection crash cushion from the Approved Products List (APL). The Contractor will be responsible for selecting a crash cushion from the APL that is an appropriate width to protect the concrete barrier (or other hazard). If the crash cushion selected requires system specified transition panels to obtain the appropriate width, no additional payment will be made for the transition panels. Only one type of crash cushion will be used on a project; however, if conditions warrant a need for using more than one type of crash cushion on a project, then the Contractor will submit a proposal to the Engineer for approval. The approved products list may be viewed at the following internet site:

https://apps.sd.gov/HC60ApprovedProducts/main.aspx

The anchoring pad for the crash cushion will at a minimum be an 8-inch-thick PCC pavement that meets the requirements of Class M6 concrete. The pad will be in accordance with the Manufacturer's recommendations if the pad needs to have thicker pavement and/or a footing.

Documentation on the crash cushion, which includes the drawing details of the crash cushion, details for the transition to the concrete barrier, and details for the concrete anchoring pad, will be provided to the Project Engineer at the pre-construction meeting.

The crash cushion will be attached to the concrete barrier with a transition that meets test level 3 requirements of MASH at locations shown below in the Table of Permanent Concrete Barrier End Protection. For bidirectional traffic, the transition will be placed on both sides of the crash cushion and barrier.

The Contractor will certify that the crash cushion was installed according to the Manufacturer's installation instructions.

All costs for furnishing and installing the crash cushion including the anchoring pad, anchors for connection to the pad, transitions to the concrete barrier (if required), strut backup, materials, labor, equipment, and incidental items will be paid for at the contract unit price per each for "Concrete Barrier End Protection".

TABLE OF PERMANENT CONCRETE BARRIER END PROTECTION

Station	Location	Unidirectional/ Bidirectional	Quantity (Each)
204+50	R	Unidirectional	1
214+22	R	Unidirectional	1
217+00	R	Unidirectional	1
242+00	R	Unidirectional	1
		Total	4

QUEUE WARNING SYSTEM

The Contractor will furnish and install a queue warning system. This system will be capable of detecting slowed and stopped traffic within all detection zones. The changeable message signs (CMS) will be placed halfway between interstate exits in each zone. CMS locations may need to be adjusted pending traffic movement within zones.

Requirements for all zones:

- Capable of detecting mainline queues anywhere within a detection zone and displaying warning messages within the affected detection zone and one zone preceding the detection zone.
- Capable of detecting mainline queues exceeding ¾ the length of a queue detection zone and displaying messages two zones preceding the detection zone.
- Capable of detecting queues on the exit ramp within 200 ft of the exit gore and displaying messages within the affected detection zone and one zone preceding the detection zone.

The system will display the following messages depending on the traffic conditions detected:

NB Zone 1:

During times of free-flowing traffic on mainline the CMS will be blank when not required for end of queue detection or incident management.

During times of moderate congestion and slow speeds (30mph to 40mph) CMS boards in zone 1 and 2 will display:

SLOWED TRAFFIC AHEAD AND REDUCE SPEED

During times of major congestion, very slow speeds, or stopped traffic conditions (below 30mph) CMS boards in zones 1 and 2 will display:

STOPPED TRAFFIC AHEAD AND CONSIDER ALT ROUTE

If the end of queue exceeds ¾ the length of zone 1, the same messages above will be displayed in zone 3 in addition to zones 1 and 2.

During times of congestion, very slow ramp speeds, or stopped traffic conditions (below 30mph) on the ramp within 200 feet of the exit gore at Cliff Avenue, the CMS boards in zones 1 and 2 will display:

RAMP DELAY AT CLIFF AVE AND CONSIDER ALT ROUTE

CMS messages warning drivers about slow or stopped traffic on mainline will be given priority over exit ramp conditions.

NB zone 2

During times of free-flowing traffic on mainline the CMS will be blank when not required for end of queue detection or incident management.

During times of moderate congestion and slow speeds (30mph to 40mph) CMS boards in zones 2 and 3 will display:

SLOWED TRAFFIC AHEAD AND REDUCE SPEED

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3/19/24

QUEUE WARNING SYSTEM (cont'd)

During times of major congestion, very slow speeds, or stopped traffic conditions (below 30mph) CMS boards in zones 2 and 3 will display:

STOPPED TRAFFIC AHEAD AND BE PREPARED TO STOP

If the end of queue exceeds ¾ the length of zone 2, the same messages above will be displayed in zone 4 in addition to zones 2 and 3.

During times of ramp congestion, very slow ramp speeds, or stopped traffic conditions (below 30mph) within 200 feet of the exit gore in zone 2, the CMS boards in zones 2 and 3 will display:

STOPPED RAMP TRAFFIC AND BE PREPARED TO STOP

CMS messages about ramp conditions within zone 2 will be given priority over messages relative to slowed traffic from Zone 1.

CMS messages warning drivers about stopped traffic on mainline in zone 2 will be given priority over exit ramp conditions and zone 1 slowed traffic conditions.

NB zone 3

During times of free-flowing traffic on mainline the CMS will be blank when not required for end of queue detection or incident management.

During times of moderate congestion and slow speeds (30mph to 40mph) CMS boards in zones 3 and 4 will display:

SLOWED TRAFFIC AHEAD AND REDUCE SPEED

During times of major congestion, very slow speeds, or stopped traffic conditions (below 30mph) CMS boards in zones 3 and 4 will display:

STOPPED TRAFFIC AHEAD AND BE PREPARED TO STOP

During times of ramp congestion, very slow ramp speeds, or stopped traffic conditions (below 30mph) within 200 feet of the exit gore in zone 3, the CMS boards in zone 3 and 4 will display:

STOPPED RAMP TRAFFIC AND BE PREPARED TO STOP

CMS messages about ramp conditions within zone 3 will be given priority over messages relative to slowed traffic from zones 1 and 2.

CMS messages warning drivers about stopped traffic on mainline in zone 3 will be given priority over exit ramp conditions and zones 2 and 3 slowed traffic conditions.

NB zone 4

During times of free-flowing traffic on mainline the CMS will be blank when not required for end of queue detection or incident management.

During times of moderate congestion and slow speeds (30mph to 40mph) CMS boards in zone 4 will display:

SLOWED TRAFFIC AHEAD AND REDUCE SPEED

During times of major congestion, very slow speeds, or stopped traffic conditions (below 30mph) CMS boards in zone 4 will display:

STOPPED TRAFFIC AHEAD AND BE PREPARED TO STOP

During times of ramp congestion, very slow ramp speeds, or stopped traffic conditions (below 30mph) within 200 feet of the exit gore in zone 4, the same messages above will be displayed in zone 4.

CMS messages warning drivers about stopped traffic on mainline in zone 4 will be given priority over exit ramp conditions and zones 3 and 4 slowed traffic conditions.

SB zone 5

During times of free-flowing traffic on mainline the CMS will be blank when not required for end of queue detection or incident management.

During times of moderate congestion and slow speeds (30mph to 40mph) CMS boards in zones 5 and 6 will display:

SLOWED TRAFFIC AHEAD AND REDUCE SPEED

During times of major congestion, very slow speeds, or stopped traffic conditions (below 30mph) CMS boards in zones 5 and 6 will display:

STOPPED TRAFFIC AHEAD AND BE PREPARED TO STOP

If the end of queue exceeds ¾ the length of zone 5, the same messages above will be displayed in zone 7 in addition to zones 5 and 6.

During times of congestion, very slow ramp speeds, or stopped traffic conditions (below 30mph) on the ramp within 200 feet of the exit gore at Cliff Avenue, the CMS boards in zones 1 and 6 will display:

RAMP DELAY AT CLIFF AVE AND CONSIDER ALT ROUTE

CMS messages warning drivers about slow or stopped traffic on mainline will be given priority over exit ramp conditions.

SB zone 6

During times of free-flowing traffic on mainline the CMS will be blank when not required for end of queue detection or incident management.

During times of moderate congestion and slow speeds (30mph to 40mph) CMS boards in zones 6 and 7 will display:

SLOWED TRAFFIC AHEAD AND REDUCE SPEED

During times of major congestion, very slow speeds, or stopped traffic conditions (below 30mph) CMS boards in zones 6 and 7 will display:

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3/19/24

QUEUE WARNING SYSTEM (cont'd)

STOPPED TRAFFIC AHEAD AND BE PREPARED TO STOP

If the end of queue exceeds ¾ the length of zone 6, the same messages above will be displayed in zone 8 in addition to zones 6 and 7.

STOPPED RAMP TRAFFIC AND BE PREPARED TO STOP

CMS messages about ramp conditions within zone 3 will be given priority over messages relative to slowed traffic from zones 1 and 2.

CMS messages warning drivers about stopped traffic on mainline in zone 6 will be given priority over exit ramp conditions in zone 5 and slowed traffic in zone 5.

SB zone 7

During times of free-flowing traffic on mainline the CMS will be blank when not required for end of queue detection or incident management.

During times of moderate congestion and slow speeds (30mph to 40mph) CMS boards in zones 7 and 8 will display:

SLOWED TRAFFIC AHEAD AND REDUCE SPEED

During times of major congestion, very slow speeds, or stopped traffic conditions (below 30mph) CMS boards in zones 7 and 8 will display:

STOPPED TRAFFIC AHEAD AND BE PREPARED TO STOP

During times of ramp congestion, very slow ramp speeds, or stopped traffic conditions (below 30mph) within 200 feet of the exit gore in zone 7, the CMS boards in zones 7 and 8 will display:

STOPPED RAMP TRAFFIC AND BE PREPARED TO STOP

CMS messages about ramp conditions within zone 7 will be given priority over messages relative to slowed traffic from zones 5 and 6.

CMS messages warning drivers about stopped traffic on mainline in zone 7 will be given priority over exit ramp conditions in zone 5 and slowed traffic conditions in zone 6.

SB zone 8

No detection required in this zone

OPERATION AND MAINTENANCE

When road work begins on the project, the Contractor will be responsible for the operation (to include initial and daily system setup and programming) and the continued maintenance (to include adjustment and replacement of any parts or materials or appurtenances when necessary) required of the queue warning system. The Contractor's operation and maintenance responsibility will end upon the Engineer's acceptance of the work on the project. It is anticipated the use of the system may cease during peak winter months during periods of no work. The operation and maintenance work is the act of keeping the systems operating to warn traffic as intended.

Queue detection warning operation or maintenance work is required to be performed by the Contractor when project conditions dictate, lane closures change, the flow of I-229 mainline or interchange ramp traffic is impeded, a potential risk to the public exists or when equipment breaks down or malfunctions. The more serious situations require a high priority response and are to be reacted to as quickly as circumstances allow.

The Contractor should plan for sufficient staff for operation, maintenance, adjustment, materials, and replacement of the queue warning system, including the digital speed limit signs as necessary. The individual(s) responsible for installation, operations and maintenance of the queue warning system will be experienced, knowledgeable, and Trained with respect to installation, setup, operation, and maintenance of the queue warning system.

Relocation of sensors, CMS signs, and digital speed limit signs should be expected as part of the work involved in maintaining the queue detection system.

In the event of failure, the Contractor will furnish necessary advance flaggers to safely control or warn traffic until the queue warning system is operational. The Contractor will furnish the flaggers within one hour of initial awareness of the queue warning system failure.

Any appurtenance of the queue warning system that fails to function in the presence of queues will result in liquidated damages of $200.00 per hour for the duration of failure.

The Contractor will be expected to secure changeable message signs and digital speed limit signs in the proper positions.

All changeable message signs and digital speed limit signs will be marked by a minimum of two reflectorized drums.

The queue warning system including changeable message signs and other electronic materials are to operate 24 hours per day 7 days per week. The equipment will be powered by utility provided power, solar power, battery power, or generator.

Solar powered battery units will have a no-charge-life of not less than 30 days. No-charge-life is the number of consecutive days that the system can continue to properly function (normal dimming and full output during varying lighting conditions for the display legend) starting with a full battery charge and with no additional charge provided by the solar cells.

The system will detect exit ramp queues and mainline queues separately. The system will be capable of detecting slowed and stopped traffic one mile in advance of the work zone and warn drivers of traffic congestion for three consecutive interchanges prior to the work zone.

The detectors will be capable of detecting traffic speeds in 5 MPH increments, calculating average and 85th percentile speeds over a specified period of time, and relaying information to warning systems for preset thresholds.

The system is expected to detect end of queue and once detected, provide adequate notification and warning. As the end of queue continues to back up, the notification and warning will be extended.

All costs associated with furnishing and the initial installation and operation, including all equipment such as changeable message signs, detection, and all miscellaneous parts and materials will be incidental to the contract unit price per month for Queue Detection System.

Costs for the daily operation, adjustment, relocation, replacement, providing technical support, and maintenance (labor, materials and equipment) of the queue warning system will be incidental to the contract unit price per hour for Maintenance of Queue Warning System.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3/19/24

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C9	C66

Plotting Date: 03/19/2024 Rev 03/19/2024 PLG

TABLE FOR TRAFFIC CONTROL (SqFt)

Sign Description	Sign Code	Width (in)	Height (in)	Sign Quantity (SqFt)	Phase 1		Phase 2a		Phase 2b		Phase 2c		Phase 3a		Phase 3b		Phase 3c		Field Determined Signs		Payment Quantity	
					No. of Signs	Total SqFt	No. of Signs	Total SqFt	No. of Signs	Total SqFt	No. of Signs	Total SqFt	No. of Signs	Total SqFt	No. of Signs	Total SqFt	No. of Signs	Total SqFt	No. of Signs	Total SqFt	No. of Signs	Total SqFt
PCN 07CY																						
Street Name Sign (Cliff Ave)	D3-1	24	12	2.00									9	18	8	16	24	48	6	12	30	60.0
Street Name Sign (E 41st St)	D3-1	24	12	2.00									5	10	2	4					5	10.0
Street Name Sign (I-229 N)	D3-1	24	12	2.00					1	2			5	10	3	6					5	10.0
Street Name Sign (I-229 S)	D3-1	24	12	2.00									6	12	3	6					6	12.0
EXIT (w/exit number)	E5-1a	78	60	32.50			1	32.5													1	32.5
EXIT CLOSED	E5-2a	48	36	12.00							1	12									1	12.0
END ROAD WORK	G20-2	48	24	8.00	4	32	2	16					2	16	2	16					4	32.0
WORK ZONE (Plaque)	G20-5aP	36	24	6.00	9	54	5	30	2	12	2	12									9	54.0
NORTH	M3-1	36	18	4.50													10	45	6	27	16	72.0
SOUTH	M3-3	36	18	4.50													10	45	6	27	16	72.0
DETOUR	M4-8	24	12	2.00													3	6	6	12	9	18.0
END DETOUR	M4-8a	24	18	3.00													2	6	6	18	8	24.0
Bike/Pedestrian Detour	M4-9a	30	24	5.00											2	10					2	10.0
DETOUR w/arrow, left	M4-9L	30	24	5.00													6	30	6	30	12	60.0
DETOUR w/arrow, right	M4-9R	30	24	5.00													5	25	6	30	11	55.0
LEFT LANE Designation	M5-4	24	18	3.00									3	9	2	6					3	9.0
RIGHT LANE Designation	M5-6	24	18	3.00									3	9	2	6					3	9.0
0° direction arrow	M6-3	21	15	2.19													3	6.5625	6	13.125	9	19.7
DO NOT BLOCK INTERSECTION	R10-7	24	30	5.00									2	10	3	15					3	15.0
ROAD CLOSED	R11-2	48	30	10.00													2	20			2	20.0
YIELD	R1-2	60	60	25.00									1	25							1	25.0
SPEED LIMIT	R2-1	36	48	12.00	11	132	7	84	2	24	2	24									11	132.0
FINES DOUBLE (Plaque)	R2-6aP	36	24	6.00	9	54	4	24	2	12	3	18									9	54.0
No right turn	R3-1	24	24	4.00					1	4							1	4			1	4.0
No left turn	R3-2	24	24	4.00					1	4			4	16	4	16	2	8			4	16.0
Thru ONLY	R3-5a	30	36	7.50									3	22.5	2	15					3	22.5
Left Turn ONLY	R3-5L	30	36	7.50									1	7.5	1	7.5					1	7.5
Right turn ONLY	R3-5R	30	36	7.50									1	7.5	1	7.5					1	7.5
Ahead or turn right	R3-6R	30	36	7.50									2	15	1	7.5					2	15.0
KEEP RIGHT w/symbol	R4-7a	24	30	5.00									5	25	5	25					5	25.0
KEEP LEFT w/symbol	R4-8a	24	30	5.00									2	10	2	10					2	10.0
KEEP LEFT w/symbol	R4-8b	24	30	5.00									1	5							1	5.0
STAY IN LANE	R4-9	36	48	12.00	2	24	2	24	2	24	2	24									2	24.0
SIDEWALK CLOSED	R9-9	24	12	2.00											2	4					2	4.0
On Ramp (Plaque)	W13-4P	36	36	9.00					1	9			1	9	2	18					2	18.0
One-direction large arrow	W1-6	48	24	8.00											1	8					1	8.0
ROAD WORK (w/distance)	W20-1	48	48	16.00	9	144	6	96	2	32	4	64	6	96	6	96					9	144.0
ROAD CLOSED AHEAD	W20-3	36	36	9.00													3	27			3	27.0
ROAD CLOSED 500 FT	W20-3	36	36	9.00													2	18			2	18.0
LEFT LANE CLOSED (w/distance)	W20-5L	48	48	16.00									1	16	1	16					1	16.0
CENTER LANE CLOSED (w/distance)	W20-5L	48	48	16.00					1	16											1	16.0
RIGHT LANE CLOSED (w/distance)	W20-5R	48	48	16.00							2	32									2	32.0
FLAGGER	W20-7a	48	48	16.00	2	32													2	32	4	64.0
SHOULDER CLOSED	W21-5a	48	48	16.00	6	96	4	64	2	32											6	96.0
SHOULDER CLOSED (w/distance)	W21-5b	48	48	16.00	6	96	4	64	2	32											6	96.0
Double reverse curve (2 lanes)	W24-1a	48	48	16.00	2	32			2	32	2	32									2	32.0
Double reverse curve (3 lanes)	W24-1b	48	48	16.00			2	32													2	32.0
REDUCED SPEED LIMIT AHEAD	W3-5	48	48	16.00	4	64	2	32	2	32	3	48									4	64.0
Merging Traffic	W4-1	48	48	16.00									1	16	1	16					1	16.0
Lane ends	W4-2	48	48	16.00							2	32	1	16	1	16					2	32.0
Added lane	W4-3	48	48	16.00	1	16	2	32													2	32.0
Traffic entering	W4-5	48	48	16.00			2	32													2	32.0
TRUCK CROSSING	W8-6	48	48	16.00	2	32													2	32	4	64.0
																				Subtotal:		1796.7

REGISTERED PROFESSIONAL ENGINEER
PHILIP L. GUNDVALDSON
9234
SOUTH DAKOTA
3/19/24

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C10	C66

Plotting Date: 03/19/2024 Rev 03/19/2024 PLG

TABLE FOR TRAFFIC CONTROL (SqFt)

Sign Description	Sign Code	Width (in)	Height (in)	Sign Quantity (SqFt)	Phase 1		Phase 2a		Phase 2b		Phase 2c		Phase 3a		Phase 3b		Phase 3c		Field Determined Signs		Payment Quantity	
					No. of Signs	Total SqFt	No. of Signs	Total SqFt	No. of Signs	Total SqFt	No. of Signs	Total SqFt	No. of Signs	Total SqFt	No. of Signs	Total SqFt	No. of Signs	Total SqFt	No. of Signs	Total SqFt	No. of Signs	Total SqFt
PCN 07CY																						
CENTER LANE CLOSED AHEAD	W9-3	48	48	16.00					1	16											1	16.0
SPECIAL (R3-8 MODIFIED)	SPECIAL	48	30	10.00									2	20	2	20					2	20.0
SPECIAL 2b	SPECIAL	48	30	10.00					2	20											2	20.0
I-229 NORTH : ON RAMP CLOSED : USE ALT ROUTE	SPECIAL	84	36	21.00					2	42											2	42.0
I-229 EXIT 4 : OFF RAMP CLOSED : USE ALT ROUTE	SPECIAL	84	36	21.00							6	126									6	126.0
ROAD CLOSED : 1 MILE AHEAD : CLIFF & I-229 JCT	SPECIAL	96	36	24.00													3	72			3	72.0
ROAD CLOSED : 1/2 MILE AHEAD : CLIFF & I-229 JCT	SPECIAL	96	36	24.00													3	72			3	72.0
RAMP CLOSED	SPECIAL	48	30	10.00					1	10											1	10.0
NO ACCESS : TO I-229 S	SPECIAL	48	24	8.00													2	16			2	16.0
HIGHWAY WORKERS GIVE 'EM A BRAKE	SPECIAL	60	30	12.50															4	50	4	50.0
																				Subtotal:		444.0
																				Total =		**2240.7**

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3/19/24

OTHER TRAFFIC CONTROL QUANTITIES

Item	Unit	Phase 1	Phase 2a	Phase 2b	Phase 2c	Phase 3a	Phase 3b	Phase 3c	Phase 4	Field Determined	Payment Quantity
PCN 07CY											
Tubular Marker	Each				21	162	153			32	**194**
Replace Tubular Marker	Each				2	16	15			3	**19**
Type C Advance Warning Arrow Board	Each			1	1					2	**3**
Linear Delineation System Panel, Barrier Mounted	Each	304	435	91	63	31	32		266	44	**479**
Remove Pavement Marking, 4" or Equivalent	Ft					2000				200	**2,200**
Remove Pavement Marking, Arrow	Each					7				1	**8**
Remove Pavement Marking, Area	SqFt					200					**200**
Concrete Barrier End Protection	Each								4		**4**
Contractor Supplied Traffic Control Movable Concrete Barrier	Each	304	435	91	63	31	32		266	44	**479**
Temporary Concrete Barrier End Protection	Each	5	5		2						**5**
Remove and Reset Traffic Control Moveable Concrete Barrier	Each	3	3	1	1	1	1				**3**
Remove and Reset Temporary Concrete Barrier End Protection	Each	5	5		2						**5**
Temporary Concrete Barrier End Protection Module Set or Repair Kit	Each	1									**1**
Contractor Furnished Portable Changeable Message Sign	Each	2									**2**
Maintenance of Queue Detection System	Hour	24	24	24	24					8	**104**
Longitudinal Pedestrian Barricade	Ft						8				**8**
Temporary Curb Ramp	Each					2	2				**2**
Longitudinal Pedestrian Barrier	Ft						300				**300**

TYPE 3 BARRICADES, 8' DOUBLE SIDED

Description	Unit	PHASE							Payment Quantity
		1	2a	2b	2c	3a	3b	3c	
Lane Closure	Each				1	4	3		
Shoulder Closure	Each	2	3						
Ramp Closure	Each			3	3				
Road Closure	Each							10	
Field Determined	Each	5	5	5	5	5	5	5	
	Total :	**7**	**8**	**8**	**9**	**9**	**8**	**15**	**15**

Temporary Pavement Marking

Phase	Location	634E0640				633E0030	633E0040
		Continuous (White)	Continuous (Yellow)	2' Skip (White)	2' Skip (Yellow)	24" (White)	Arrow (White)
		(Ft)	(Ft)	(Ft)	(Ft)	(Ft)	(Each)
1	208+08 to 233+22	5066	2520				
2a	217+00 to 234+26	4982					
2b	209+00 to 234+50	2928	1454				
2c	192+50 to 206+00	2700	1350				
3a	Cliff Ave	92	380	358	988	36	3
3b	Cliff Ave	100	100	320	774	24	3
Field Determined		1587	580	68	176		
				186	485		
	Total :	**15868**	**5804**	**186**	**485**	**60**	**6**

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3/19/24

MOBILE QUEUE DETECTION ZONE LAYOUT

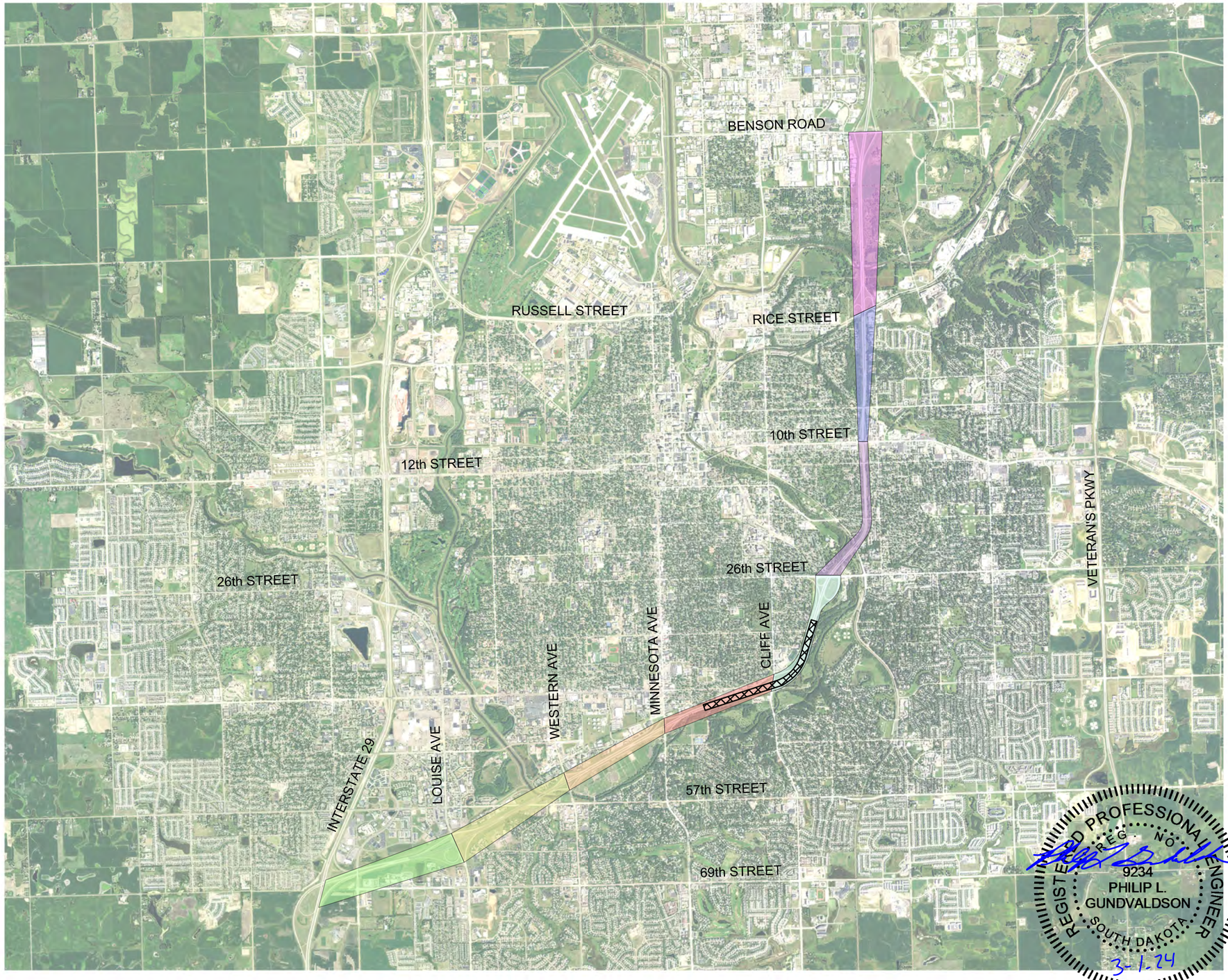
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C12	C66

Plotting Date: 03/01/2024

LEGEND

- ZONE 1 - CLIFF AVE TO MINNESOTA AVE
- ZONE 2 - MINNESOTA AVE TO WESTERN AVE
- ZONE 3 - WESTERN AVE TO LOUISE AVE
- ZONE 4 - LOUISE AVE TO I-29
- ZONE 5 - CLIFF AVE TO 26TH STREET
- ZONE 6 - 26TH STREET TO 10TH STREET
- ZONE 7 - 10TH STREET TO RICE STREET
- ZONE 8 - RICE STREET TO BENSON RD
- WORK AREA



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:5000

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_QueueDetectionZone.dgn

TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C13	C66

Plotting Date: 03/01/2024

PORTABLE MESSAGE SIGN

PORTABLE MESSAGE SIGN

PHASE 1

EXIT 4 CONST AHEAD	MAX WIDTH 12 FT	USE ALT ROUTE

PHASE 2a, 2b

EXIT 4 CONST AHEAD	MAX WIDTH 12 FT	USE ALT ROUTE

PHASE 2c

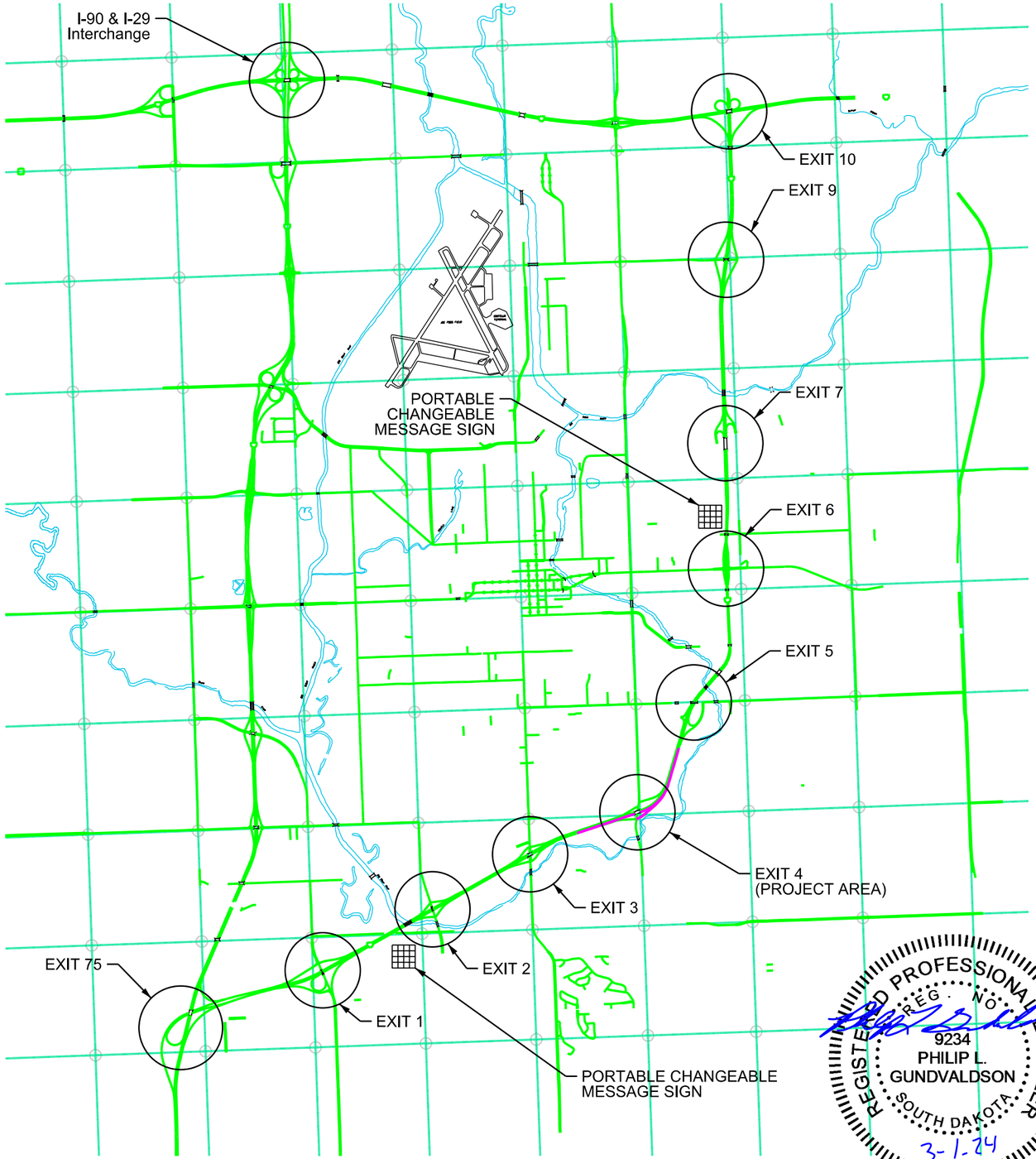
EXIT 4 CLOSED AHEAD	MAX WIDTH 12 FT	USE ALT ROUTE

PHASE 3a, 3b

ROAD WORK AHEAD	CLIFF AVE JCT	EXPECT DELAYS

PHASE 3c

ROAD WORK AHEAD	CLIFF AVE CLOSED	USE ALT ROUTE



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - N/A

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\c_TC-RestrictionSignage.dgn

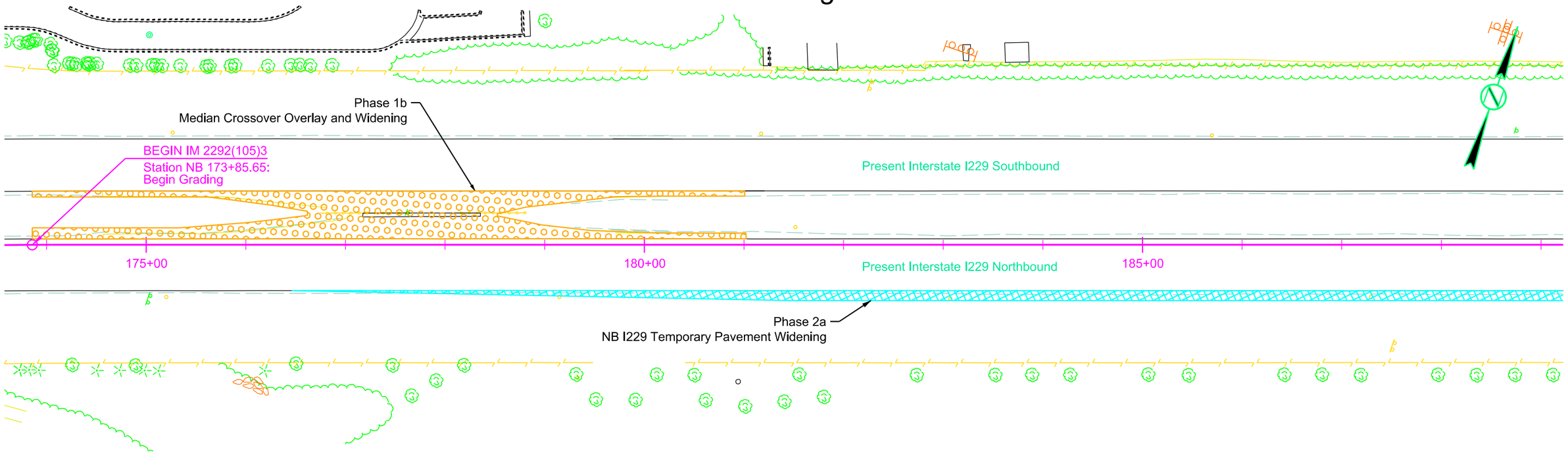
SEQUENCE OF OPERATIONS

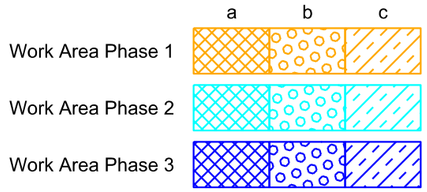
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C14	C66

Plotting Date: 03/01/2024

Phasing





PHASE 1a (NB I229 Inside Widening)

- Closure of Inside Lane of NB I229
- Waste Material Removal
- Grading to Widen Inside Shoulder
- Gravel Surfacing Installation

PHASE 1b (Exit 3-Exit 4 Milling & Widening)

- Closure of Inside Lane of NB I229 and Inside Lane of SB I229
- Mill Existing Crossover
- Grading to Widen Crossover
- Repavement of Crossover
- Pipe Culvert Extension

PHASE 1c (Exit 4-Exit 5 Widening)

- Closure of Inside Lane of NB I229
- Grading to Widen Crossover
- Paving of Widened Crossover

PHASE 2a (I229 Widening & Diversion)

- Closure of Outside Lane of NB I229
- Waste Material Removal
  - → I229 NB: STA 176+45 RT to STA 195+89 RT
  - → I229 NB: STA 220+00 RT to STA 246+70 RT
- Guardrail Construction

PHASE 2b (Ramp B)

- Closure of Outside Lane of NB I229
- Closure of Ramp B
- Complete Grading & Surfacing for Full Width
- Complete Ramp B Retaining Wall

PHASE 2c (Ramp C)

- Closure of Outside Lane of NB I229
- Closure of Ramp C
- Complete Grading & Surfacing for Full Width

PHASE 3a

- Closure of Existing Southbound Cliff Avenue
- Construction of South Temporary Bridge Retaining Wall
- Southern Embankment and Abutment Construction
- Drainage Pipe Extensions

PHASE 3b

- Closure of Existing Nourthbound Cliff Avenue
- Existing Sidewalk Detour
- Northern Embankment and Abutment Construction
- Drainage Pipe Extensions

PHASE 3c

- Closure of Cliff Avenue
- Temporary Bridge installation.

PHASE 4

- Installation of Concrete Barrier.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07CYs_Section\C_SOO-Layouts.dgn

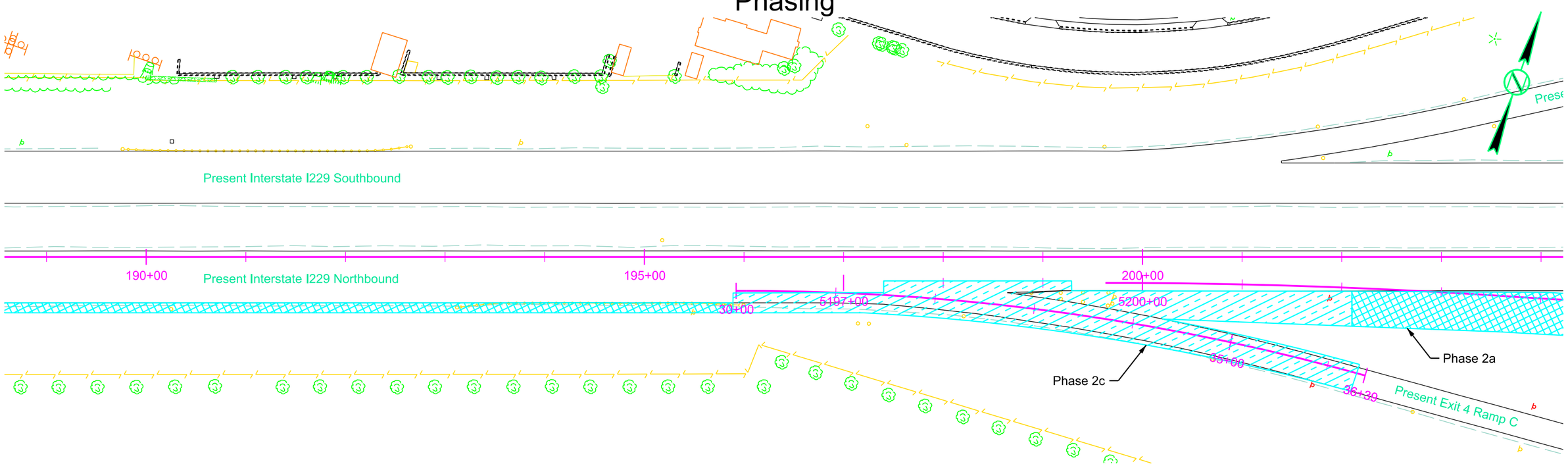
SEQUENCE OF OPERATIONS

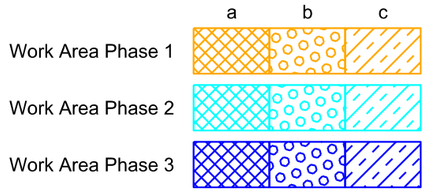
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C15	C66

Plotting Date: 03/01/2024

Phasing





PHASE 1a (NB I229 Inside Widening)

- Closure of Inside Lane of NB I229
- Waste Material Removal
- Grading to Widen Inside Shoulder
- Gravel Surfacing Installation

PHASE 1b (Exit 3-Exit 4 Milling & Widening)

- Closure of Inside Lane of NB I229 and Inside Lane of SB I229
- Mill Existing Crossover
- Grading to Widen Crossover
- Repavement of Crossover
- Pipe Culvert Extension

PHASE 1c (Exit 4-Exit 5 Widening)

- Closure of Inside Lane of NB I229
- Grading to Widen Crossover
- Paving of Widened Crossover

PHASE 2a (I229 Widening & Diversion)

- Closure of Outside Lane of NB I229
- Waste Material Removal
  - → I229 NB: STA 176+45 RT to STA 195+89 RT
  - → I229 NB: STA 220+00 RT to STA 246+70 RT
- Guardrail Construction

PHASE 2b (Ramp B)

- Closure of Outside Lane of NB I229
- Closure of Ramp B
- Complete Grading & Surfacing for Full Width
- Complete Ramp B Retaining Wall

PHASE 2c (Ramp C)

- Closure of Outside Lane of NB I229
- Closure of Ramp C
- Complete Grading & Surfacing for Full Width

PHASE 3a

- Closure of Existing Southbound Cliff Avenue
- Construction of South Temporary Bridge Retaining Wall
- Southern Embankment and Abutment Construction
- Drainage Pipe Extensions

PHASE 3b

- Closure of Existing Nourthbound Cliff Avenue
- Existing Sidewalk Detour
- Northern Embankment and Abutment Construction
- Drainage Pipe Extensions

PHASE 3c

- Closure of Cliff Avenue
- Temporary Bridge installation.

PHASE 4

- Installation of Concrete Barrier.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100
Plotted From - InfrastructureDesignGroup
File - ...\07CYs_SectionC_SOO-Layouts.dgn

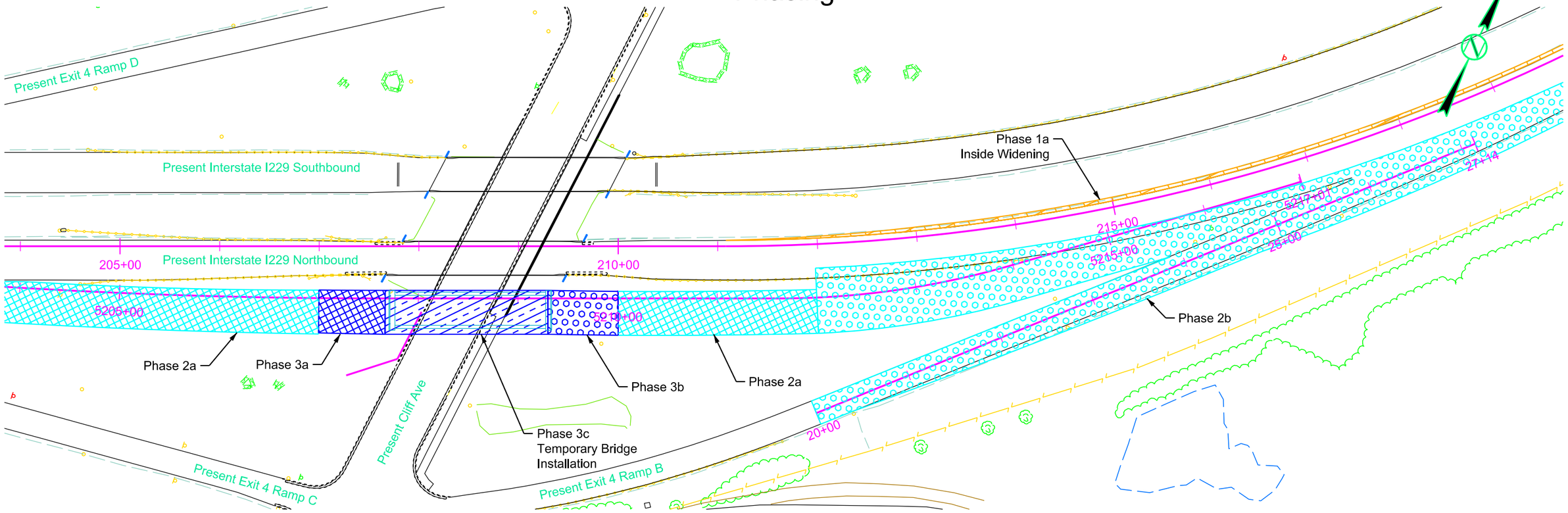
SEQUENCE OF OPERATIONS

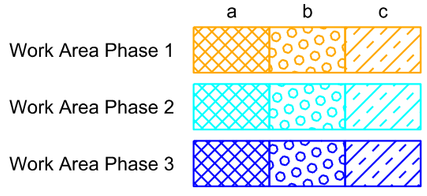
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C16	C66

Plotting Date: 03/01/2024

Phasing





PHASE 1a (NB I229 Inside Widening)

- Closure of Inside Lane of NB I229
- Waste Material Removal
- Grading to Widen Inside Shoulder
- Gravel Surfacing Installation

PHASE 1b (Exit 3-Exit 4 Milling & Widening)

- Closure of Inside Lane of NB I229 and Inside Lane of SB I229
- Mill Existing Crossover
- Grading to Widen Crossover
- Repavement of Crossover
- Pipe Culvert Extension

PHASE 1c (Exit 4-Exit 5 Widening)

- Closure of Inside Lane of NB I229
- Grading to Widen Crossover
- Paving of Widened Crossover

PHASE 2a (I229 Widening & Diversion)

- Closure of Outside Lane of NB I229
- Waste Material Removal
  - → I229 NB: STA 176+45 RT to STA 195+89 RT
  - → I229 NB: STA 220+00 RT to STA 246+70 RT
- Guardrail Construction

PHASE 2b (Ramp B)

- Closure of Outside Lane of NB I229
- Closure of Ramp B
- Complete Grading & Surfacing for Full Width
- Complete Ramp B Retaining Wall

PHASE 2c (Ramp C)

- Closure of Outside Lane of NB I229
- Closure of Ramp C
- Complete Grading & Surfacing for Full Width

PHASE 3a

- Closure of Existing Southbound Cliff Avenue
- Construction of South Temporary Bridge Retaining Wall
- Southern Embankment and Abutment Construction
- Drainage Pipe Extensions

PHASE 3b

- Closure of Existing Nourthbound Cliff Avenue
- Existing Sidewalk Detour
- Northern Embankment and Abutment Construction
- Drainage Pipe Extensions

PHASE 3c

- Closure of Cliff Avenue
- Temporary Bridge installation.

PHASE 4

- Installation of Concrete Barrier.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_SectionC_SOOLayouts.dgn

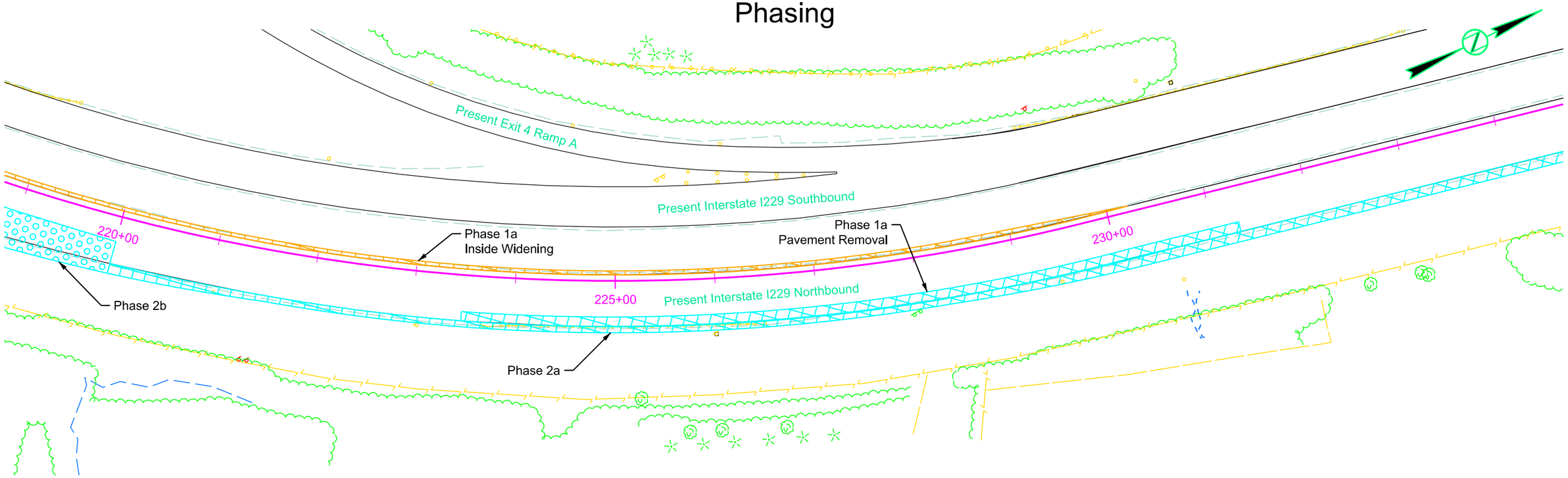
SEQUENCE OF OPERATIONS

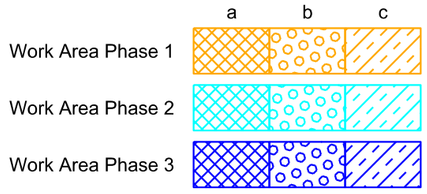
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C17	C66

Plotting Date: 03/01/2024

Phasing





PHASE 1a (NB I229 Inside Widening)

- Closure of Inside Lane of NB I229
- Waste Material Removal
- Grading to Widen Inside Shoulder
- Gravel Surfacing Installation

PHASE 1b (Exit 3-Exit 4 Milling & Widening)

- Closure of Inside Lane of NB I229 and Inside Lane of SB I229
- Mill Existing Crossover
- Grading to Widen Crossover
- Repavement of Crossover
- Pipe Culvert Extension

PHASE 1c (Exit 4-Exit 5 Widening)

- Closure of Inside Lane of NB I229
- Grading to Widen Crossover
- Paving of Widened Crossover

PHASE 2a (I229 Widening & Diversion)

- Closure of Outside Lane of NB I229
- Waste Material Removal
  - → I229 NB: STA 176+45 RT to STA 195+89 RT
  - → I229 NB: STA 220+00 RT to STA 246+70 RT
- Guardrail Construction

PHASE 2b (Ramp B)

- Closure of Outside Lane of NB I229
- Closure of Ramp B
- Complete Grading & Surfacing for Full Width
- Complete Ramp B Retaining Wall

PHASE 2c (Ramp C)

- Closure of Outside Lane of NB I229
- Closure of Ramp C
- Complete Grading & Surfacing for Full Width

PHASE 3a

- Closure of Existing Southbound Cliff Avenue
- Construction of South Temporary Bridge Retaining Wall
- Southern Embankment and Abutment Construction
- Drainage Pipe Extensions

PHASE 3b

- Closure of Existing Nourthbound Cliff Avenue
- Existing Sidewalk Detour
- Northern Embankment and Abutment Construction
- Drainage Pipe Extensions

PHASE 3c

- Closure of Cliff Avenue
- Temporary Bridge installation.

PHASE 4

- Installation of Concrete Barrier.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100
Plotted From - InfrastructureDesignGroup
File - ...\07CYs_Section\C_SOO-Layouts.dgn

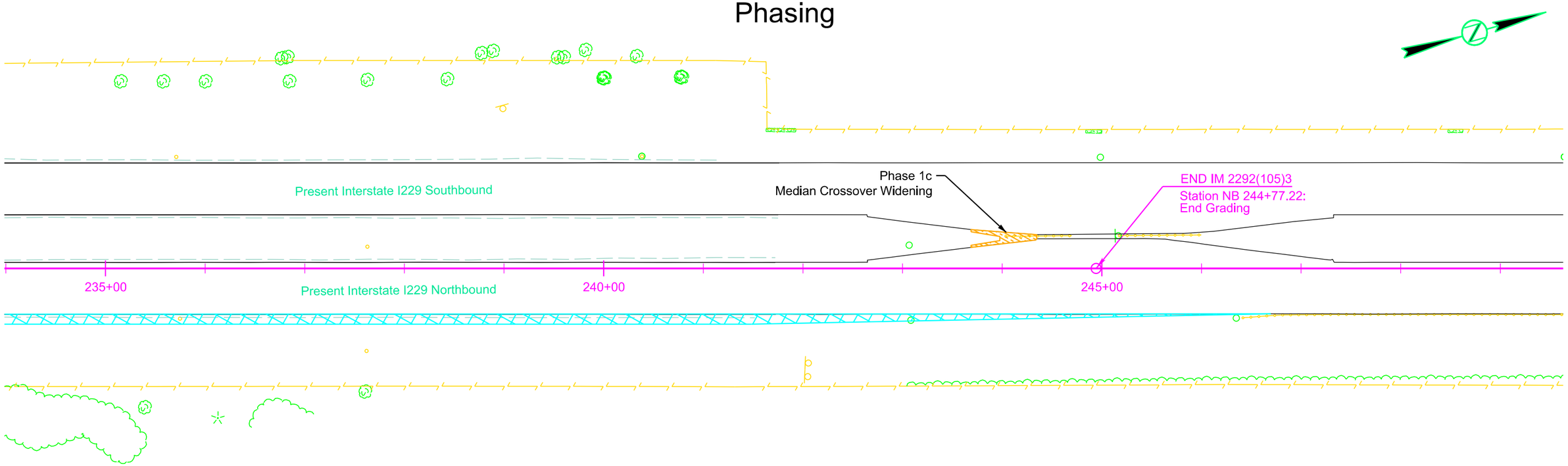
SEQUENCE OF OPERATIONS

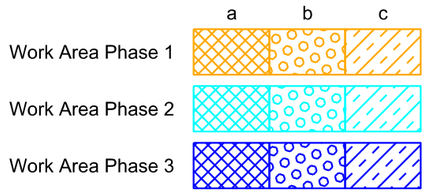
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C18	C66

Plotting Date: 03/01/2024

Phasing





PHASE 1a (NB I229 Inside Widening)

- Closure of Inside Lane of NB I229
- Waste Material Removal
- Grading to Widen Inside Shoulder
- Gravel Surfacing Installation

PHASE 1b (Exit 3-Exit 4 Milling & Widening)

- Closure of Inside Lane of NB I229 and Inside Lane of SB I229
- Mill Existing Crossover
- Grading to Widen Crossover
- Repavement of Crossover
- Pipe Culvert Extension

PHASE 1c (Exit 4-Exit 5 Widening)

- Closure of Inside Lane of NB I229
- Grading to Widen Crossover
- Paving of Widened Crossover

PHASE 2a (I229 Widening & Diversion)

- Closure of Outside Lane of NB I229
- Waste Material Removal
  - → I229 NB: STA 176+45 RT to STA 195+89 RT
  - → I229 NB: STA 220+00 RT to STA 246+70 RT
- Guardrail Construction

PHASE 2b (Ramp B)

- Closure of Outside Lane of NB I229
- Closure of Ramp B
- Complete Grading & Surfacing for Full Width
- Complete Ramp B Retaining Wall

PHASE 2c (Ramp C)

- Closure of Outside Lane of NB I229
- Closure of Ramp C
- Complete Grading & Surfacing for Full Width

PHASE 3a

- Closure of Existing Southbound Cliff Avenue
- Construction of South Temporary Bridge Retaining Wall
- Southern Embankment and Abutment Construction
- Drainage Pipe Extensions

PHASE 3b

- Closure of Existing Nourthbound Cliff Avenue
- Existing Sidewalk Detour
- Northern Embankment and Abutment Construction
- Drainage Pipe Extensions

PHASE 3c

- Closure of Cliff Avenue
- Temporary Bridge installation.

PHASE 4

- Installation of Concrete Barrier.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100
Plotted From - InfrastructureDesignGroup
File - ...\07CYs_SectionC_SOOLayouts.dgn

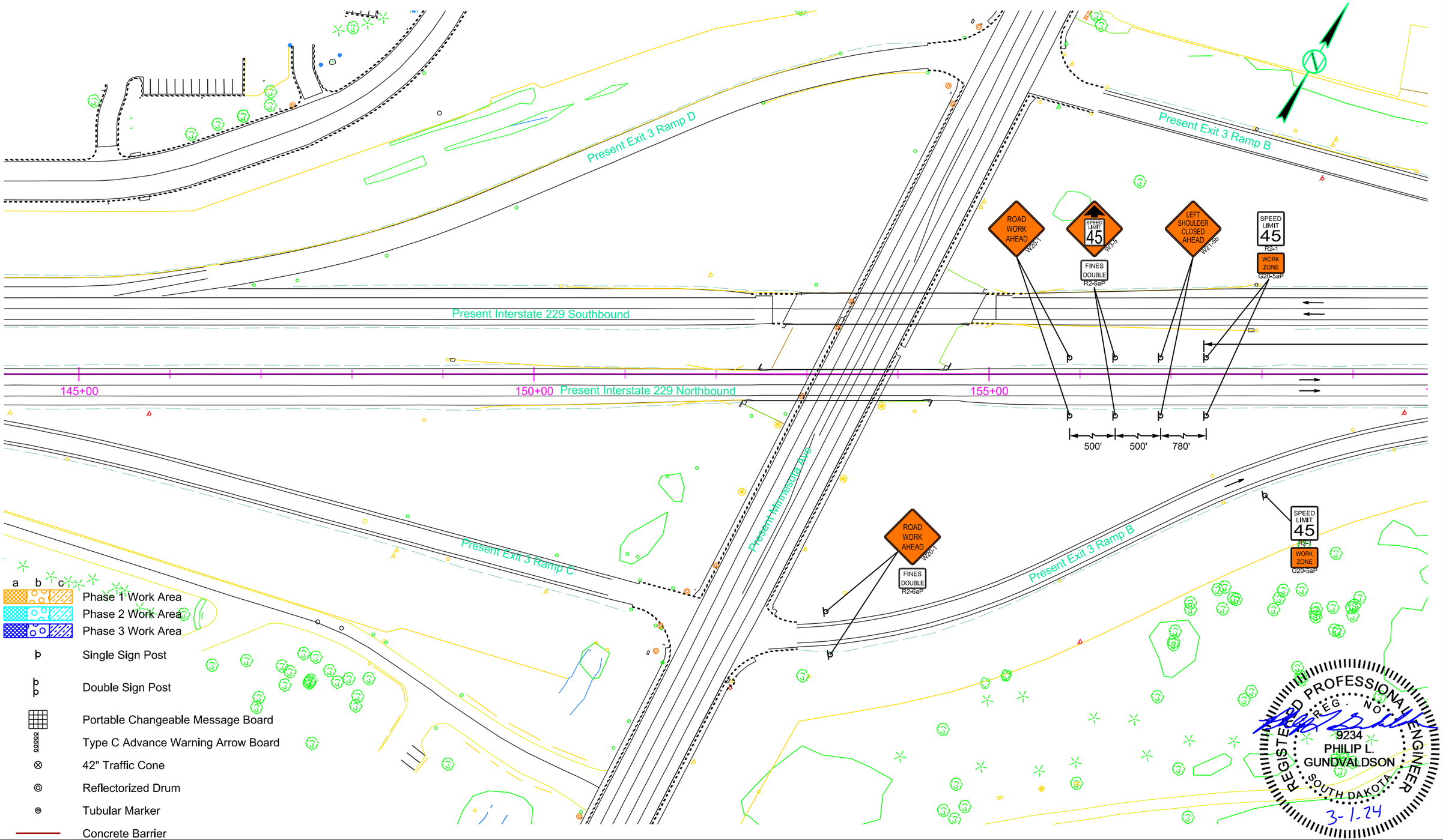
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 1 Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C19	C66

Plotting Date: 03/01/2024



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_TC-Layouts-Phase1.dgn

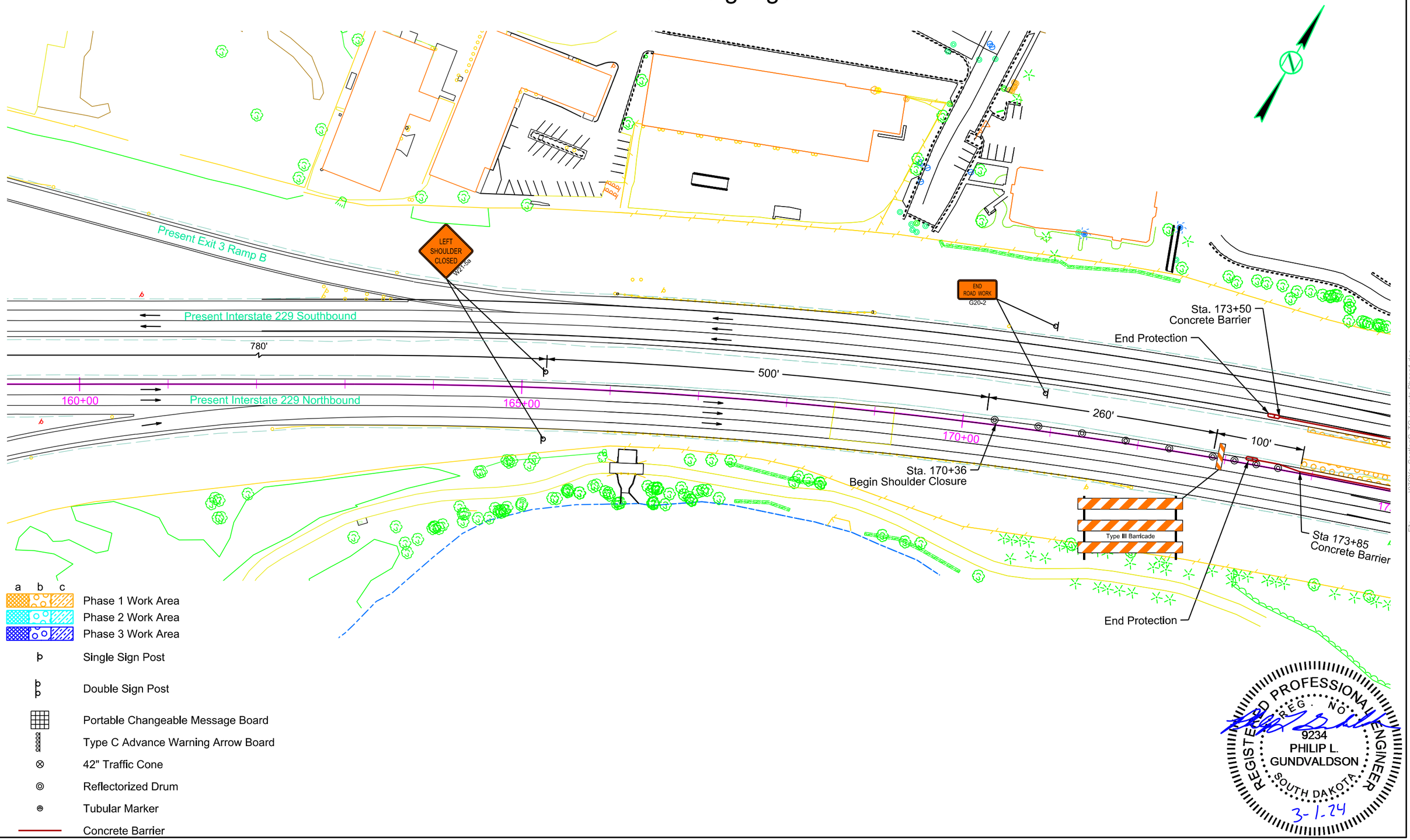
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 1 Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C20	C66

Plotting Date: 03/01/2024



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_TC-Layouts+Phase1.dgn

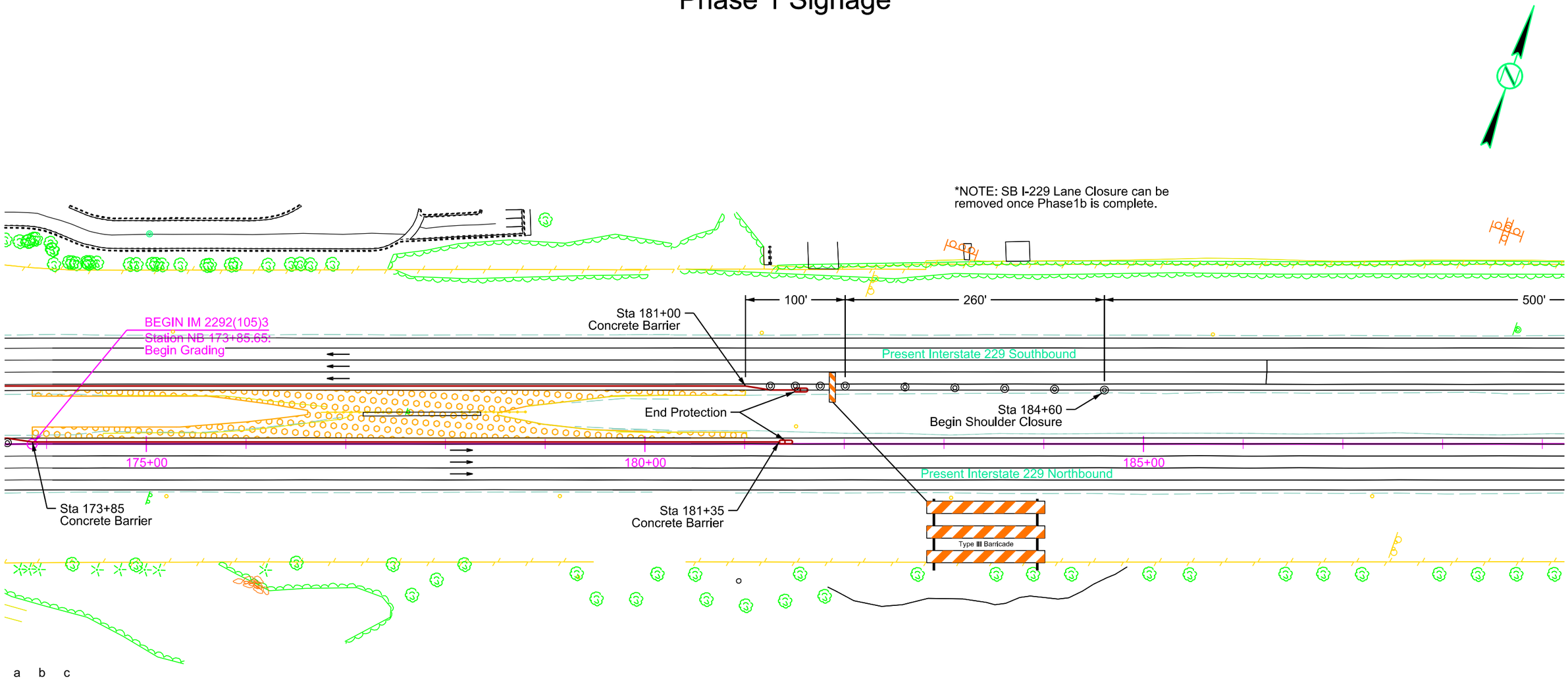
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 1 Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C21	C66

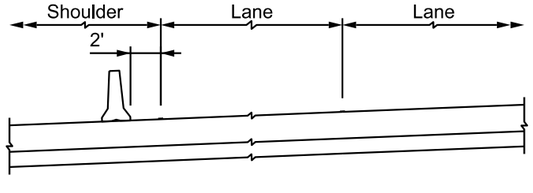
Plotting Date: 03/01/2024



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

TYPICAL BARRIER OFFSET DETAIL



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07CYs_Section\C_TC-Layouts-Phase1.dgn

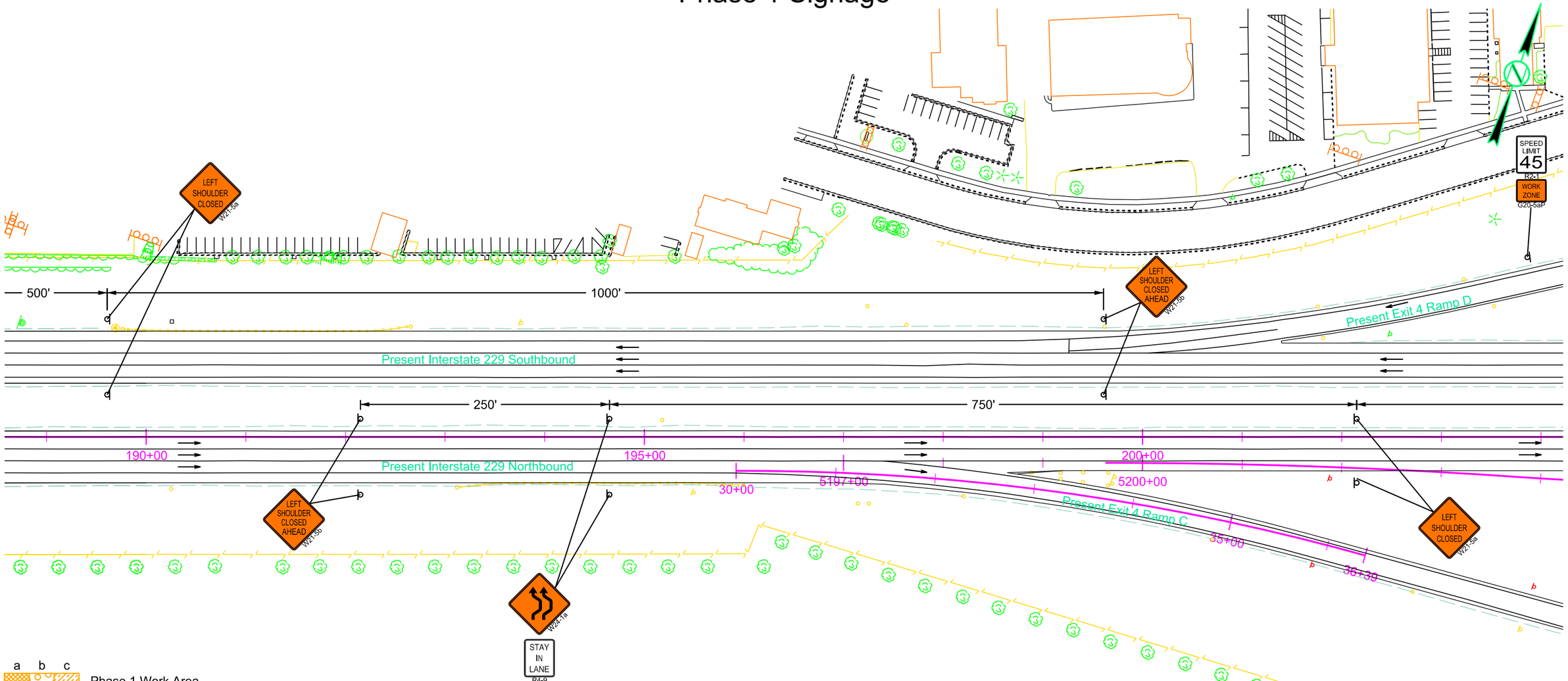
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 1 Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C22	C66

Plotting Date: 03/01/2024



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

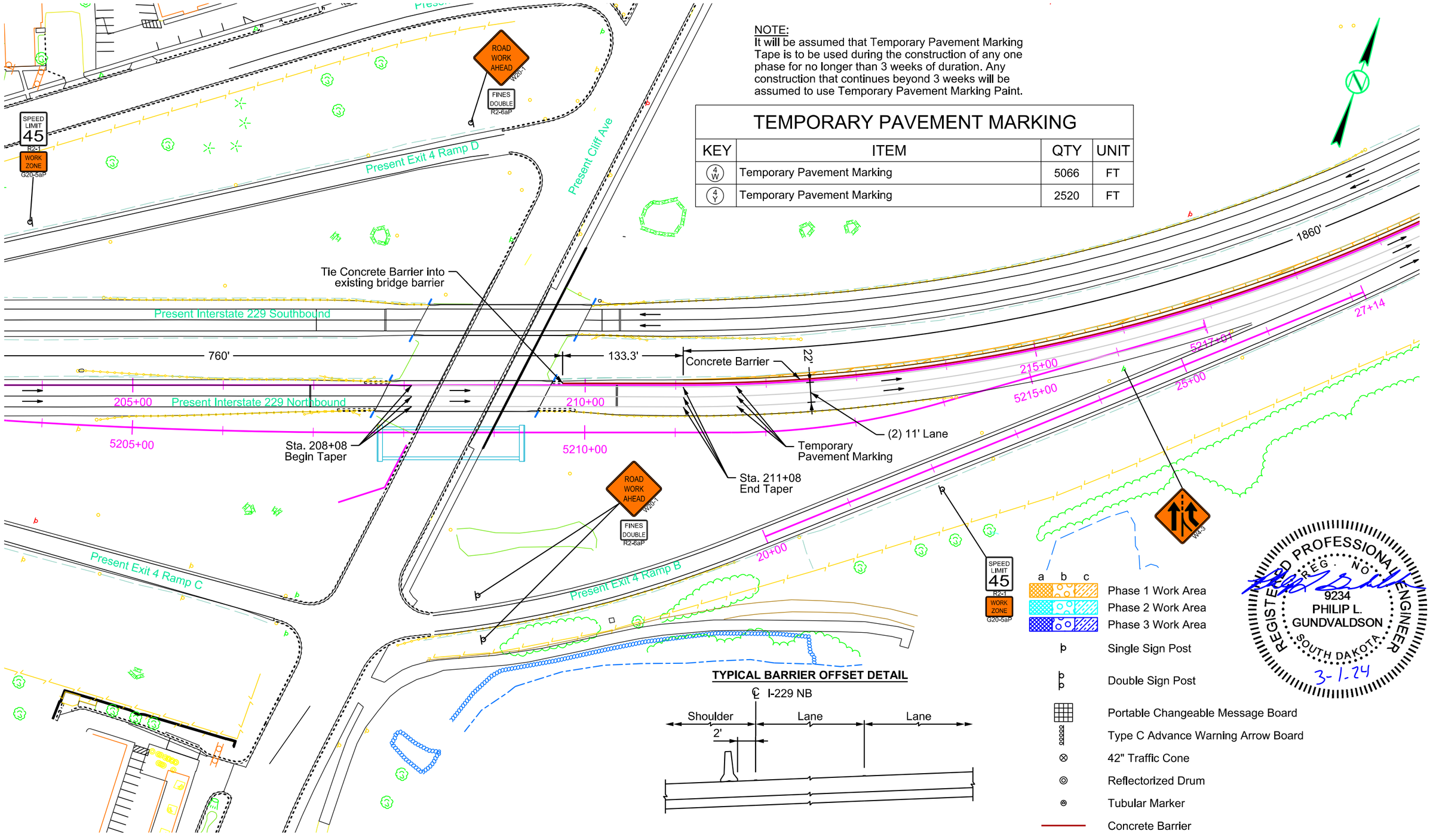
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C23	C66

Plotting Date: 03/01/2024

Phase 1 Signage

NOTE:
It will be assumed that Temporary Pavement Marking Tape is to be used during the construction of any one phase for no longer than 3 weeks of duration. Any construction that continues beyond 3 weeks will be assumed to use Temporary Pavement Marking Paint.

TEMPORARY PAVEMENT MARKING			
KEY	ITEM	QTY	UNIT
4 W	Temporary Pavement Marking	5066	FT
4 Y	Temporary Pavement Marking	2520	FT



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07CYs_Section\C_TC-Layouts-Phase1.dgn

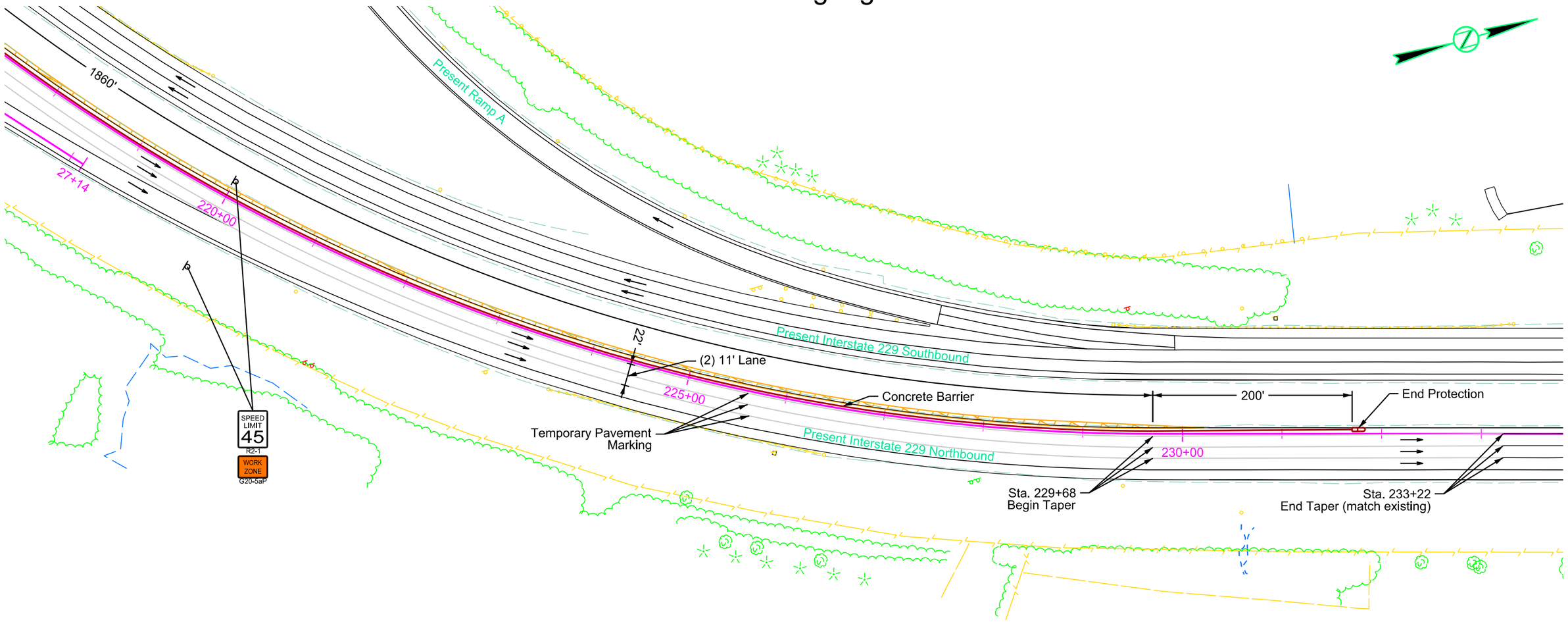
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C24	C66

Plotting Date: 03/01/2024

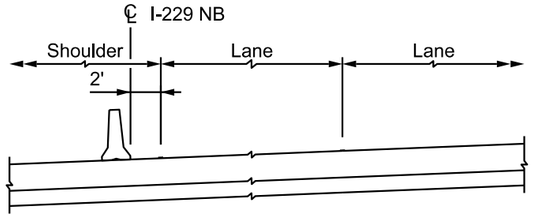
Phase 1 Signage



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

TYPICAL BARRIER OFFSET DETAIL



REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_TC-Layouts-Phase1.dgn

TRAFFIC CONTROL

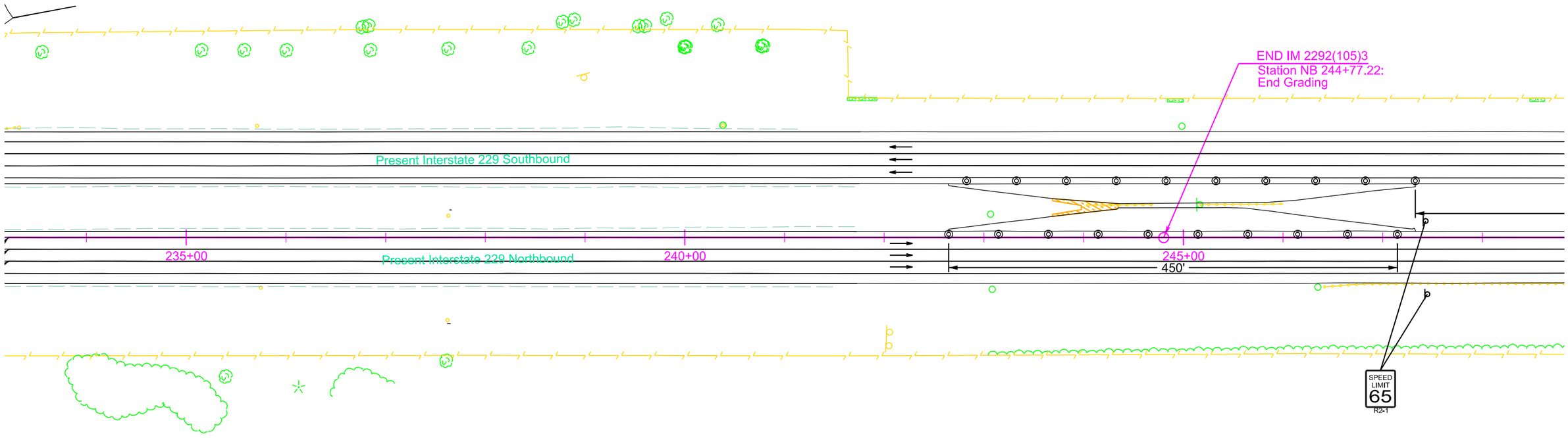
FOR BIDDING PURPOSES ONLY

Phase 1 Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C25	C66

Plotting Date: 03/01/2024

*NOTE: SB I-229 Lane Closure can be removed once Phase 1c is complete.



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

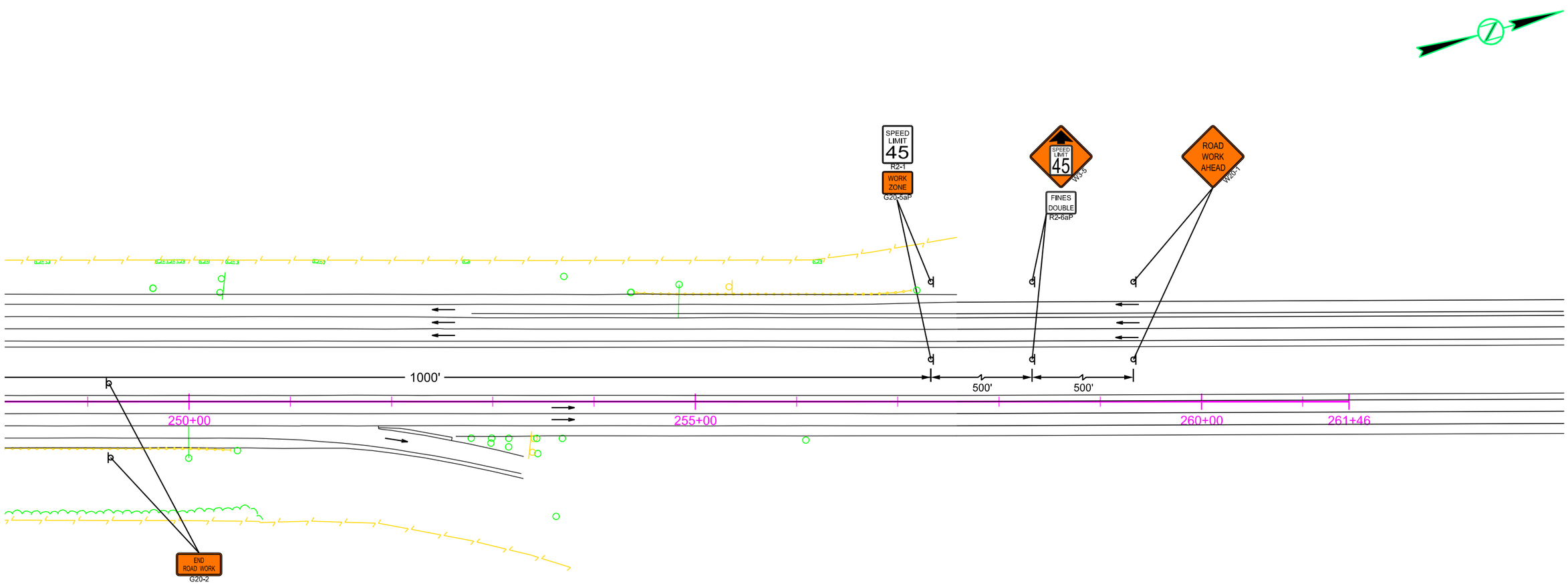
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 1 Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C26	C66

Plotting Date: 03/01/2024



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_SectionC_TC-Layouts-Phase1.dgn

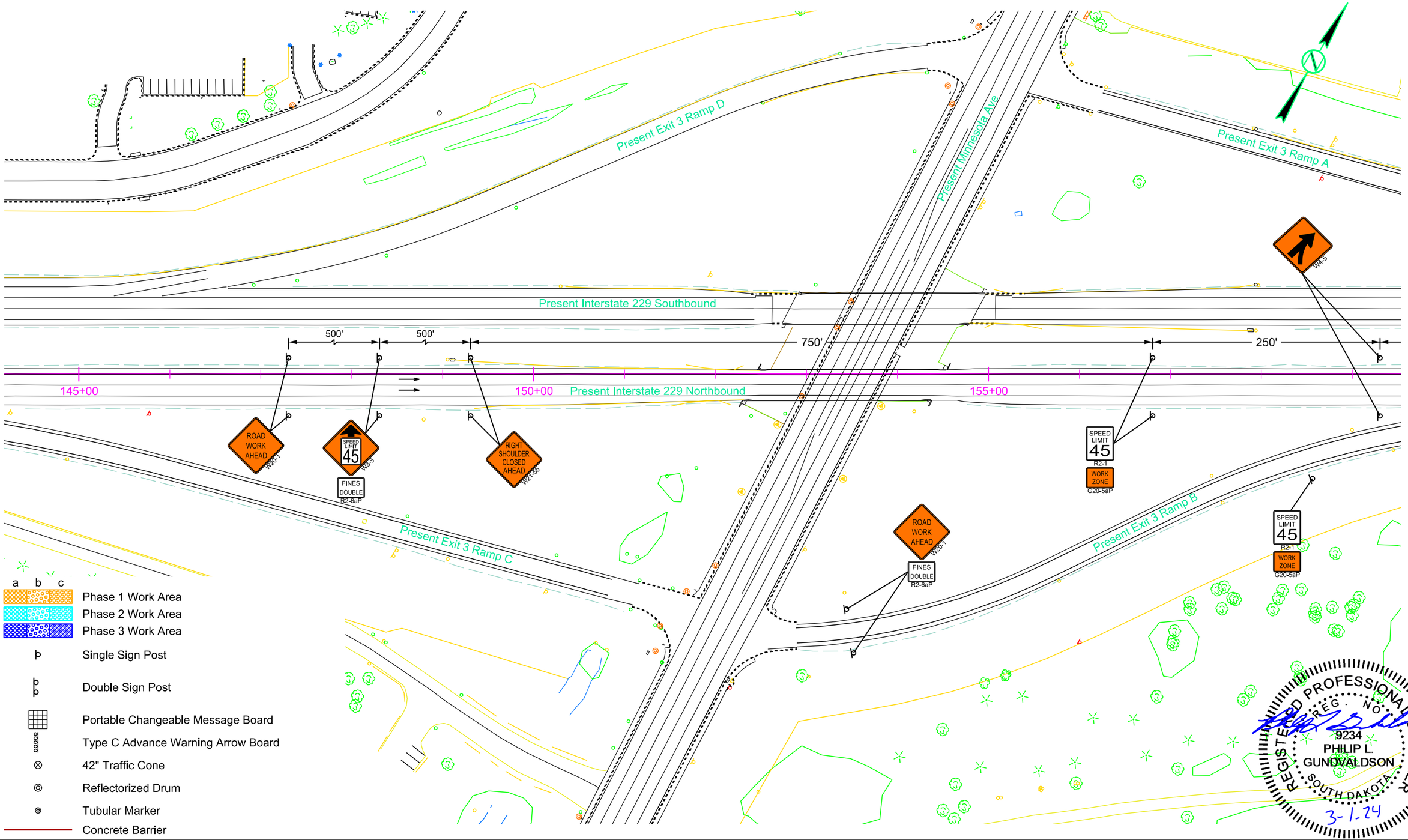
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 2a Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C27	C66

Plotting Date: 03/01/2024



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_TC-Layouts-Phase2a.dgn

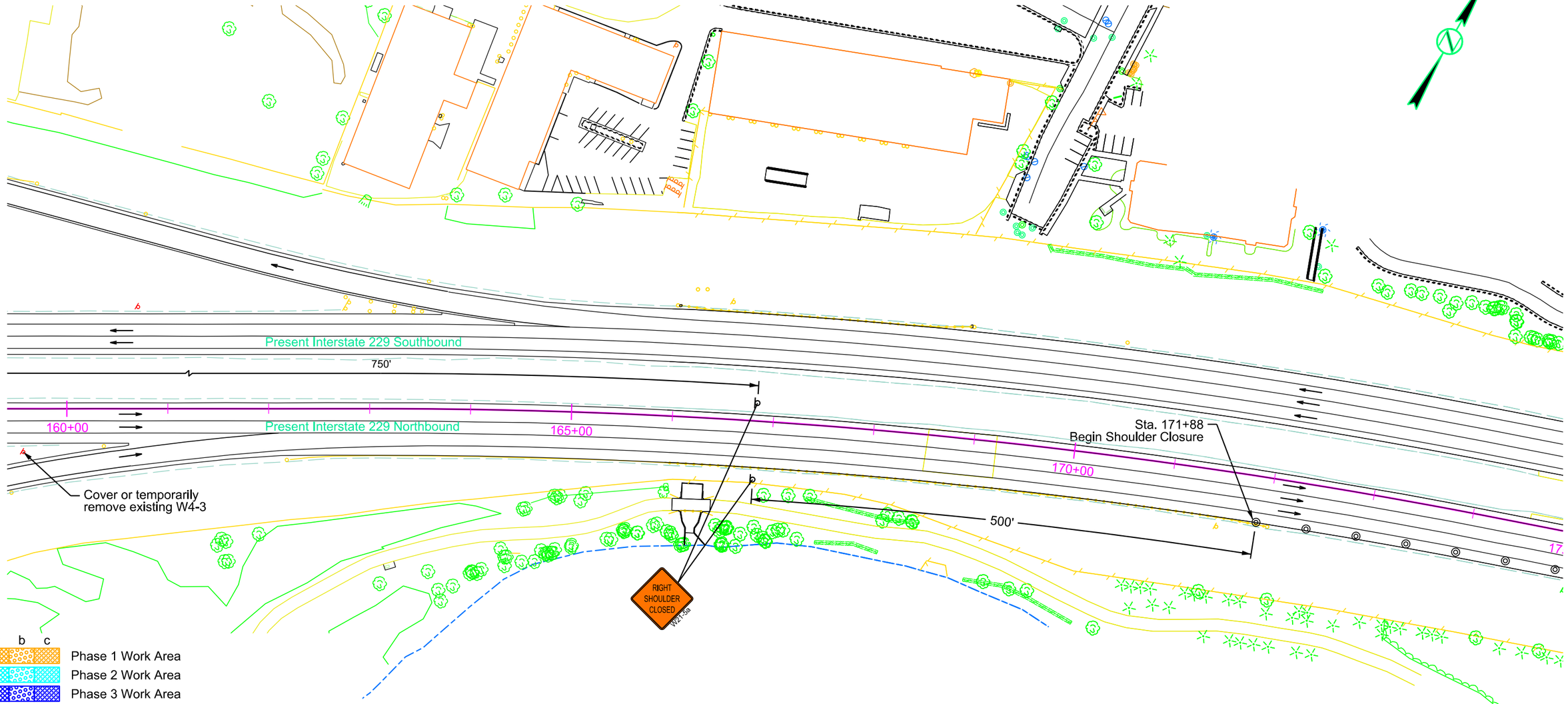
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 2a Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C28	C66

Plotting Date: 03/01/2024



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CY's_Section\C_TC-Layouts-Phase2a.dgn

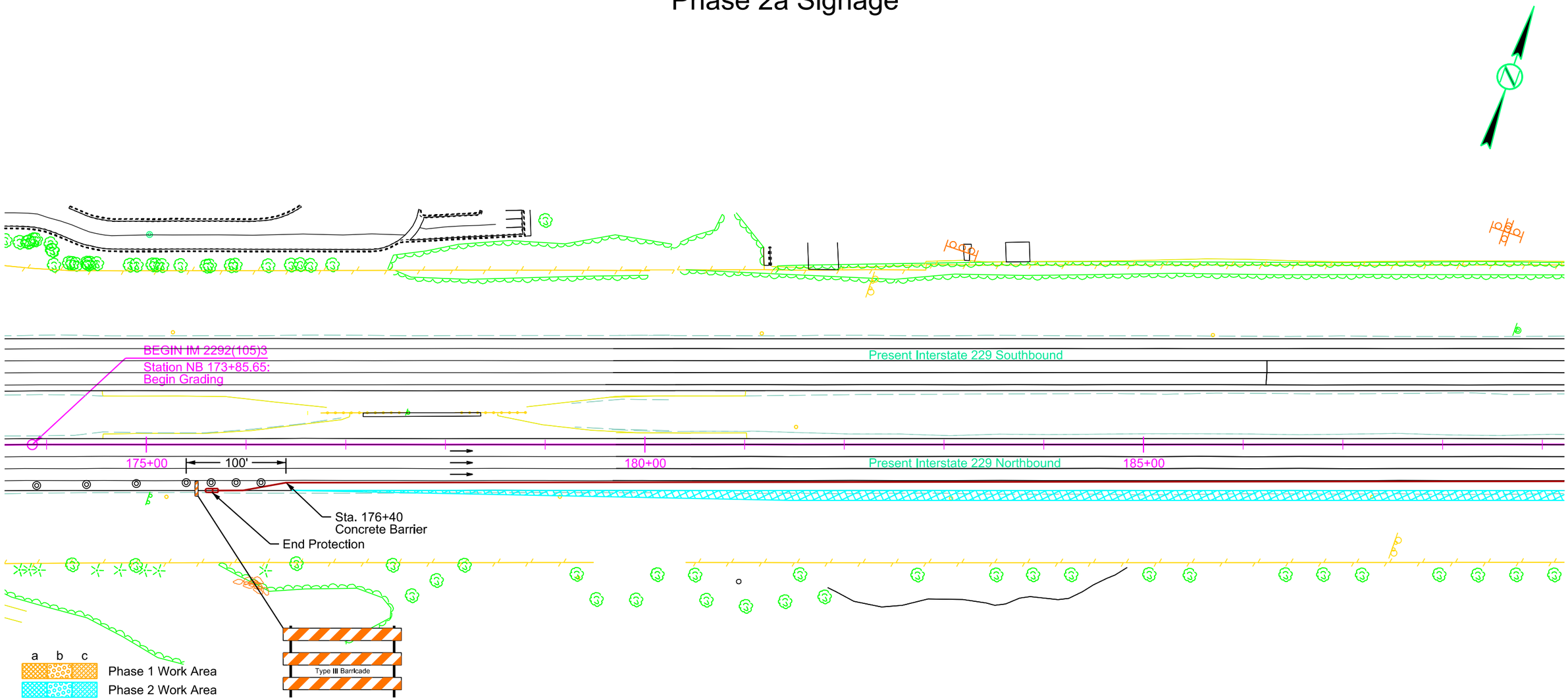
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 2a Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C29	C66

Plotting Date: 03/01/2024



a b c

Phase 1 Work Area

Phase 2 Work Area

Phase 3 Work Area

Single Sign Post

Double Sign Post

Portable Changeable Message Board

Type C Advance Warning Arrow Board

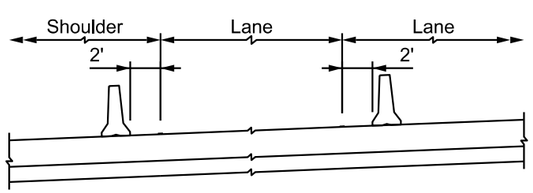
42" Traffic Cone

Reflectorized Drum

Tubular Marker

Concrete Barrier

TYPICAL BARRIER OFFSET DETAIL



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07CYs_SectionC_TC-Layouts-Phase2a.dgn

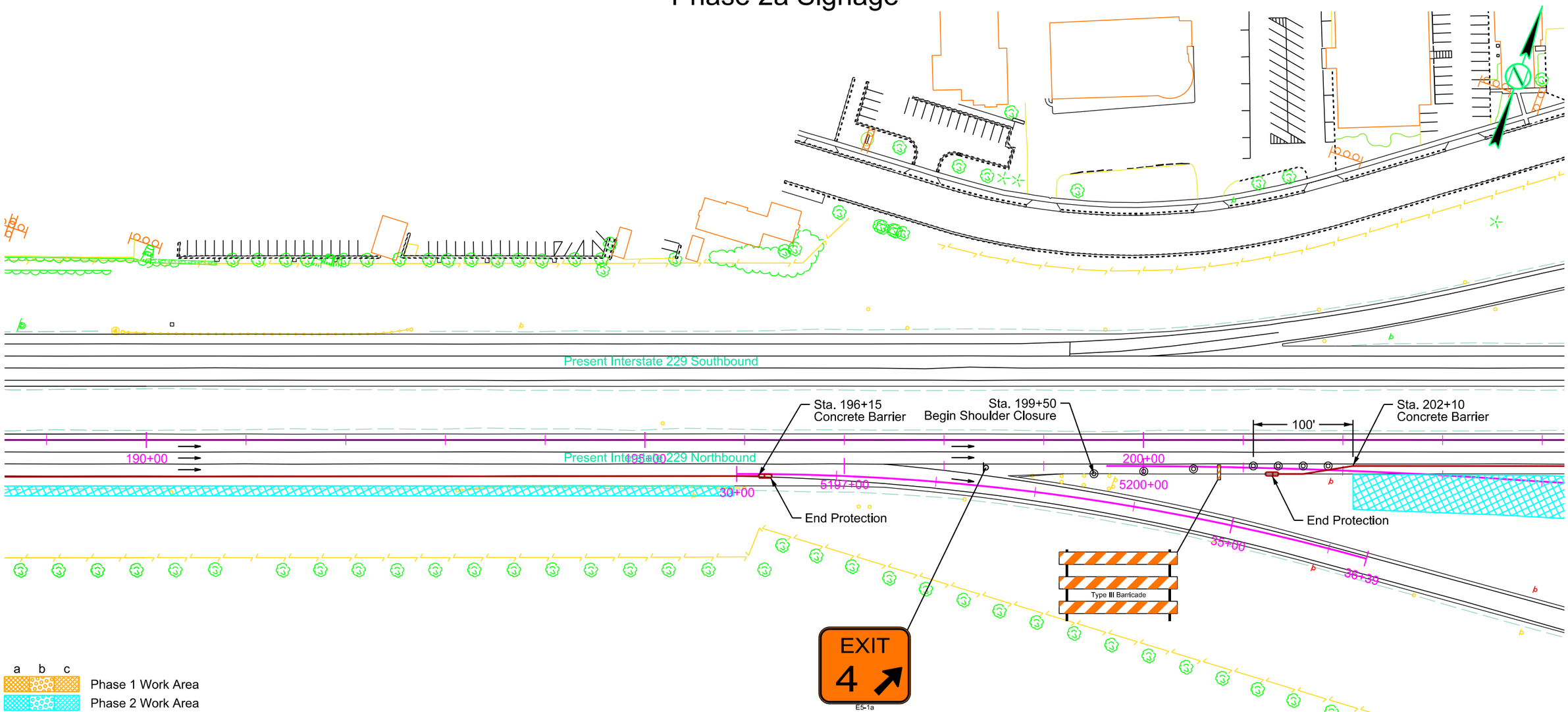
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 2a Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C30	C66

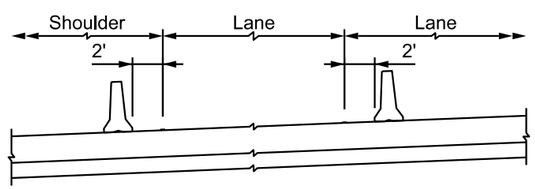
Plotting Date: 03/01/2024



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

TYPICAL BARRIER OFFSET DETAIL



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_TC-Layouts-Phase2a.dgn

TRAFFIC CONTROL

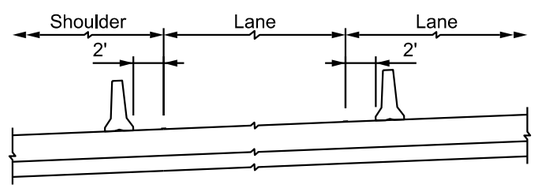
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C31	C66

Plotting Date: 03/01/2024

Phase 2a Signage

TYPICAL BARRIER OFFSET DETAIL



Present Exit 4 Ramp D
Present Cliff Ave
Present Interstate 229 Southbound
Present Exit 4 Ramp C
Present Exit 4 Ramp B
Tie Concrete Barrier into Exisiting Bridge Barrier
205+00 Present Interstate 229 Northbound
5205+00
210+00
5210+00
215+00
5215+00
5217+93
20+00
21+14
25+00
End Protection
Sta. 217+00 Begin Taper
500'
W2-1a
STAY IN LANE R4-9
ROAD WORK AHEAD W20-1
FINES DOUBLE R2-6aP
RIGHT SHOULDER CLOSED AHEAD W21-5b
SPEED LIMIT 45 R2-1
WORK ZONE G20-5aP
W4-3
RIGHT SHOULDER CLOSED W21-5b
Type III Barricade

a b c
- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100
Plotted From - InfrastructureDesignGroup
File - ...\07\CYs_SectionC_TC-Layouts-Phase2a.dgn

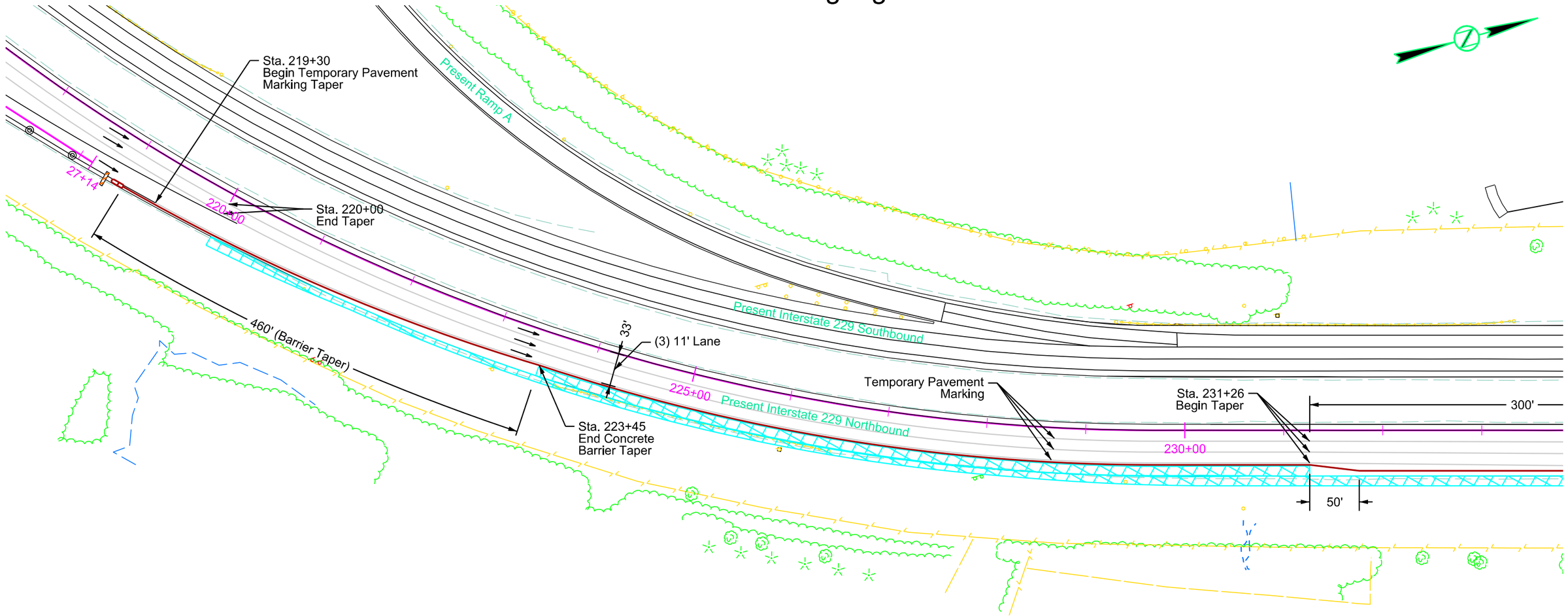
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C32	C66

Plotting Date: 03/01/2024

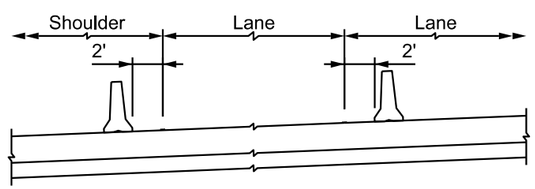
Phase 2a Signage



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

TYPICAL BARRIER OFFSET DETAIL



TEMPORARY PAVEMENT MARKING

KEY	ITEM	QTY	UNIT
(4W)	Temporary Pavement Marking	4982	FT

NOTE:
It will be assumed that Temporary Pavement Marking Tape is to be used during the construction of any one phase for no longer than 3 weeks of duration. Any construction that continues beyond 3 weeks will be assumed to use Temporary Pavement Marking Paint.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100
Plotted From - InfrastructureDesignGroup
File - ...\07CYs_Section\C_TC-Layouts-Phase2a.dgn

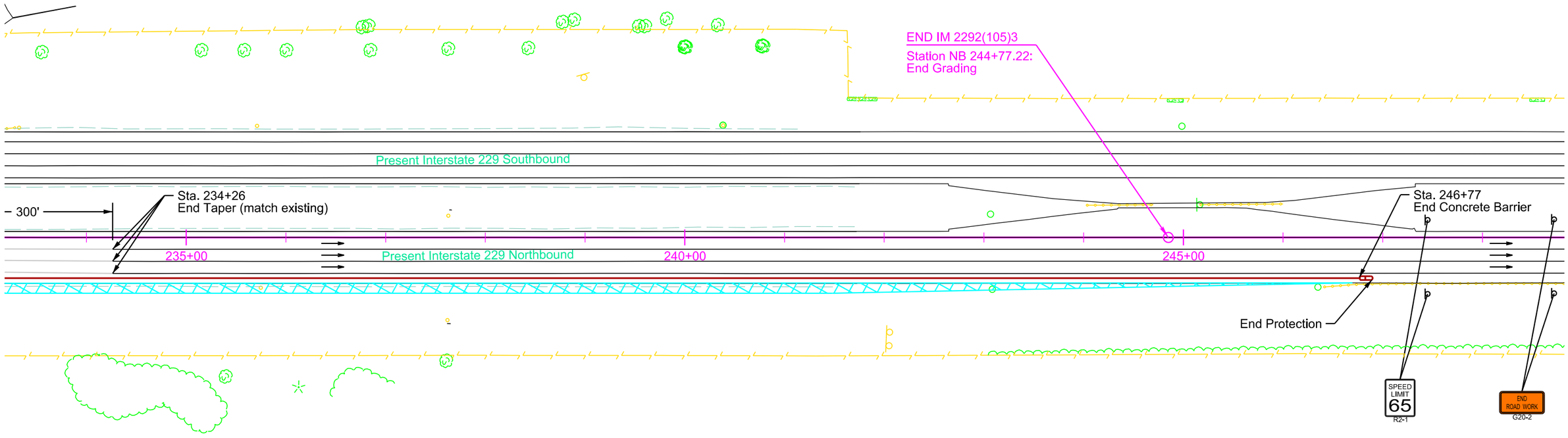
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 2a Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C33	C66

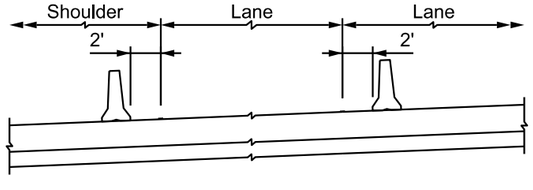
Plotting Date: 03/01/2024



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

TYPICAL BARRIER OFFSET DETAIL



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

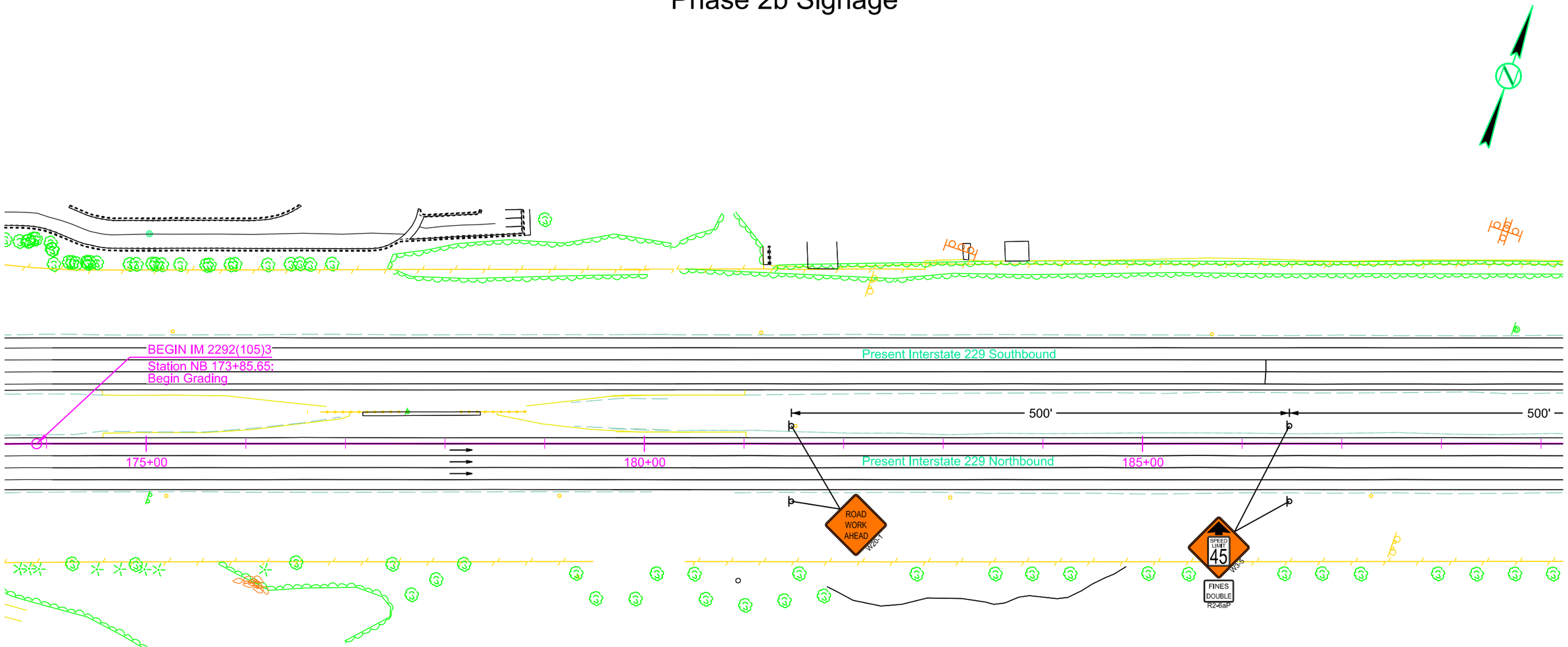
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 2b Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C34	C66

Plotting Date: 03/01/2024



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07CYs_SectionC_TC-Layouts-Phase2b.dgn

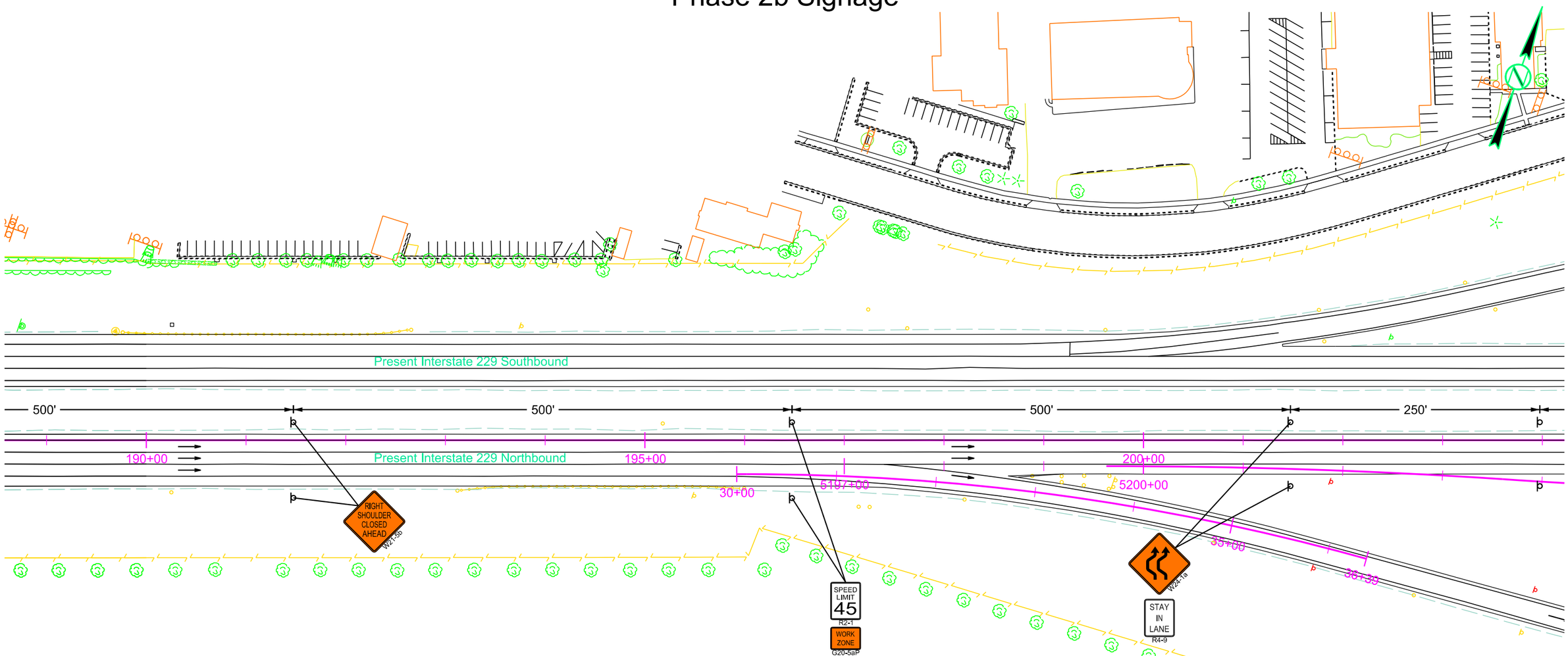
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C35	C66

Plotting Date: 03/01/2024

Phase 2b Signage



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07CYs_SectionC_TC-Layouts-Phase2b.dgn

TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

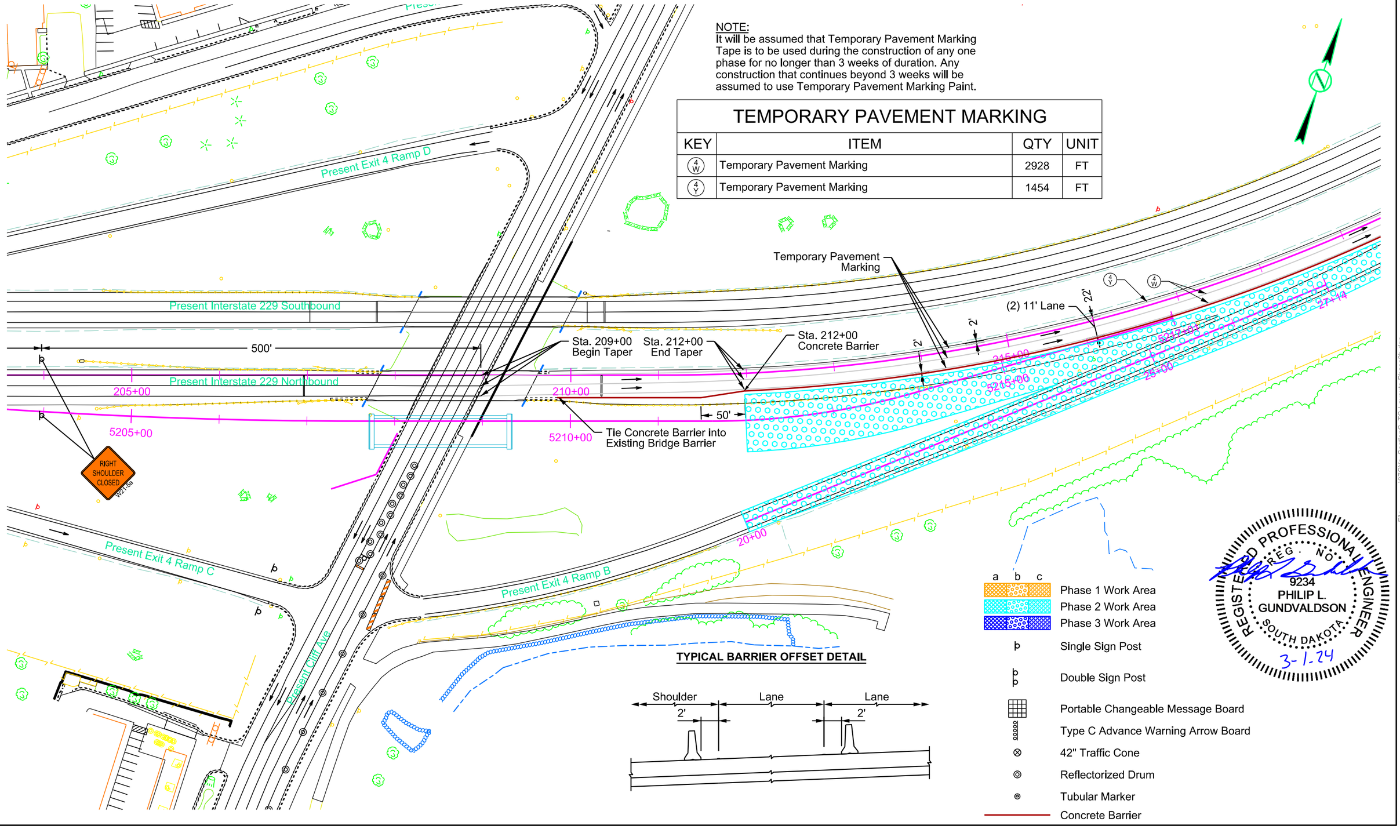
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C36	C66

Plotting Date: 03/01/2024

Phase 2b Signage

NOTE:
It will be assumed that Temporary Pavement Marking Tape is to be used during the construction of any one phase for no longer than 3 weeks of duration. Any construction that continues beyond 3 weeks will be assumed to use Temporary Pavement Marking Paint.

TEMPORARY PAVEMENT MARKING			
KEY	ITEM	QTY	UNIT
4W	Temporary Pavement Marking	2928	FT
4Y	Temporary Pavement Marking	1454	FT



TYPICAL BARRIER OFFSET DETAIL

a b c
Phase 1 Work Area
Phase 2 Work Area
Phase 3 Work Area
Single Sign Post
Double Sign Post
Portable Changeable Message Board
Type C Advance Warning Arrow Board
42" Traffic Cone
Reflectorized Drum
Tubular Marker
Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100
Plotted From - InfrastructureDesignGroup
File - ...\07CYs_SectionC_TC-Layouts-Phase2b.dgn

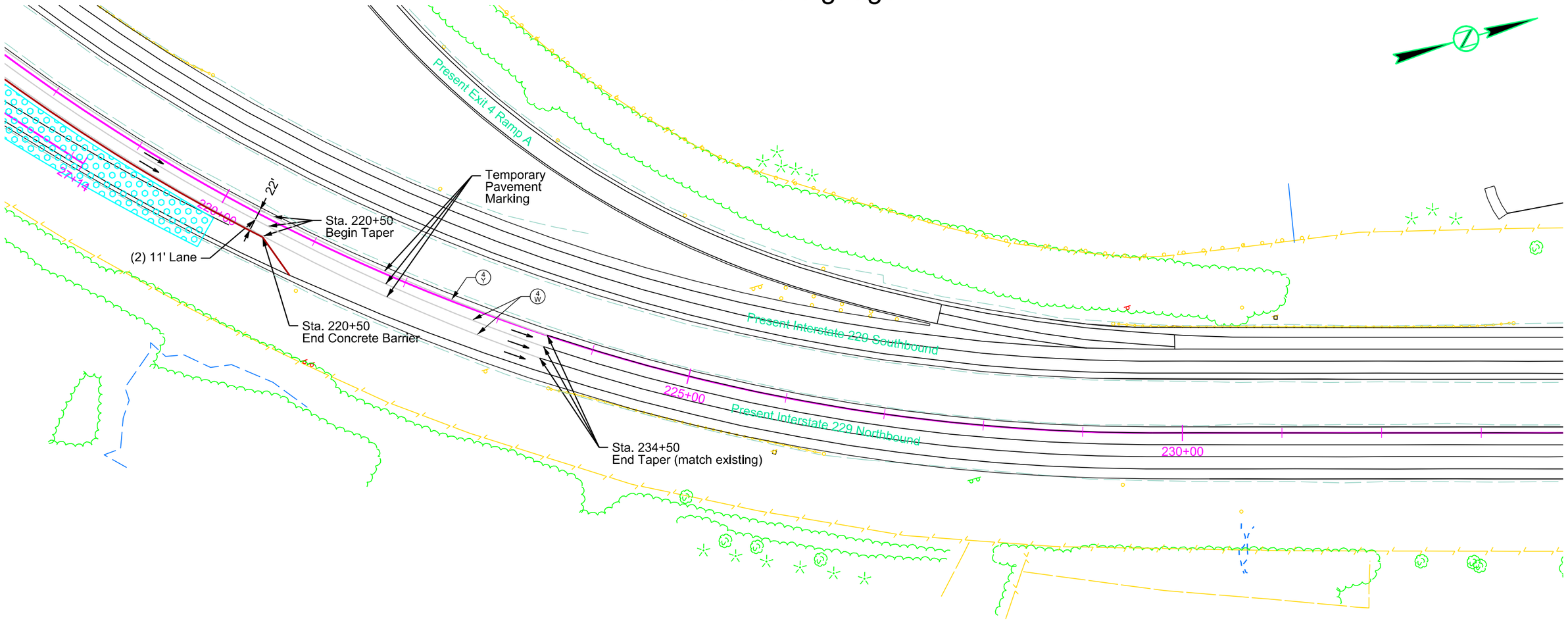
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C37	C66

Plotting Date: 03/01/2024

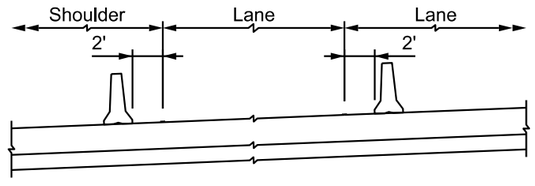
Phase 2b Signage



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

TYPICAL BARRIER OFFSET DETAIL



REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_SectionC_TC-Layouts-Phase2b.dgn

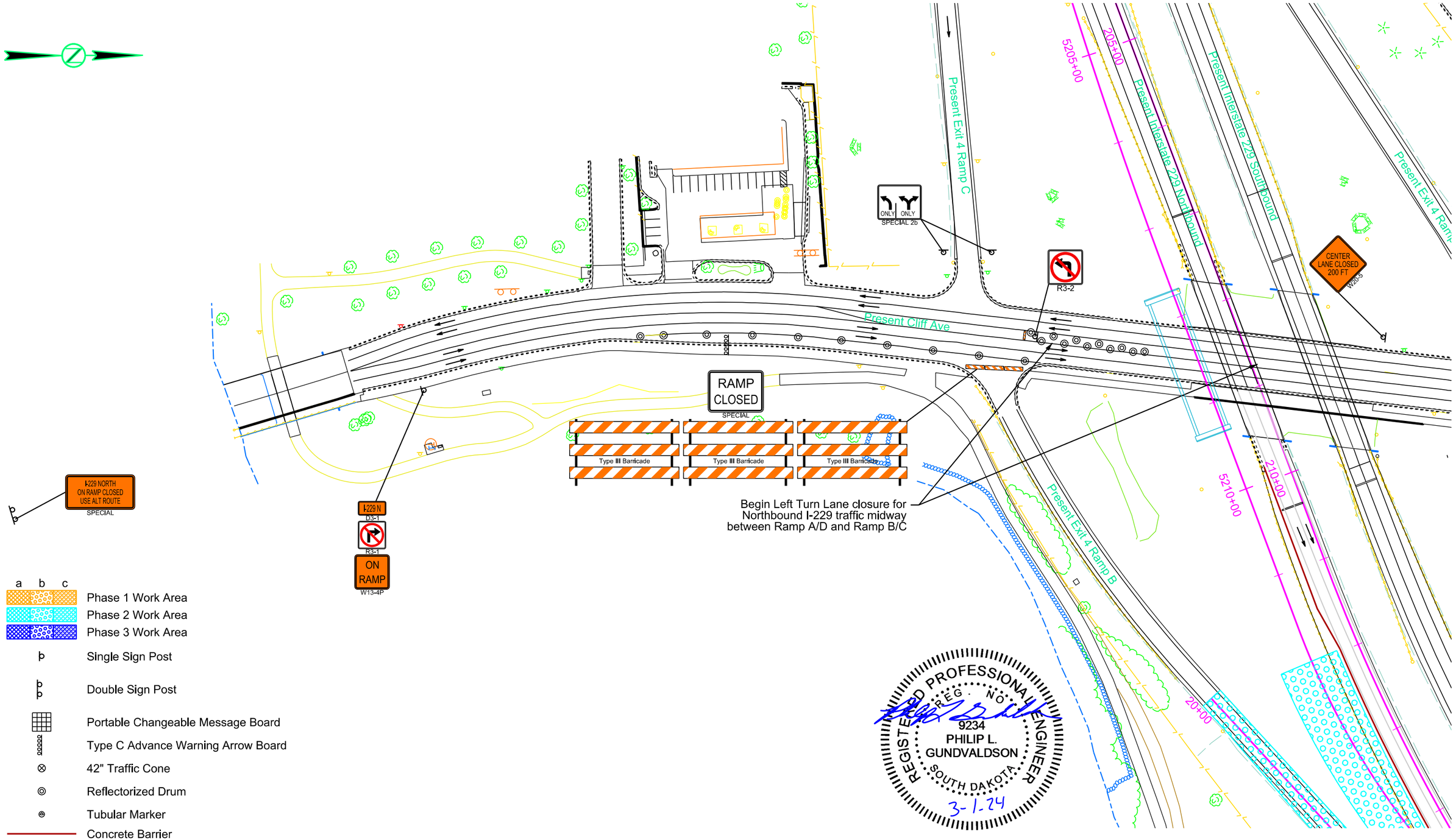
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 2b Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C38	C66

Plotting Date: 03/01/2024



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_TC-Layouts-Phase2b.dgn

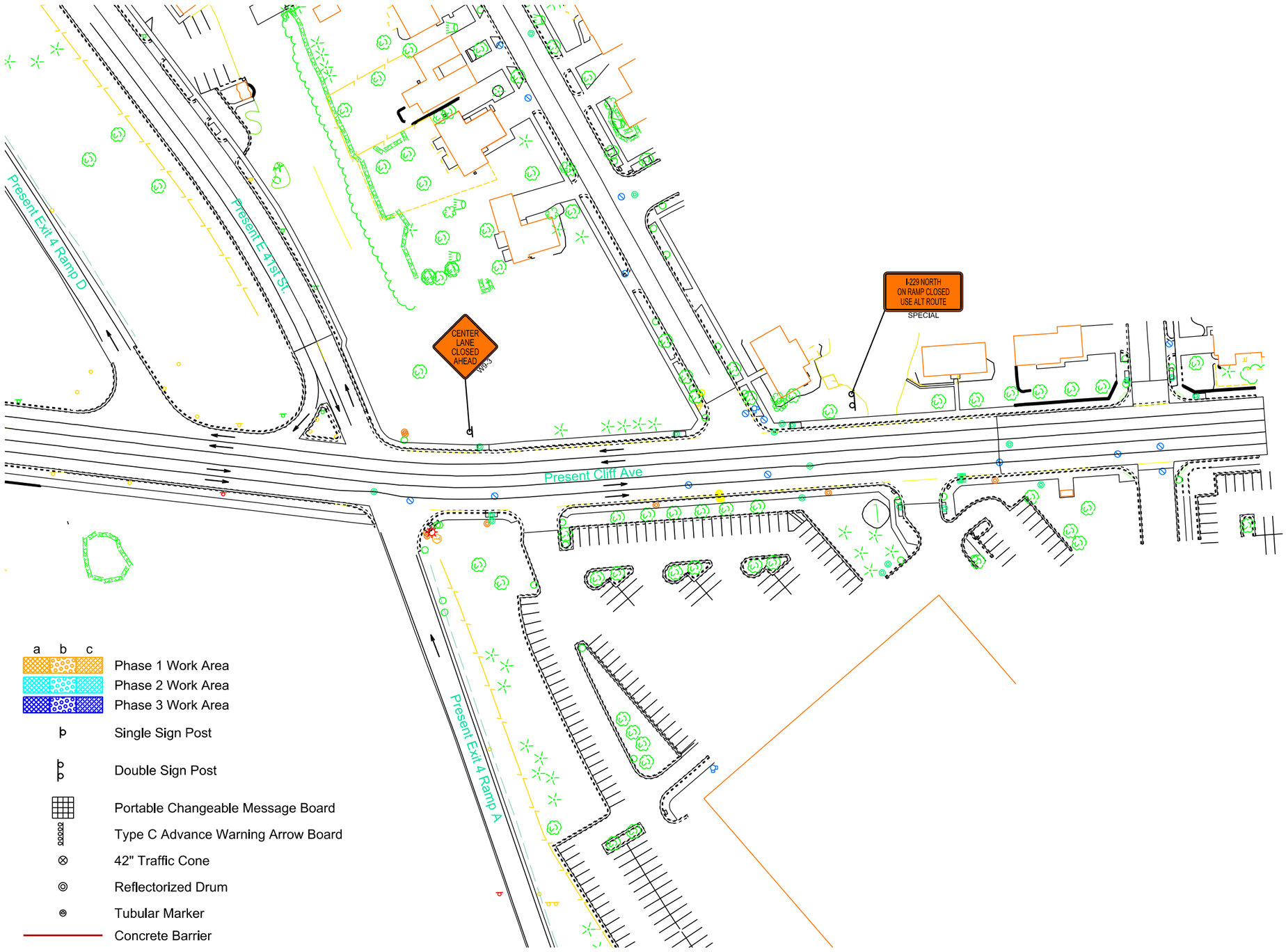
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 2b Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C39	C66

Plotting Date: 03/01/2024



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_SectionC_TC-Layouts-Phase2b.dgn

TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 2c Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C40	C66

Plotting Date: 03/01/2024

Present Exit 3 Ramp D

Present Minnesota Ave

Present Exit 3 Ramp A

I-229 EXIT 4
OFF RAMP CLOSED
USE ALT ROUTE
SPECIAL

Present Interstate 229 Southbound

500'

500'

145+00

150+00

155+00

Present Interstate 229 Northbound

I-229 EXIT 4
OFF RAMP CLOSED
USE ALT ROUTE
SPECIAL

Install 1000' ahead of present I229 SB Exit 3 Ramp C

SPEED LIMIT 45 W3-5

FINES DOUBLE R2-6aP

Present Exit 3 Ramp B

ROAD WORK AHEAD W20-1

Present Exit 3 Ramp C

I-229 EXIT 4
OFF RAMP CLOSED
USE ALT ROUTE
SPECIAL

a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_TC-Layouts-Phase2c.dgn

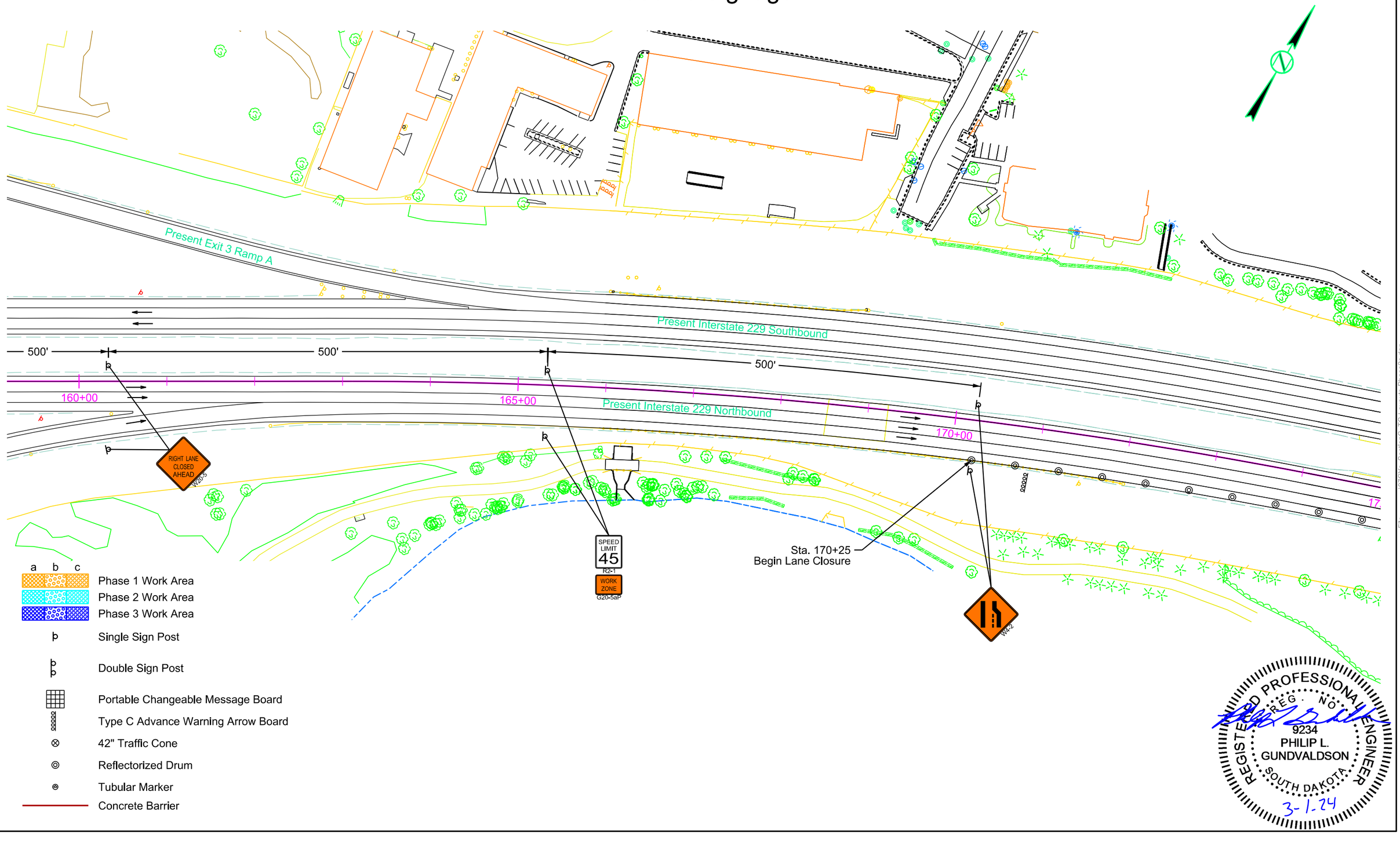
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 2c Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C41	C66

Plotting Date: 03/01/2024



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CY's_Section\C_TC-Layouts-Phase2c.dgn

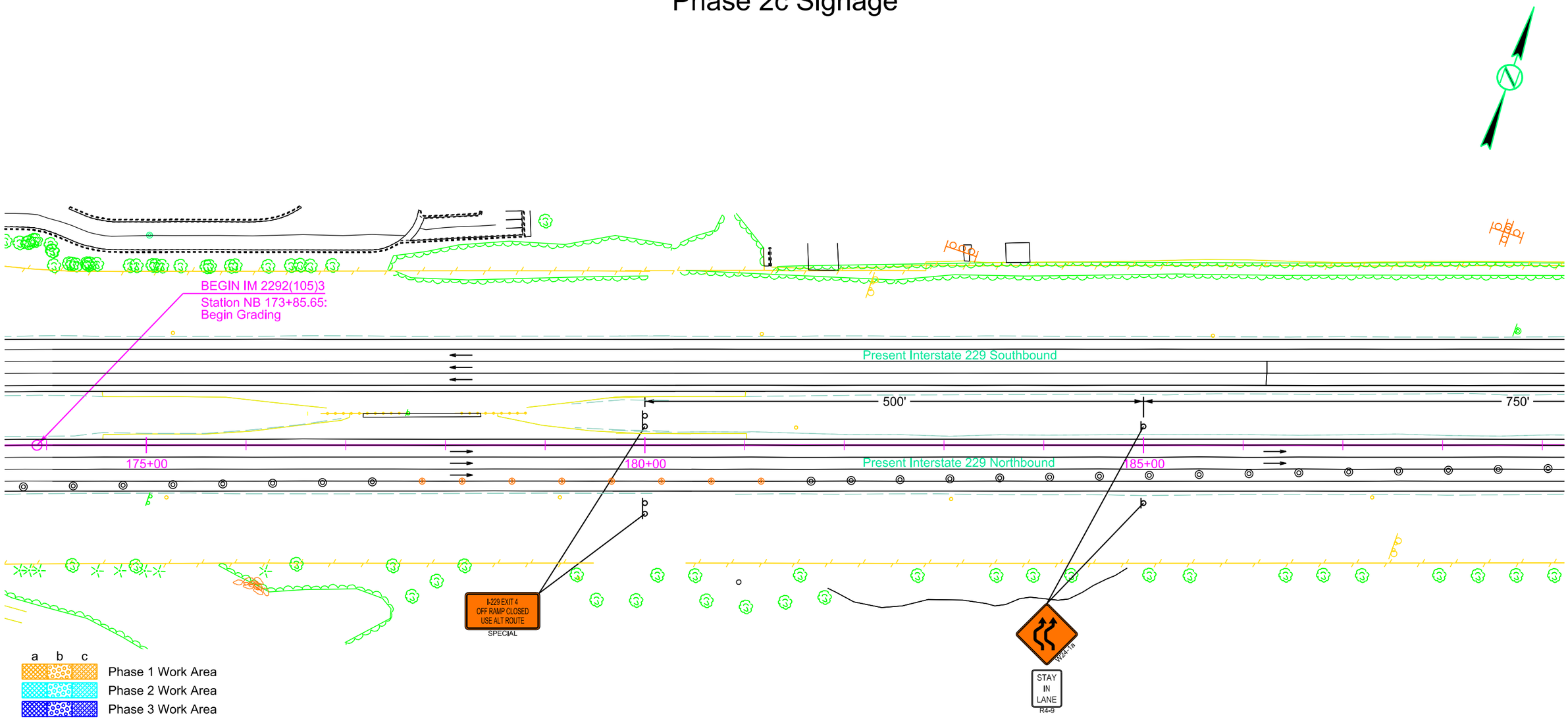
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 2c Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C42	C66

Plotting Date: 03/01/2024



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07CYs_SectionC_TC-Layouts-Phase2c.dgn

TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

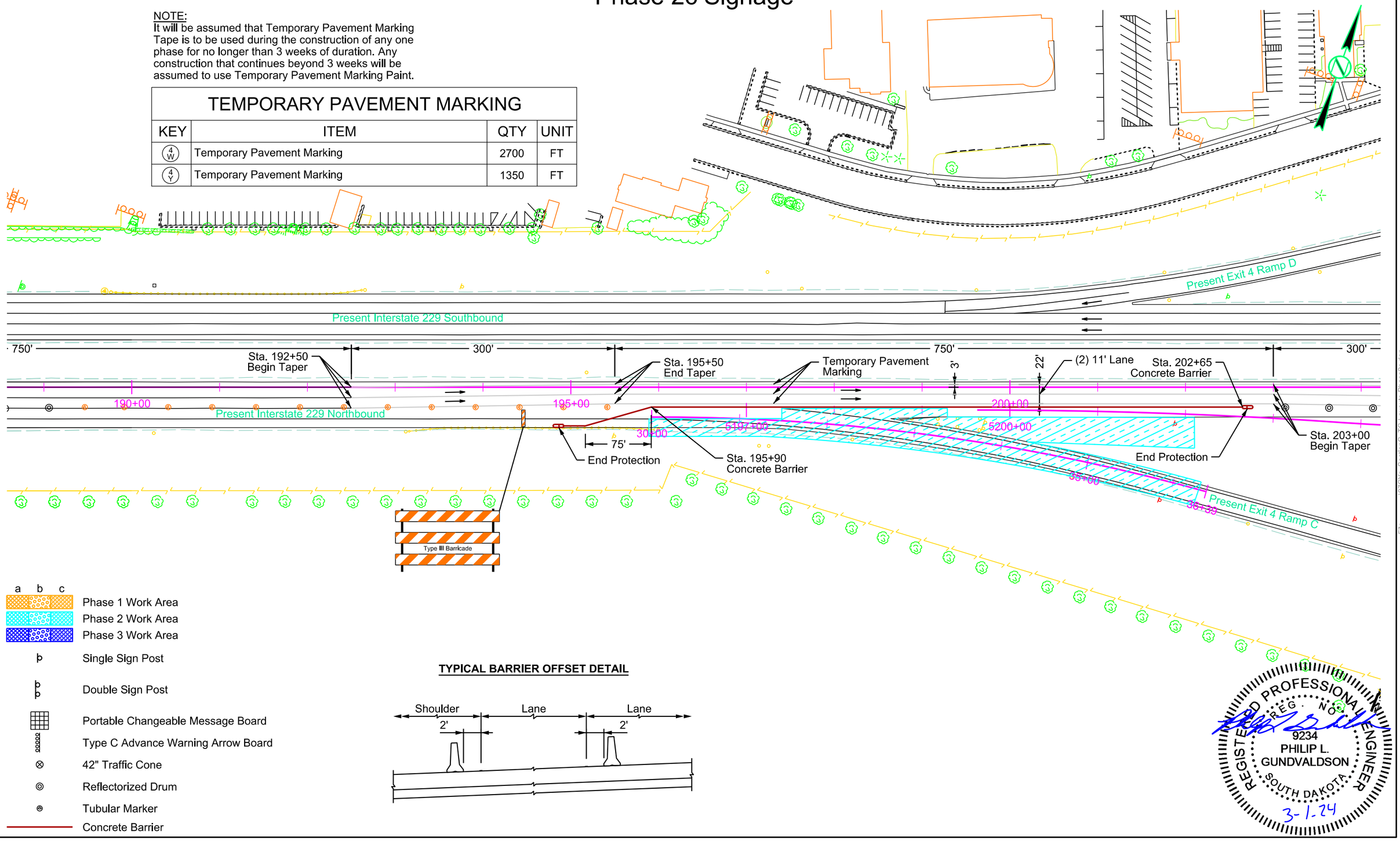
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C43	C66

Plotting Date: 03/01/2024

Phase 2c Signage

NOTE:
It will be assumed that Temporary Pavement Marking Tape is to be used during the construction of any one phase for no longer than 3 weeks of duration. Any construction that continues beyond 3 weeks will be assumed to use Temporary Pavement Marking Paint.

TEMPORARY PAVEMENT MARKING			
KEY	ITEM	QTY	UNIT
(4W)	Temporary Pavement Marking	2700	FT
(4Y)	Temporary Pavement Marking	1350	FT



a b c
- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

TYPICAL BARRIER OFFSET DETAIL

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 2c Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C44	C66

Plotting Date: 03/01/2024

Plot Scale - 1:100

Install 1000' ahead of present I229 SB Exit 5

I-229 EXIT 4
OFF RAMP CLOSED
USE ALT ROUTE
SPECIAL

Present Exit 4 Ramp D

Present Interstate 229 Southbound

300'

Sta. 206+00
End Taper (match existing)

Present Interstate 229 Northbound

205+00

5205+00

210+00

5210+00

215+00

5215+00

5217+93

25+00

27+14

20+00

Present Cliff Ave

Present Exit 4 Ramp B

Present Exit 4 Ramp C

EXIT
CLOSED
E5-2a

Type III Barricade

Type III Barricade

Type III Barricade

a b c

Phase 1 Work Area

Phase 2 Work Area

Phase 3 Work Area

Single Sign Post

Double Sign Post

Portable Changeable Message Board

Type C Advance Warning Arrow Board

42" Traffic Cone

Reflectorized Drum

Tubular Marker

Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plotted From - InfrastructureDesignGroup

File - ...\07CYs_SectionC_TC-Layouts-Phase2c.dgn

TRAFFIC CONTROL

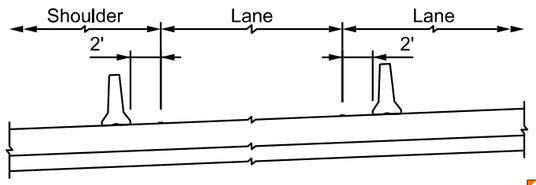
FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C45	C66

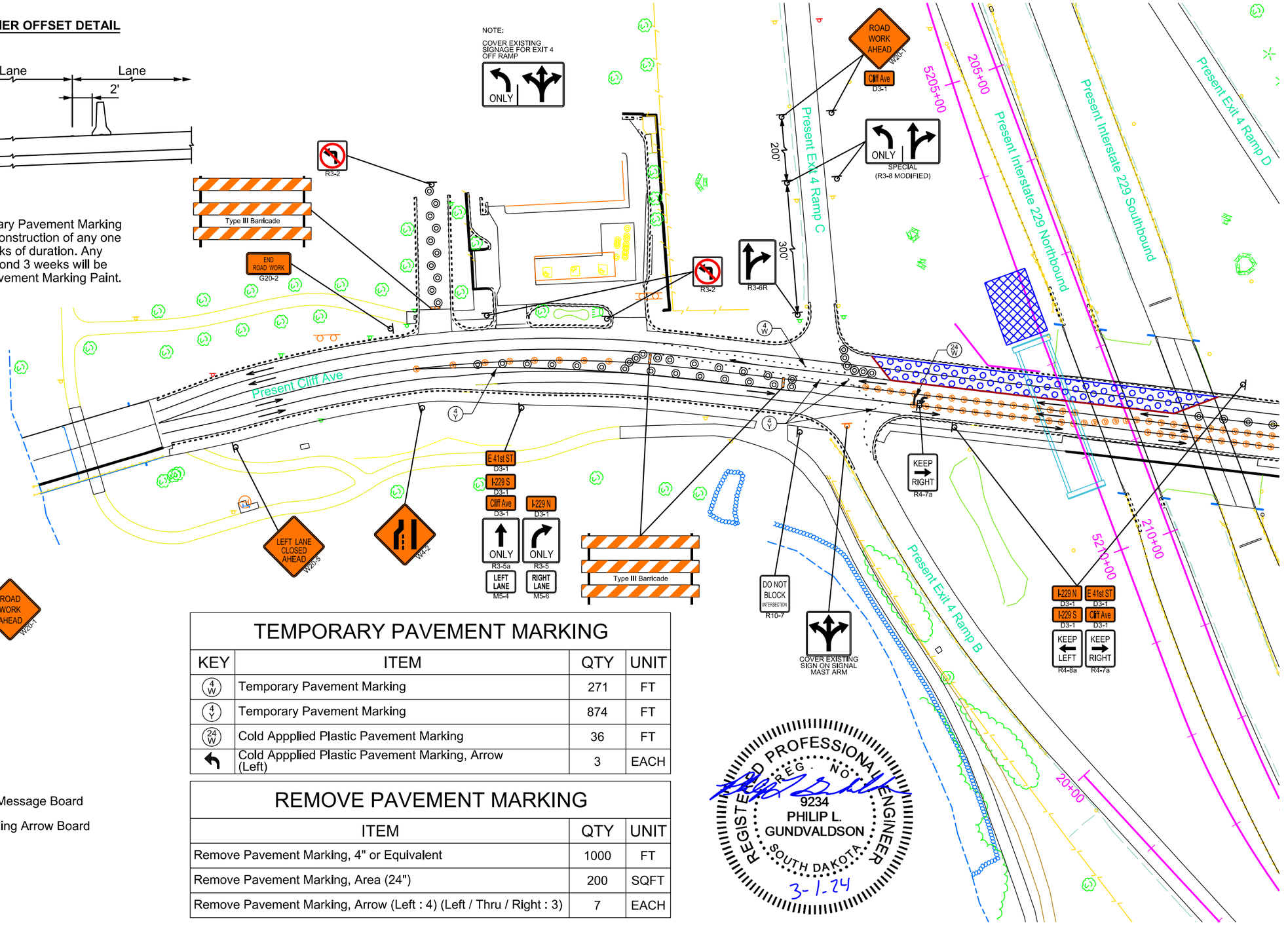
Plotting Date: 03/01/2024

Phase 3a Signage

TYPICAL BARRIER OFFSET DETAIL



NOTE:
It will be assumed that Temporary Pavement Marking Tape is to be used during the construction of any one phase for no longer than 3 weeks of duration. Any construction that continues beyond 3 weeks will be assumed to use Temporary Pavement Marking Paint.



a Phase 1 Work Area
b Phase 2 Work Area
c Phase 3 Work Area

- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

TEMPORARY PAVEMENT MARKING

KEY	ITEM	QTY	UNIT
4 W	Temporary Pavement Marking	271	FT
4 Y	Temporary Pavement Marking	874	FT
24 W	Cold Appplied Plastic Pavement Marking	36	FT
	Cold Appplied Plastic Pavement Marking, Arrow (Left)	3	EACH

REMOVE PAVEMENT MARKING

ITEM	QTY	UNIT
Remove Pavement Marking, 4" or Equivalent	1000	FT
Remove Pavement Marking, Area (24")	200	SQFT
Remove Pavement Marking, Arrow (Left : 4) (Left / Thru / Right : 3)	7	EACH

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07CYs_SectionC_TC-Layouts-Phase3a.dgn

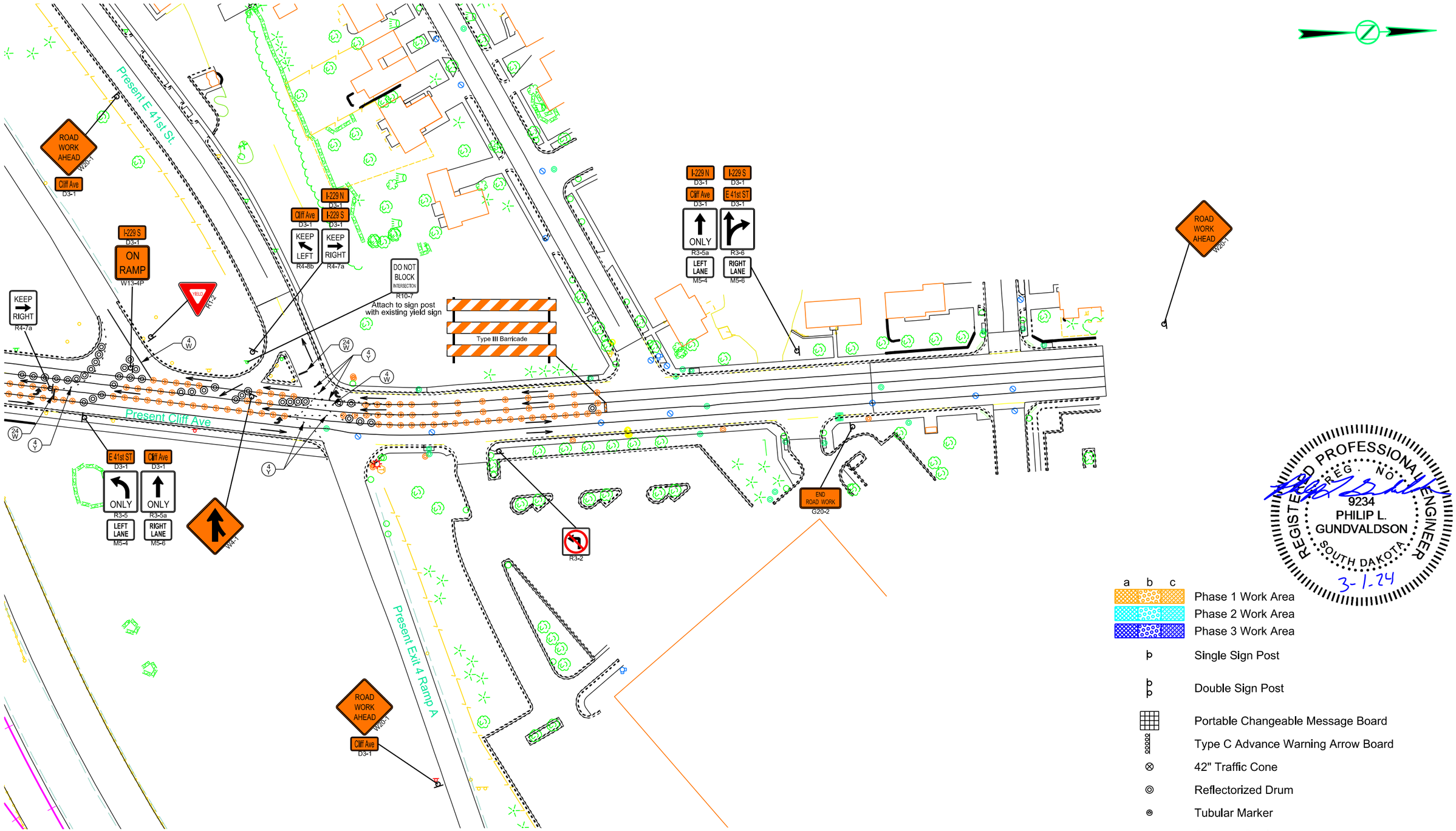
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 3a Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C46	C66

Plotting Date: 03/01/2024



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_SectionC_TC-Layouts-Phase3a.dgn

TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

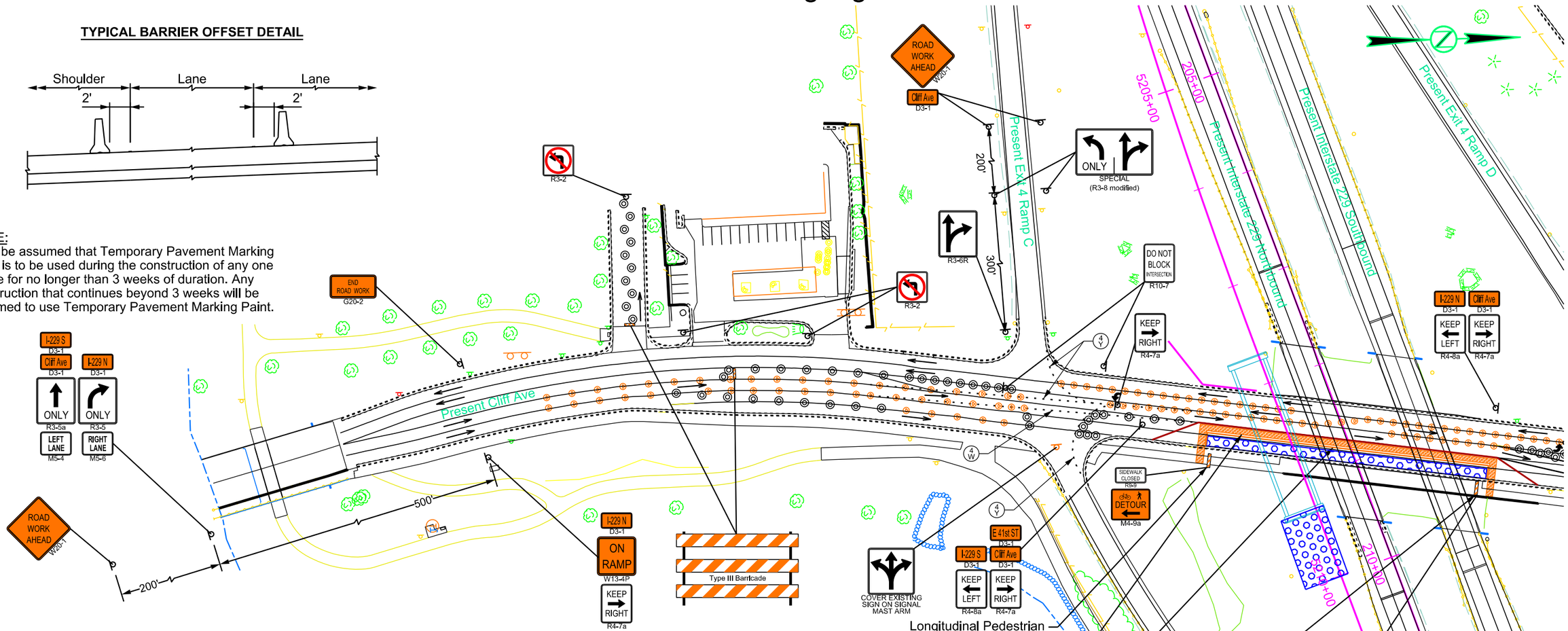
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C47	C66

Plotting Date: 03/01/2024

Phase 3b Signage

TYPICAL BARRIER OFFSET DETAIL

NOTE:
It will be assumed that Temporary Pavement Marking Tape is to be used during the construction of any one phase for no longer than 3 weeks of duration. Any construction that continues beyond 3 weeks will be assumed to use Temporary Pavement Marking Paint.



a b c
- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier
- Pedestrian Path

TEMPORARY PAVEMENT MARKING

KEY	ITEM	QTY	UNIT
4 W	Temporary Pavement Marking	420	FT
4 Y	Temporary Pavement Marking	874	FT
24 W	Cold Appplied Plastic Pavement Marking	24	FT
	Cold Appplied Plastic Pavement Marking, Arrow (Left)	3	EACH

REMOVE PAVEMENT MARKING

ITEM	QTY	UNIT
Remove Pavement Marking, 4" or Equivalent	1000	FT

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_TC-Layouts-Phase3b.dgn

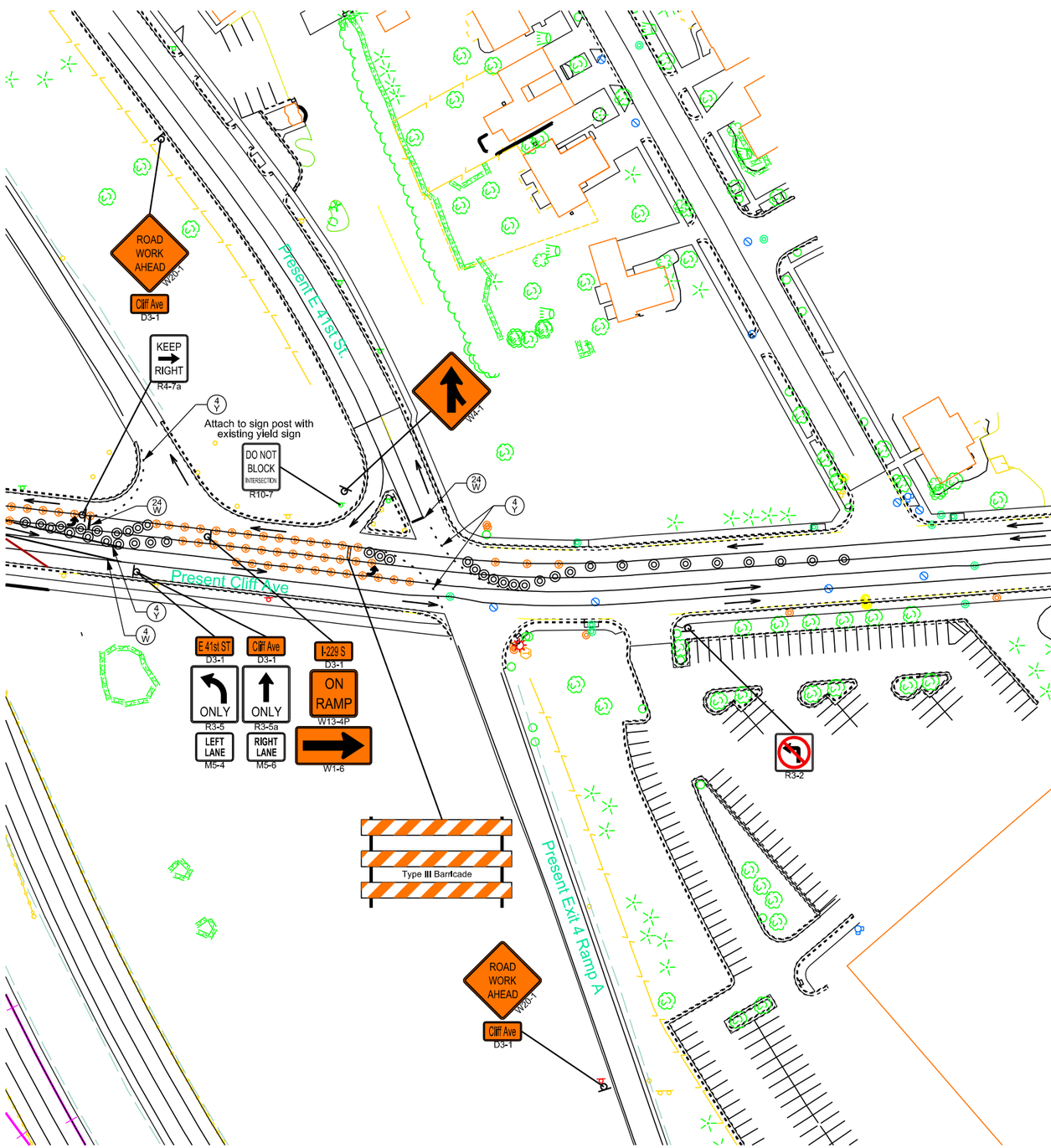
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 3b Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C48	C66

Plotting Date: 03/01/2024



a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker
- Concrete Barrier
- Pedestrian Path

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_TC-Layouts-Phase3b.dgn

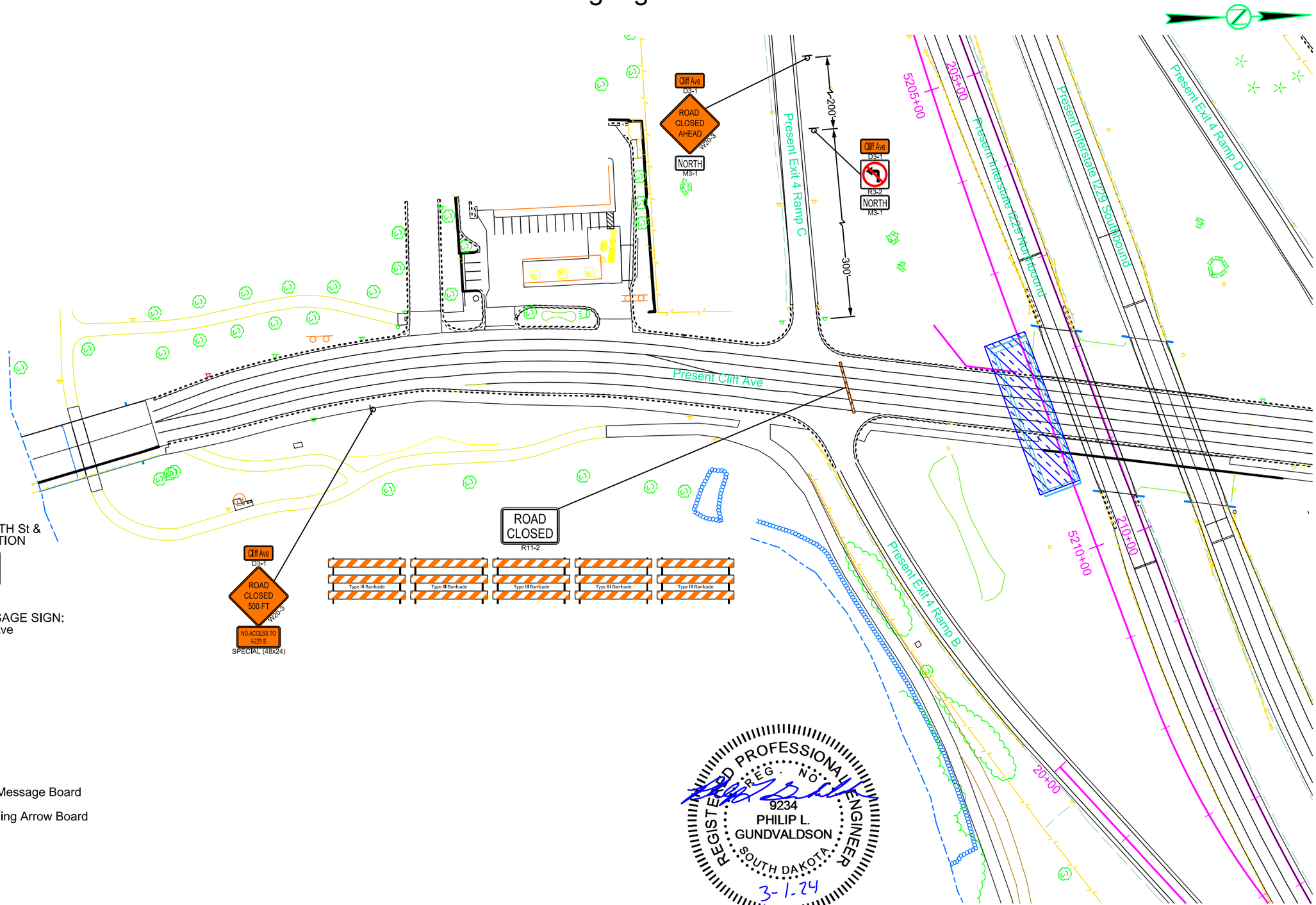
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 3c Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C49	C66

Plotting Date: 03/01/2024



INSTALL (3) AT E 57TH St & CLIFF AVE JUNCTION

ROAD CLOSED 1 MILE AHEAD CLIFF AVE & I-229 JCT
SPECIAL

PORTABLE MESSAGE SIGN: E 57th ST & Cliff Ave

a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07Cys_SectionC_TC-Layouts-Phase3c.dgn

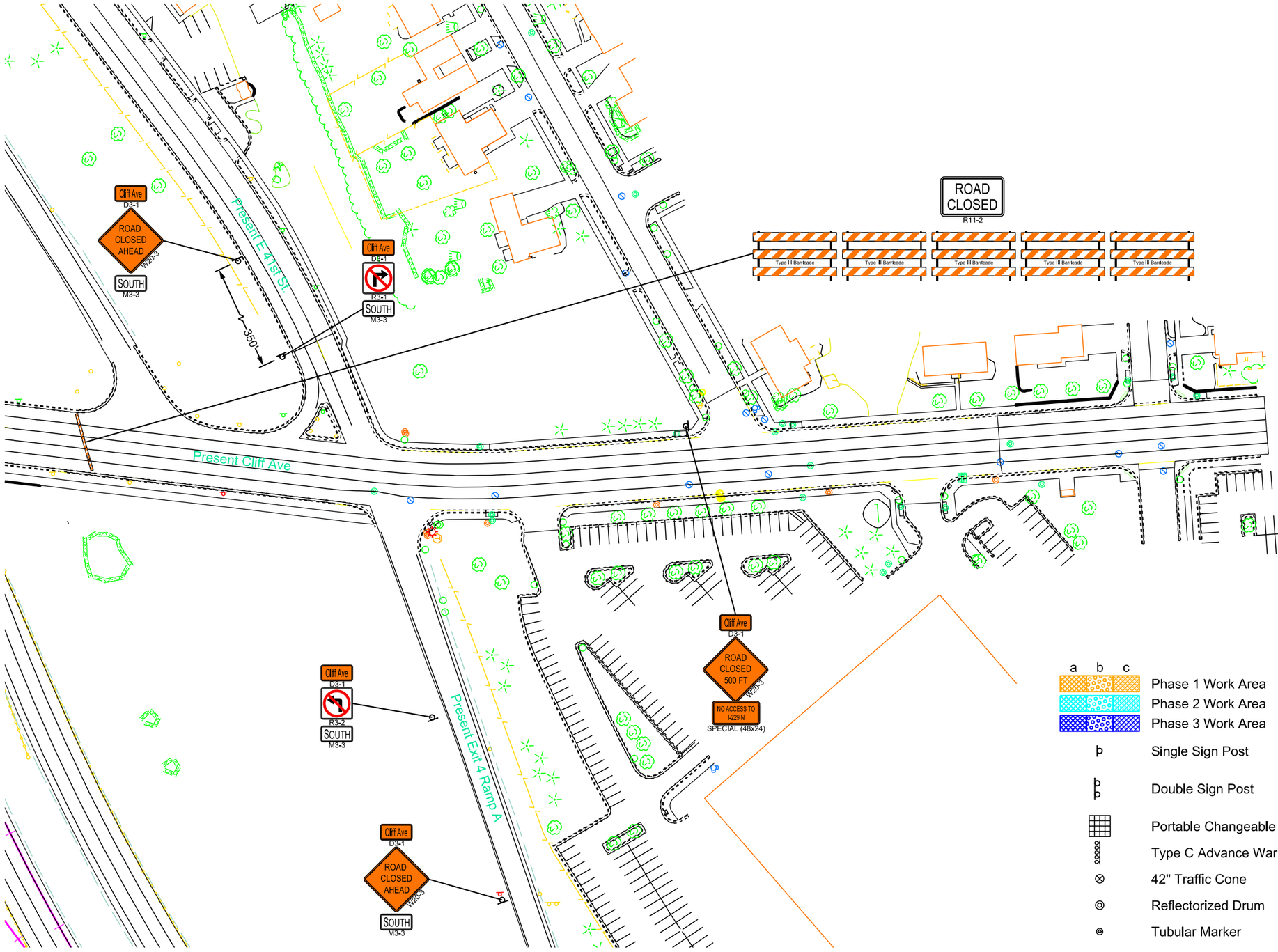
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 3c Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C50	C66

Plotting Date: 03/01/2024



PORTABLE MESSAGE SIGN:
E 57th ST & Cliff Ave

INSTALL (3) AT E 33RD St
& CLIFF AVE JUNCTION

ROAD CLOSED
1/2 MILE AHEAD
CLIFF AVE & I-229 JCT
SPECIAL

a b c

- Phase 1 Work Area
- Phase 2 Work Area
- Phase 3 Work Area
- Single Sign Post
- Double Sign Post
- Portable Changeable Message Board
- Type C Advance Warning Arrow Board
- 42" Traffic Cone
- Reflectorized Drum
- Tubular Marker

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07CYs_SectionC_TC-Layouts-Phase3c.dgn

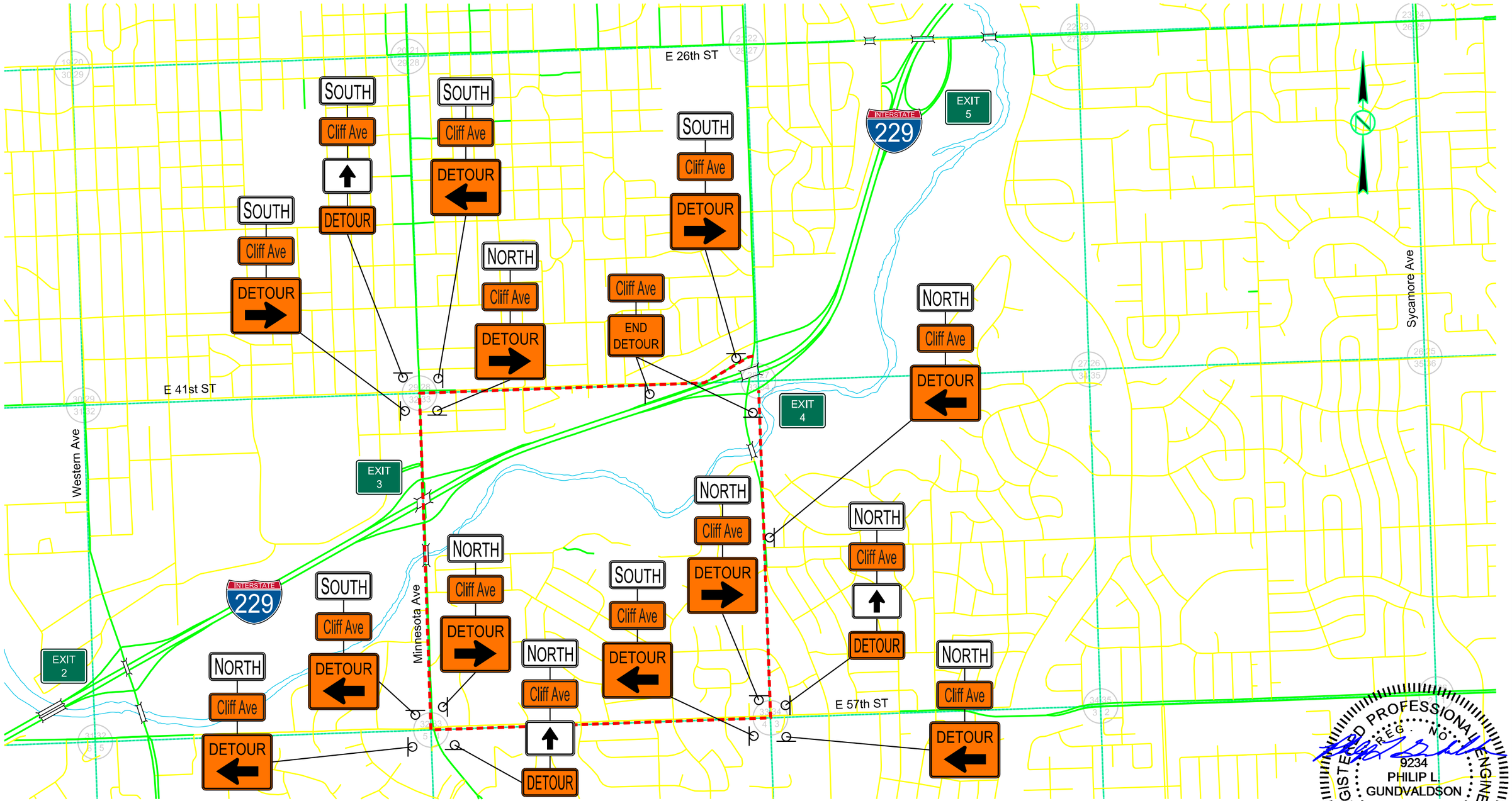
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 3c Signage

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C51	C66

Plotting Date: 03/01/2024



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - 1:1500

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_TC-Layouts-Phase3c-DETOUR.dgn

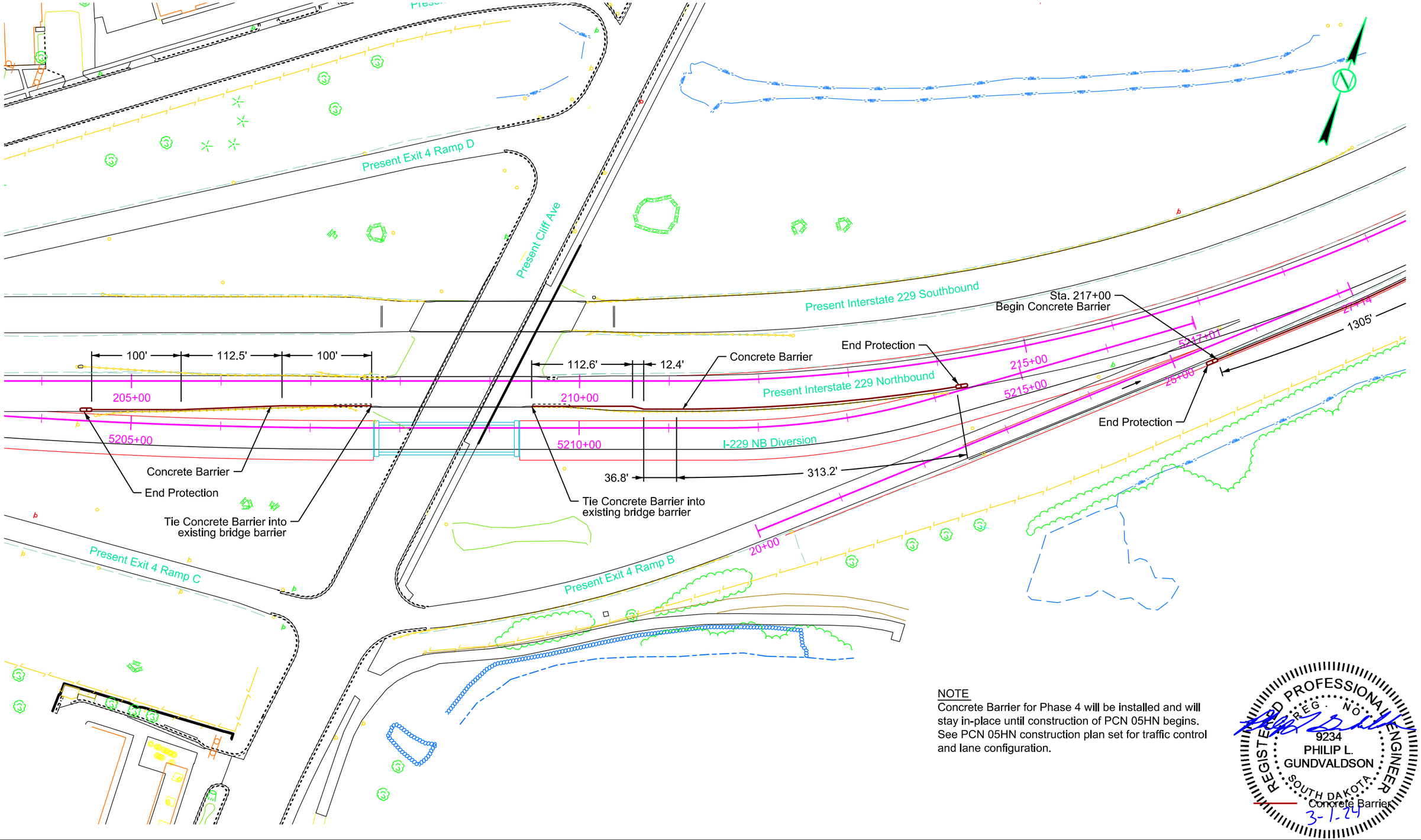
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C52	C66

Plotting Date: 03/01/2024

Phase 4



NOTE
Concrete Barrier for Phase 4 will be installed and will stay in-place until construction of PCN 05HN begins. See PCN 05HN construction plan set for traffic control and lane configuration.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Concrete Barrier

Plot Scale - 1:100

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_TC-Layouts-Phase4.dgn

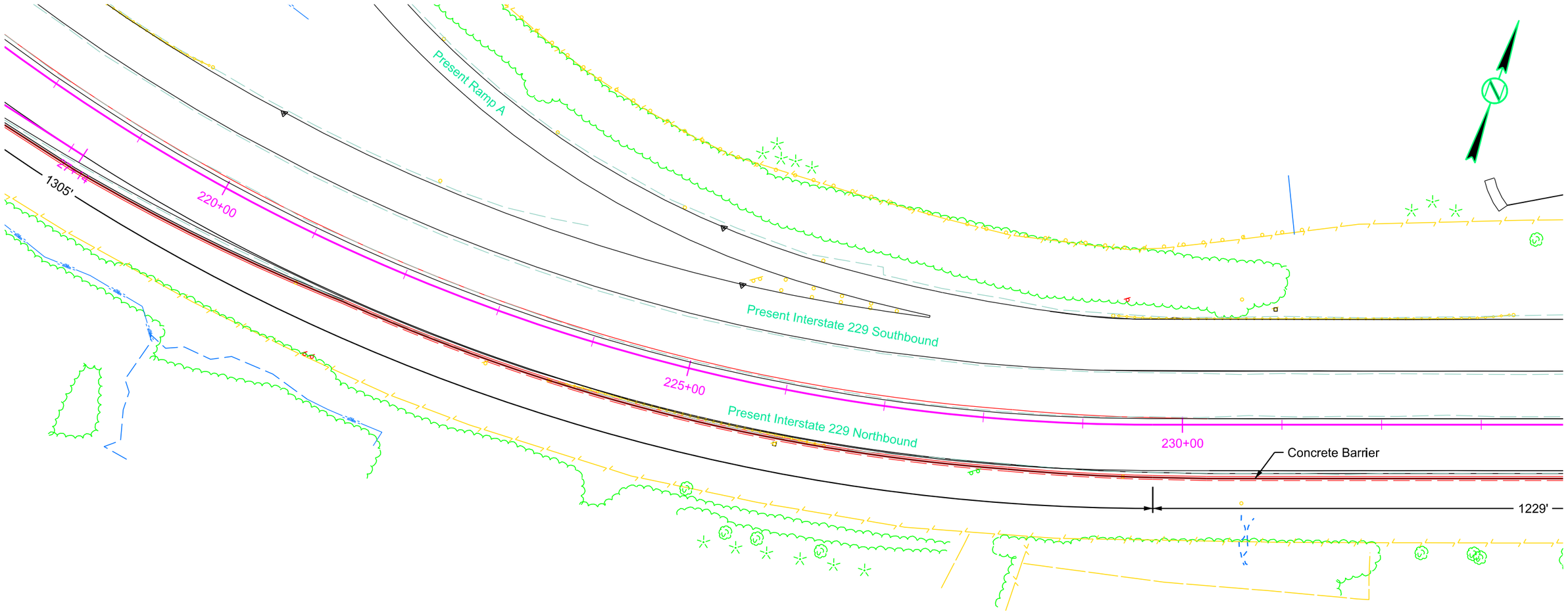
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 4

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C53	C66

Plotting Date: 03/01/2024



NOTE

Concrete Barrier for Phase 4 will be installed and will stay in-place until construction of PCN 05HN begins. See PCN 05HN construction plan set for traffic control and lane configuration.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
3-1-24

Concrete Barrier

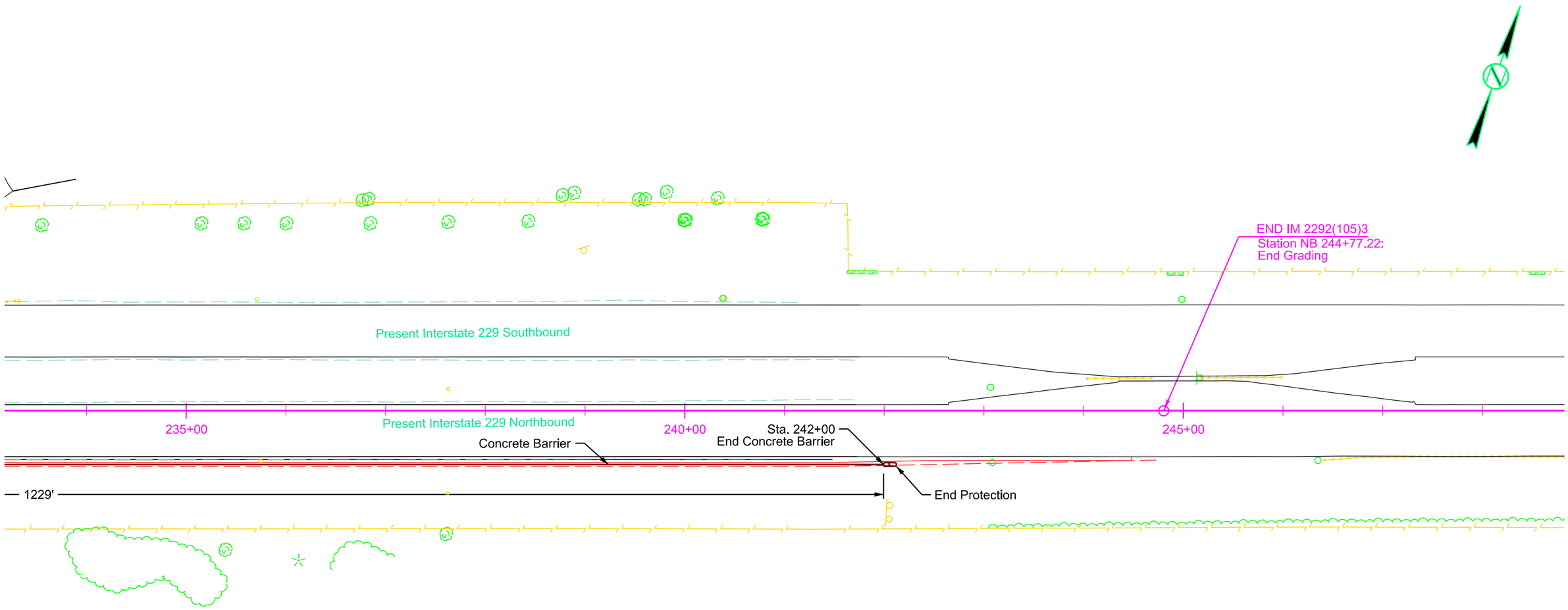
TRAFFIC CONTROL

FOR BIDDING PURPOSES ONLY

Phase 4

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C54	C66

Plotting Date: 03/01/2024



NOTE
Concrete Barrier for Phase 4 will be installed and will stay in-place until construction of PCN 05HN begins. See PCN 05HN construction plan set for traffic control and lane configuration.

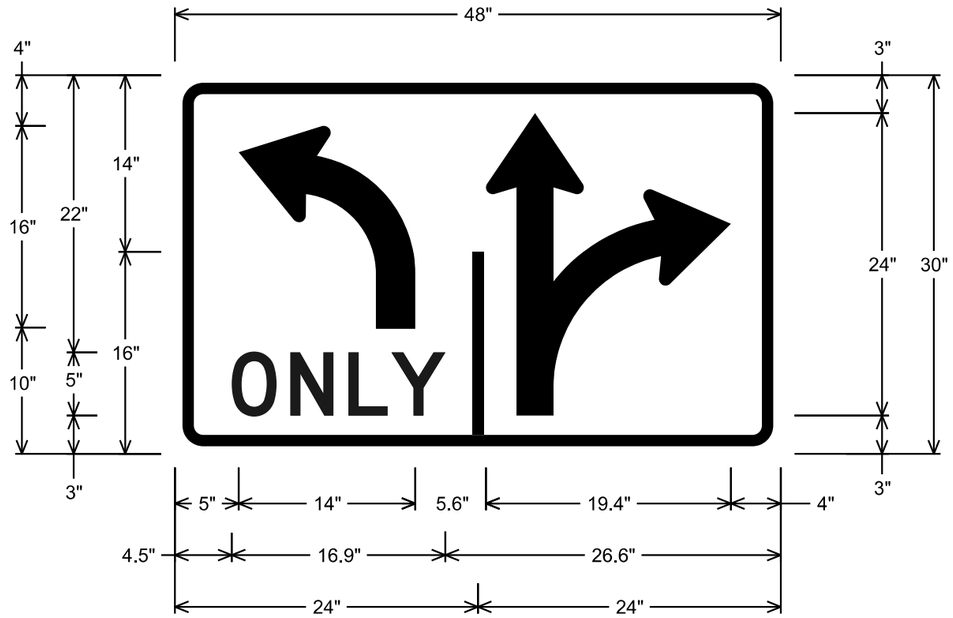
REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9234
PHILIP L. GUNDVALDSON
SOUTH DAKOTA
Concrete Barrier
3-1-24

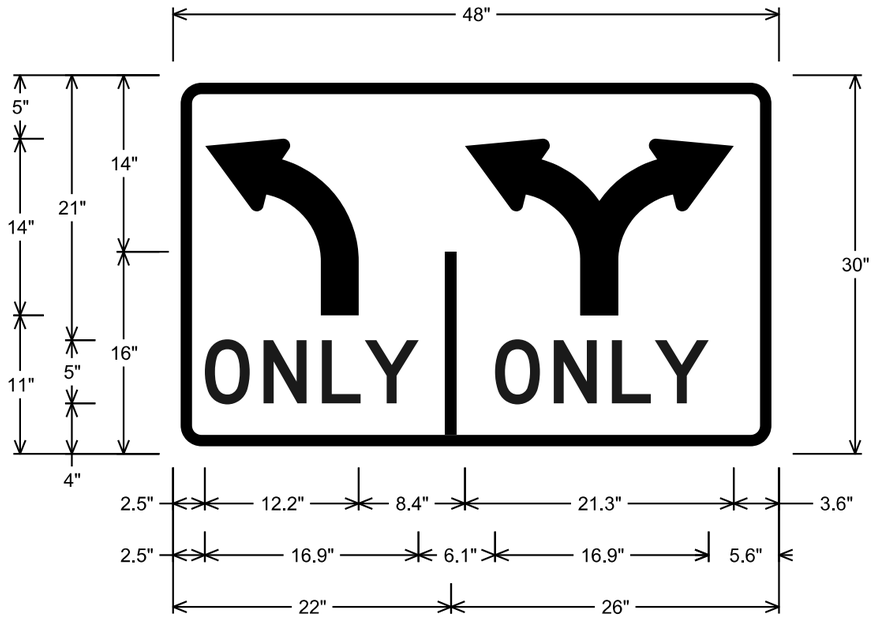
SIGN DETAILS

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C55	C66

Plotting Date: 03/01/2024





SIGN NUMBER	SPECIAL (R3-8 MODIFIED)
WIDTH x HEIGHT	48" x 30"
BORDER WIDTH	3/4"
CORNER RADIUS	3"
BACKGROUND	TYPE: TYPE IV HIGH INTENSITY COLOR: WHITE
LEGEND / BORDER	TYPE: TYPE IV HIGH INTENSITY COLOR: BLACK

SIGN NUMBER	SPECIAL 2b
WIDTH x HEIGHT	48" x 30"
BORDER WIDTH	3/4"
CORNER RADIUS	3"
BACKGROUND	TYPE: TYPE IV HIGH INTENSITY COLOR: WHITE
LEGEND / BORDER	TYPE: TYPE IV HIGH INTENSITY COLOR: BLACK

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - N/A

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_SignDetails.dgn

SIGN DETAILS

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C56	C66

Plotting Date: 03/01/2024

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	84" x 36"
BORDER WIDTH	3/4"
CORNER RADIUS	3"
BACKGROUND	TYPE: TYPE IV HIGH INTENSITY COLOR: ORANGE
LEGEND / BORDER	TYPE: TYPE IV HIGH INTENSITY COLOR: BLACK

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	84" x 36"
BORDER WIDTH	3/4"
CORNER RADIUS	3"
BACKGROUND	TYPE: TYPE IV HIGH INTENSITY COLOR: ORANGE
LEGEND / BORDER	TYPE: TYPE IV HIGH INTENSITY COLOR: BLACK

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - N/A

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_Sign\Details.dgn

SIGN DETAILS

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C57	C66

Plotting Date: 03/01/2024

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	72" x 36"
BORDER WIDTH	3/4"
CORNER RADIUS	3"
BACKGROUND	TYPE: TYPE IV HIGH INTENSITY COLOR: ORANGE
LEGEND / BORDER	TYPE: TYPE IV HIGH INTENSITY COLOR: BLACK

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	72" x 36"
BORDER WIDTH	3/4"
CORNER RADIUS	3"
BACKGROUND	TYPE: TYPE IV HIGH INTENSITY COLOR: ORANGE
LEGEND / BORDER	TYPE: TYPE IV HIGH INTENSITY COLOR: BLACK

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3-1-24

Plot Scale - N/A

Plotted From - InfrastructureDesignGroup

File - ...\07\CYs_Section\C_SignDetails.dgn

SIGN DETAILS

FOR BIDDING PURPOSES ONLY

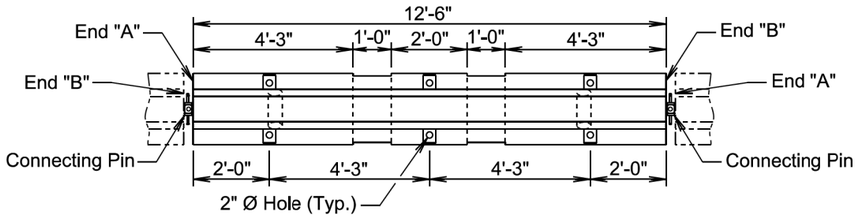
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C58	C66

Plotting Date: 03/01/2024

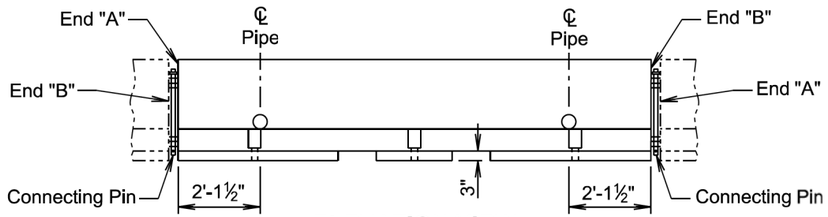
SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	48" x 30"
BORDER WIDTH	3/4"
CORNER RADIUS	3"
BACKGROUND	TYPE: TYPE IV HIGH INTENSITY COLOR: WHITE
LEGEND / BORDER	TYPE: TYPE IV HIGH INTENSITY COLOR: BLACK

SIGN NUMBER	SPECIAL
WIDTH x HEIGHT	48" x 24"
BORDER WIDTH	3/4"
CORNER RADIUS	3"
BACKGROUND	TYPE: TYPE IV HIGH INTENSITY COLOR: ORANGE
LEGEND / BORDER	TYPE: TYPE IV HIGH INTENSITY COLOR: BLACK

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9234
PHILIP L.
GUNDVALDSON
SOUTH DAKOTA
3-1-24



PLAN VIEW



ELEVATION VIEW

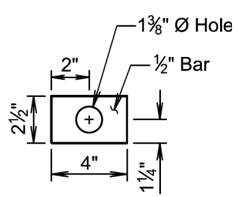
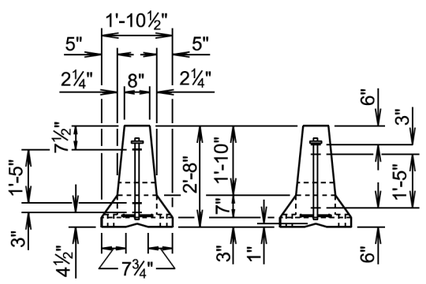
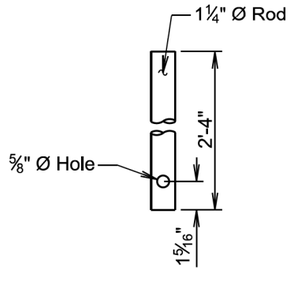


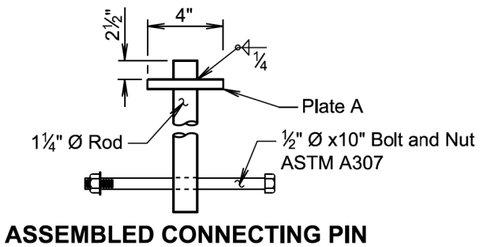
PLATE A



VIEW END A **VIEW END B**



CONNECTING PIN DETAIL



ASSEMBLED CONNECTING PIN

September 14, 2018

Published Date: 2024	SDDOT	***TRAFFIC CONTROL MOVABLE CONCRETE BARRIERS (F SHAPE INTERIOR SECTION)***	***PLATE NUMBER*** 628.01 *Sheet 1 of 2*

GENERAL NOTES:

The detailed drawings are for illustrative purpose and depicts the current version of the F shape concrete barrier. If new movable concrete barriers are requested on a project, they will be constructed according to the F shape movable concrete barrier details on standard plate 628.10.

Each movable concrete barrier section weighs 5030 ± pounds.

Each movable concrete barrier section is detailed to provide end "A" to end "B" connection by insertion of a pin through steel loops.

The Jersey shape or any version of the F shape traffic control movable concrete barriers may be used on a project, however, only the same type or version will be used for each run of barriers.

Movable concrete barrier sections will be placed to provide uniform bearing of the sections with the paved surface as approved by the Engineer.

Movable concrete barrier sections will never be moved or lifted using the end loops.

Movable concrete barrier sections that have been damaged will not be used. Barrier sections are considered damaged if the loops are end welded onto existing damaged loops, loops are fractured, or there is exposed rebar from fractured concrete.

All cost for transporting the barriers from the specified location to the project site, installing, and returning the barriers to the specified location will be incidental to the contract unit price per each for "Traffic Control Movable Concrete Barrier".

If the concrete barriers need to be moved and reset on the project, requiring the barriers to be transported by truck, all cost for removing, transporting, and resetting the barriers will be incidental to the contract unit price per each for "Remove and Reset Traffic Control Movable Concrete Barrier". All cost for small shifts in alignment of the barriers, not requiring the barriers to be transported by truck, will be incidental to various contract items.

September 14, 2018

Published Date: 2024	SDDOT	***TRAFFIC CONTROL MOVABLE CONCRETE BARRIERS (F SHAPE INTERIOR SECTION)***	***PLATE NUMBER*** 628.01 *Sheet 2 of 2*

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C60	C66

Plotting Date: 03/01/2024

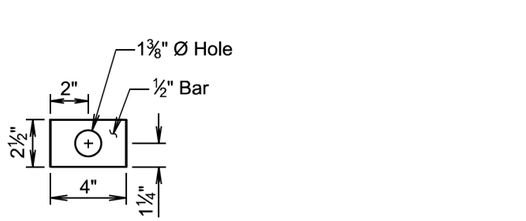
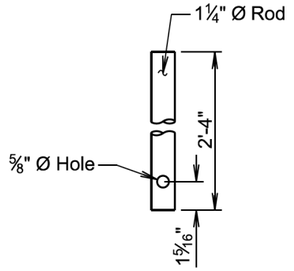
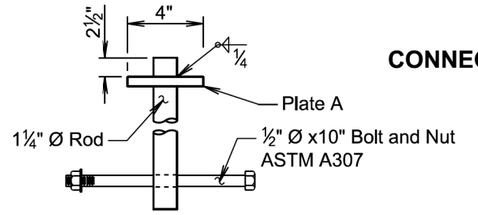


PLATE A



CONNECTING PIN DETAIL



ASSEMBLED CONNECTING PIN

GENERAL NOTES:

The detailed drawings are for illustrative purpose and depicts the current version of the F shape concrete barrier end section. If new concrete barrier end sections are requested on a project, they will be constructed according to the F shape movable concrete barrier end section details on standard plate 628.11.

Each movable concrete barrier end section weighs 2450 ± pounds.

Each movable concrete barrier end section is detailed to provide end "A" to end "B" connection by insertion of a pin through steel loops.

The Jersey shape or any version of the F shape traffic control movable concrete barriers may be used on a project, however, only the same type or version will be used for each run of barriers.

Movable concrete barrier sections will be placed to provide uniform bearing of the sections with the paved surface as approved by the Engineer.

Movable concrete barrier end sections will never be moved or lifted using the end loops.

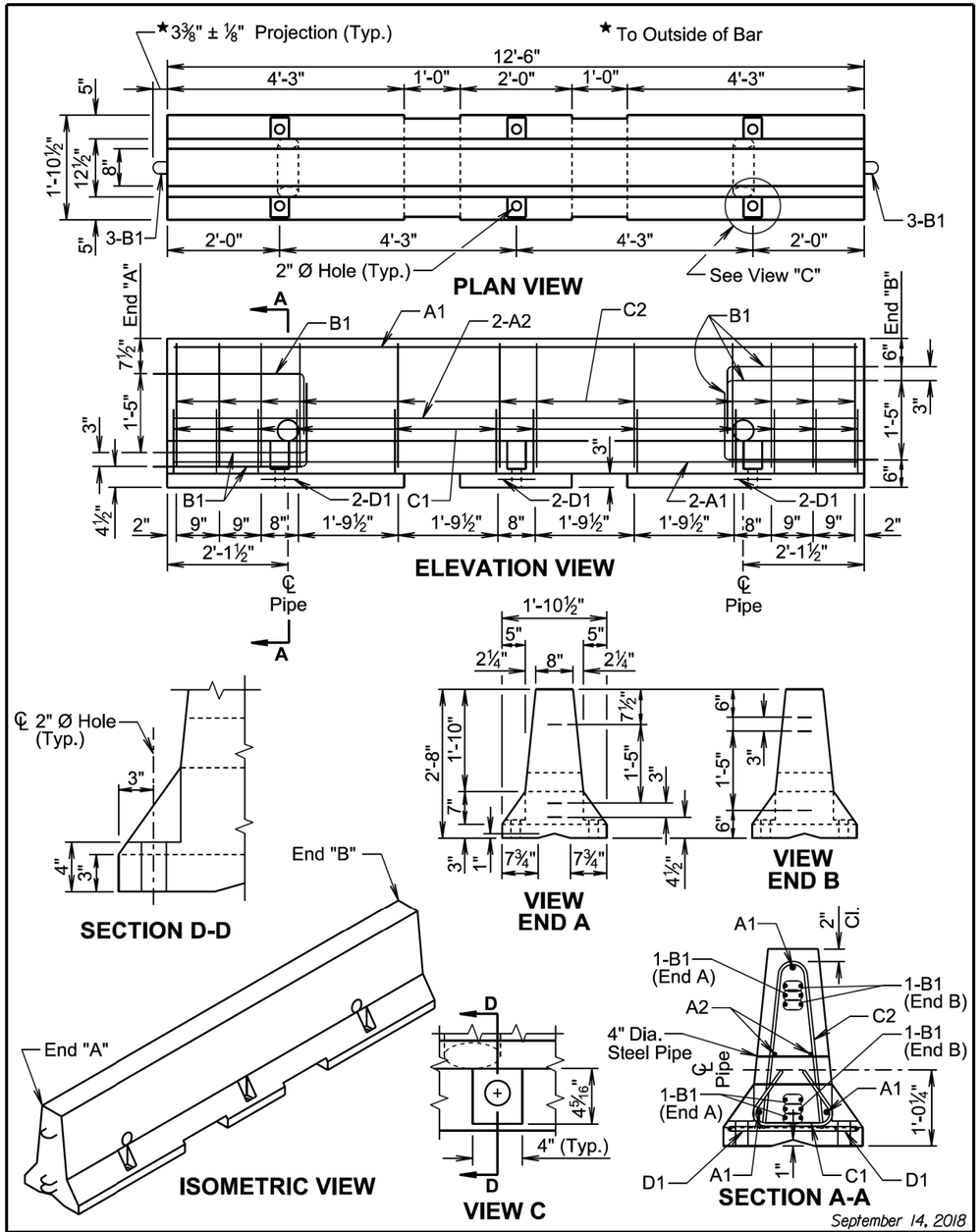
Movable concrete barrier end sections that have been damaged will not be used. Barrier sections are considered damaged if the loops are end welded onto existing damaged loops, loops are fractured, or there is exposed rebar from fractured concrete.

All cost for transporting the barriers from the specified location to the project site, installing, and returning the barriers to the specified location will be incidental to the contract unit price per each for "Traffic Control Movable Concrete Barrier".

If the concrete barriers need to be moved and reset on the project, requiring the barriers to be transported by truck, all cost for removing, transporting, and resetting the barriers will be incidental to the contract unit price per each for "Remove and Reset Traffic Control Movable Concrete Barrier". All cost for small shifts in alignment of the barriers, not requiring the barriers to be transported by truck, will be incidental to various contract items.

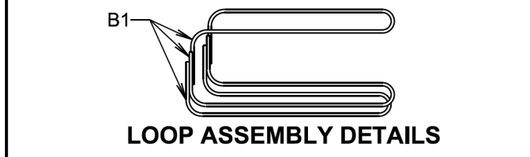
September 14, 2018

Published Date: 2024	SDDOT	TRAFFIC CONTROL MOVABLE CONCRETE BARRIERS (F SHAPE END SECTION)	PLATE NUMBER 628.02
			Sheet 2 of 2

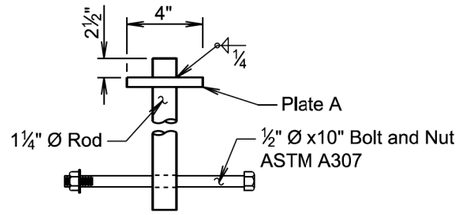


September 14, 2018

Published Date: 2024	SDDOT	MOVABLE F SHAPE CONCRETE BARRIERS (INTERIOR SECTION)	PLATE NUMBER 628.10
			Sheet 1 of 2



LOOP ASSEMBLY DETAILS



ASSEMBLED CONNECTING PIN

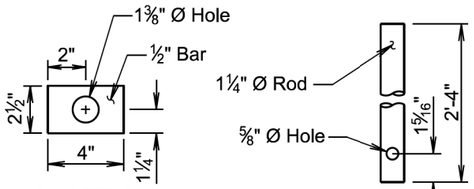
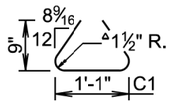


PLATE A

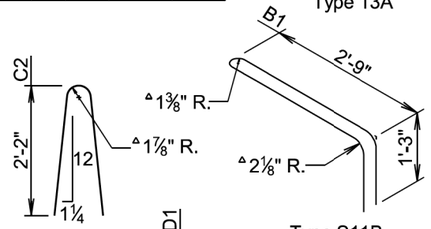
CONNECTING PIN DETAIL

REINFORCING SCHEDULE
(for one interior section)

Mk.	No.	Size	Length	Type	Bending Details
A1	3	5	12'-2"	Str.	
A2	2	4	12'-2"	Str.	
B1	6	6	8'-3"	S11B	
C1	12	4	2'-9"	13A	
C2	12	4	4'-6"	S11A	
D1	6	6	3'-0"	S11	

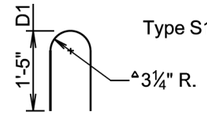


Type 13A



Type S11A

Type S11B



Type S11

NOTES:
All dimensions are out to out of bars.
△ All radii are to inside of bars.

GENERAL NOTES:

Concrete will be Class M6 in accordance with Section 462 of the Specifications. Type I, II, or III cement will be used.

All reinforcing steel will conform to ASTM A615m Grade 60, except B1 bars. The B1 loop bars will be ¾ inch smooth steel bars with a minimum yield of 60 ksi and conform to ASTM A706 or A709. The loops will be installed within ⅛ inch of the plan dimensions.

Steel for pins will conform to ASTM A36. Pipe will be galvanized and conform to ASTM A53.

Galvanize the connecting pin assembly after fabrication in accordance with ASTM A123. Paint exposed portions of the loop assembly B1 bars with a zinc rich galvanizing paint.

All exposed edges will be chamfered ¾ inch.

Use 2 inch clear cover on all reinforcing steel EXCEPT as shown.

Each movable concrete barrier section is detailed to provide End "A" to End "B" connection by insertion of a pin through loops formed by reinforcing bars "B1".

All costs for materials, labor, equipment, and incidentals necessary for furnishing the complete movable concrete barrier interior section including one connecting pin assembly will be incidental to the contract unit price per each for "Movable F Shape Concrete Barrier, Interior Section".

For informational purposes only, each movable concrete barrier interior section contains 1.3 Cu. Yds. of concrete and 214 Lbs. of reinforcing steel.

September 14, 2018

Published Date: 2024	SDDOT	MOVABLE F SHAPE CONCRETE BARRIERS (INTERIOR SECTION)	PLATE NUMBER 628.10
			Sheet 2 of 2

The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

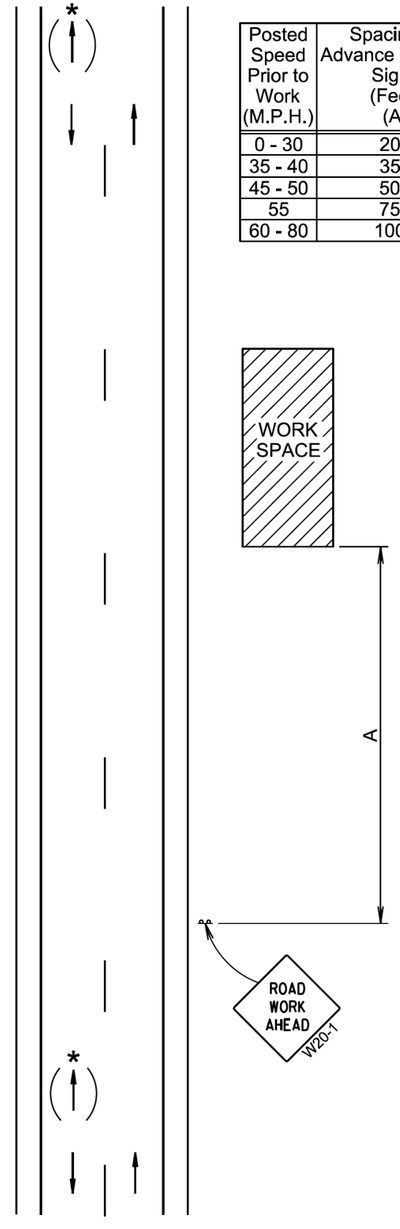
The signs illustrated will be used where there are distracting situations; such as: vehicles parked on shoulder, vehicles accessing the work site via the highway, and equipment traveling on or crossing the roadway to perform work operations.

The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.

* If the work space is on a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

For short term, short duration, or mobile operations, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 80	1000



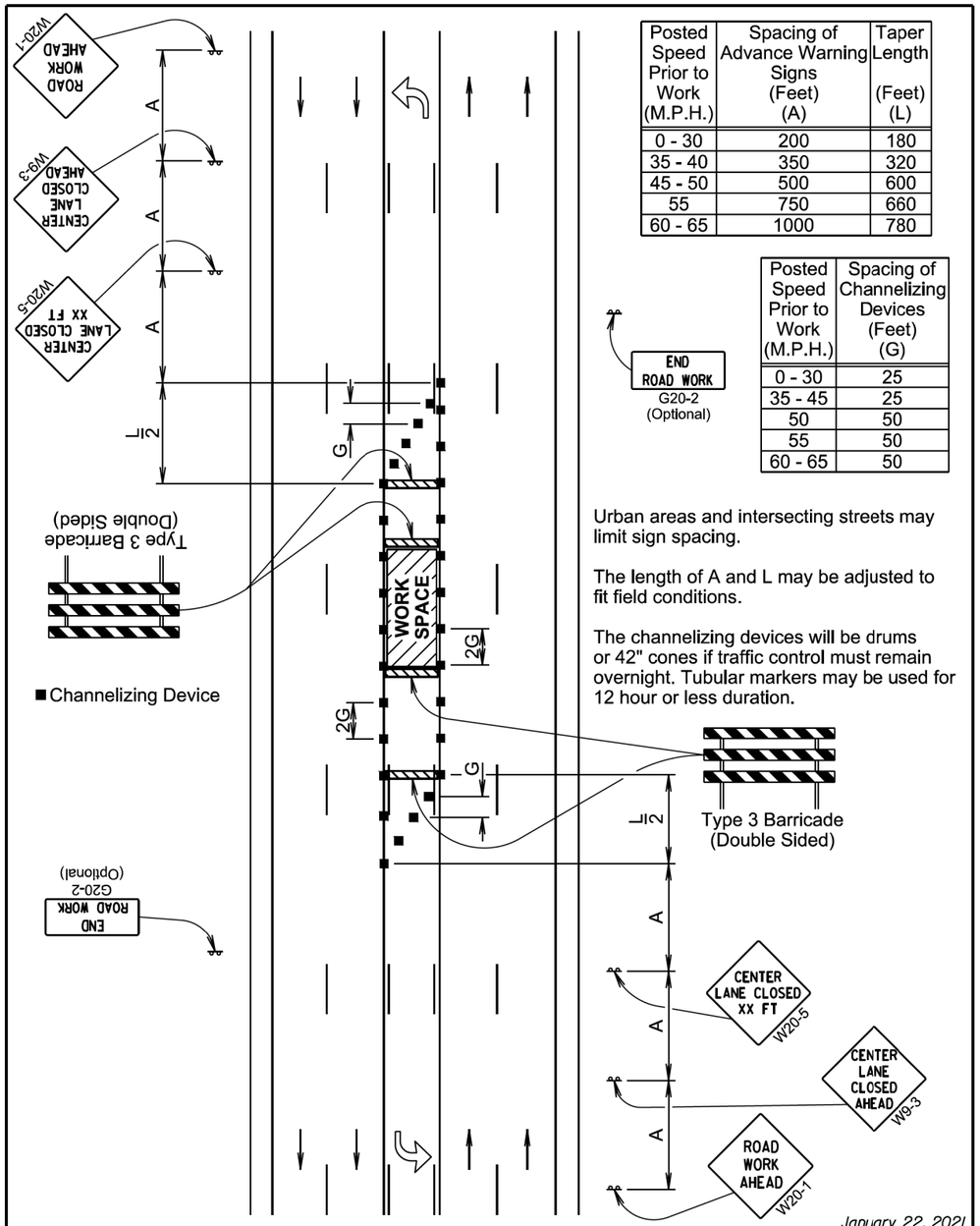
January 22, 2021

Published Date: 2024	SDDOT	WORK BEYOND THE SHOULDER	PLATE NUMBER 634.01
			Sheet 1 of 1

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C62	C66

Plotting Date: 03/01/2024



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Taper Length (Feet) (L)
0 - 30	200	180
35 - 40	350	320
45 - 50	500	600
55	750	660
60 - 65	1000	780

END ROAD WORK
G20-2
(Optional)

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50
55	50
60 - 65	50

Urban areas and intersecting streets may limit sign spacing.

The length of A and L may be adjusted to fit field conditions.

The channelizing devices will be drums or 42" cones if traffic control must remain overnight. Tubular markers may be used for 12 hour or less duration.

January 22, 2021

Published Date: 2024

SDDOT

5-LANE, CENTER LANE CLOSED

PLATE NUMBER 634.55

Sheet 1 of 1

◎ Reflectorized Drum

■ Channelizing Device

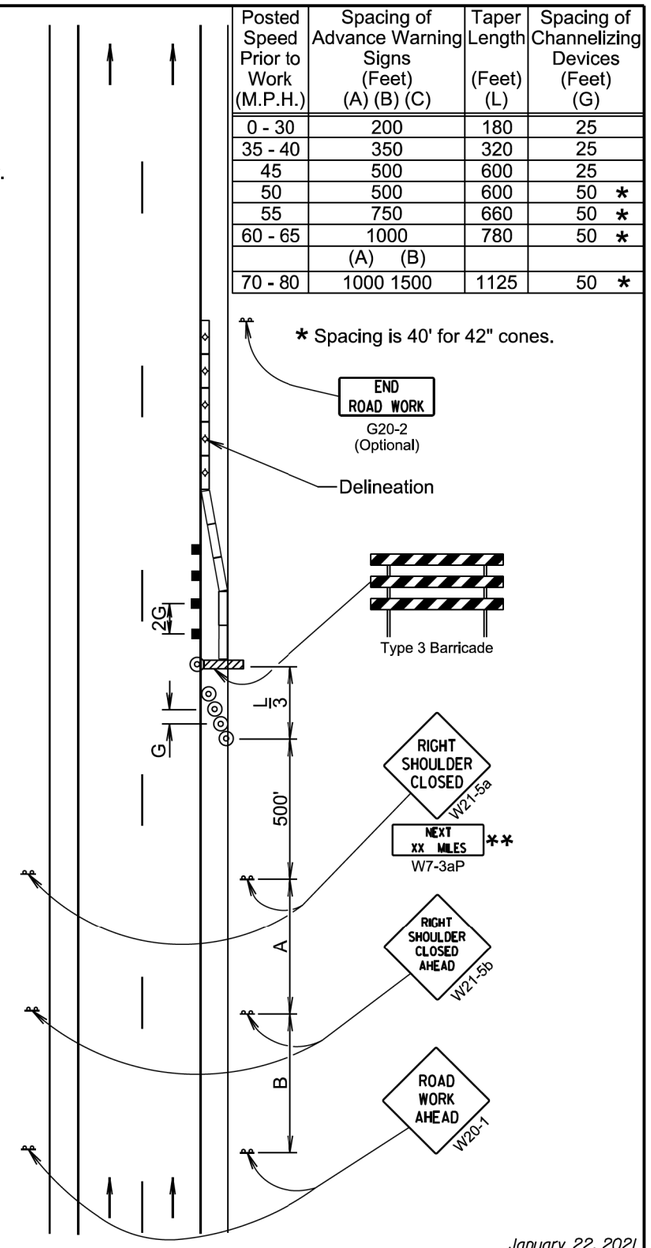
▭ Movable Concrete Barrier

** For distances ½ mile or greater.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

This standard plate shows one method which may be used to close a shoulder of a roadway for a long term project. The Engineer will determine if the use of barriers is required. If barriers are required, the layout details will be included elsewhere in the plans.

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	180	25
35 - 40	350	320	25
45	500	600	25
50	500	600	50 *
55	750	660	50 *
60 - 65	1000	780	50 *
	(A) (B)		
70 - 80	1000 1500	1125	50 *



January 22, 2021

Published Date: 2024

SDDOT

SHOULDER CLOSED

PLATE NUMBER 634.61

Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 65	1000
	(A) (B) (C)
70 - 80	1000 1500 2640

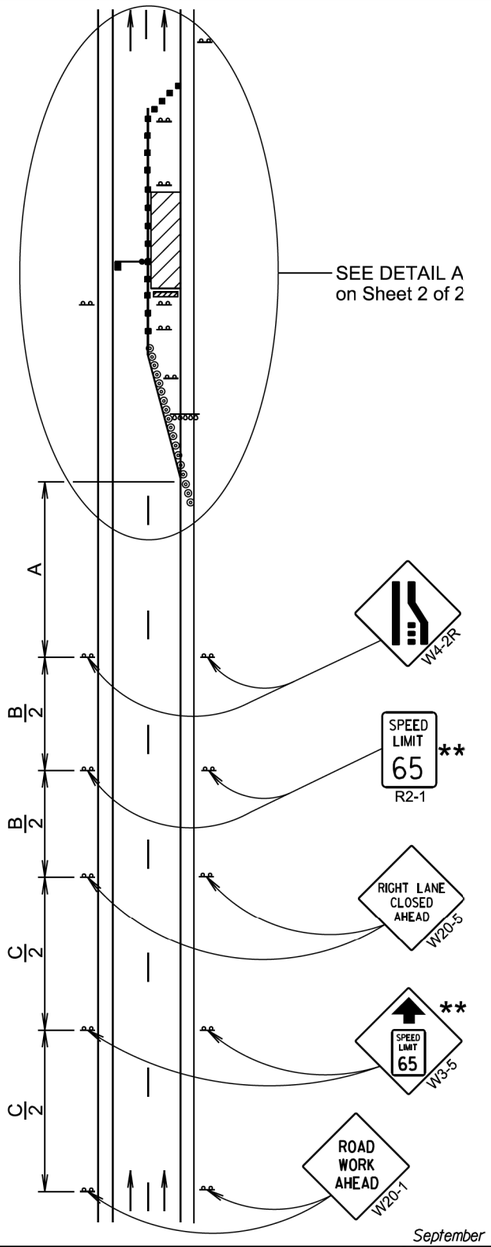
** Speed appropriate for location.

◎ Reflectorized Drum

▪ Channelizing Device

ROAD WORK AHEAD sign is only required in advance of the first lane closure.

High speed is defined as having a posted speed limit greater than 45 mph.



September 22, 2021

Published Date: 2024	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 1 of 2

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (Feet) (L)
0 -30	25	180
35 - 40	25	320
45	25	600
50	50 *	600
55	50 *	660
60 - 65	50 *	780
70 - 80	50 *	960

* Spacing is 40' for 42" cones.

** Speed appropriate for location.

*** Use speed limit designated for the condition when workers are present in the work space. Signs will be covered or removed when workers are not present.

Flagger (As Necessary)

◎ Reflectorized Drum

▪ Channelizing Device

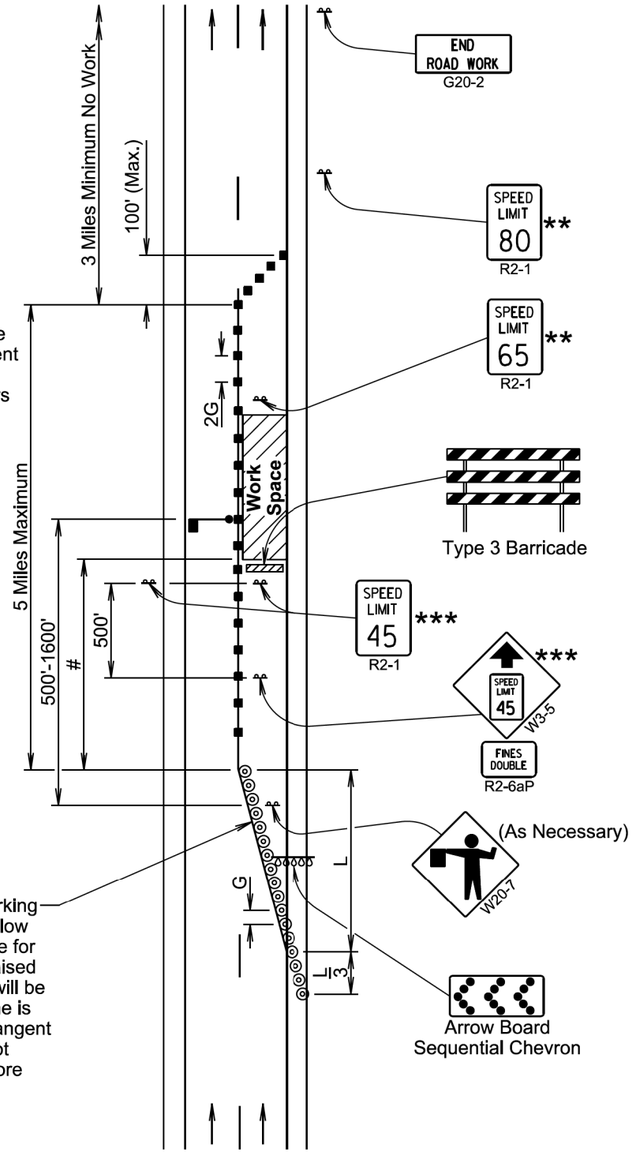
The Work Space will be a minimum of 500' from the end of the taper.

The FLAGGER sign will be used whenever there is a Flagger present.

The channelizing devices will be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

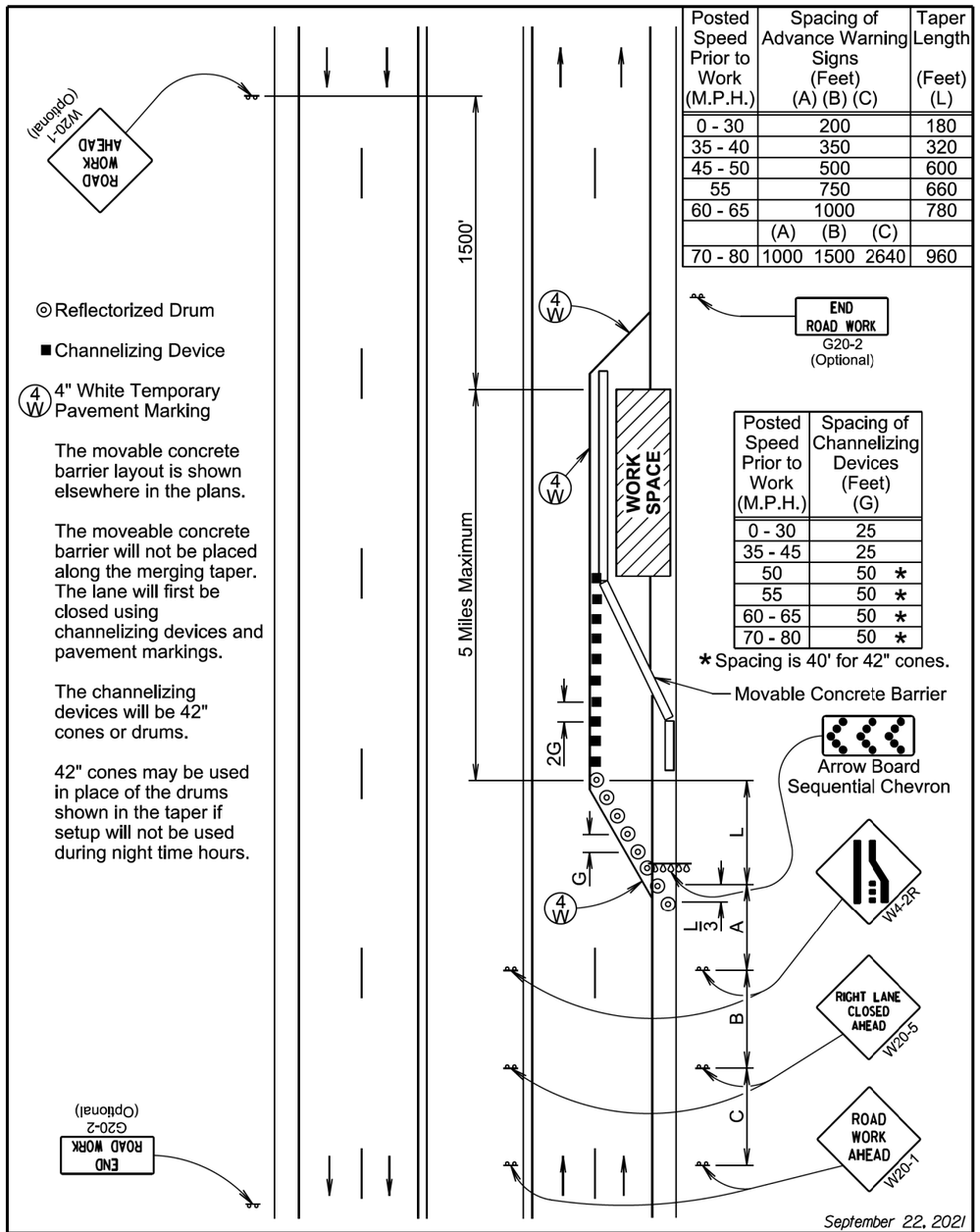
4" white temporary pavement marking tape for right lane closures, 4" yellow temporary pavement marking tape for left lane closures, or temporary raised pavement markers at 5' spacing will be installed in the taper when the lane is closed overnight, and along the tangent section where the skip lines do not exist and the lane is closed for more than 3 days.



DETAIL A

September 22, 2021

Published Date: 2024	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 2 of 2



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)
0 - 30	200	180
35 - 40	350	320
45 - 50	500	600
55	750	660
60 - 65	1000	780
	(A) (B) (C)	
70 - 80	1000 1500 2640	960

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50 *
55	50 *
60 - 65	50 *
70 - 80	50 *

* Spacing is 40' for 42" cones.

◎ Reflectorized Drum

■ Channelizing Device

4 W 4" White Temporary Pavement Marking

The movable concrete barrier layout is shown elsewhere in the plans.

The moveable concrete barrier will not be placed along the merging taper. The lane will first be closed using channelizing devices and pavement markings.

The channelizing devices will be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

September 22, 2021

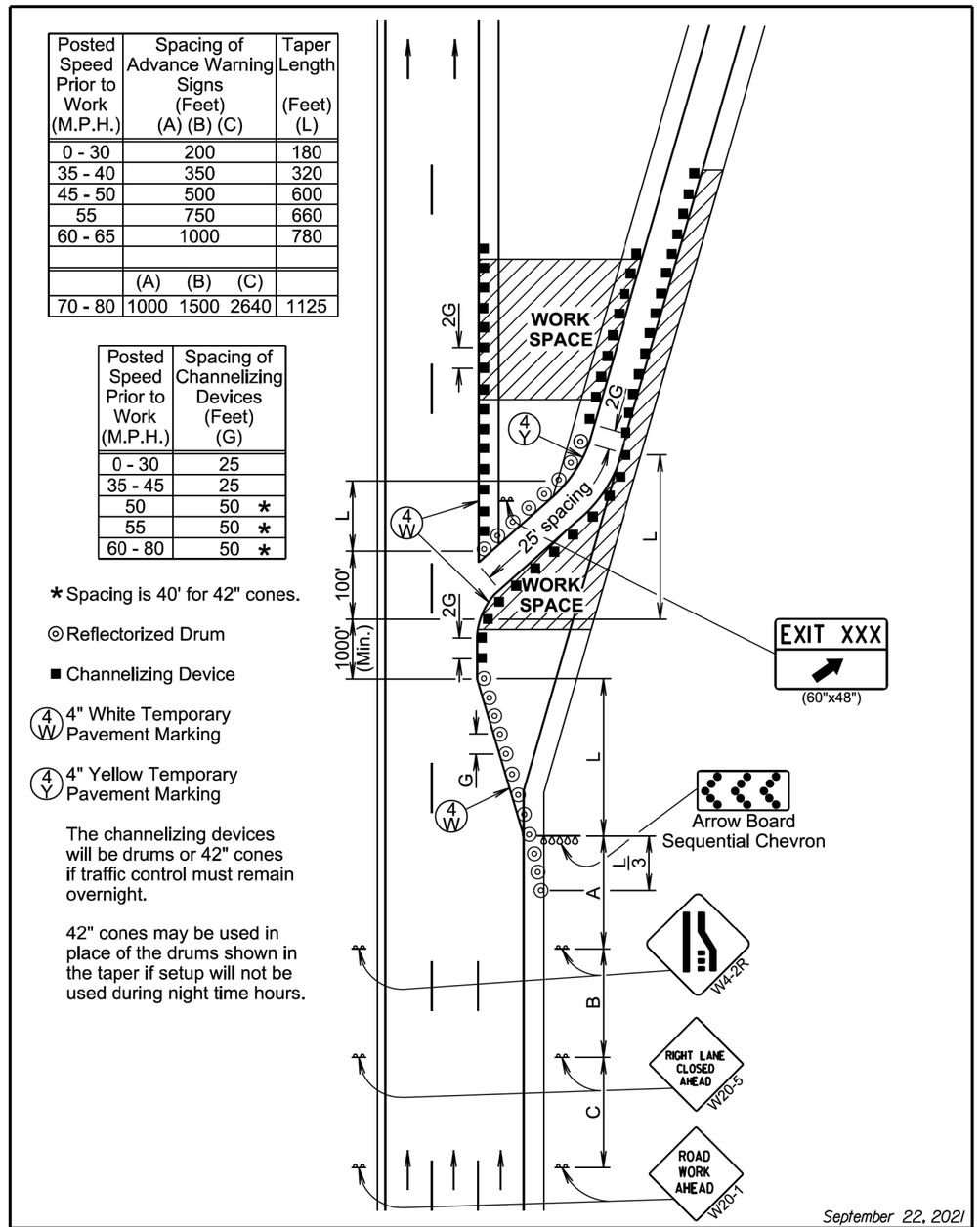
Published Date: 2024

SDDOT

LANE CLOSURE WITH BARRIER

PLATE NUMBER 634.65

Sheet 1 of 1



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)
0 - 30	200	180
35 - 40	350	320
45 - 50	500	600
55	750	660
60 - 65	1000	780
	(A) (B) (C)	
70 - 80	1000 1500 2640	1125

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50 *
55	50 *
60 - 80	50 *

* Spacing is 40' for 42" cones.

◎ Reflectorized Drum

■ Channelizing Device

4 W 4" White Temporary Pavement Marking

4 Y 4" Yellow Temporary Pavement Marking

The channelizing devices will be drums or 42" cones if traffic control must remain overnight.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

September 22, 2021

Published Date: 2024

SDDOT

WORK IN VICINITY OF EXIT RAMP

PLATE NUMBER 634.68

Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C65	C66

Plotting Date: 03/01/2024

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)
0 - 30	200	180
35 - 40	350	320
45 - 50	500	600
55	750	660
60 - 65	1000	780
	(A) (B) (C)	
70 - 80	1000 1500 2640	1125

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50 *
55	50 *
60 - 80	50 *

* Spacing is 40' for 42" cones.

◎ Reflectorized Drum

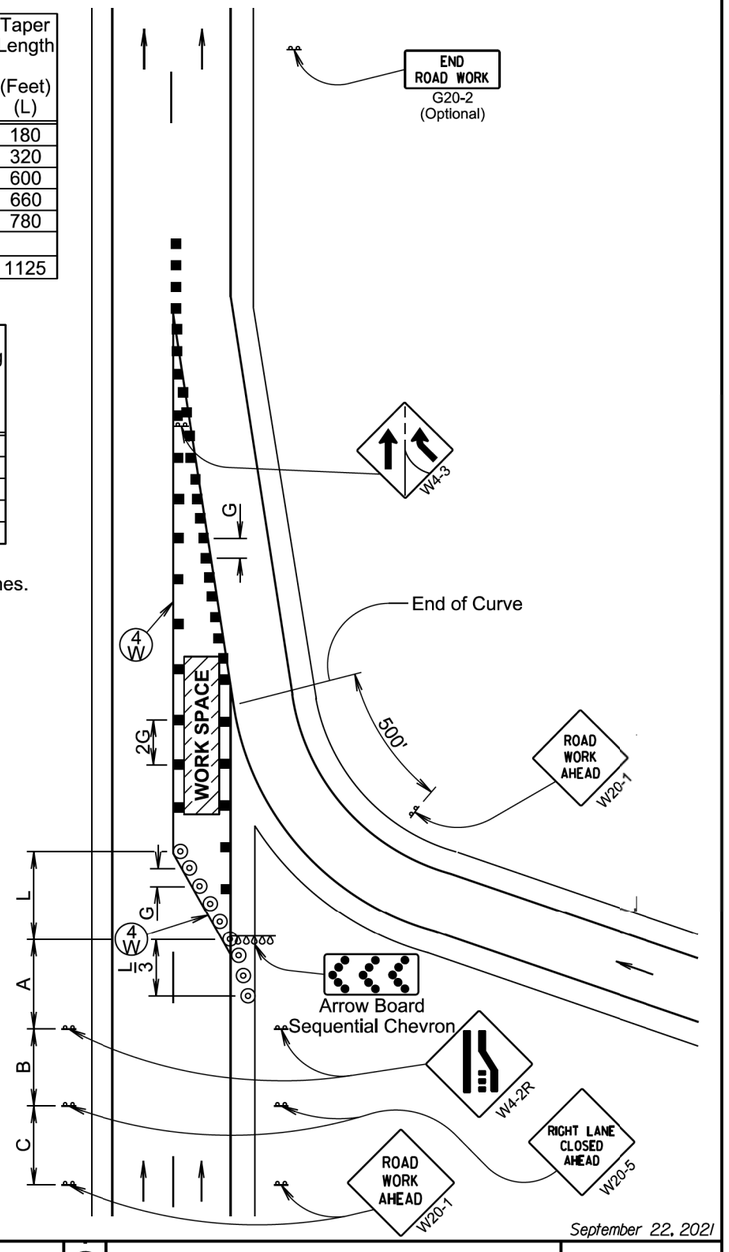
■ Channelizing Device

(4W) 4" White Temporary Pavement Marking

Temporary pavement markings will be used if traffic control must remain overnight.

The channelizing devices will be drums or 42" cones if traffic control must remain overnight.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.



September 22, 2021

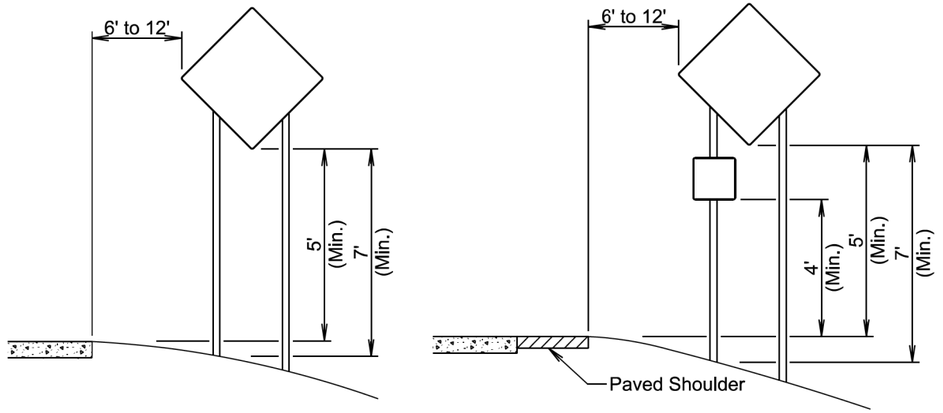
Published Date: 2024

SDDOT

WORK IN VICINITY OF ENTRANCE RAMP

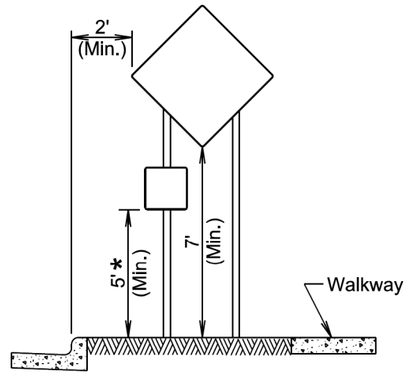
PLATE NUMBER 634.70

Sheet 1 of 1

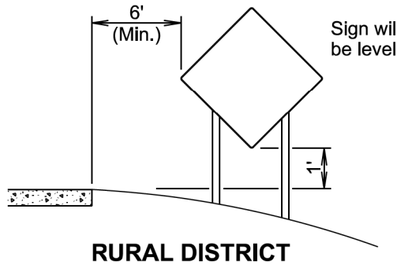


RURAL DISTRICT

RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT



RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

January 22, 2021

Published Date: 2024

SDDOT

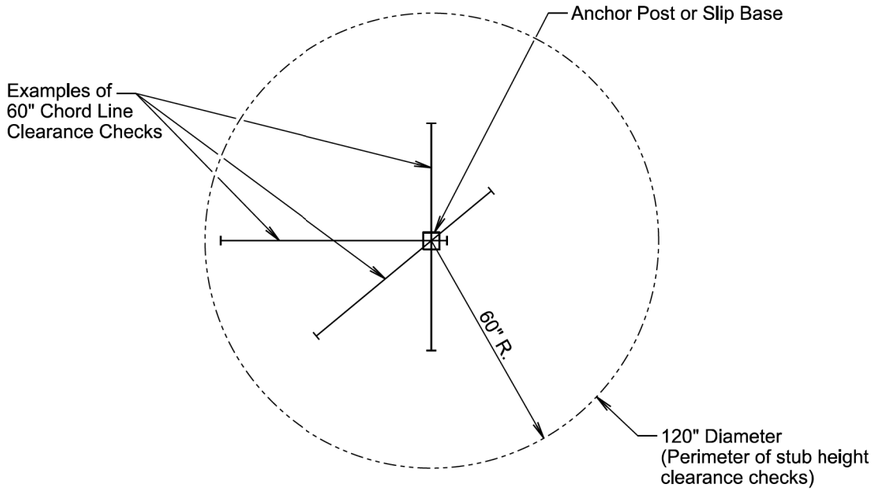
CRASHWORTHY SIGN SUPPORTS
(Typical Construction Signing)

PLATE NUMBER 634.85

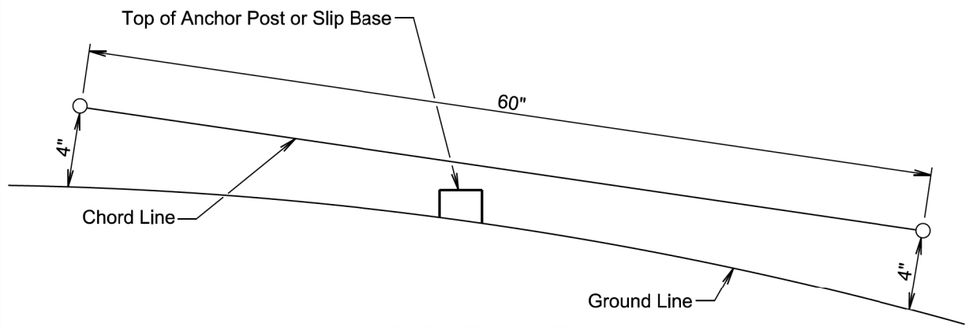
Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 2292(105)3	C66	C66

Plotting Date: 03/01/2024



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

The top of anchor posts and slip bases WILL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height will be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

January 22, 2021

Published Date: 2024	SDDOT	***BREAKAWAY SUPPORT STUB CLEARANCE***	***PLATE NUMBER*** 634.99
			Sheet 1 of 1