



APPROVED MINUTES

January 20, 2022 Standards Committee Meeting

March 2, 2022

TO: Standards Committee

FROM: Scott Trammell, Secretary

RE: Minutes from the January 20, 2022 Standards Committee Meeting

The Standards Committee meeting was called to order by Mr. Pankow, Chair, at 09:02 a.m. on January 20, 2022, which was held virtually via *Teams* (Microsoft application). The meeting was adjourned at 10:46 am.

The following committee members were in attendance:

Gregory Pankow, Chairman, Director, Construction Management
John Wooden, Contract Administration Division
Dave Boruff, Traffic Engineering
Peter White, Bridge Engineering
Joseph Novak, Construction Management
Matt Thomas*, Pavement Engineering
Jim Reilman, Materials and Tests Division
Michael Koch, District Construction, Fort Wayne District
Mark Orton, Highway Engineering
Kurt Pelz, Construction Technical Support
Anne Rearick, Engineering and Asset Management
*Proxy for Kumar Dave

Also, presence of the following throughout the meeting was captured by the *Microsoft Teams*:

Bazlamit, Subhi, INDOT
Blanchard, Jacob, INDOT
Fisher, Steve, INDOT
Harris, Tom, INDOT

McNutt, Donald, guest
Mouser, Elizabeth, INDOT
Nelson, Mike, INDOT
Hailat, Mahmoud, INDOT

Awwad, Nathan, INDOT
Lesh, Jim, INDOT
Duncan, Thomas, FHWA
Ritter, John, INDOT
Barney, Bruce, INDOT
Fegan, Roland, INDOT
Smart, Steve, guest
Smutzer, Katherine, INDOT
Garg, Lalit, INDOT
Bowen, Alisa, INDOT
Camarata, Rebecca, INDOT
Davis, Herbert, INDOT

Osborn, Dan, ICI
Patterson, Patrick, INDOT
Hammada, Ahmmed, guest
Hauser, Derrick, INDOT
Podorvanova, Lana, INDOT
Sturgeon, Dan, INDOT
Jacobs, David, INDOT
Trammell, Scott, INDOT
Bruno, Joseph, INDOT
Patel, Prakash, INDOT
McGregor, John, INDOT
Wortkoetter, Andrew, INDOT

The following items were listed for consideration:

A. GENERAL BUSINESS ITEMS

OLD BUSINESS

(No items were listed)

NEW BUSINESS

1. *Approval of the Minutes from the December 17, 2021 meeting*

Mr. Pankow requested a motion to approve the Minutes from the December 17, 2021 meeting. Following a discussion between Mr. Novak and Mr. Koch, language pertaining to Item No. 3 Project Work Zone has been revised to work area, or construction zone. Also, Mr. Reilman had revised item 4, language and drawings regarding clarifying the height of the wall.

Motion: Mr. Novak
Second: Mr. Reilman
Ayes: 10
Nays: 0

ACTION:

PASSED AS REVISED

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS

(No items were listed)

NEW BUSINESS

(No items were listed)

C. STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS PROPOSED ITEMS

OLD BUSINESS

(No items were listed)

NEW BUSINESS

Item No. 1 (2022 SS) Mr. White pg 5

2022 Standard Specifications

609.09	Finishing
609.13	Method of Measurement
609.14	Basis of Payment
704.05	Finishing Concrete
704.07	Method of Measurement
704.08	Basis of Payment
722.11	Texturing
722.15	Method of Measurement
722.16	Basis of Payment

ACTION: PASSED AS SUBMITTED

Item No. 2 (2022 SS) Mr. Reilman pg 13

2022 Standard Specifications

401.16	Density
402.16	Low Temperature Compaction Requirements
410.16	Density

ACTION: PASSED AS SUBMITTED

Item No. 3 (2022 SS) Mr. Reilman pg 18

Recurring Special Provisions:

401-x-xxx	VOID REDUCING ASPHALT MEMBRANE FOR HMA
410-x-xxx	VOID REDUCING ASPHALT MEMBRANE FOR SMA

ACTION: PASSED AS REVISED

Item No. 4 (2022 SS)

Mr. Reilman

pg 29

Recurring Special Provisions:

401-R-417

HMA SPRAY PAVER AND EMULSION

410-R-418

SMA SPRAY PAVER AND EMULSION

ACTION:

PASSED AS SUBMITTED

Item No. 5 (2022 SS)

Mr. Boruff

pg 33

Recurring Special Provisions:

801-x-xxx

TEMPORARY CURB RAMP

801-x-xxx

TEMPORARY ACCESSIBLE PEDESTRIAN PATH

801-x-xxx

TEMPORARY PEDESTRIAN CHANNELIZER

801-x-xxx

AUDIBLE INFORMATION DEVICE

ACTION:

WITHDRAWN

Item No. 6 (2022 SS)

Mr. Boruff

pg 46

Standard Drawings:

E 802-DMSS (-01 thru -22)

Dynamic Message Sign Structure

E 802-SCLS (-01 thru -23)

Sign Cantilever Structure

ACTION:

PASSED AS SUBMITTED

cc: Committee Members
FHWA
ICI

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Tining plastic concrete bridge deck and approach slab surfaces can have detrimental effects on the quality and ride of the concrete surface. The newly placed concrete must begin to set before grooves can be raked into the surface in order for the grooves to maintain their shape. Therefore, the curing operation can't be started immediately after placement and some water will be lost due to surface evaporation. The grooves that are tined into fresh concrete also increase the surface area, which exacerbates the evaporation concern. The tining process also snags and displaces coarse aggregate, which can create voids at or near the surface that increase permeability. Transverse grooves also create more wheel noise than smooth or longitudinally grooved surfaces.

PROPOSED SOLUTION: Longitudinal grooves are proposed to be cut into the cured concrete surface of bridge decks, bridge deck rigid overlays, and reinforced concrete bridge approach slabs.

APPLICABLE STANDARD SPECIFICATIONS: 609.09, 609.13, 609.14, 704.05, 704.07, 704.08, 722.11, 722.15, 722.16

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: N/A

APPLICABLE SECTION OF GIFE: N/A

APPLICABLE RECURRING SPECIAL PROVISIONS: N/A

PAY ITEMS AFFECTED: '722-12732 LONGITUDINAL GROOVING' should be become recurring rather than unique.

APPLICABLE SUB-COMMITTEE ENDORSEMENT: The INDOT Strategic Steering Committee voted at the end of October 2021 to implement longitudinal grooving for bridge decks. An ad-hoc committee comprised of Jim Reilman, Mike Nelson, Jim Lesh, Joe Novak, Michael Koch, and Tommy Nantung developed the proposed RSP.

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE: Project containing 609, 704-51002 CONCRETE, C, SUPERSTRUCTURE, or 722 pay items.

IMPACT ANALYSIS (attach report): yes

Submitted By: Pete White, PE

Title: Design Manager

Organization: INDOT Bridge Engineering

Phone Number: 317-232-5371

Date: December 20, 2021

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Approved Materials List? No

Will this proposal improve:

Construction costs? No

Construction time? No

Customer satisfaction? Yes

Congestion/travel time? No

Ride quality? Yes

Will this proposal reduce operational costs or maintenance effort? Yes

Will this item improve safety:

For motorists? No

For construction workers? No

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? Yes

Design process? No

Will this change provide the contractor more flexibility? No

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? No

Is this proposal needed for compliance with:

Federal or State regulations? No

AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda: The INDOT Strategic Steering Committee has voted to implement longitudinal grooving for bridge decks.

REVISION TO STANDARD SPECIFICATIONS

SECTION 609- REINFORCED CONCRETE BRIDGE APPROACHES

609.09 Finishing; 609.13 Method of Measurement; 609.14 Basis of Payment

SECTION 704 - CONCRETE FLOOR SLABS

704.05 Finishing Concrete; 704.07 Method of Measurement; 704.08 Basis of Payment

SECTION 722 - CONCRETE BRIDGE DECK OVERLAYS

722.11 Texturing; 722.15 Method of Measurement; 722.16 Basis of Payment

The Standard Specifications are revised as follows:

SECTION 609, BEGIN LINE 67, DELETE AND INSERT AS FOLLOWS:

609.09 Finishing

The RCBA shall be finished with equipment in accordance with 508.04(c)3 and 508.04(c)4. The operations shall be controlled so that an excess of mortar and water is not worked to the top. Long handled floats may be used to smooth and fill in open textured areas. The edges of formed RCBA shall be tooled or chamfered.

The finished RCBA surface shall be textured with a double thickness burlap drag or a minimum 4 ft wide turf drag. ~~Immediately after the finishing operation is complete and before the surface film has formed, the surface of the RCBA shall be textured by transverse grooving in accordance with 504.03. The grooves may be formed by mechanized equipment using a vibrating beam roller, a series of discs or other approved device. Manual tools such as fluted floats, spring steel tined rakes, or finned floats with a single row of fins may be used. The grooves shall be relatively uniform and smooth and shall be formed without tearing the surface or bringing coarse aggregate to the top. Longitudinal grooving shall be in accordance with 722.11 and shall not commence until the smoothness has been measured in accordance with 609.11.~~

~~All areas of hardened RCBA which do not conform to the requirements due to either a deficiency in the grooving or a rough open textured surface shall be corrected. Corrections shall be made by cutting transverse grooves in the hardened surface with an approved cutting machine and retexturing to a satisfactory finish as directed.~~

SECTION 609, BEGIN LINE 131, INSERT AS FOLLOWS:

609.13 Method of Measurement

Reinforced concrete bridge approaches, including extensions required for bridge railing transitions, will be measured by the square yard. Subbase for PCCP will be measured in accordance with 302.08. Subgrade treatment will be measured in accordance with 207.05. Geotextile will be measured in accordance with 214.05. Reinforcing bars will be measured in accordance with 703.07. Threaded tie bar assemblies will be measured in accordance with 703.07. *Longitudinal grooving will be measured in accordance with 722.15.*

Finishing and curing of the RCBA will not be measured for payment. Construction joints or type I-A joints will not be measured.

609.14 Basis of Payment

REVISION TO STANDARD SPECIFICATIONS

SECTION 609- REINFORCED CONCRETE BRIDGE APPROACHES

609.09 Finishing; 609.13 Method of Measurement; 609.14 Basis of Payment

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704.05 Finishing Concrete; 704.07 Method of Measurement; 704.08 Basis of Payment

SECTION 722 - CONCRETE BRIDGE DECK OVERLAYS

722.11 Texturing; 722.15 Method of Measurement; 722.16 Basis of Payment

Reinforced concrete bridge approaches, including extensions required for bridge railing transitions, will be paid for at the contract unit price per square yard. Subbase for PCCP will be paid for in accordance with 302.09. Subgrade treatment will be measured in accordance with 207.06. Geotextile will be paid for in accordance with 214.06. Reinforcing bars will be paid for in accordance with 703.08. Threaded tie bar assemblies will be paid for in accordance with 703.08. *Longitudinal grooving will be paid for in accordance with 722.16.*

SECTION 704, BEGIN LINE 129, INSERT AS FOLLOWS:

As soon as the water begins to leave, the surface shall be given a final check with the lightweight straightedge. The required cross section shall be preserved. The final surface shall be free from porous spots caused by the disturbance of coarse aggregate particles during the final checking and brooming. ~~After final checking, the surface shall be tined finished in accordance with 504.03.~~ If a new bridge deck is to be overlaid with latex modified concrete, the surface of such deck shall be heavily broom textured to provide maximum bonding of the overlay material.

Just before the concrete has taken the initial set, the ends of slabs, exposed edges, and transverse construction joints shall be rounded to a 1/4 in. radius. Longitudinal construction joints shall not be edged unless otherwise directed.

Smoothness shall be in accordance with 502.20. If, after the above requirements have been met, portions of the floor are not entirely satisfactory, the removal and replacement of such portions may be ordered to secure a satisfactory floor. Such removal and replacement shall be done with no additional payment.

After final smoothness checking, the surface shall be longitudinally grooved in accordance with 722.11.

SECTION 704, BEGIN LINE 157, INSERT AS FOLLOWS:

704.07 Method of Measurement

Concrete floor slab will be measured by the cubic yard in accordance with 702.27. However, no allowance will be made for variations in beam fillet depths, coping depths, or diaphragm depths, which are deemed necessary due to the beam camber, as constructed, which varies from that shown on the plans. Reinforcing bars will be measured in accordance with 703.07. Castings will be measured in accordance with 702.27. *Longitudinal grooving will be measured in accordance with 722.15.*

REVISION TO STANDARD SPECIFICATIONS

SECTION 609- REINFORCED CONCRETE BRIDGE APPROACHES

609.09 Finishing; 609.13 Method of Measurement; 609.14 Basis of Payment

SECTION 704 - CONCRETE FLOOR SLABS

704.05 Finishing Concrete; 704.07 Method of Measurement; 704.08 Basis of Payment

SECTION 722 - CONCRETE BRIDGE DECK OVERLAYS

722.11 Texturing; 722.15 Method of Measurement; 722.16 Basis of Payment

704.08 Basis of Payment

The accepted quantities of concrete floor slab will be paid for at the contract unit price per cubic yard for concrete, C, superstructure. Reinforcing bars will be paid for in accordance with 703.08. Castings will be paid for in accordance with 702.28. *Longitudinal grooving will be paid for in accordance with 722.16.*

SECTION 722, BEGIN LINE 552, DELETE AND INSERT AS FOLLOWS:

722.11 Texturing

The overlay surface shall be textured with a double thickness burlap drag or a minimum 4 ft wide turf drag immediately following the placement of the overlay material. Areas where the texture is disturbed by other finishing operations shall be immediately restored to a burlap drag finish.

Grooving or tining in the plastic concrete of the concrete overlay will not be allowed. ~~Transverse~~ *Longitudinal* grooving, when specified, shall not commence until the curing requirements have been met in accordance with 722.12. Grooves shall be cut into the hardened concrete surfaces ~~perpendicular~~ *parallel* to the centerline using a mechanical cutting device. For curved bridges, grooves shall be cut ~~transverse to~~ *along* the curve chord within the spans. Grooving shall be done before traffic is allowed on the surface except as follows.

The Contractor shall have the option of cutting the ~~transverse~~ *longitudinal* grooves at the end of each phase of construction or waiting until all phases have been completed. If the Contractor elects to delay the grooving process until completion of all phases, the concrete overlay surface for any phase opened to traffic shall receive an interim coarse broom finish during placement.

The completion of the grooving process shall be within 30 days of completion of the last phase of construction. Any additional maintenance of traffic operations required for the grooving process shall be included in the cost of Maintaining Traffic. The interim broom finish shall not be allowed as a surface texture when opened to traffic over a winter season. If the coarse broom texture is present and the Contractor is not in a position to finish all phases of the project, ~~transverse~~ *longitudinal* grooving shall be placed into the hardened concrete in order to establish an acceptable driving surface texture for the winter season.

Each groove shall be 1/8 in. \pm 1/64 in. in width, 3/16 in. \pm 1/16 in. in depth. The grooves shall be uniformly spaced at 3/4 in. intervals measured from the center of groove to center of groove ~~or randomly spaced at intervals between 5/8 in. to 1 1/4 in. from center of groove to center of groove with an average spacing of 7/8 in.~~ Grooving shall not be

REVISION TO STANDARD SPECIFICATIONS

SECTION 609- REINFORCED CONCRETE BRIDGE APPROACHES

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704.05 Finishing Concrete; 704.07 Method of Measurement; 704.08 Basis of Payment

SECTION 722 - CONCRETE BRIDGE DECK OVERLAYS

722.11 Texturing; 722.15 Method of Measurement; 722.16 Basis of Payment

within the area approximately 2 ft adjacent to the curbs *or railings*. ~~The grooving shall terminate approximately 6 in. from any expansion joints with steel nosing~~*The grooving shall not be cut closer than 3 in. nor further than 6 in. from any construction joint running parallel to the grooving. The grooving shall not be cut within 6 in. of deck drains, curbs, or expansion joints. If the bridge has a variable width traffic lane, the grooving shall remain parallel to the centerline of the main roadway. Any staggering of the groove terminations to accommodate the variable width shall be within the shoulders.* Stair stepped ends in grooving will be allowed for skewed bridge decks. When a new reinforced concrete approach slab is placed adjacent to the overlay, the grooving shall extend across the reinforced concrete approach slab. Grooving shall terminate approximately 6 in. from the interface with the roadway pavement.

The grooving machine shall contain diamond blades mounted on a multi-blade arbor on a self-propelled machine built for grooving hardened concrete surfaces. The grooving machine shall have a depth control device that detects variations in the deck surface and adjusts the cutting head height to maintain a specified depth of the grooves. The grooving machine shall have a guide device to control multi-pass alignment.

The Contractor shall submit a waste water control and disposal plan for approval seven days prior to commencing grooving activities. The waste water control and disposal plan shall detail how all waste water generated by the grooving activities shall be contained, tested for pH, stored and transported to a disposal facility in accordance with 202.

Cleaning of the grooving debris and slurry shall be performed with a vacuum system equipped with fugitive dust control devices and capable of removing wet debris and water in the same pass. The vacuum equipment shall be capable of washing the deck with pressurized water during the vacuum operation to dislodge all debris and slurry from the bridge deck surface. Debris and slurry shall not be allowed to dry prior to vacuuming.

SECTION 722, BEGIN LINE 863, DELETE AND INSERT AS FOLLOWS:

~~Transverse~~*Longitudinal* grooving will be measured by the square yard. No deduction in measurement will be made for areas where grooving is terminated or not required.

Epoxy resin adhesive and bond coat will not be measured for payment. Blasting, cleaning, finishing, texturing other than the ~~transverse~~*longitudinal* grooving, and curing will not be measured for payment.

SECTION 722, BEGIN LINE 913, DELETE AND INSERT AS FOLLOWS:

~~Transverse~~*Longitudinal* grooving will be paid for at the contract unit price per

REVISION TO STANDARD SPECIFICATIONS

SECTION 609- REINFORCED CONCRETE BRIDGE APPROACHES

609.09 Finishing; 609.13 Method of Measurement; 609.14 Basis of Payment

SECTION 704 - CONCRETE FLOOR SLABS

704.05 Finishing Concrete; 704.07 Method of Measurement; 704.08 Basis of Payment

SECTION 722 - CONCRETE BRIDGE DECK OVERLAYS

722.11 Texturing; 722.15 Method of Measurement; 722.16 Basis of Payment

square yard.

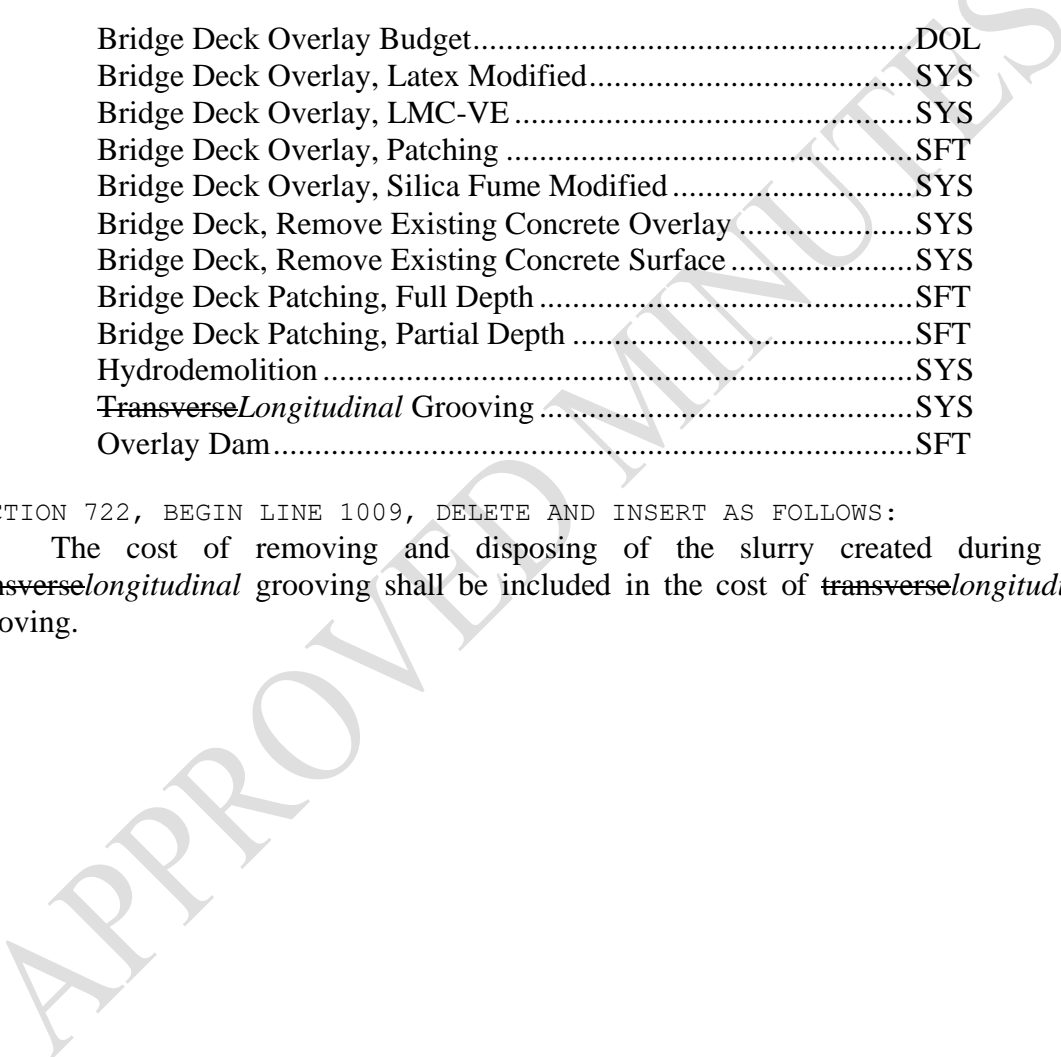
SECTION 722, BEGIN LINE 928, DELETE AND INSERT AS FOLLOWS:

Payment will be made under:

Pay Item	Pay Unit Symbol
Bridge Deck Overlay Budget.....	DOL
Bridge Deck Overlay, Latex Modified.....	SYS
Bridge Deck Overlay, LMC-VE	SYS
Bridge Deck Overlay, Patching	SFT
Bridge Deck Overlay, Silica Fume Modified	SYS
Bridge Deck, Remove Existing Concrete Overlay	SYS
Bridge Deck, Remove Existing Concrete Surface	SYS
Bridge Deck Patching, Full Depth	SFT
Bridge Deck Patching, Partial Depth	SFT
Hydrodemolition	SYS
Transverse Longitudinal Grooving	SYS
Overlay Dam.....	SFT

SECTION 722, BEGIN LINE 1009, DELETE AND INSERT AS FOLLOWS:

The cost of removing and disposing of the slurry created during the ~~transverse~~longitudinal grooving shall be included in the cost of ~~transverse~~longitudinal grooving.



COMMENTS AND ACTION

609.09 Finishing; 609.13 Method of Measurement; 609.14 Basis of Payment
 704.05 Finishing Concrete; 704.07 Method of Measurement; 704.08 Basis of Payment
 722.11 Texturing; 722.15 Method of Measurement; 722.16 Basis of Payment

DISCUSSION:

This item was introduced and presented by Mr. White, assisted by Jim Lesh, who explained that tining plastic concrete bridge decks and approach slab surfaces can have detrimental effects on the quality and ride of the concrete surface. The newly placed concrete must begin to set before grooves can be raked into the surface in order for the grooves to maintain their shape. Further explanations were provided by Mr. Lesh.

Mr. White therefore stated that longitudinal grooves are proposed to be cut into the cured concrete surface of bridge decks, bridge deck rigid overlays, and reinforced concrete bridge approach slabs, as shown above. Minor editorial revisions are as shown.

There was no further discussion and this item passed as submitted.

Motion: Mr. White Second: Mr. Reilman Ayes: 10 Nays: 0 FHWA Approval: YES	Action: <input checked="" type="checkbox"/> Passed as Submitted <input type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn
Standard Specifications Sections referenced and/or affected: 609.09, 609.13, 609.14 begin pg 521; 704.05, 704.07, 704.08 begin pg 655; 722.11, 722.15, 722.16 begin pg 780.	<input checked="" type="checkbox"/> 2024 Standard Specifications <input checked="" type="checkbox"/> Revise Pay Items List <input checked="" type="checkbox"/> Create RSP (No. <u>722-RB-317</u>) Effective: <u>September 1, 2022</u> RSP Sunset Date:
Recurring Special Provision references in: NONE	<input type="checkbox"/> Revise RSP (No. __) Effective: RSP Sunset Date:
Standard Drawing affected: NONE	<input type="checkbox"/> Standard Drawing Effective:
Design Manual Sections affected: NONE	<input type="checkbox"/> Create RPD (No. __) Effective:
GIFE Sections cross-references: NONE	<input checked="" type="checkbox"/> GIFE Update <input type="checkbox"/> Frequency Manual Update <input checked="" type="checkbox"/> SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: HMA contractors sometime have difficulty having access to HMA when performing coring operations.

PROPOSED SOLUTION: Allow a bagged alternative material that can be on the truck. It seems most surrounding states use a non shrink concrete/mortar for filling core holes in HMA. No issues with material compatibility or pop outs. It may be a better solution as core holes often have moisture.

APPLICABLE STANDARD SPECIFICATIONS: 401, 402 and 410

APPLICABLE STANDARD DRAWINGS: NA

APPLICABLE DESIGN MANUAL SECTION: NA

APPLICABLE SECTION OF GIFE: NA

APPLICABLE RECURRING SPECIAL PROVISIONS: NA

PAY ITEMS AFFECTED: NA

APPLICABLE SUB-COMMITTEE ENDORSEMENT:

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:
Insert in all contracts with a 401, 402, or 410 pay item.

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT Materials and Tests

Phone Number: 317-522-9692

Date: 12/15/21

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD SPECIFICATIONS

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? N

Will approval of this item affect the Approved Materials List? N

Will this proposal improve:

Construction costs? N

Construction time? N

Customer satisfaction? N

Congestion/travel time? N

Ride quality? N

Will this proposal reduce operational costs or maintenance effort? Y

Will this item improve safety:

For motorists? N

For construction workers? Y

Will this proposal improve quality for:

Construction procedures/processes? Y

Asset preservation? Y

Design process? N

Will this change provide the contractor more flexibility? Y

Will this proposal provide clarification for the Contractor and field personnel? Y

Can this item improve/reduce the number of potential change orders? N

Is this proposal needed for compliance with:

Federal or State regulations? N

AASHTO or other design code? N

Is this item editorial? N

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO STANDARD SPECIFICATIONS

SECTION 401 – QC/QA HMA PAVEMENT

401.16 Density

SECTION 402 – HMA PAVEMENT

402.16 Low Temperature Compaction Requirements

SECTION 410 – QC/QA HMA – SMA PAVEMENT

410.16 Density

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 401, BEGIN LINE 583, DELETE AND INSERT AS FOLLOWS:

Within one work day of coring operations the Contractor shall clean, dry, and refill the core holes with *either HMA of similar or smaller size particles or bridge deck repair material from the QPL of Rapid Setting Patch Materials. The rapid setting patch material shall be mixed in a separate container and placed in the hole perin accordance with the manufacturer's recommendations, consolidated by rodding, and struck-off flush with the adjacent pavement.*

SECTION 402, BEGIN LINE 338, DELETE AND INSERT AS FOLLOWS:

~~Within one work day of coring operations, the Contractor shall clean, dry, refill, and compact the core holes with suitable HMA of similar or smaller size particles in accordance with 401.16.~~

SECTION 410, BEGIN LINE 378, DELETE AND INSERT AS FOLLOWS:

Within one work day of coring operations the Contractor shall clean, dry, and refill the core holes with *either SMA of similar or smaller size particles or other approved material or bridge deck repair material from the QPL of Rapid Setting Patch Materials. The rapid setting patch material shall be mixed in a separate container and placed in the hole perin accordance with the manufacturer's recommendations, consolidated by rodding, and struck-off flush with the adjacent pavement.* The Contractor's plan for refilling core holes shall be outlined in the QCP.

COMMENTS AND ACTION

401.16 Density

402.16 Low Temperature Compaction Requirements

410.16 Density

DISCUSSION:

Mr. Reilman introduced and presented this item stating that HMA contractors sometimes have difficulty gaining access to HMA when performing coring operations.

Mr. Reilman proposed to allow a bagged alternative material that can be on the truck. It seems most surrounding states use a non-shrink concrete/mortar for filling core holes in HMA. No issues with material compatibility or pop outs. It may be a better solution as core holes often have moisture.

Prior to the meeting: Mr. Koch commented that as the proposal includes good constraint language/guidance for use of material from the Rapid Setting Patch list, 402 line 338 is within 402.16 'Low Temp Compaction Req' but 401 and 410 may also occur during cooler weather. Mr. Koch asked if it is a best practice to use temperature sensitive material to fill cores at temperature extremes and with high likelihood of relatively soon deicer applications? Set times are another constraint as I doubt traffic would be controlled for the needed duration. That said, *something* is better than a hole...

Mr. Reilman responded that the "in accordance with the manufacturer's recommendations" should exclude it from being used in freezing weather, since most of them have either a 33°F or 40°F restriction. We think concrete will actually outperform HMA in the core hole, even in colder weather. 402 has restrictions for below 60°F and 45°F, which would still allow for the use of concrete. The allowance for paving below 32°F simply means they will have to use the HMA option, same for 401 or 410.

Mr. Reilman also stated that, regarding cure times, time sensitive applications wouldn't have the need for a bagged material anyway. The HMA would be readily available nearby, or they would simply have to use HMA, no matter what. The idea here is to give another option, at the Contractor's choice, on what makes the most sense for the job. Also, even if it wasn't "fully" cured, by the time traffic was put on it, it will have set up enough for a tire to bridge the hole, assuming the core hole was in the wheel path.

There was no further discussion and this item passed as submitted. The RSP will be revised, and may be considered for inclusion into the 2026 spec book, but are not yet ready for the 2024 spec book.

COMMENTS AND ACTION

401.16 Density
 402.16 Low Temperature Compaction Requirements
 410.16 Density

[continued]

Motion: Mr. Reilman Second: Mr. Novak Ayes: 10 Nays: 0 FHWA Approval: YES	Action: <input checked="" type="checkbox"/> Passed as Submitted <input type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn
<u>Referenced and/or affected:</u> Standard Specifications sections 401.16 pg. 314; 402.16 pg. 344; 410. 16 pg. 361.	<input type="checkbox"/> 2024 Standard Specifications <input type="checkbox"/> Revise Pay Items List <input type="checkbox"/> Create RSP (No. __) Effective: RSP Sunset Date:
Recurring Special Provision: 401-R-736 QC/QA HMA PAVEMENT 402-R-737 HMA PAVEMENT 410-R-738 QC/QA HMA – SMA PAVEMENT	<input checked="" type="checkbox"/> Revise RSP (No. <u>401-R-736, 402-R-737, and 410-R-738</u>) Effective: <u>June 1, 2022</u> RSP Sunset Date:
Standard Drawing affected: NONE	<input type="checkbox"/> Standard Drawing Effective:
Design Manual Sections affected: NONE	<input type="checkbox"/> Create RPD (No. __) Effective:
GIFE Sections cross-references: NONE	<input checked="" type="checkbox"/> GIFE Update <input type="checkbox"/> Frequency Manual Update <input type="checkbox"/> SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: VRAM exists as a USP and is continually having to go thru the USP process.

PROPOSED SOLUTION: Convert the 401 and 410 USPs to RSPs

APPLICABLE STANDARD SPECIFICATIONS: 401 and 410

APPLICABLE STANDARD DRAWINGS: NA

APPLICABLE DESIGN MANUAL SECTION: NA

APPLICABLE SECTION OF GIFE: NA

APPLICABLE RECURRING SPECIAL PROVISIONS: NA

PAY ITEMS AFFECTED: NA

APPLICABLE SUB-COMMITTEE ENDORSEMENT:

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:
Contracts with 401-12439 VOID REDUCING ASPHALT MEMBRANE, or
410-12466 VOID REDUCING ASPHALT MEMBRANE FOR SMA

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT Materials and Tests

Phone Number: 317-522-9692

Date: 12/21/21

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO SPECIAL PROVISIONS

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? N

Will approval of this item affect the Approved Materials List? N

Will this proposal improve:

Construction costs? N

Construction time? N

Customer satisfaction? Y

Congestion/travel time? N

Ride quality? Y

Will this proposal reduce operational costs or maintenance effort? Y

Will this item improve safety:

For motorists? N

For construction workers? N

Will this proposal improve quality for:

Construction procedures/processes? Y

Asset preservation? Y

Design process? N

Will this change provide the contractor more flexibility? N

Will this proposal provide clarification for the Contractor and field personnel? Y

Can this item improve/reduce the number of potential change orders? Y

Is this proposal needed for compliance with:

Federal or State regulations? N

AASHTO or other design code? N

Is this item editorial? N

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO SPECIAL PROVISIONS

401-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR HMA (proposed new)

410-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR SMA (proposed new)

401-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR HMA

(Adopted xx-xx-22)

The Standard Specifications are revised as follows:

SECTION 101, AFTER LINE 144, INSERT AS FOLLOWS:

VOC volatile organic compounds
VRAM void reducing asphalt membrane

SECTION 401, BEGIN LINE 446, DELETE AND INSERT AS FOLLOWS:

401.15 Joints

Longitudinal joints in the surface shall be at the lane lines of the pavement. Longitudinal joints below the surface shall be offset from previously constructed joints by approximately 6 in. and be located within 12 in. of the lane line.

(a) Hot Poured Joint Adhesive for Applications

Hot poured joint adhesive in accordance with 906 shall be applied to longitudinal joints constructed between two adjacent HMA courses in the top course of *all category 2, 3 and 4 dense graded intermediate mixture courses, and all category 2 and 3 dense graded 4.75 mm, 9.5 mm, and 12.5 mm surface mixture courses, and all 4.75 mm surface mixture courses.* This includes joints within the traveled way as well as between any of the following: traveled way and an auxiliary lane; traveled way and a paved shoulder; and auxiliary lane and a paved shoulder.

The material shall be heated in a jacketed, double boiler melting kettle. The kettle shall have an attached pressure feed wand system with applicator shoe.

SECTION 401, AFTER LINE 500, INSERT AS FOLLOWS:

(b) VRAM for Applications

VRAM, in accordance with 902 shall be applied under the area where a longitudinal joint will be formed in the top course of all category 4 dense graded 9.5 mm and 12.5 mm surface mixture courses. This shall include the area where a longitudinal joint will be formed within the traveled way, between the traveled way and an auxiliary lane, between the traveled way and a paved shoulder, and between an auxiliary lane and a paved shoulder.

Application of the VRAM material shall be with a distributor in accordance with 409.03(a) that is equipped with a heating and recirculating system along with a functioning auger agitating system or vertical shaft mixer in the tank to prevent localized heating. Material from a melting kettle may be dispensed through a pressure feed wand with an applicator shoe or through a pressure feed wand into a hand-operated thermal push cart used for transport and application. All transport and storage assets for the VRAM material shall be equipped with a heating and recirculating system along with a functioning auger agitating system or vertical shaft mixer in the tank to prevent localized heating.

REVISION TO SPECIAL PROVISIONS

401-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR HMA (proposed new)

410-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR SMA (proposed new)

Prior to the application of the VRAM, the existing surface to be treated shall be free of foreign materials deemed detrimental by the Engineer and shall also be dry and cleaned of all dust, debris and any substances that will prevent adherence. The VRAM may be placed before or after the tack coat. If after, the tack coat shall be fully cured prior to placement of VRAM.

The width and minimum application rate shall be in accordance with the following table:

<i>VRAM Application Rate-Table</i>			
<i>HMA Planned Lay Rate, lb/sq yd</i>	<i>VRAM Width, in.</i>	<i>VRAM Application Rate, lb/ft*</i>	<i>Coarse-graded mixture** VRAM Application Rate, lb/ft*</i>
<i>165</i>	<i>18</i>	<i>0.95</i>	<i>1.26</i>
<i>≥ 220</i>	<i>18</i>	<i>0.95</i>	<i>1.51</i>
<i>Tolerance</i>		<i>±10%</i>	<i>± 10%</i>
<p><i>* The application rate has a surface demand for liquid included within it. The nominal thickness of the VRAM may taper from the center of the application to a lesser thickness on the edge of the application. The width and weight per foot shall be maintained. If the material is placed under a joint formed between two mixtures requiring different rates, the lower application rate shall be used.</i></p>			
<p><i>** A coarse-graded mixture shall will be defined as a 9.5 mm mixture having less than 47% passing the No. 8 (2.36 mm) sieve or a 12.5 mm mixture having less than 39% passing the No. 8 (2.36 mm) sieve.</i></p>			

The application shall be within 2 in. of being centered under the joint of the HMA course being constructed. When only half of the joint is exposed, the application shall be applied at half of the prescribed width, shall be adjacent to the center of the joint, and the vertical face of the cold joint left in place shall also be coated.

The Contractor shall furnish a bill of lading, to the Engineer, for each tanker supplying material to the project. The flow, application rate, and tracking of material will be verified within the first 1,000 ft of the day's scheduled application length and every 12,000 ft the remainder of the day. For projects less than 3,000 ft, the rate will be verified once. A suitable paper or pan shall be placed at a random location in the path of placement. The paper or pan shall be picked up and weighed after application to determine the weight per ft yield. The Contractor shall replace the VRAM in the areas where the samples were taken.

The VRAM shall be applied in a single pass. A distributor or melting kettle shall apply the material to within 1 1/2 in. of the width specified. Placement shall stop and remedial action shall be taken if the material flows more than 2 in. from initial placement. Release paper shall be placed over the previous application to prevent doubling the thickness when starting another run.

REVISION TO SPECIAL PROVISIONS

401-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR HMA (proposed new)

410-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR SMA (proposed new)

The VRAM shall be suitable for construction traffic to drive on without pickup or tracking within 30 minutes of placement. Placement shall stop and damaged areas shall be repaired if pickup or tracking occurs. The paver end plate and grade control device shall be raised above the finished height of the material prior to start of paving.

Cores for density determination shall be in accordance with 401.16 and 401.20 and shall not be taken within 12 in. of either the confined edge or the non-confined edge of the course placed where VRAM has been applied.

Milled pavement corrugations, when specified in accordance with 606, shall be sealed using liquid asphalt sealant in accordance with 401.15(a) and 902.01(b).

SECTION 401, BEGIN LINE 906, INSERT AS FOLLOWS:

401.21 Method of Measurement

HMA mixtures will be measured by the ton of the type specified, in accordance with 109.01(b). The measured quantity will be divided by the MAF to determine the pay quantity.

Milled shoulder corrugations will be measured in accordance with 606.02.

Joint adhesive will be measured by the linear foot in accordance with 109.01(a). Liquid asphalt sealant *and VRAM for HMA* will be measured by the linear foot.

401.22 Basis of Payment

The accepted quantities for this work will be paid for at the contract unit price per ton for QC/QA-HMA, of the type specified, complete in place.

Payment for furnishing, calibrating, and operating the profilograph, and furnishing profile information will be made at the contract lump sum price for profilograph, HMA.

Adjustments to the contract payment with respect to mixture, density, and smoothness for mixture produced will be included in a quality adjustment pay item in accordance with 109.05.1.

Milled shoulder corrugations will be paid for in accordance with 606.03.

Joint adhesive will be paid for at the contract unit price per linear foot, complete in place. Liquid asphalt sealant will be paid for at the contract unit price per linear foot. *VRAM for HMA will be paid for at the contract unit price per linear foot for full width applications. VRAM for HMA will be paid for at half the contract unit price per linear foot for half width applications.*

Payment will be made under:

REVISION TO SPECIAL PROVISIONS

401-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR HMA (proposed new)

410-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR SMA (proposed new)

Pay Item	Pay Unit Symbol
Joint Adhesive, _____ course type	LFT
Liquid Asphalt Sealant	LFT
Void Reducing Asphalt Membrane for HMA.....	LFT
Profilograph, HMA	LS
QC/QA-HMA, _____, _____, _____, _____ mm..... (ESAL ⁽¹⁾) (PG ⁽²⁾) (Course ⁽³⁾) (Mix ⁽⁴⁾)	TON

(1) ESAL Category as defined in 401.04

(2) Number represents the high temperature binder grade. Low temperature grades are - 22

(3) Surface, Intermediate, or Base

(4) Mixture Designation

SECTION 902, AFTER LINE 140, INSERT AS FOLLOWS:

(f) VRAM

The asphalt material comprising the VRAM shall be in accordance with the following:

Test Characteristics	Test Requirements	Test Method
Dynamic shear @ 88°C (unaged), $G^*/\sin \delta$, kPa	1.00 min.	AASHTO T 315
Creep stiffness @ -18°C (unaged), Stiffness (S), MPa m-value	300 max. 0.300 min.	AASHTO T 313
Ash, %	1.0 - 4.0	AASHTO T 111
Elastic Recovery, 100 mm elongation, cut immediately, 25°C, %	70 min.	AASHTO T 301
Separation of Polymer, Difference in °C of the softening point (Ring and Ball)	3 max.	ASTM D7173, AASHTO T 53

Elastomers shall be added to a base asphalt and shall be either a styrene-butadiene diblock or triblock copolymer without oil extension, or a styrene-butadiene rubber. Air blown asphalt, acid modification, or other modifiers will not be allowed.

VRAM shall be furnished by a supplier on the QPL of Performance-Graded Asphalt Binder Suppliers. A type A certification for the VRAM material shall be furnished in accordance with 916.

REVISION TO SPECIAL PROVISIONS

401-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR HMA (proposed new)

410-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR SMA (proposed new)

(Note: Proposed changes shown highlighted gray)

410-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR SMA

(Adopted xx-xx-22)

The Standard Specifications are revised as follows:

SECTION 101, AFTER LINE 144, INSERT AS FOLLOWS:

VOC volatile organic compounds
VRAM void reducing asphalt membrane

SECTION 410, BEGIN LINE 297, DELETE AND INSERT AS FOLLOWS:

410.15 Joints

Longitudinal joints in the surface shall be at the lane lines of the pavement.

(a) Hot Poured Joint Adhesive for Applications

Hot poured joint adhesive in accordance with 906 shall be applied to longitudinal joints constructed between ~~two adjacent HMA courses in the top course of dense graded intermediate mixtures and all 9.5 mm and 12.5 mm SMA mixture intermediate courses or longitudinal joints constructed between the SMA mixture intermediate courses and dense graded HMA intermediate courses.~~ This includes joints within the traveled way as well as between any of the following: traveled way and an auxiliary lane; traveled way and a paved shoulder; and auxiliary lane and a paved shoulder.

The material shall be heated in a jacketed, double boiler melting kettle. The kettle shall have an attached pressure feed wand system with applicator shoe.

The joint adhesive shall be applied to the face of the previously constructed edge at the joint using a wand applicator. Prior to application of the joint adhesive, the joint face shall be dry and free of loose material and foreign objects. The adhesive shall be applied on the joint face 1/8 in. thick at the temperature recommended by the manufacturer. Excess joint adhesive shall not be allowed to pool on the top of the previously constructed pavement course or the pavement to be overlaid. The application of the adhesive shall be made within the same day, but at least 30 minutes prior to construction of the longitudinal joint.

Transverse joints shall be constructed by exposing a near vertical full depth face of the previous course. For areas inaccessible to rollers, other mechanical devices shall be used to achieve the required density.

If constructed under traffic, temporary transverse joints shall be feathered to provide a smooth transition to the driving surface.

(b) VRAM for Applications

VRAM in accordance with 902 shall be applied under the area where a longitudinal

REVISION TO SPECIAL PROVISIONS

401-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR HMA (proposed new)

410-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR SMA (proposed new)

joint will be formed in the top course of all SMA surface mixture courses. This shall include the area where a longitudinal joint will be formed within the traveled way, between the traveled way and an auxiliary lane, between the traveled way and a paved shoulder, and between an auxiliary lane and a paved shoulder.

Application of the VRAM material shall be with a distributor in accordance with 409.03(a) that is equipped with a heating and recirculating system along with a functioning auger agitating system or vertical shaft mixer in the tank to prevent localized heating. Material from a melting kettle may be dispensed through a pressure feed wand with an applicator shoe or through a pressure feed wand into a hand-operated thermal push-cart used for transport and application. All transport and storage assets for the VRAM material shall be equipped with a heating and recirculating system along with a functioning auger agitating system or vertical shaft mixer in the tank to prevent localized heating.

Prior to the application of the VRAM, the existing surface to be treated shall be free of foreign materials deemed detrimental by the Engineer and shall also be dry and cleaned of all dust, debris and any substances that will prevent adherence. The VRAM may be placed before or after the tack coat. If after, the tack coat shall be fully cured prior to placement of VRAM.

The width and minimum application rate shall be in accordance with the following table:

<i>VRAM Application Rate Table for SMA mixtures in accordance with 410</i>		
<i>SMA Planned Lay Rate, lb/sq yd</i>	<i>VRAM Width, in.</i>	<i>VRAM Application Rate *, lb/ft</i>
<i>165</i>	<i>18</i>	<i>1.26</i>
<i>220</i>	<i>18</i>	<i>1.51</i>
<i>Tolerance</i>		<i>±10%</i>
<i>* The application rate has a surface demand for liquid included within it. The nominal thickness of the VRAM may taper from the center of the application to a lesser thickness on the edge of the application. The width and weight per foot shall be maintained. If the material is placed under a joint formed between a SMA mixture and a dense graded HMA mixture, the lower application rate shall be used.</i>		

The application shall be within 2 in. of being centered under the joint of the course being constructed. When only half of the joint is exposed, the application shall be applied at half the prescribed width, shall be adjacent to the center of the joint, and the vertical face of the cold joint left in place shall also be coated.

The Contractor shall furnish a bill of lading, to the Engineer, for each tanker supplying material to the project. The flow, application rate, and tracking of material will be verified within the first 1,000 ft of the day's scheduled application length and every

REVISION TO SPECIAL PROVISIONS

401-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR HMA (proposed new)

410-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR SMA (proposed new)

12,000 ft the remainder of the day. For projects less than 3,000 ft, the rate will be verified once. A suitable paper or pan shall be placed at a random location in the path of placement. The paper or pan shall be picked up and weighed after application to determine the weight per foot yield. The Contractor shall replace the VRAM in the areas where the samples were taken.

The VRAM shall be applied in a single pass. A distributor or melting kettle shall apply the material to within 1 1/2 in. of the width specified. Placement shall stop and remedial action shall be taken if the material flows more than 2 in. from initial placement. Release paper shall be placed over the previous application to prevent doubling the thickness when starting another run.

The VRAM shall be suitable for construction traffic to drive on without pickup or tracking within 30 minutes of placement. Placement shall stop and damaged areas shall be repaired if pickup or tracking occurs. The paver end plate and grade control device shall be raised above the finished height of the material prior to start of paving.

Cores for density determination shall be in accordance with 401.16 and 401.20, and shall not be taken within 12 in. of either the confined edge or the non-confined edge of the course placed where VRAM has been applied.

SECTION 410, AFTER LINE 488, DELETE AND INSERT AS FOLLOWS:

410.21 Method of Measurement

SMA mixtures will be measured by the ton of the type specified, in accordance with 109.01(b). The measured quantity will be divided by the MAF to determine the pay quantity.

Joint adhesive will be measured by the linear foot in accordance with 109.01(a). *VRAM for SMA will be measured by the linear foot.*

410.22 Basis of Payment

The accepted quantities for this work will be paid for at the contract unit price per ton for QC/QA-HMA, of the type specified, – SMA, complete in place.

Payment for furnishing, calibrating, and operating the profilograph, and furnishing profile information will be made in accordance with 401.22.

Joint adhesive will be paid for by the linear foot, complete in place. *VRAM for SMA will be paid for at the contract unit price per linear foot for full width applications. VRAM for SMA will be paid for at half the contract unit price per linear foot for half width applications.*

Adjustments to the contract payment with respect to mixture, density, and smoothness for mixture produced will be included in a quality assurance adjustment pay

REVISION TO SPECIAL PROVISIONS

401-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR HMA (proposed new)

410-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR SMA (proposed new)

item. The unit price for this pay item will be \$1.00 and the quantity will be in units of dollars. The quantity is the total calculated in accordance with 410.19. A change order developed in accordance with 109.05 will be prepared to reflect contract adjustments.

Payment will be made under:

Pay Item	Pay Unit Symbol
Joint Adhesive, _____ course type	LFT
Void Reducing Asphalt Membrane for SMA.....	LFT
QC/QA-HMA, _____, _____, _____, _____ mm, - SMA	TON
(ESAL ⁽¹⁾) (PG ⁽²⁾) (Course ⁽³⁾) (Mix ⁽⁴⁾)	
Quality Assurance Adjustment	DOL
⁽¹⁾ ESAL Category as defined in 410.04 ⁽²⁾ Number represents the high temperature binder grade. Low temperature grades are - 22 ⁽³⁾ Surface or Intermediate ⁽⁴⁾ Mixture Designation	

SECTION 902, AFTER LINE 140, INSERT AS FOLLOWS:

(f) VRAM

The asphalt material comprising the VRAM shall be in accordance with the following:

<i>Test Characteristics</i>	<i>Test Requirements</i>	<i>Test Method</i>
<i>Dynamic shear @ 88°C (unaged), G*/sin δ, kPa</i>	<i>1.00 min.</i>	<i>AASHTO T 315</i>
<i>Creep stiffness @ -18°C (unaged), Stiffness (S), MPa m-value</i>	<i>300 max. 0.300 min.</i>	<i>AASHTO T 313</i>
<i>Ash, %</i>	<i>1.0 - 4.0</i>	<i>AASHTO T 111</i>
<i>Elastic Recovery, 100 mm elongation, cut immediately, 25°C, %</i>	<i>70 min.</i>	<i>AASHTO T 301</i>
<i>Separation of Polymer, Difference in °C of the softening point (Rring and Bball)</i>	<i>3 max.</i>	<i>ASTM D7173, AASHTO T 53</i>

Elastomers shall be added to a base asphalt and shall be either a styrene-butadiene diblock or triblock copolymer without oil extension, or a styrene-butadiene rubber. Air blown asphalt, acid modification, or other modifiers will not be allowed.

VRAM shall be furnished by a supplier on the QPL of Performance-Graded Asphalt Binder Suppliers. A type A certification for the VRAM material shall be furnished in accordance with 916.

COMMENTS AND ACTION

401-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR HMA (proposed new)

410-x-xxx VOID REDUCING ASPHALT MEMBRANE FOR SMA (proposed new)

DISCUSSION:

This item was introduced and presented by Mr. Reilman, assisted by Mr. Awwad, who pointed out that VRAM exists as a USP and is continually having to go thru the USP process.

Mr. Reilman proposed to convert the 401 and 410 USPs to RSPs.

Mr. Koch stated that, for 401, although we rarely use 4.75mm surface, Cat 2 & 3 requires Hot Pour Joint Adhesive and we are silent on Cat 4, and asked “What if anything should be done for Cat 4 4.75mm surface?”

Mr. Awwad responded that, looking at bid history, it looks like a cat 4 4.75mm was used once in the last 7 years. It should be added to the hot pour section. But it makes an incredibly long and confusing sentence even longer and more confusing. I really don’t want to have to convert this to a table!

Minor revisions are as shown above. Mr. Reilman revised his motion.

There was no further discussion and this item passed as revised. The RSPs may be considered for inclusion into the 2026 spec book, but are not yet ready for the 2024 spec book.

<p>Motion: Mr. Reilman Second: Mr. Novak Ayes: 10 Nays: 0 FHWA Approval: YES</p>	<p>Action:</p> <p><input type="checkbox"/> Passed as Submitted <input checked="" type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn</p>
<p>Standard Specifications Sections referenced and/or affected:</p>	<p><input type="checkbox"/> 2024 Standard Specifications <input type="checkbox"/> Revise Pay Items List</p>
<p>401 begin pg 311; 410 begin pg 359; 902 begin pg 978.</p>	<p><input checked="" type="checkbox"/> Create RSP (No. <u>401-R-750 and 410-R-751</u>) Effective: <u>September 1, 2022</u> RSP Sunset Date:</p>
<p>Recurring Special Provision references in: NONE</p>	<p><input type="checkbox"/> Revise RSP (No. __) Effective: RSP Sunset Date:</p>
<p>Standard Drawing affected: NONE</p>	<p><input type="checkbox"/> Standard Drawing Effective:</p>
<p>Design Manual Sections affected: NONE</p>	<p><input type="checkbox"/> Create RPD (No. __) Effective: GIFE Update</p>
<p>GIFE Sections cross-references: NONE</p>	<p><input checked="" type="checkbox"/> Frequency Manual Update <input checked="" type="checkbox"/> SiteManager Update</p>

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Spray pavers have difficulty paving in the 8' to 11' range, but our spec can require spray paver use when the width is 8' or wider .

PROPOSED SOLUTION: specify spray paver use to be where paving width is 11' or wider

APPLICABLE STANDARD SPECIFICATIONS: 401 and 410

APPLICABLE STANDARD DRAWINGS: NA

APPLICABLE DESIGN MANUAL SECTION: NA

APPLICABLE SECTION OF GIFE: NA

APPLICABLE RECURRING SPECIAL PROVISIONS: 401-R-417, 410-R-418

PAY ITEMS AFFECTED: NA

APPLICABLE SUB-COMMITTEE ENDORSEMENT:

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:

IMPACT ANALYSIS (attach report):

Submitted By: Jim Reilman

Title: State Materials Engineer

Organization: INDOT Materials and Tests

Phone Number: 317-522-9692

Date: 12/21/21

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO SPECIAL PROVISIONS

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? N

Will approval of this item affect the Approved Materials List? N

Will this proposal improve:

Construction costs? N

Construction time? N

Customer satisfaction? N

Congestion/travel time? N

Ride quality? N

Will this proposal reduce operational costs or maintenance effort? Y

Will this item improve safety:

For motorists? N

For construction workers? N

Will this proposal improve quality for:

Construction procedures/processes? Y

Asset preservation? Y

Design process? Y

Will this change provide the contractor more flexibility? Y

Will this proposal provide clarification for the Contractor and field personnel? Y

Can this item improve/reduce the number of potential change orders? N

Is this proposal needed for compliance with:

Federal or State regulations? N

AASHTO or other design code? N

Is this item editorial? N

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda: After a post construction meeting with the Vincennes district and the contractor, it was felt this was the only ambiguous part of the spec.

REVISION TO SPECIAL PROVISIONS

401-R-417 HMA SPRAY PAVER AND EMULSION

410-R-418 SMA SPRAY PAVER AND EMULSION

[401-R-417 HMA SPRAY PAVER AND EMULSION](#) (shown only affected excerpt)

401.14 Spreading and Finishing

The mixture placed on a shoulder, approach, taper, or gore area shall be placed by means of laydown equipment in accordance with 409.03(c)1, 409.03(c)2, or 409.03(c)3 and tacked in accordance with 406 and 409.03(a). No additional payment will be made if the Contractor elects to use equipment and materials in accordance with 409.03(c)4 and 902.01(b)2.

The mixture placed on all travel lanes, turn lanes, auxiliary lanes, and ramps which are 11 ft or more in width shall be placed upon an approved surface by means of laydown equipment in accordance with 409.03(c)4. This shall include a mixture placed simultaneously with a travel lane, turn lane, auxiliary lane, or ramp.

[410-R-418 SMA SPRAY PAVER AND EMULSION](#) (shown only affected excerpt)

410.14 Spreading and Finishing

The mixture placed on a shoulder, approach, taper, or gore area shall be placed by means of laydown equipment in accordance with 409.03(c)1, 409.03(c)2, or 409.03(c)3 and tacked in accordance with 406 and 409.03(a). No additional payment will be made if the Contractor elects to use equipment and materials in accordance with 409.03(c)4 and 902.01(b)2.

The mixture placed on all travel lanes, turn lanes, auxiliary lanes, and ramps which are 11 ft or more in width shall be placed upon an approved surface by means of laydown equipment in accordance with 409.03(c)4. This shall include a mixture placed simultaneously with a travel lane, turn lane, auxiliary lane, or ramp.

COMMENTS AND ACTION

401-R-417 HMA SPRAY PAVER AND EMULSION

410-R-418 SMA SPRAY PAVER AND EMULSION

DISCUSSION:

Mr. Reilman introduced and presented this item, assisted by Mr. Awwad, stating that spray pavers have difficulty paving in the 8 ft to 11 ft range, but our spec can require spray paver use when the width is 8 ft or wider.

Mr. Reilman proposed to specify spray paver use to be where paving width is 11 ft or wider.

Ms. Mouser asked if we need to make a revision to the Design Memo. Mr. Awwad and Mr. said they'll look into that.

There was no further discussion and this item passed as submitted. The RSPs will be revised, and may be considered for inclusion into the 2026 spec book, but are not yet ready for the 2024 spec book.

<p>Motion: Mr. Reilman Second: Mr. Pelz Ayes: 10 Nays: 0 FHWA Approval: YES</p>	<p>Action:</p> <p><input checked="" type="checkbox"/> Passed as Submitted <input type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn</p>
<p>Standard Specifications Sections referenced and/or affected: 401 begin pg. 299; 410 begin pg. 351.</p>	<p><input type="checkbox"/> 2024 Standard Specifications <input type="checkbox"/> Revise Pay Items List</p>
<p>Recurring Special Provision references in: 401-R-417 HMA SPRAY PAVER AND EMULSION</p>	<p><input type="checkbox"/> Create RSP (No. __) Effective: RSP Sunset Date:</p>
<p>410-R-418 SMA SPRAY PAVER AND EMULSION</p>	<p><input checked="" type="checkbox"/> Revise RSP (No. <u>401-R-417 and 410-R-418</u>) Effective: <u>June 1, 2022</u> RSP Sunset Date:</p>
<p>Standard Drawing affected: NONE</p>	<p><input type="checkbox"/> Standard Drawing Effective:</p>
<p>Design Manual Sections affected: NONE</p>	<p><input type="checkbox"/> Create RPD (No. __) Effective:</p>
<p>GIFE Sections cross-references: NONE</p>	<p><input type="checkbox"/> GIFE Update <input type="checkbox"/> Frequency Manual Update <input type="checkbox"/> SiteManager Update</p>

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: A wide range of pedestrians may be affected by a work zone, including the young, elderly, and people with disabilities. To better provide accessible temporary facilities for pedestrians there is a need to standardize the various unique special provisions for temporary curb ramps and temporary accessible pedestrian paths being used on individual construction contracts into recurring special provisions and create recurring special provisions for temporary pedestrian channelizers and audible information devices.

PROPOSED SOLUTION: Establish a recurring special provision for [1] temporary curb ramps, [2] temporary accessible pedestrian paths, [3] temporary pedestrian channelizers, and [4] audible information devices.

APPLICABLE STANDARD SPECIFICATIONS: 801

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: IDM §503-3.04(13)

APPLICABLE SECTION OF GIFE: §22

APPLICABLE RECURRING SPECIAL PROVISIONS: N/A

PAY ITEMS AFFECTED: 801-11990, Temporary Curb Ramp (EACH)
801-12641, Temporary Accessible Pedestrian Path (SYS)
Create new pay items for temporary pedestrian channelizer (LFT) and audible information devices (EACH)

APPLICABLE SUB-COMMITTEE ENDORSEMENT: The proposed RSP has been reviewed by INDOT's ADA Technical Advisory Committee and industry.

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE:
Required for all contracts with **801-11990**, **801-12641**, *temporary pedestrian channelizer*, or *audible information device*, pay items.

IMPACT ANALYSIS (attach report): Yes

Submitted By: Joe Bruno on behalf of Dave Boruff
Title: Sr. Engineer of Signals & Markings
Organization: INDOT Traffic Engineering Division
Phone Number: (317) 234-7949
Date: 12/27/2021

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO SPECIAL PROVISIONS

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Qualified Products List? No

Will this proposal improve:

Construction costs? No

Construction time? Yes

Customer satisfaction? Yes

Congestion/travel time? No

Ride quality? No

Will this proposal reduce operational costs or maintenance effort? No

Will this item improve safety:

For motorists? No

For pedestrians? Yes

For construction workers? Yes

Will this proposal improve quality for:

Construction procedures/processes? Yes

Asset preservation? No

Design process? Yes

Will this change provide the contractor more flexibility? No

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? Yes

Is this proposal needed for compliance with:

Federal or State regulations? Yes

AASHTO or other design code? No

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda: Establishing the RSP's will eliminate the need to review individual USP's for temporary curb ramps and temporary accessible pedestrian paths.

REVISION TO SPECIAL PROVISIONS

801-x-xxx TEMPORARY CURB RAMP (proposed new)

801-x-xxx TEMPORARY ACCESSIBLE PEDESTRIAN PATH (proposed new)

801-x-xxx TEMPORARY PEDESTRIAN CHANNELIZER (proposed new)

801-x-xxx AUDIBLE INFORMATION DEVICE (proposed new)

801-x-xxx TEMPORARY CURB RAMP

(Adopted xx-xx-22)

Description

This work shall consist of installing temporary curb ramps for temporary pedestrian access at various intersections in accordance with 105.03.

Materials

Materials shall be in accordance with 604.02 or from the Department's QPL of ADA Compliant Work Zone Devices.

Construction Requirements

The Contractor shall place temporary curb ramps to provide ADA compliant temporary access for pedestrians in accordance with 107.08 and as shown on the plans.

The temporary curb ramp shall be a minimum of 48 in. wide and have a slip resistant surface. The ramp shall not have greater than an 8.33% running slope or 2.00% cross slope.

For curb heights greater than 4 in, the temporary curb ramp shall have edge protection. For curb heights less than or equal to 4 in. either the sides shall be flared, or edge protection shall be provided. Edge protection shall be continuous and at least 8 in. in height. Rails or other barriers used for edge protection shall protrude less than 4 in. into the curb ramp.

Handrails are required for curb ramps with a rise greater than 6.0 in. The handrail shall be at least 34 in. but no more than 38 in. above the surface of the ramp and any lower handrail shall be no more than 28 in. above the ramp surface.

The temporary curb ramp shall be placed either perpendicular or parallel to the curb. If the ramp is placed parallel to curb a minimum of a 48 in. by 48 in. turning space shall be provided at each required turn location. The turning space shall have a cross slope and running slope of 2.00% or less.

Temporary curb ramp shall be accessed from an ADA compliant landing area.

The temporary curb ramp shall be kept free of any obstructions or trip hazards including debris, mud, construction equipment, and stored materials.

For temporary curb ramps not constructed in accordance with 604.02 the Contractor shall submit the manufacturer's technical data,

REVISION TO SPECIAL PROVISIONS

- 801-x-xxx TEMPORARY CURB RAMP (proposed new)
- 801-x-xxx TEMPORARY ACCESSIBLE PEDESTRIAN PATH (proposed new)
- 801-x-xxx TEMPORARY PEDESTRIAN CHANNELIZER (proposed new)
- 801-x-xxx AUDIBLE INFORMATION DEVICE (proposed new)

specifications and installation instructions for the model selected from the QPL to the Engineer for approval.

The final layout of the temporary curb ramp at each location shall be as approved by the Engineer prior to closing the existing sidewalk.

Method of Measurement

Temporary curb ramp will be measured by the number of units installed, maintained, and removed.

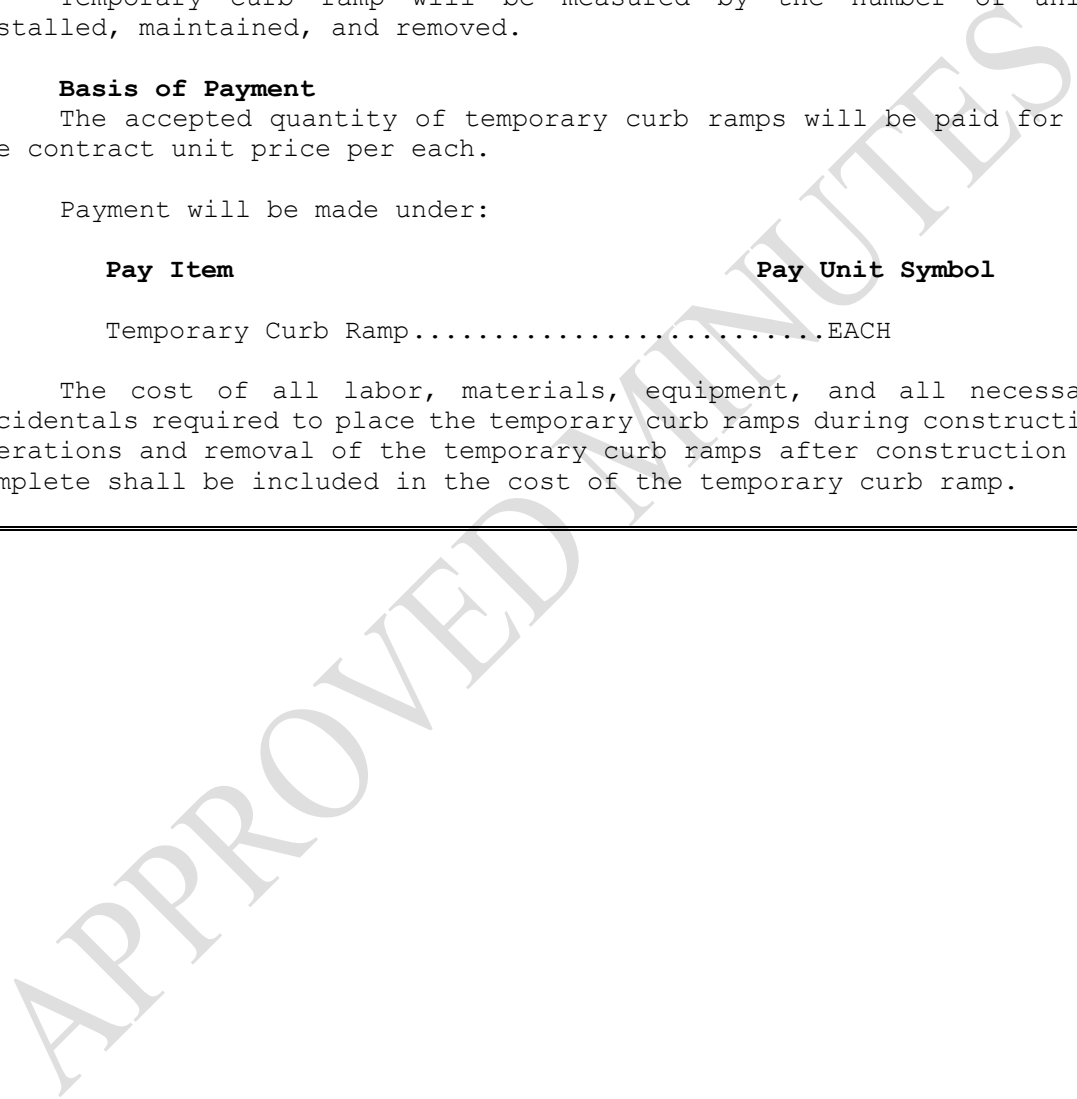
Basis of Payment

The accepted quantity of temporary curb ramps will be paid for at the contract unit price per each.

Payment will be made under:

Pay Item	Pay Unit Symbol
Temporary Curb Ramp.....	EACH

The cost of all labor, materials, equipment, and all necessary incidentals required to place the temporary curb ramps during construction operations and removal of the temporary curb ramps after construction is complete shall be included in the cost of the temporary curb ramp.



REVISION TO SPECIAL PROVISIONS

801-x-xxx TEMPORARY CURB RAMP (proposed new)

801-x-xxx TEMPORARY ACCESSIBLE PEDESTRIAN PATH (proposed new)

801-x-xxx TEMPORARY PEDESTRIAN CHANNELIZER (proposed new)

801-x-xxx AUDIBLE INFORMATION DEVICE (proposed new)

801-x-xxx TEMPORARY ACCESSIBLE PEDESTRIAN PATH

(Adopted xx-xx-22)

Description

This work shall consist of installing temporary accessible pedestrian path in accordance with 105.03 and as shown on the plans.

Materials

Materials shall be in accordance with 604.02 or selected from the Department's QPL of ADA Compliant Work Zone Devices. ~~and as follows:~~

~~The temporary accessible pedestrian path shall be a minimum of 48 in. wide. The temporary accessible pedestrian path shall not be made of plywood. The temporary accessible pedestrian path shall have a firm and stable slip resistant surface.~~

Construction Requirements

The Contractor shall place a temporary accessible pedestrian path to provide ADA compliant temporary access for pedestrians in accordance with 107.08, 604, 801 and as shown on the plans.

Prior to placement of the temporary accessible pedestrian path, the existing ground shall be cleared of any removable debris to provide a level surface. The maximum cross slope shall be 2.00%. The existing ground shall be cleared or excavated of natural vegetation as needed for temporary surface construction.

The temporary accessible pedestrian path shall be a minimum of 48 in. wide. The temporary accessible pedestrian path shall not be made of plywood. The temporary accessible pedestrian path shall have a firm and stable slip resistant surface.

The temporary accessible pedestrian path shall be kept free of any obstructions or trip hazards including debris, mud, construction equipment, and stored materials.

If the temporary accessible pedestrian path is less than 60 in. wide, a 60 in. by 60 in. passing space shall be provided every 200 ft.

The final layout of the temporary pedestrian access path at each location shall be as approved by the Engineer prior to closing any existing sidewalk.

Method of Measurement

Temporary surfaces for temporary pedestrian access will be measured by the square yard.

Basis of Payment

REVISION TO SPECIAL PROVISIONS

801-x-xxx TEMPORARY CURB RAMP (proposed new)

801-x-xxx TEMPORARY ACCESSIBLE PEDESTRIAN PATH (proposed new)

801-x-xxx TEMPORARY PEDESTRIAN CHANNELIZER (proposed new)

801-x-xxx AUDIBLE INFORMATION DEVICE (proposed new)

The accepted quantity of temporary surfaces for temporary pedestrian access will be paid for at the contract unit price per square yard.

Payment will be made under:

Pay Item

Pay Unit Symbol

Temporary Accessible Pedestrian PathSYS

The cost of all labor, materials, equipment, railing, handrail, excavation or removal of existing vegetation, in-kind replacement of existing vegetation and all necessary incidentals required to place the temporary surfaces during construction operations and removal of the temporary surfaces after construction is complete shall be included in the cost of the pay item.

APPROVED MINUTES

REVISION TO SPECIAL PROVISIONS

801-x-xxx TEMPORARY CURB RAMP (proposed new)

801-x-xxx TEMPORARY ACCESSIBLE PEDESTRIAN PATH (proposed new)

801-x-xxx TEMPORARY PEDESTRIAN CHANNELIZER (proposed new)

801-x-xxx AUDIBLE INFORMATION DEVICE (proposed new)

801-x-xxx TEMPORARY PEDESTRIAN CHANNELIZER

(Adopted xx-xx-22)

Description

This work shall consist of installing temporary traffic barriers used as pedestrian channelizers to provide a barrier between pedestrians and construction activities at various intersections in accordance with 105.03 and as shown on the plans.

Materials

Materials shall be in accordance with 801.02 and selected from the Department's QPL of ADA Compliant Work Zone Devices.

Construction Requirements

The Contractor shall place the temporary pedestrian channelizer in accordance with 801.10.

The temporary pedestrian channelizer shall have a minimum height of 32 in. The temporary pedestrian channelizers shall interlock such that gaps do not allow pedestrians to stray from the channelized path.

The temporary pedestrian channelizers shall have continuous hand-trailing edging on sides facing pedestrian traffic with a minimum height of 32 in. and a maximum height of 38 in. The hand-trailing edging shall be mounted so that it is a minimum of 2 in. from the vertical surface of the support.

The temporary pedestrian channelizer shall have a continuous detection plate on sides facing pedestrian traffic no greater than 2 in. above the ground. The detection plate shall have a minimum height of 8 in.

The top and bottom of the surfaces of the temporary pedestrian channelizer, or the hand-trailing edging and detection plate shall have strips of alternating orange and white reflective sheeting oriented vertically or at a 45° angle.

Temporary pedestrian channelizers shall not block water drainage from the walkway. A gap height or opening from the walkway surface up to 2 in. maximum height is allowed for drainage purposes.

Temporary pedestrian channelizers shall be free of sharp or rough edges, and fasteners shall be rounded to prevent harm to hand, arms, or clothing of pedestrians.

Ballast for the temporary pedestrian channelizers shall be located behind the device away from the pedestrian.

REVISION TO SPECIAL PROVISIONS

801-x-xxx TEMPORARY CURB RAMP (proposed new)

801-x-xxx TEMPORARY ACCESSIBLE PEDESTRIAN PATH (proposed new)

801-x-xxx TEMPORARY PEDESTRIAN CHANNELIZER (proposed new)

801-x-xxx AUDIBLE INFORMATION DEVICE (proposed new)

The final layout of the temporary pedestrian channelizer at each location shall be as approved by the Engineer the prior to closing the existing sidewalk.

Method of Measurement

Temporary pedestrian channelizers will be measured by the linear foot, complete in place.

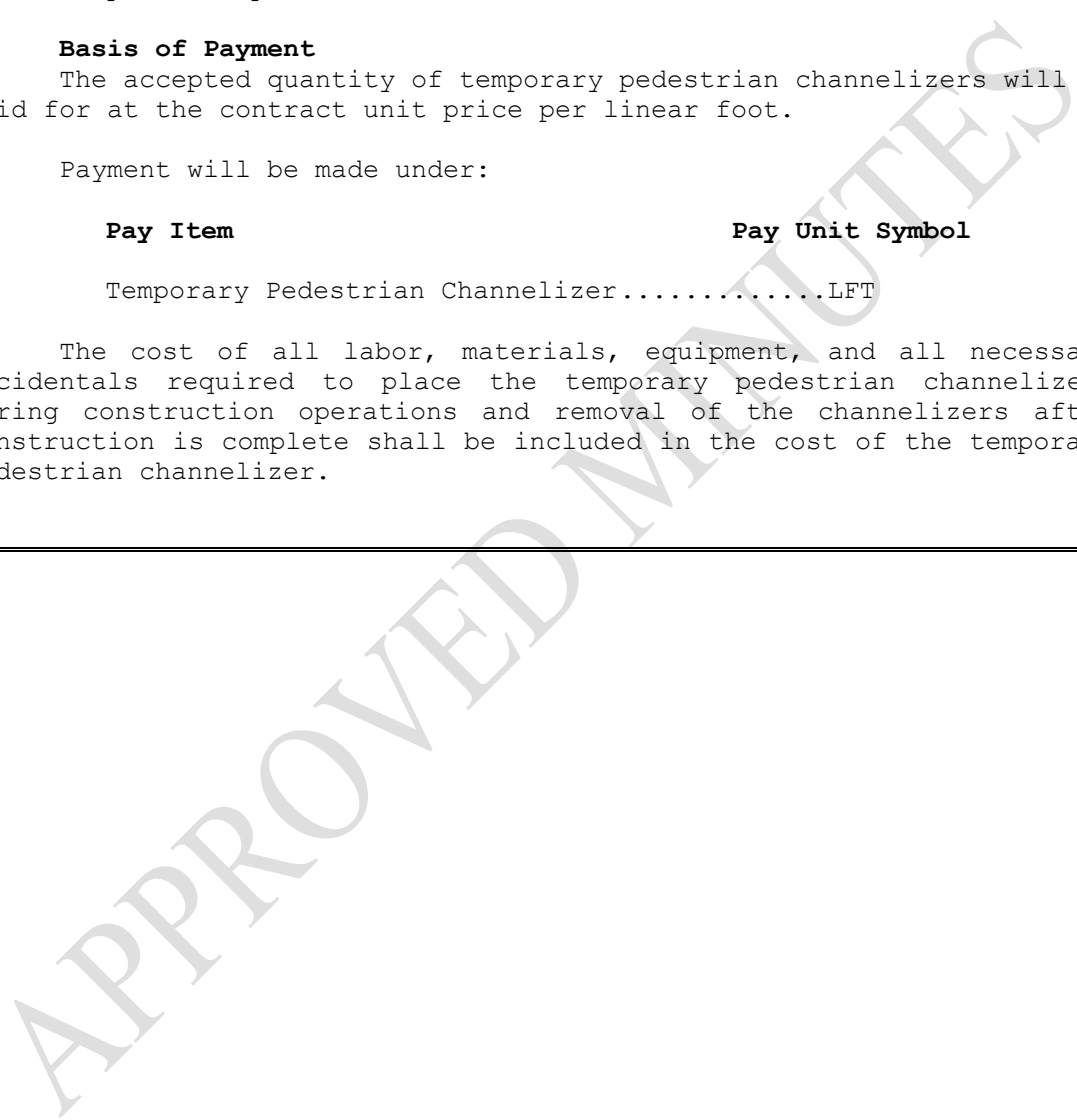
Basis of Payment

The accepted quantity of temporary pedestrian channelizers will be paid for at the contract unit price per linear foot.

Payment will be made under:

Pay Item	Pay Unit Symbol
Temporary Pedestrian Channelizer.....	LFT

The cost of all labor, materials, equipment, and all necessary incidentals required to place the temporary pedestrian channelizers during construction operations and removal of the channelizers after construction is complete shall be included in the cost of the temporary pedestrian channelizer.



REVISION TO SPECIAL PROVISIONS

801-x-xxx TEMPORARY CURB RAMP (proposed new)

801-x-xxx TEMPORARY ACCESSIBLE PEDESTRIAN PATH (proposed new)

801-x-xxx TEMPORARY PEDESTRIAN CHANNELIZER (proposed new)

801-x-xxx AUDIBLE INFORMATION DEVICE (proposed new)

801-x-xxx AUDIBLE INFORMATION DEVICE

(Adopted xx-xx-22)

Description

This work shall consist of installing audible information in accordance with 105.03 and as shown on the plans. The device aids movement of visually disabled pedestrians at intersections and mid-block crosswalks by providing notification of sidewalk or crosswalks closures.

Materials

Materials shall be in accordance with 801.02 and selected from the Department's QPL of ADA Compliant Work Zone Devices.

Construction Requirements

The Contractor shall place the audible information device in accordance with 801.10.

The device shall emit a speech message to inform pedestrians of the sidewalk or crosswalk closure and to guide them to the temporary crossing location. The device shall be capable of having a 60 second message duration and shall be capable of onsite message programming. The device shall have a built-in speaker for broadcasting.

The device shall activate by a built-in sensor that detects pedestrians at a minimum range of 15 ~~ft~~ or a built-in push button for activation by pedestrians with a locator tone that is discernable at 15 ft. The device shall be battery powered.

Audible features shall be at least 2 dB but no more than 5 dB louder than ambient sound, up to a maximum volume of 89 dB measured at 36 in. from the device.

The device shall be mountable on channelizing devices, pedestrian barriers, or on an independent support post.

The audible information device shall be placed so as not to reduce the effective sidewalk or pedestrian path width to less than 4 ft.

The final location of the audible information device at each location shall be as shown on the plans or as directed by the Engineer the prior to closing the existing crosswalk or sidewalk.

Method of Measurement

The audible information devices will be measured by the number of units installed.

Basis of Payment

The accepted quantity of audible information device will be paid for at the contract unit price per each.

REVISION TO SPECIAL PROVISIONS

801-x-xxx TEMPORARY CURB RAMP (proposed new)

801-x-xxx TEMPORARY ACCESSIBLE PEDESTRIAN PATH (proposed new)

801-x-xxx TEMPORARY PEDESTRIAN CHANNELIZER (proposed new)

801-x-xxx AUDIBLE INFORMATION DEVICE (proposed new)

Payment will be made under:

Pay Item

Pay Unit Symbol

Audible Information Device.....EACH

The cost of all labor, materials, equipment, and all necessary incidentals required to place the audible information device during construction operations and removal of the device after construction is complete shall be included in the cost of the audible information device.

APPROVED MINUTES

COMMENTS AND ACTION

801-x-xxx TEMPORARY CURB RAMP (proposed new)

801-x-xxx TEMPORARY ACCESSIBLE PEDESTRIAN PATH (proposed new)

801-x-xxx TEMPORARY PEDESTRIAN CHANNELIZER (proposed new)

801-x-xxx AUDIBLE INFORMATION DEVICE (proposed new)

DISCUSSION:

This item was introduced and presented by Mr. Boruff, assisted by Mr. Bruno, who explained that a wide range of pedestrians may be affected by a work zone, including the young, elderly, and people with disabilities. To better provide accessible temporary facilities for pedestrians, there is a need to standardize the various unique special provisions for temporary curb ramps and temporary accessible pedestrian paths being used on individual construction contracts into recurring special provisions and create recurring special provisions for temporary pedestrian channelizers and audible information devices. Ms. Mouser provided further clarification.

Mr. Boruff proposed to establish a recurring special provision for each current USP for, [1] temporary curb ramps, [2] temporary accessible pedestrian paths, [3] temporary pedestrian channelizers, and [4] audible information devices.

Prior to the meeting: Mr. Koch mentioned that the devices are likely within the clear zone. Do the various devices need to be crash tested or comply with 801-C-157?

Mr. Bruno responded that the temporary pedestrian channelizer is required to be crash tested under ITM 958 , but the other devices are not required to be crash tested. The temporary pedestrian channelizer would not be considered a light-weight traffic control device so RSP 801-C-157 is not applicable. Temporary curb ramps and temporary accessible pedestrian paths are not actually traffic control devices.

Mr. Koch asked if the ADA compliant WZ devices list a general term which could include Portable Traffic Signal or a list yet to be created?

Mr. Bruno answered that IDM 958 was established last fall for ADA Compliant Work Zone Devices. At this time, ITM 958 has the QPL requirements for 4 devices: temporary curb ramps, temporary accessible pedestrian paths, temporary pedestrian channelizers, and audible information devices. So far INDOT has only received one product submittal for the QPL and no models have been approved. But for now, the term "ADA Compliant Work Zone Devices" is intended to cover just these four devices. Portable traffic signals have a separate QPL.

Mr. Koch asked if the product is on the QPL, do we have the right to approve or reject the device? Mr. Bruno said, Yes, we do, and provided some examples.

Mr. Koch said that the Temporary Accessible Pedestrian Path is Ok for an RSP, but should the limitations be a requirement to get on the QPL? Mr. Bruno said, Yes, these requirements are also listed in ITM 958.

For the Temporary Pedestrian Channelizer, Mr. Koch said the height of the handrail is specified. Should we mention expected rigidity or will this be addressed on the QPL?

Mr. Bruno said that the hand-trailing edge does not have to meet the requirements of a handrail. It is intended to guide the visually impaired along the route. Concerns about the potential rigidity of a hand-trailing edge would be addressed during the product evaluation phase before adding a model to the QPL.

COMMENTS AND ACTION

801-x-xxx TEMPORARY CURB RAMP (proposed new)

801-x-xxx TEMPORARY ACCESSIBLE PEDESTRIAN PATH (proposed new)

801-x-xxx TEMPORARY PEDESTRIAN CHANNELIZER (proposed new)

801-x-xxx AUDIBLE INFORMATION DEVICE (proposed new)

Concerning the Audible Information Device, Mr. Koch stated that it is well-intentioned, but the device raises many questions. Such as: What language would the device be in? How do we know what languages will be needed? Who performs the translations? What security is on the device to prevent tampering and harmful messaging? Is there verbal guidance? Is there a decibel requirement? Is the device needed as other temp ADA features have detection plates which provide guidance?

Mr. Bruno responded that INDOT has installed 3,605 accessible pedestrian push buttons on 270 contracts and all of the speech walk messages are in English. The need for an additional language should be rare. The need for an additional languages would be identified during public hearings or by the project TMP team. Translations will be by INDOT Communications, the LPA, or Google Translate. INDOT's ADA Technical Advisory Committee prefers the Empco-Lite model since the message is activated by a pedestrian motion sensor, but the MDI model, which is pedestrian activated but has a locator tone for the visually impaired, appears to be more vandal resistant. For locations where tampering is a concern, the specs for the MDI model could be added back in. The Empco-Lite model has a message guide. The decibel requirements for APS in 922.04(b)5a could be added to the RSP. The FHWA Indiana Division Office has asked INDOT about using this device on a few projects. The RSP will not be applicable most of the time, but it could be appropriate for an urban project near a school or employer for the visually impaired, especially if the project has more than 2 MOT phases.

Mr. Koch countered that without 'ADA Compliant Work Zone Devices' posted on the QPL site, we cannot use 'Temp Pedestrian Channelizer' and 'audible information device' as both have an AND statement. Mr. Koch also stated that if problems arise, we may need to convey what we want field personnel to review more than just whether or not the product is on the QPL.

As for the Audible Information Device, Mr. Koch concurred that we need a tamper resistant device.

Minor revisions to the Audible Information Device special provision are as shown.

Mr. Boruff withdrew this item at this time, pending further review.

COMMENTS AND ACTION

- 801-x-xxx TEMPORARY CURB RAMP (proposed new)
- 801-x-xxx TEMPORARY ACCESSIBLE PEDESTRIAN PATH (proposed new)
- 801-x-xxx TEMPORARY PEDESTRIAN CHANNELIZER (proposed new)
- 801-x-xxx AUDIBLE INFORMATION DEVICE (proposed new)

[continued]

<p>Motion: Mr. Boruff Second: Mr. Pelz Ayes: Nays: FHWA Approval:</p>	<p>Action: ___ Passed as Submitted ___ Passed as Revised <u>X</u> Withdrawn</p>
<p>Standard Specifications Sections referenced and/or affected: 801 begin pg 863.</p>	<p>___ 2024 Standard Specifications ___ Revise Pay Items List</p>
<p>Recurring Special Provision references in: PROPOSED NEW</p>	<p>___ Create RSP (No. __) Effective: RSP Sunset Date:</p>
<p>Standard Drawing affected: NONE</p>	<p>___ Revise RSP (No. __) Effective: RSP Sunset Date:</p>
<p>Design Manual Sections affected: IDM §503-3.04(13)</p>	<p>___ Standard Drawing Effective:</p>
<p>GIFE Sections affected: Section 22.</p>	<p>___ Create RPD (No. __) Effective:</p>
	<p>___ GIFE Update ___ Frequency Manual Update ___ SiteManager Update</p>

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The current standard Dynamic Message Sign and Sign Cantilever Structures are not designed per the current AASHTO LRFD code. During inspections anchor bolt hardware is frequently found to be loose or seized out of position. Walkway handrail posts on DMS structures have failed due to freeze/thaw of water accumulating inside the post.

PROPOSED SOLUTION: Design the structures per latest AASHTO LRFD 2015 code, revise the standard drawings accordingly. Add detail on the proper anchor bolt hardware tightening order ("star pattern"). Add a detail for drain holes in the handrail post (DMSS series).

APPLICABLE STANDARD SPECIFICATIONS: 802.17 and 910.19

APPLICABLE STANDARD DRAWINGS: 802-DMSS and 802-SCLS

APPLICABLE DESIGN MANUAL SECTION: 502-1.01(11)

APPLICABLE SECTION OF GIFE: N/A

APPLICABLE RECURRING SPECIAL PROVISIONS: N/A

PAY ITEMS AFFECTED: No

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad hoc review by the Traffic Design, Bridge Design, and Industry. Parsons performed the structural analysis.

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE: when pay items for "Overhead Sign Structure, DMS Box Truss" and "Overhead Sign Structure, Cantilever, Type (A,,I)" are included in the contract.

IMPACT ANALYSIS (attach report): Yes

Submitted By: Dave Boruff

Title: Manager, Office of Traffic Administration

Organization: Traffic Engineering Division

Phone Number: 317-234-7975

Date: 12/28/21

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS
REVISION TO STANDARD DRAWINGS

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No

Will approval of this item affect the Approved Materials List? No

Will this proposal improve:

Construction costs? No

Construction time? No

Customer satisfaction? N/A

Congestion/travel time? N/A

Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? Yes

Will this item improve safety:

For motorists? Yes

For construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? No

Asset preservation? Yes

Design process? No

Will this change provide the contractor more flexibility? No

Will this proposal provide clarification for the Contractor and field personnel? N.A

Can this item improve/reduce the number of potential change orders? N/A

Is this proposal needed for compliance with:

Federal or State regulations? Yes

AASHTO or other design code? Yes


Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

REVISION TO STANDARD DRAWINGS

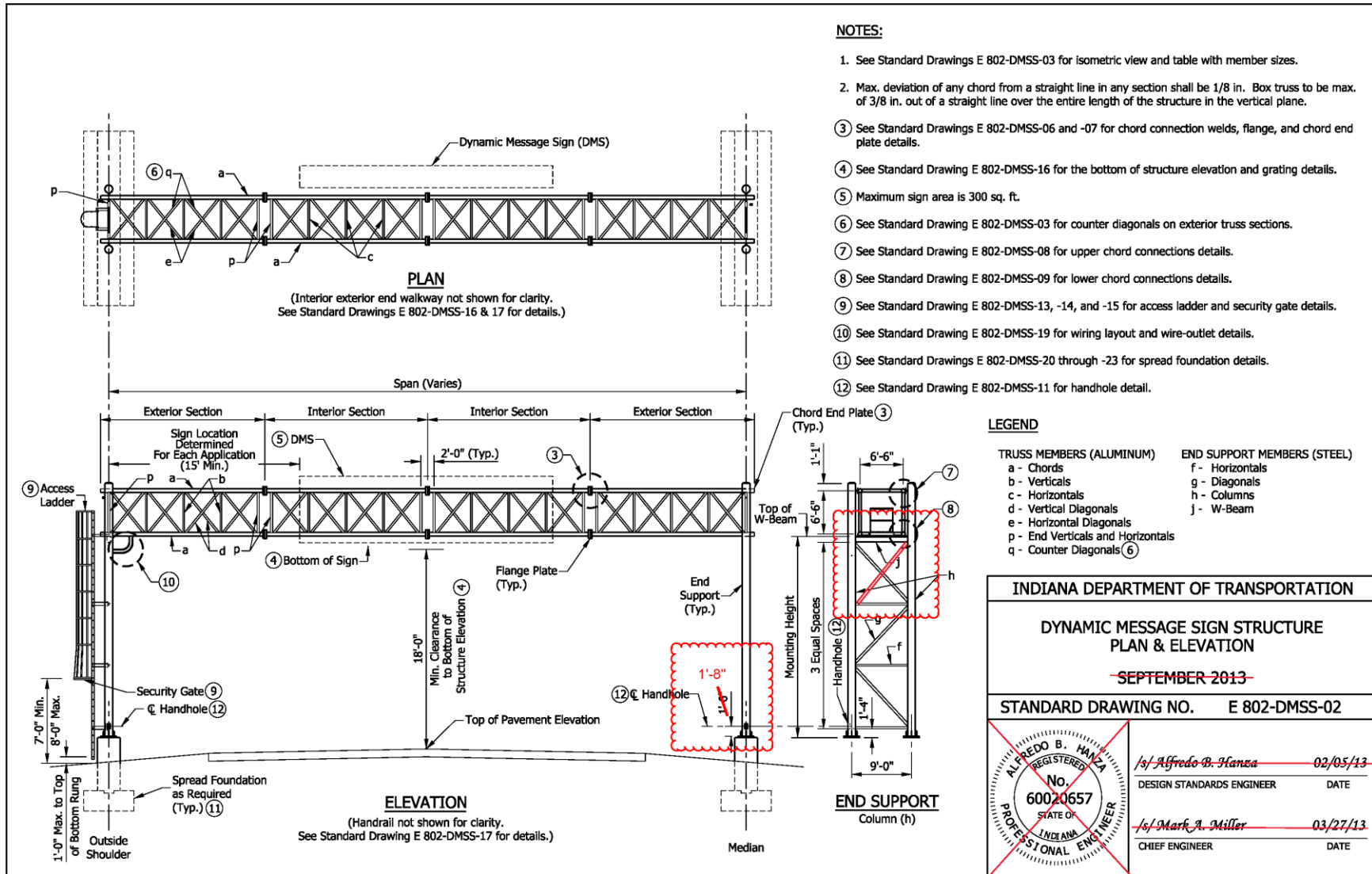
802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE

INDEX	
SHEET NO.	SUBJECT
1	Index
2	Plan & Elevation
3	Truss Sections, Member Size Table
4	Table of Dimensions, Spans 34' thru 81'
5	Table of Dimensions, Spans 82' thru 130' & Camber
6	Chord Connections and Weld Details
7	Flange & Chord End Plate Details
8	End Support Upper Chord Connection Details
9	End Support Lower Chord Connection Details
10	End Support Base Plate and I.D. Fag Details
11	End Support Handhole, Top Cap, and J-Hook Details
12	Anchor Plates, Anchor Bolts, and Metal Skirt Details
13	Ladder Details
14	Ladder Details
15	Security Gate Details
16	Walkway Grating Details
17	Walkway Grating Details
18	Walkway Grating Details
19	Wiring Layout Details
20	Spread Foundation at 33" Concrete Barrier Wall
21	Spread Foundation at 45" Concrete Barrier Wall
22	Spread Foundation at Median or Shoulder, 36" Height
23	Spread Foundations Quantities

INDIANA DEPARTMENT OF TRANSPORTATION	
DYNAMIC MESSAGE SIGN STRUCTURE DRAWING INDEX	
SEPTEMBER 2013	
STANDARD DRAWING NO.	E 802-DMSS-01
	/s/ Alfredo B. Hanza 02/05/13 DESIGN STANDARDS ENGINEER DATE
	/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER DATE

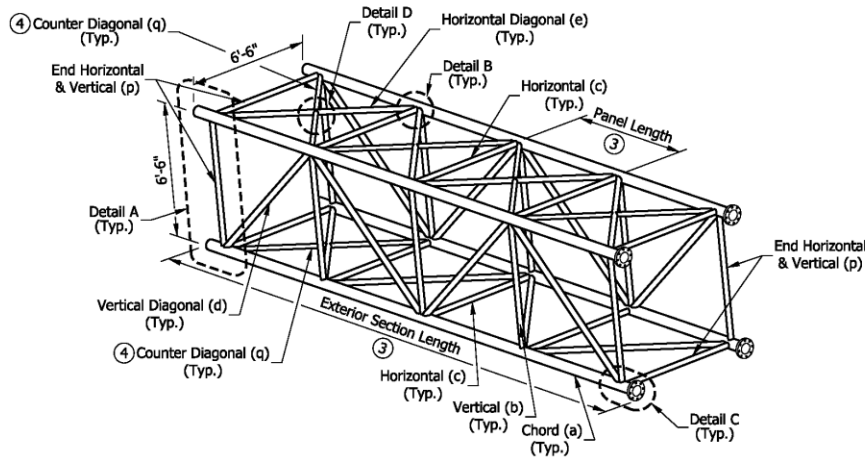
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE

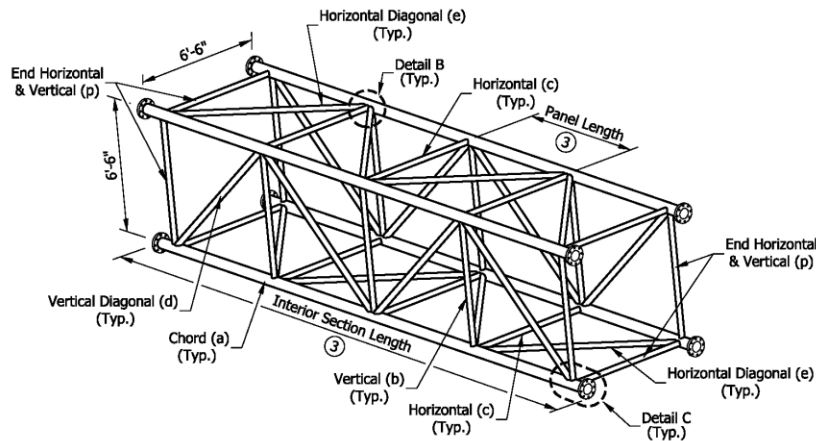


REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



TYPICAL EXTERIOR TRUSS SECTION



TYPICAL INTERIOR TRUSS SECTION

NOTES:

1. See Standard Drawing E 802-DMSS-06 for Details A through D.
2. Truss members to be aluminum. End support members to be steel. Steel pipe diameters shown in table are nominal pipe sizes.
3. Number of panels and sections varies. See Standard Drawing E 802-DMSS-04 and -05 for recommended dimensions.
4. Counter Diagonal (q) shall be provided in exterior sections at the top of each panel and at the bottom of end panel only as shown. It is not required in interior sections.
5. See Standard Drawing E 802-DMSS-02 for end support members.

MAX. SPAN = 130 ft. MAX. SIGN AREA = 300 sq. ft. MAX. MOUNTING HEIGHT = 24'-6"		
ALUMINUM TRUSS MEMBERS		
MEMBER	MARK	O.D. (IN.) x WALL THK. (IN.)
CHORD	a	7 x 0.375
VERTICAL	b	3 x 0.250
HORIZONTAL	c	4 x 0.250
VERTICAL DIAGONAL	d	3.5 x 0.500
HORIZONTAL DIAGONAL	e	4 x 0.500
END VERTICAL and HORIZONTAL	p	4 x 0.375
COUNTER DIAGONAL (SEE NOTE 4)	q	2.5 x 0.500
STEEL END-SUPPORT MEMBERS		
COLUMN	h	14 x 0.375
HORIZONTAL	f	3.5 x 0.216
DIAGONAL	g	4.5 x 0.438
W-BEAM	j	W10 x 68

INDIANA DEPARTMENT OF TRANSPORTATION

DYNAMIC MESSAGE SIGN STRUCTURE
 TRUSS SECTIONS, MEMBER SIZE TABLE

~~SEPTEMBER 2013~~

STANDARD DRAWING NO. E 802-DMSS-03

	/s/ Alfredo B. Hanza	02/05/13
	DESIGN STANDARDS ENGINEER	DATE
	/s/ Mark A. Miller	03/27/13
	CHIEF ENGINEER	DATE

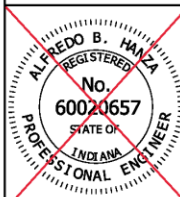
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE

DIMENSIONS FOR DYNAMIC MESSAGE SIGN STRUCTURES (34' THRU 81')									
SPAN	EXTERIOR SECTIONS					INTERIOR SECTIONS			
SPAN-TRUSS LENGTH, (FT)	NO. OF EXT. SECTIONS	NO. OF PANELS PER SECTION	VARIABLE END DIMEN.	PANEL LENGTH	SECTION LENGTH	NO. OF INT. SECTIONS	NO. OF PANELS PER SECTION	PANEL LENGTH	SECTION LENGTH
34	1	6	6"	5'-6"	35'-6"	0			
35	1	6	6"	5'-8"	36'-6"	0			
36	2	3	6"	5'-6"	18'-9"	0			
37	2	3	6"	5'-8"	19'-3"	0			
38	2	3	6"	5'-10"	19'-9"	0			
39	2	3	6"	6'-0"	20'-3"	0			
40	2	3	6"	6'-2"	20'-9"	0			
41	2	3	6"	6'-4"	21'-3"	0			
42	2	3	6"	6'-6"	21'-9"	0			
43	2	4	6"	5'-0"	22'-3"	0			
44	2	4	6"	5'-1 1/2"	22'-9"	0			
45	2	4	6"	5'-3"	23'-3"	0			
46	2	4	6"	5'-4 1/2"	23'-9"	0			
47	2	4	6"	5'-6"	24'-3"	0			
48	2	4	6"	5'-7 1/2"	24'-9"	0			
49	2	4	6"	5'-9"	25'-3"	0			
50	2	4	6"	5'-10 1/2"	25'-9"	0			
51	2	4	6"	6'-0"	26'-3"	0			
52	2	4	6"	6'-1 1/2"	26'-9"	0			
53	2	4	6"	6'-3"	27'-3"	0			
54	2	4	6"	6'-4 1/2"	27'-9"	0			
55	2	4	6"	6'-6"	28'-3"	0			
56	2	5	5 1/4"	5'-3 3/4"	28'-9"	0			
57	2	5	6 1/4"	5'-4 3/4"	29'-3"	0			
58	2	5	6"	5'-6"	29'-9"	0			
59	2	5	5 3/4"	5'-7 1/4"	30'-3"	0			
60	2	5	5 1/2"	5'-8 1/2"	30'-9"	0			
61	2	5	6 1/2"	5'-9 1/2"	31'-3"	0			
62	2	5	6 1/4"	5'-10 3/4"	31'-9"	0			
63	2	5	6"	6'-0"	32'-3"	0			
64	2	5	5 3/4"	6'-1 1/4"	32'-9"	0			
65	2	5	5 1/2"	6'-2 1/2"	33'-3"	0			
66	2	5	5 1/4"	6'-3 3/4"	33'-9"	0			
67	2	5	5"	6'-5"	34'-3"	0			
68	2	5	6"	6'-6"	34'-9"	0			
69	2	4	6"	5'-4"	23'-7"	1	4	5'-4"	23'-4"
70	2	4	6"	5'-5"	23'-11"	1	4	5'-5"	23'-8"
71	2	4	6"	5'-6"	24'-3"	1	4	5'-6"	24'-0"
72	2	4	6"	5'-7"	24'-7"	1	4	5'-7"	24'-4"
73	2	4	6"	5'-8"	24'-11"	1	4	5'-8"	24'-8"
74	2	4	6"	5'-9"	25'-3"	1	4	5'-9"	25'-0"
75	2	4	6"	5'-10"	25'-7"	1	4	5'-10"	25'-4"
76	2	4	6"	5'-11"	25'-11"	1	4	5'-11"	25'-8"
77	2	4	6"	6'-0"	26'-3"	1	4	6'-0"	26'-0"
78	2	4	6"	6'-1"	26'-7"	1	4	6'-1"	26'-4"
79	2	4	6"	6'-2"	26'-11"	1	4	6'-2"	26'-8"
80	2	4	6"	6'-3"	27'-3"	1	4	6'-3"	27'-0"
81	2	4	6"	6'-4"	27'-7"	1	4	6'-4"	27'-4"

NOTES:

1. The table of dimensions for a dynamic message sign structure is divided and put on two Standard Drawings E 802-DMSS-04 and -05. The table shows dimensions with all sections requirements accounted for.
2. All panels on a truss shall be the same length. The minimum panel length for all trusses is 5'-0" and the maximum is 6'-6".
3. A single interior section in a truss shall have an even number of panels to maintain the pattern of the vertical diagonals.
4. Use minimum number of sections for each truss, keeping the maximum section length at 35'-6".
5. See Standard Drawing E 802-DMSS-05 for required camber.

INDIANA DEPARTMENT OF TRANSPORTATION	
DYNAMIC MESSAGE SIGN STRUCTURE TABLE OF DIMENSIONS SPANS 34' THRU 81' SEPTEMBER 2013	
STANDARD DRAWING NO. E 802-DMSS-04	
	/s/ Alfredo B. Hanza 02/05/13 DESIGN STANDARDS ENGINEER DATE
	/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER DATE

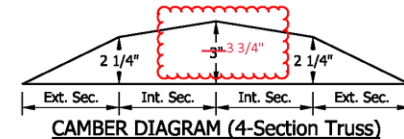
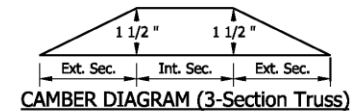
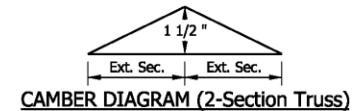
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE

DIMENSIONS FOR DYNAMIC MESSAGE SIGN STRUCTURES (82' THRU 130')									
SPAN	EXTERIOR SECTIONS					INTERIOR SECTIONS			
SPAN-TRUSS LENGTH, (FT)	NO. OF EXT. SECTIONS	NO. OF PANELS PER SECTION	VARIABLE END DIMEN.	PANEL LENGTH	SECTION LENGTH	NO. OF INT. SECTIONS	NO. OF PANELS PER SECTION	PANEL LENGTH	SECTION LENGTH
82	2	4	6"	6'-5"	27'-11"	1	4	6'-5"	27'-8"
83	2	4	6"	6'-6"	28'-3"	1	4	6'-6"	28'-0"
84	2	5	5 3/4"	5'-7 3/4"	30'-5 1/2"	1	4	5'-7 3/4"	24'-7"
85	2	5	6 1/2"	5'-8 1/2"	30'-10"	1	4	5'-8 1/2"	24'-10"
86	2	5	5 1/2"	5'-9 1/2"	31'-2"	1	4	5'-9 1/2"	25'-2"
87	2	5	6 1/4"	5'-10 1/4"	31'-6 1/2"	1	4	5'-10 1/4"	25'-5"
88	2	5	7"	5'-11"	31'-11"	1	4	5'-11"	25'-8"
89	2	5	6"	6'-0"	32'-3"	1	4	6'-0"	26'-0"
90	2	5	5"	6'-1"	32'-7"	1	4	6'-1"	26'-4"
91	2	5	5 3/4"	6'-1 3/4"	32'-11 1/2"	1	4	6'-1 3/4"	26'-7"
92	2	5	6 1/2"	6'-2 1/2"	33'-4"	1	4	6'-2 1/2"	26'-10"
93	2	5	5 1/2"	6'-3 1/2"	33'-8"	1	4	6'-3 1/2"	27'-2"
94	2	5	6 1/4"	6'-4 1/4"	34'-0 1/2"	1	4	6'-4 1/4"	27'-5"
95	2	5	5 1/4"	6'-5 1/4"	34'-4 1/2"	1	4	6'-5 1/4"	27'-9"
96	2	5	6"	6'-6"	34'-9"	1	4	6'-6"	28'-0"
97	2	4	6"	5'-7 1/2"	24'-9"	2	4	5'-7 1/2"	24'-6"
98	2	4	6"	5'-8 1/4"	25'-0"	2	4	5'-8 1/4"	24'-9"
99	2	4	6"	5'-9"	25'-3"	2	4	5'-9"	25'-0"
100	2	4	6"	5'-9 3/4"	25'-6"	2	4	5'-9 3/4"	25'-3"
101	2	4	6"	5'-10 1/2"	25'-9"	2	4	5'-10 1/2"	25'-6"
102	2	4	6"	5'-11 1/4"	26'-0"	2	4	5'-11 1/4"	25'-9"
103	2	4	6"	6'-0"	26'-3"	2	4	6'-0"	26'-0"
104	2	4	6"	6'-0 3/4"	26'-6"	2	4	6'-0 3/4"	26'-3"
105	2	4	6"	6'-1 1/2"	26'-9"	2	4	6'-1 1/2"	26'-6"
106	2	4	6"	6'-2 1/4"	27'-0"	2	4	6'-2 1/4"	26'-9"
107	2	4	6"	6'-3"	27'-3"	2	4	6'-3"	27'-0"
108	2	4	6"	6'-3 3/4"	27'-6"	2	4	6'-3 3/4"	27'-3"
109	2	4	6"	6'-4 1/2"	27'-9"	2	4	6'-4 1/2"	27'-6"
110	2	4	6"	6'-5 1/4"	28'-0"	2	4	6'-5 1/4"	27'-9"
111	2	4	6"	6'-6"	28'-3"	2	4	6'-6"	28'-0"
112	2	5	5'-3"	5'-3"	28'-6"	2	5	5'-3"	28'-3"
113	2	5	7"	5'-3 1/2"	28'-9 1/2"	2	5	5'-3 1/2"	28'-5 1/2"
114	2	5	5 1/2"	5'-4 1/4"	28'-11 3/4"	2	5	5'-4 1/4"	28'-9 1/4"
115	2	5	6 1/2"	5'-4 3/4"	29'-3 1/4"	2	5	5'-4 3/4"	28'-11 3/4"
116	2	5	5"	5'-5 1/2"	29'-5 1/2"	2	5	5'-5 1/2"	29'-3 1/2"
117	2	5	6"	5'-6"	29'-9"	2	5	5'-6"	29'-6"
118	2	5	5"	5'-6 1/2"	29'-10 1/2"	2	5	5'-6 1/2"	29'-8 1/2"
119	2	5	5 1/2"	5'-7 1/4"	30'-2 3/4"	2	5	5'-7 1/4"	30'-0 1/4"
120	2	5	6 1/2"	5'-7 3/4"	30'-6 1/4"	2	5	5'-7 3/4"	30'-2 3/4"
121	2	5	5"	5'-8 1/2"	30'-8 1/2"	2	5	5'-8 1/2"	30'-6 1/2"
122	2	5	6"	5'-9"	31'-0"	2	5	5'-9"	30'-9"
123	2	5	7"	5'-9 1/2"	31'-3 1/2"	2	5	5'-9 1/2"	30'-11 1/2"
124	2	5	5 1/2"	5'-10 1/4"	31'-5 3/4"	2	5	5'-10 1/4"	31'-3 1/4"
125	2	5	6 1/2"	5'-10 3/4"	31'-9 1/4"	2	5	5'-10 3/4"	31'-5 3/4"
126	2	5	5"	5'-11 1/2"	31'-11 1/2"	2	5	5'-11 1/2"	31'-9 1/2"
127	2	5	6"	6'-0"	32'-3"	2	5	6'-0"	32'-0"
128	2	5	7"	6'-0 1/2"	32'-6 1/2"	2	5	6'-0 1/2"	32'-2 1/2"
129	2	5	5 1/2"	6'-1 1/4"	32'-8 3/4"	2	5	6'-1 1/4"	32'-6 1/4"
130	2	5	6 1/2"	6'-1 3/4"	33'-0 1/4"	2	5	6'-1 3/4"	32'-8 3/4"

NOTES:

1. Camber diagrams to build truss structures with 2 to 4 sections are shown. Cambers shown are for fabrication only and are measured with trusses fully supported at no-load conditions. Allowable camber tolerance for truss is 25% of specific camber value.
2. See Standard Drawing E 805-DMSS-04 for additional notes.



INDIANA DEPARTMENT OF TRANSPORTATION

DYNAMIC MESSAGE SIGN STRUCTURE
 TABLE OF DIMENSIONS
 SPANS 82' THRU 130' & CAMBER
~~SEPTEMBER 2013~~

STANDARD DRAWING NO. E 802-DMSS-05

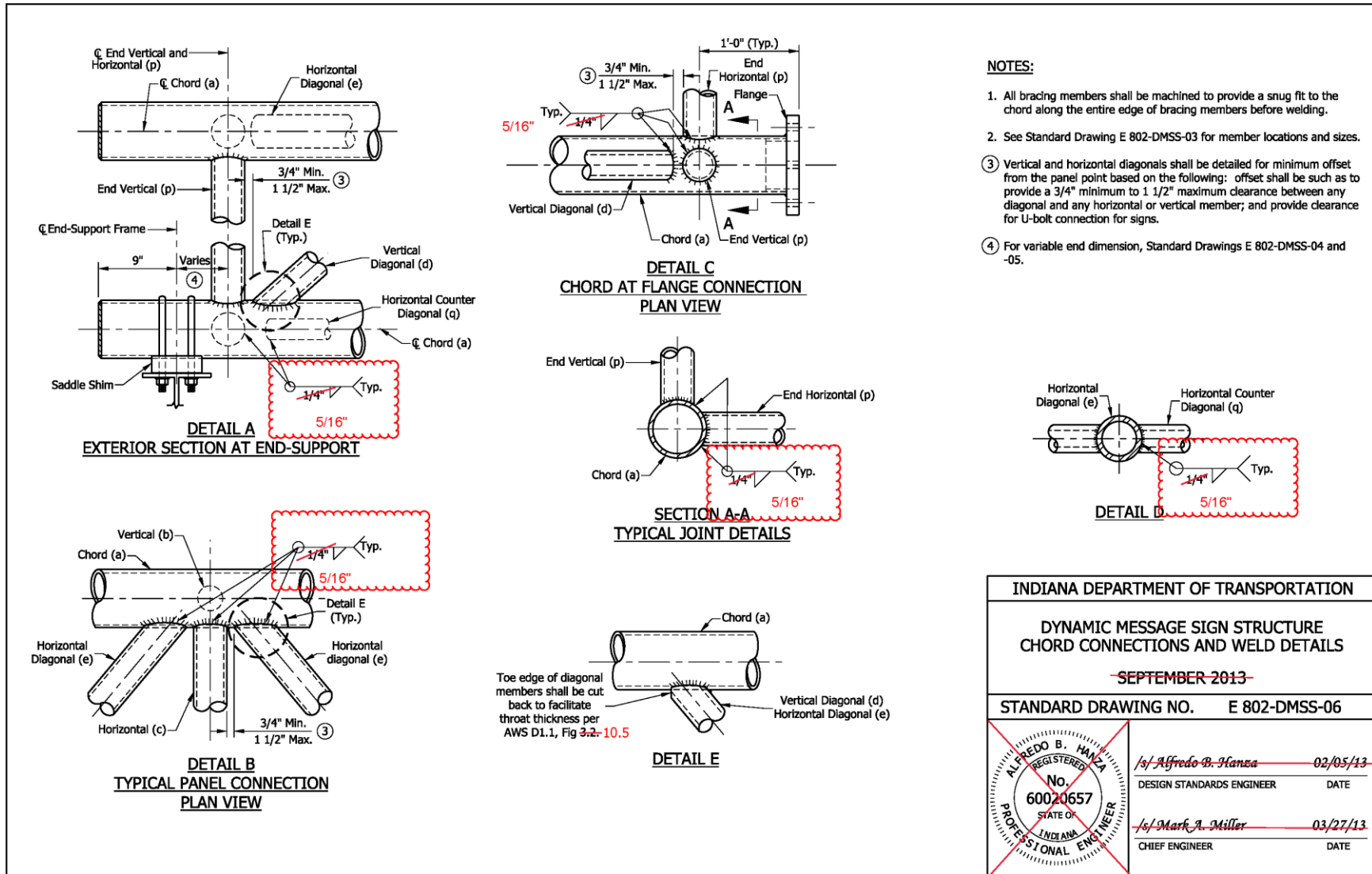
ALFREDO B. HANZLA
 REGISTERED
 No. 60020657
 STATE OF INDIANA
 PROFESSIONAL ENGINEER

~~/s/ Alfredo B. Hanzla~~ 02/05/13
 DESIGN STANDARDS ENGINEER DATE

~~/s/ Mark A. Miller~~ 03/27/13
 CHIEF ENGINEER DATE

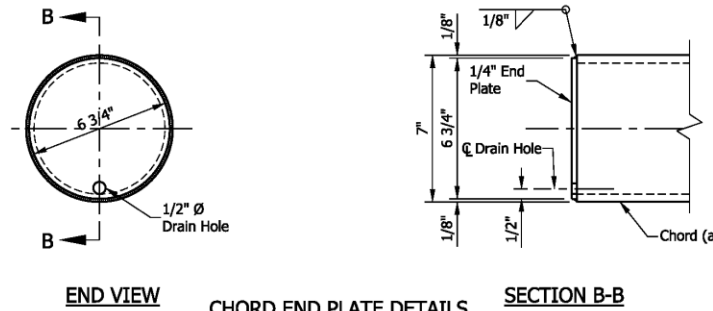
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



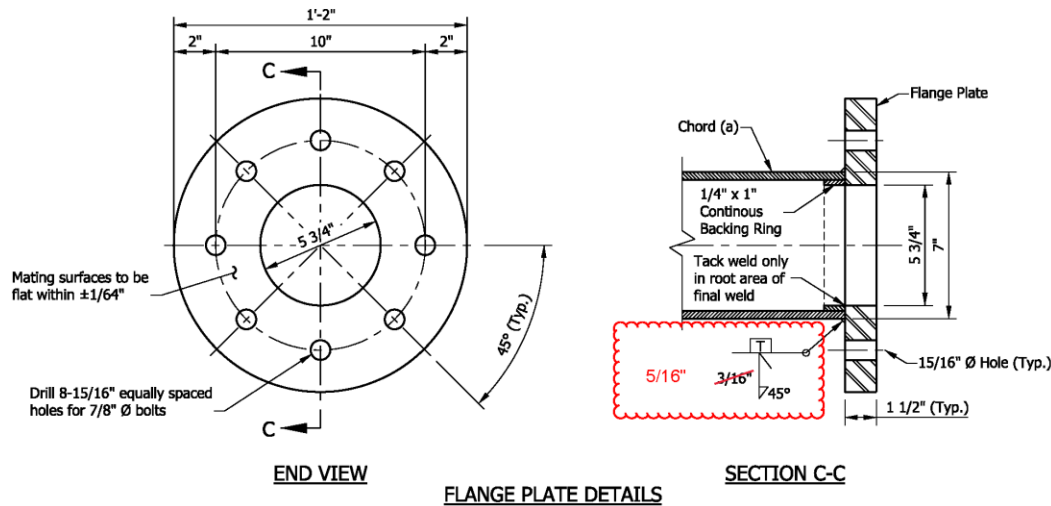
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



NOTE:

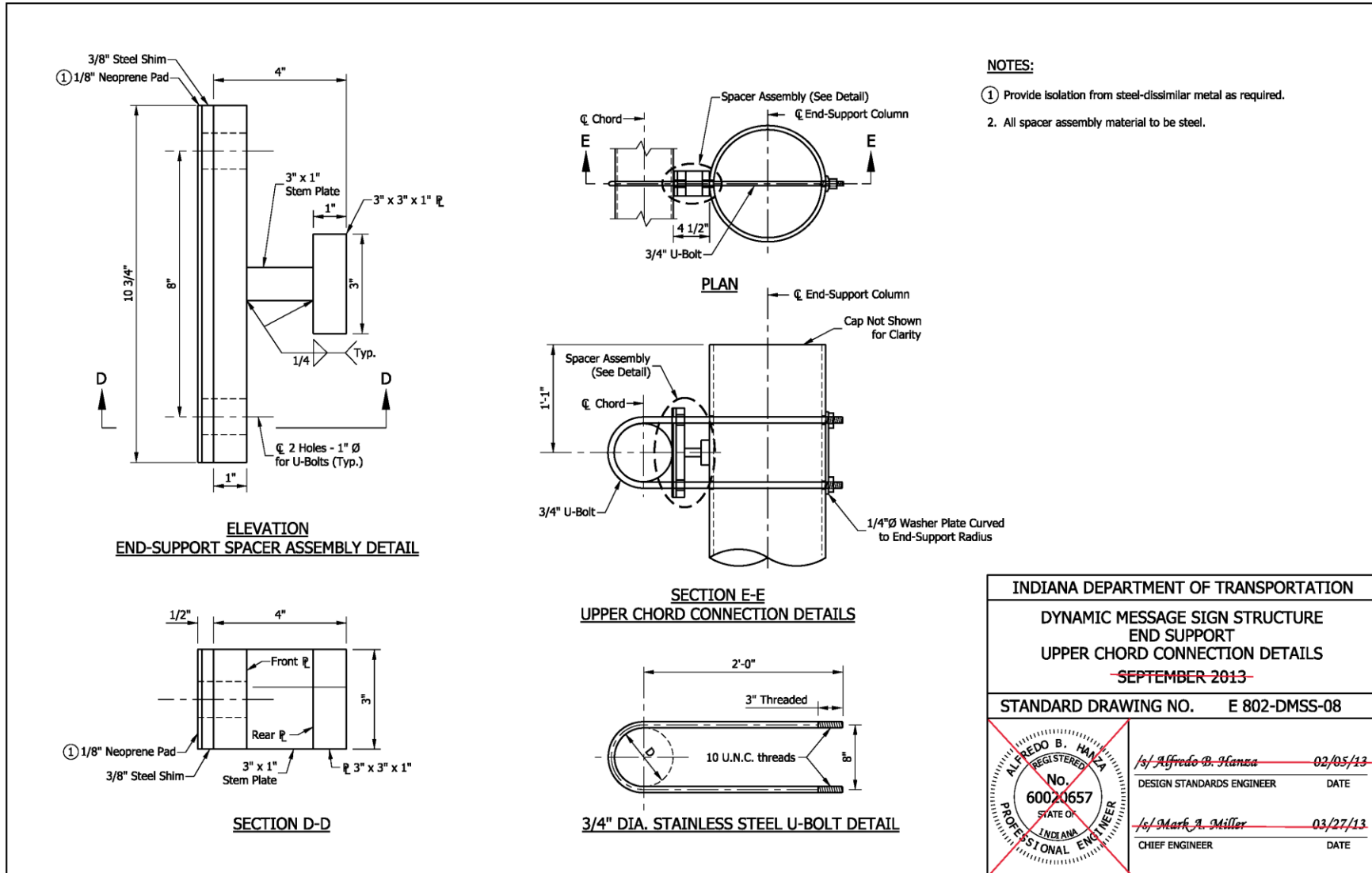
1. See Standard Drawing E 802-DMSS-02 for chord flange locations.



INDIANA DEPARTMENT OF TRANSPORTATION	
DYNAMIC MESSAGE SIGN STRUCTURE FLANGE & CHORD END PLATE DETAILS	
SEPTEMBER 2013	
STANDARD DRAWING NO. E 802-DMSS-07	
	/s/ Alfredo B. Hanza 02/05/13 DESIGN STANDARDS ENGINEER DATE
	/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER DATE

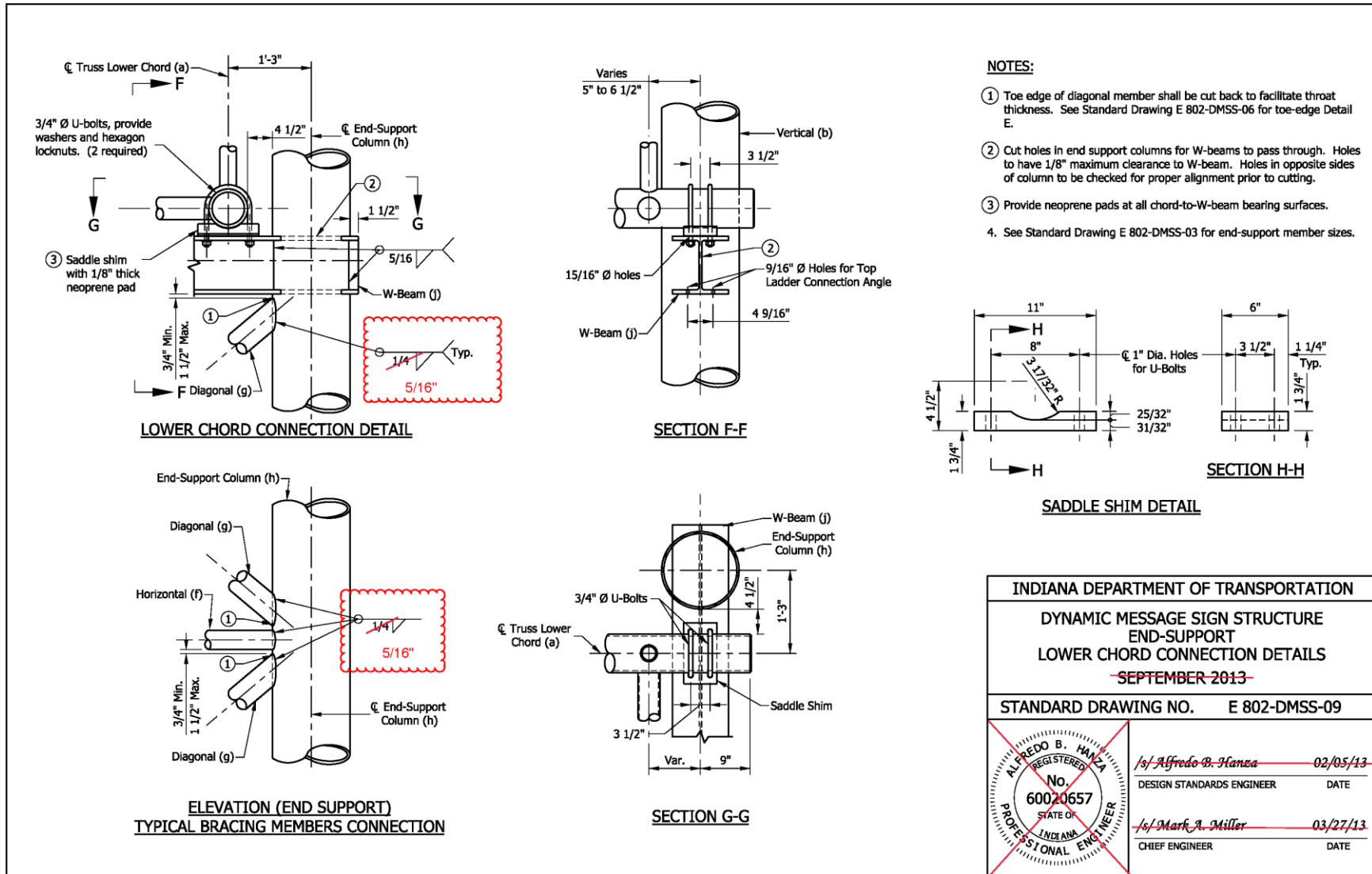
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



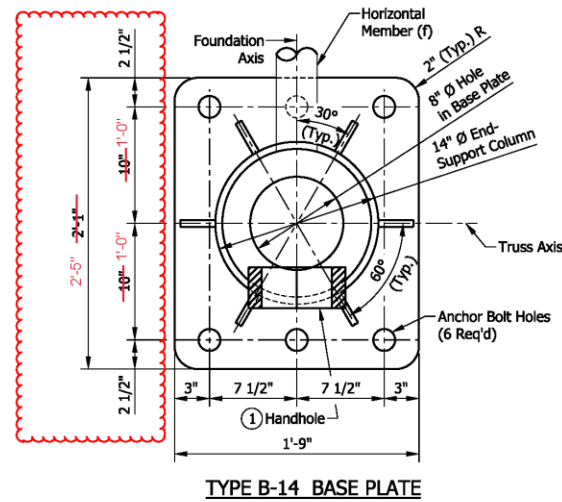
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE

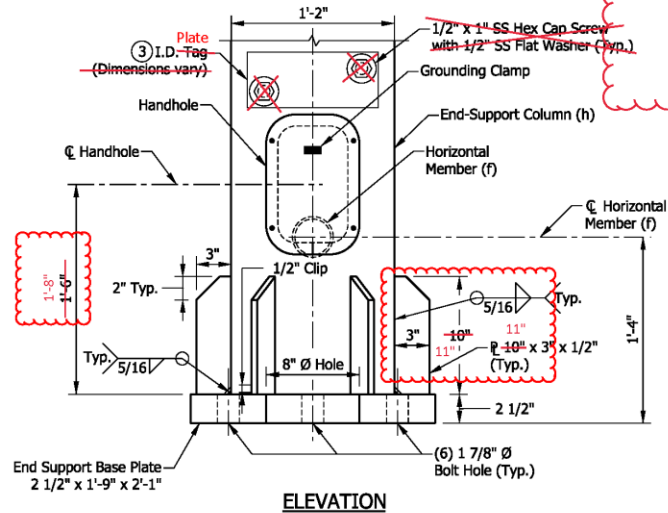


REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



TYPE B-14 BASE PLATE



ELEVATION

I.D. PLATE AND OTHER DETAILS
 ADDED TO SHEET

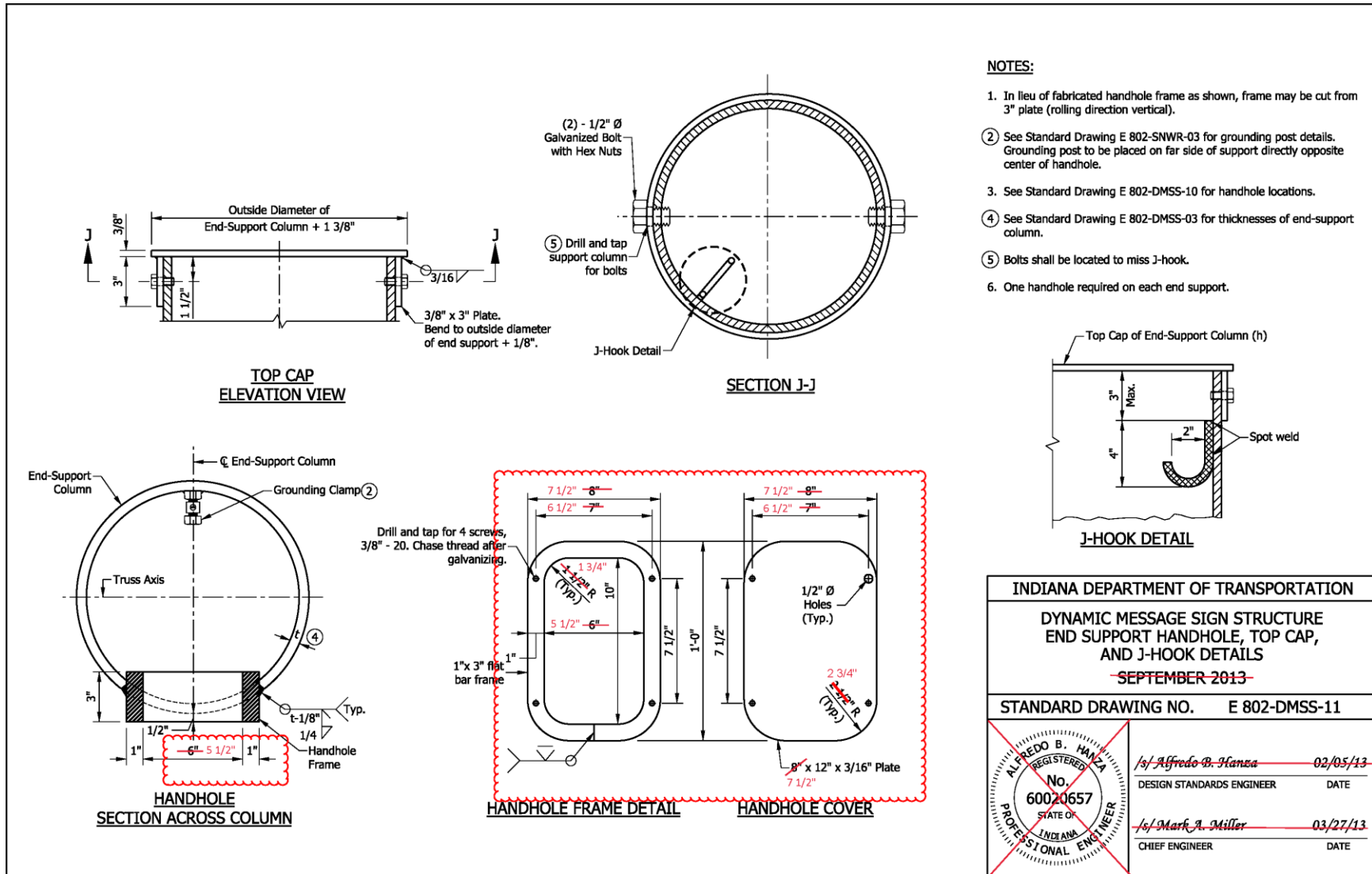
NOTES:

- ① See Standard Drawing E 802-DMSS-11 for handhole details.
2. See Standard Drawing E 802-DMSS-12 for anchor bolts and skirt details.
- ③ I.D. tag is a 1/8" stainless steel plate with the following information stamped in 1/2" black letters:
~~Manufacturer~~, ~~Drawing/Order #~~
~~Contract #~~, ~~Structure Type~~
~~Fabrication Date~~, ~~Structure Length~~
~~End Support Mounting Height~~
4. Each end support requires one I.D. tag.

INDIANA DEPARTMENT OF TRANSPORTATION	
DYNAMIC MESSAGE SIGN STRUCTURE END SUPPORT BASE PLATE AND I.D. TAG DETAILS	
SEPTEMBER 2013	
STANDARD DRAWING NO. E 802-DMSS-10	
	/s/ Alfredo B. Hanza 02/05/13 DESIGN STANDARDS ENGINEER DATE
	/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER DATE

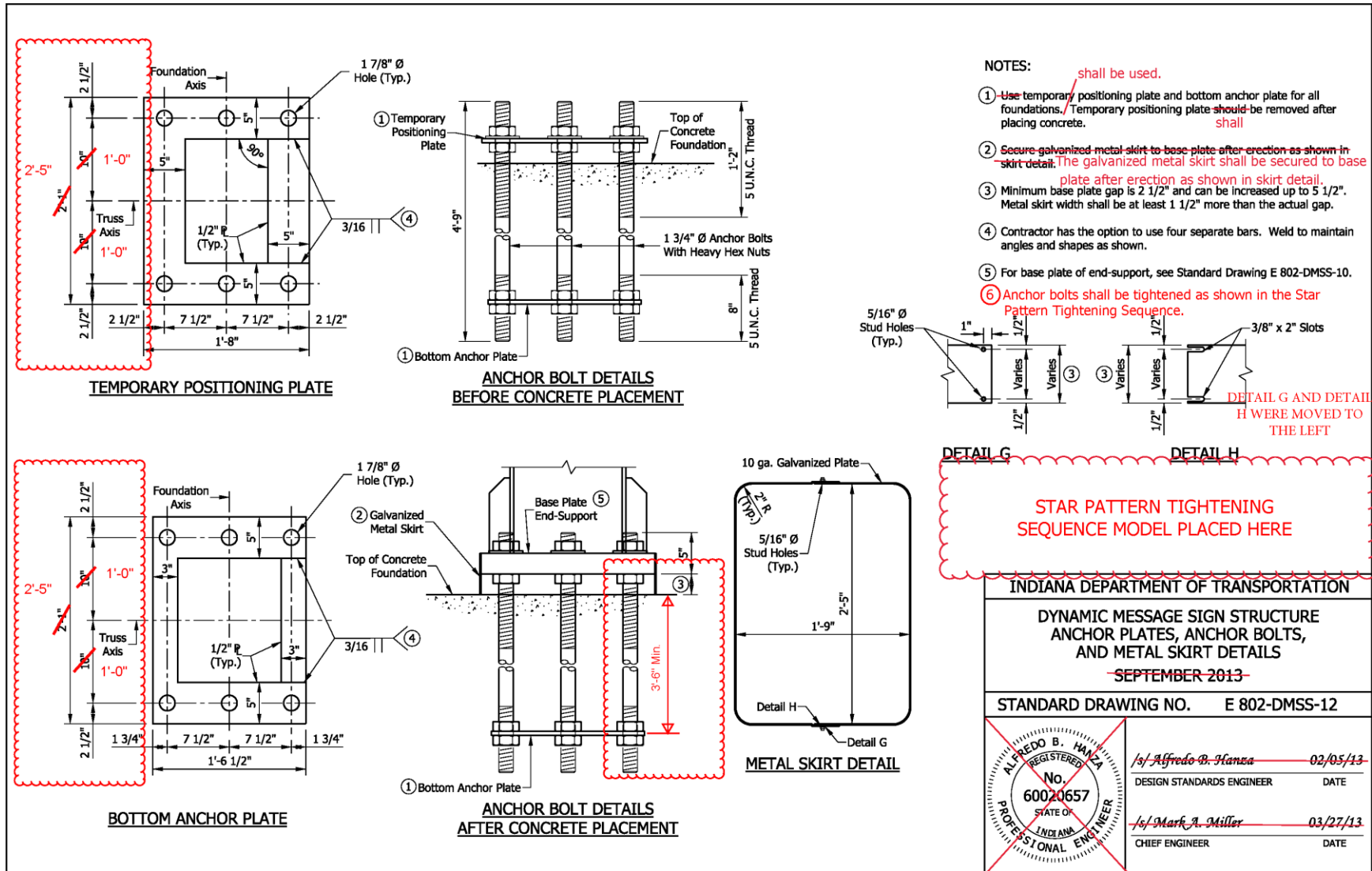
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



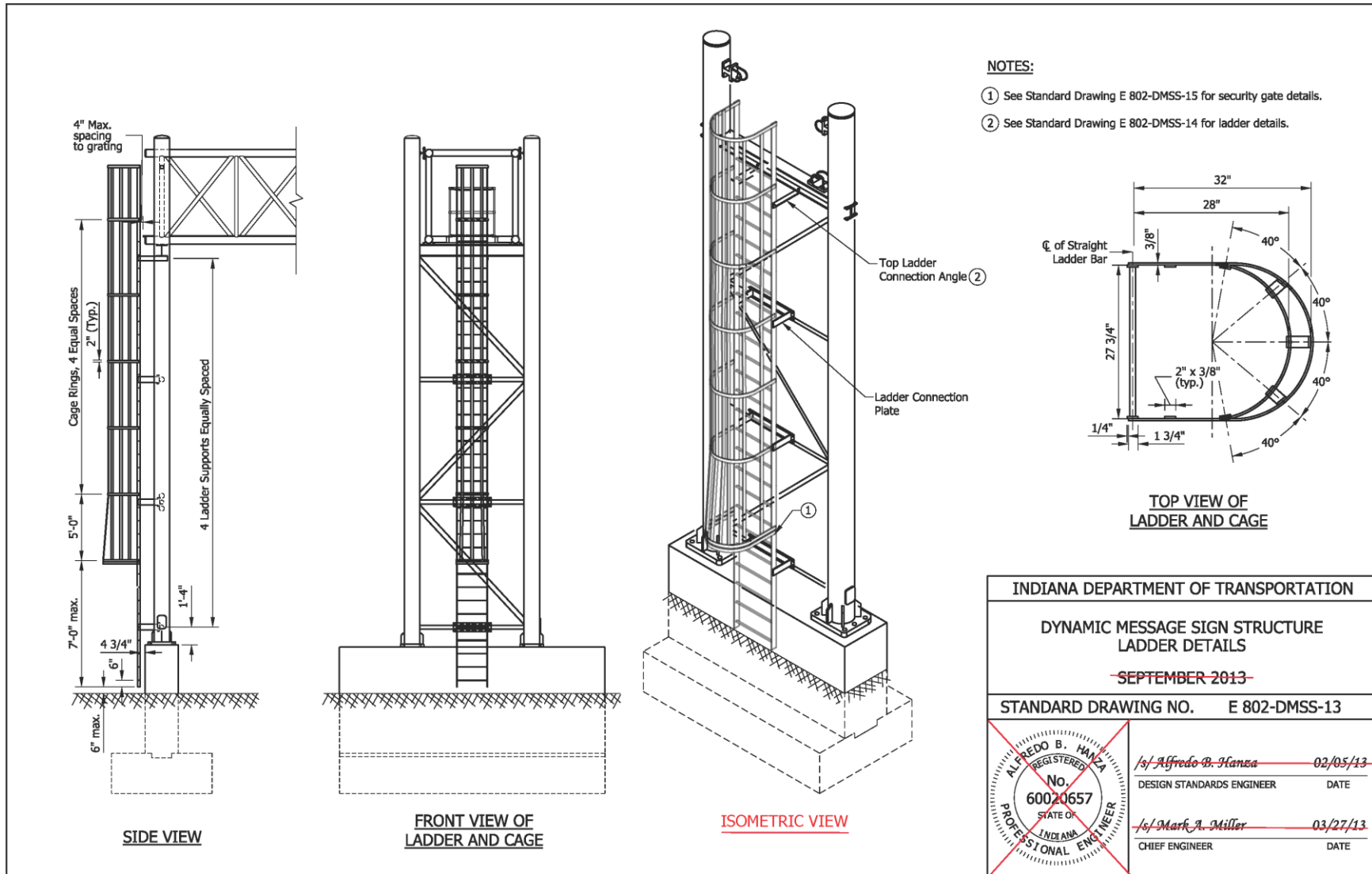
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



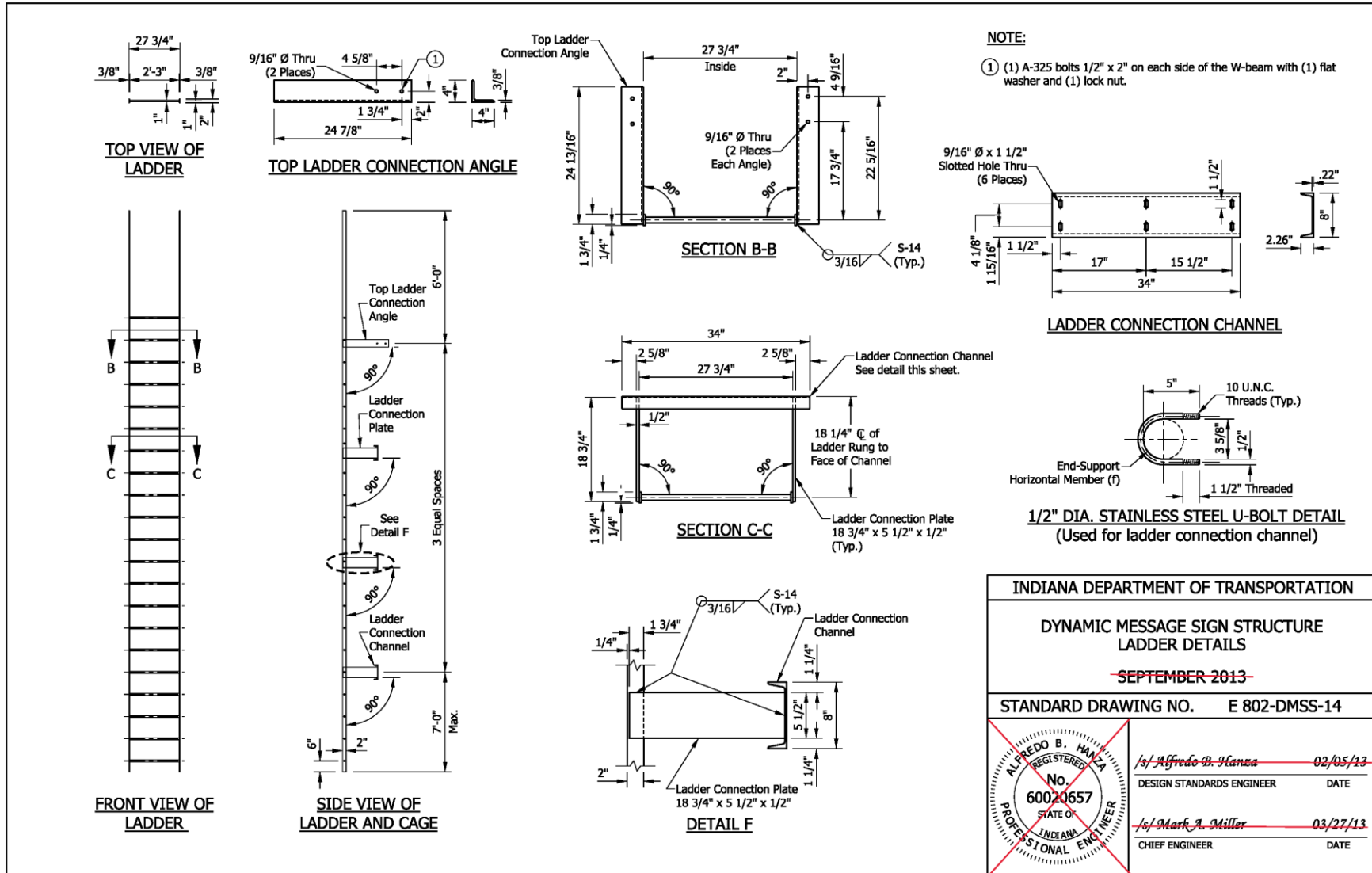
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



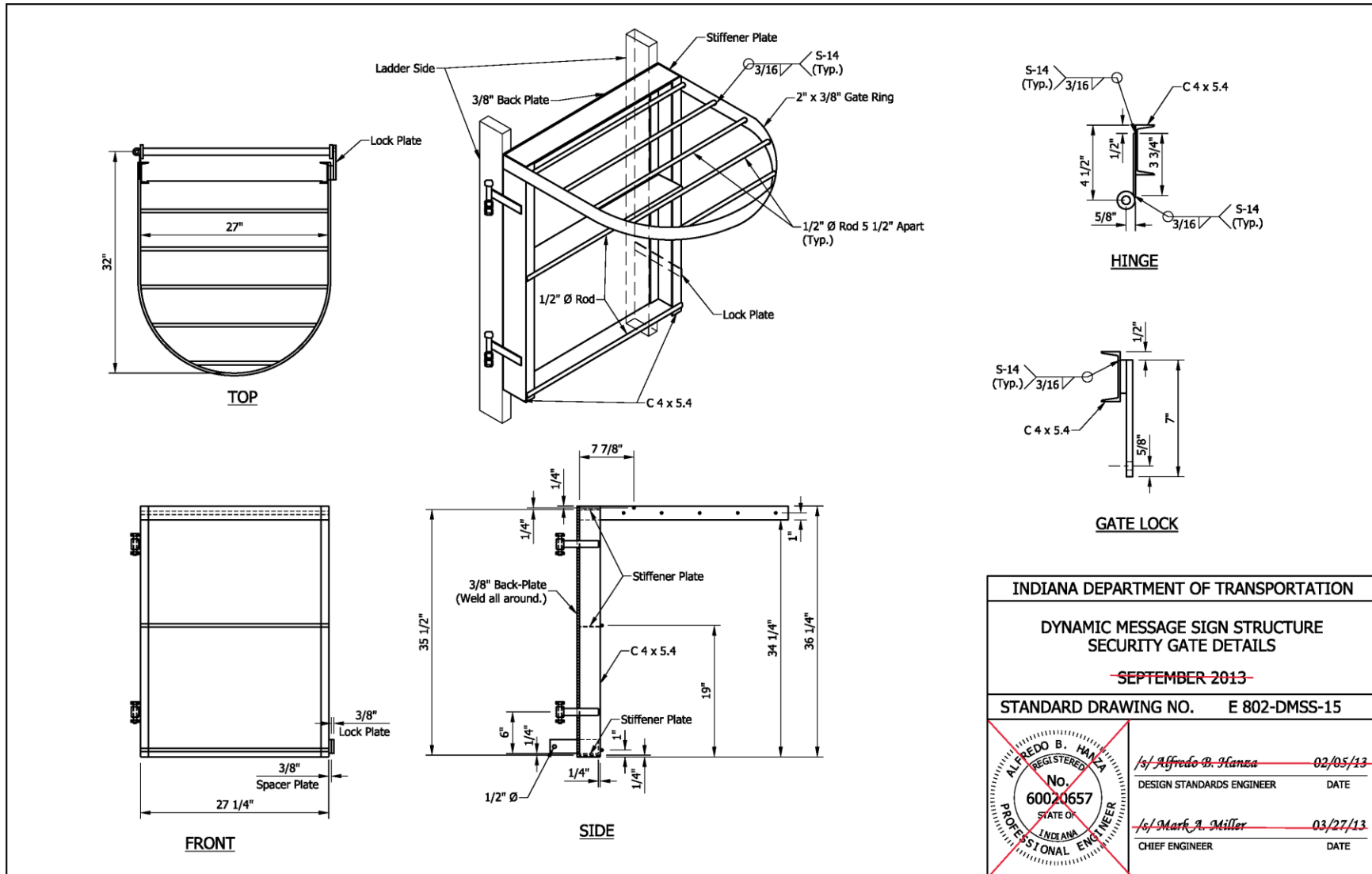
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



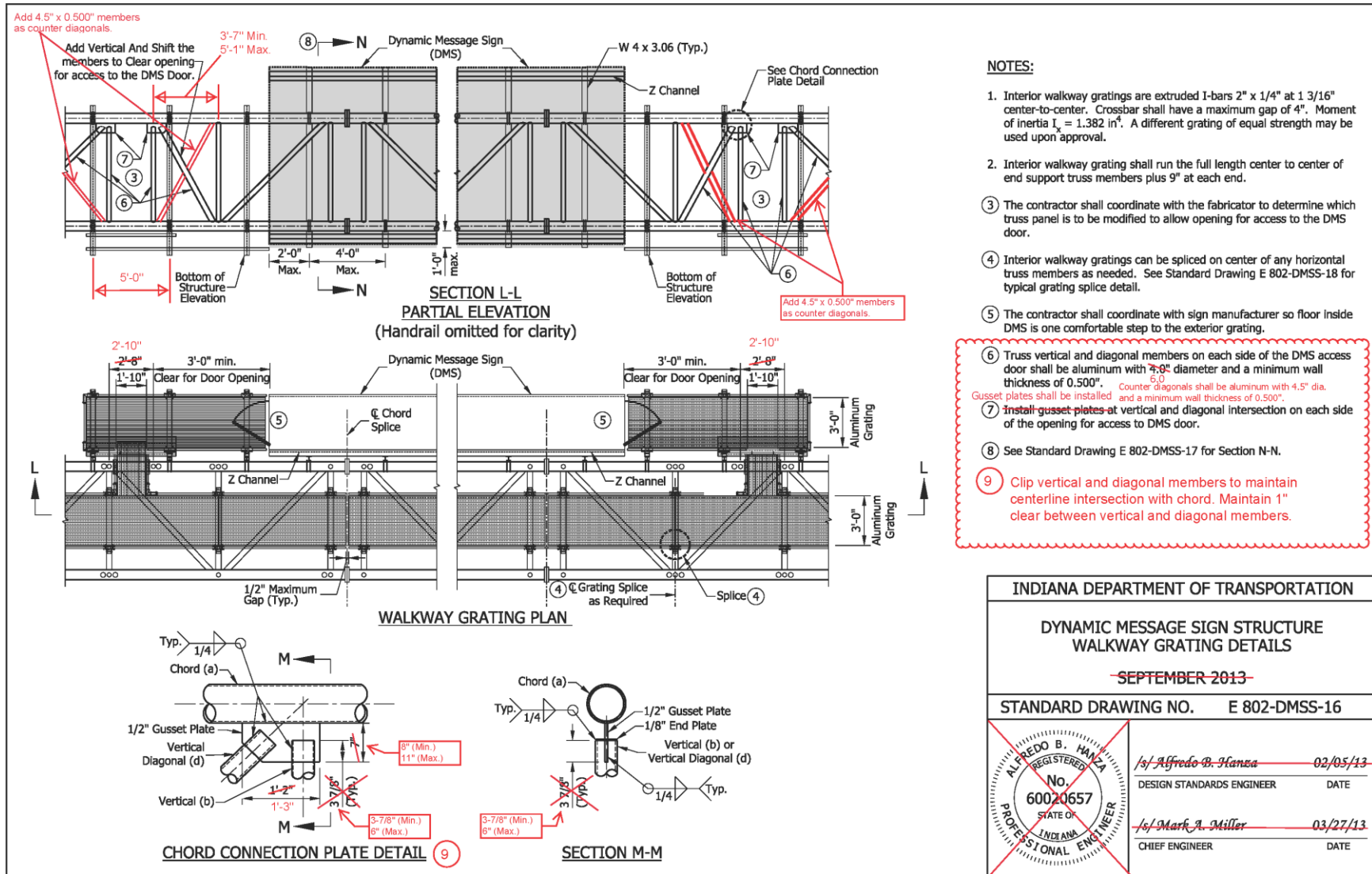
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



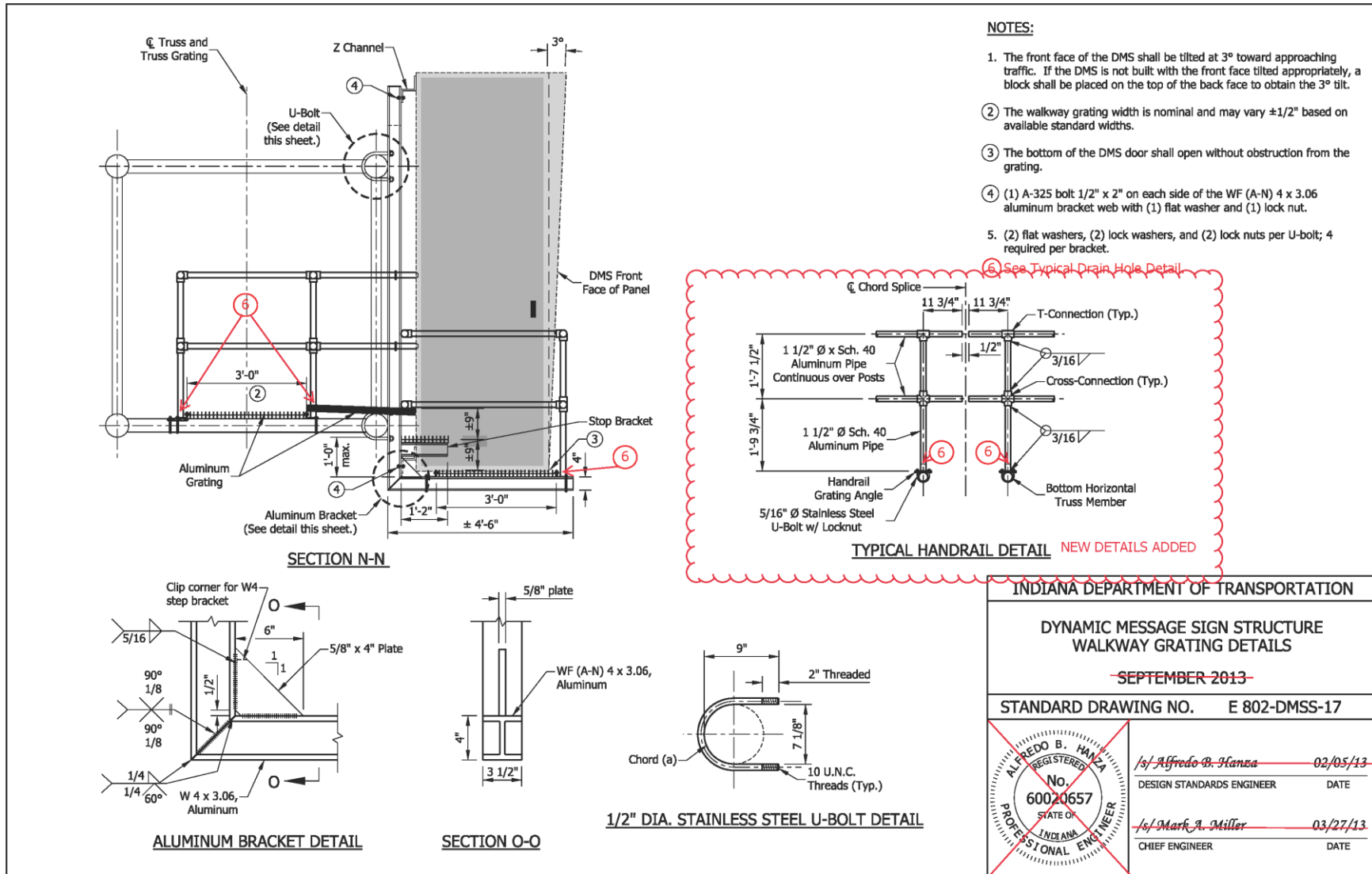
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



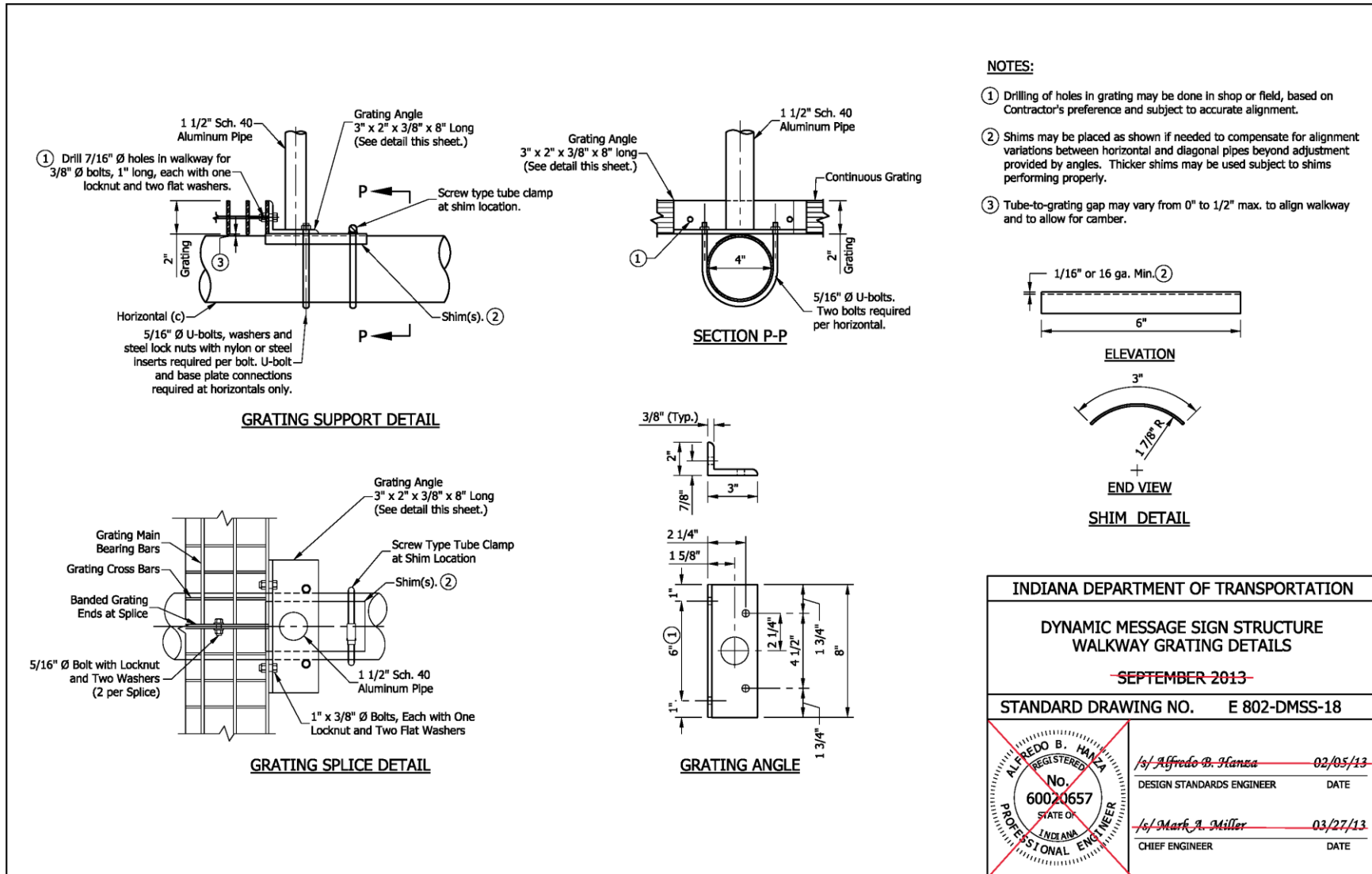
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



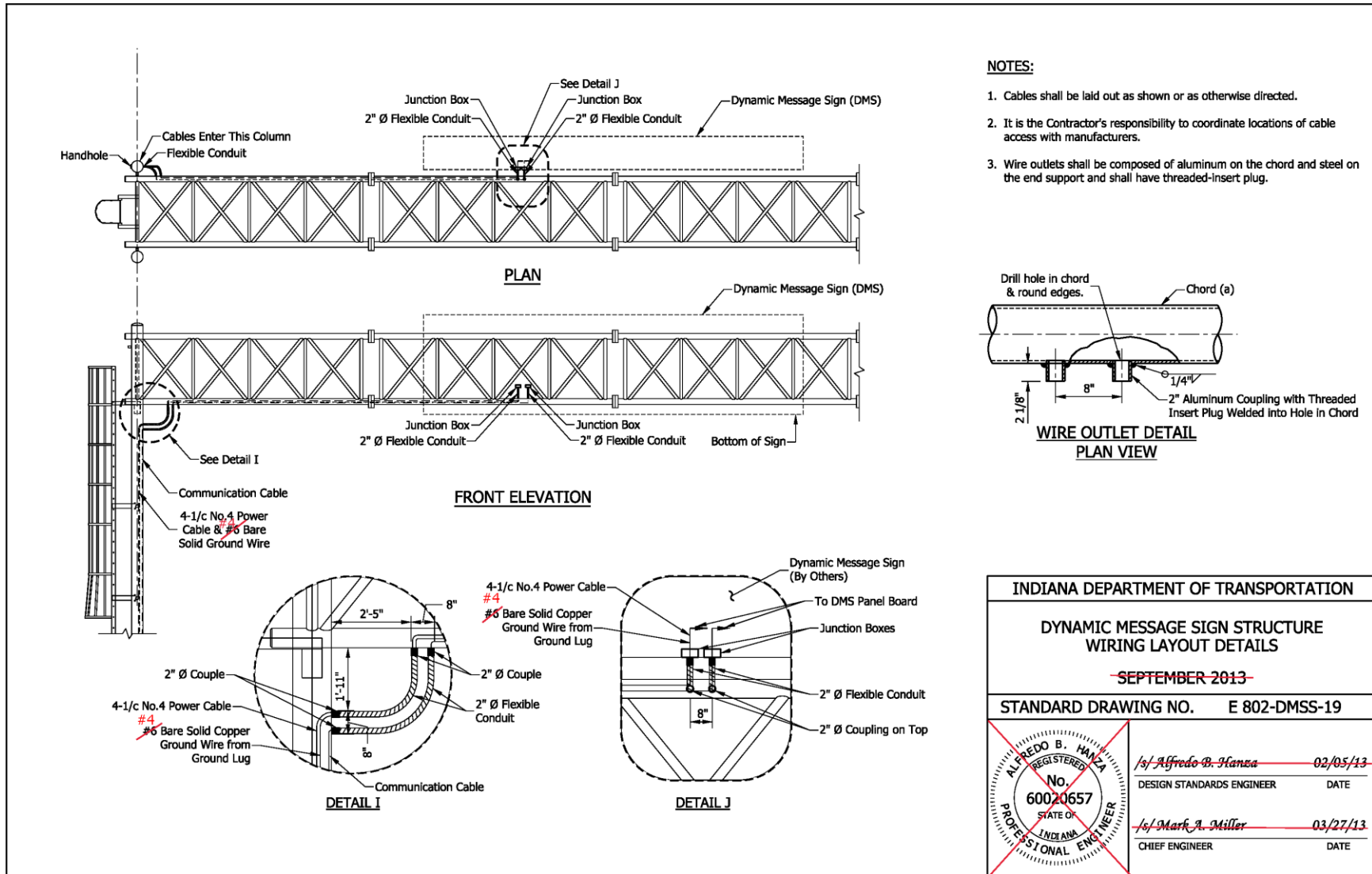
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



REVISION TO STANDARD DRAWINGS

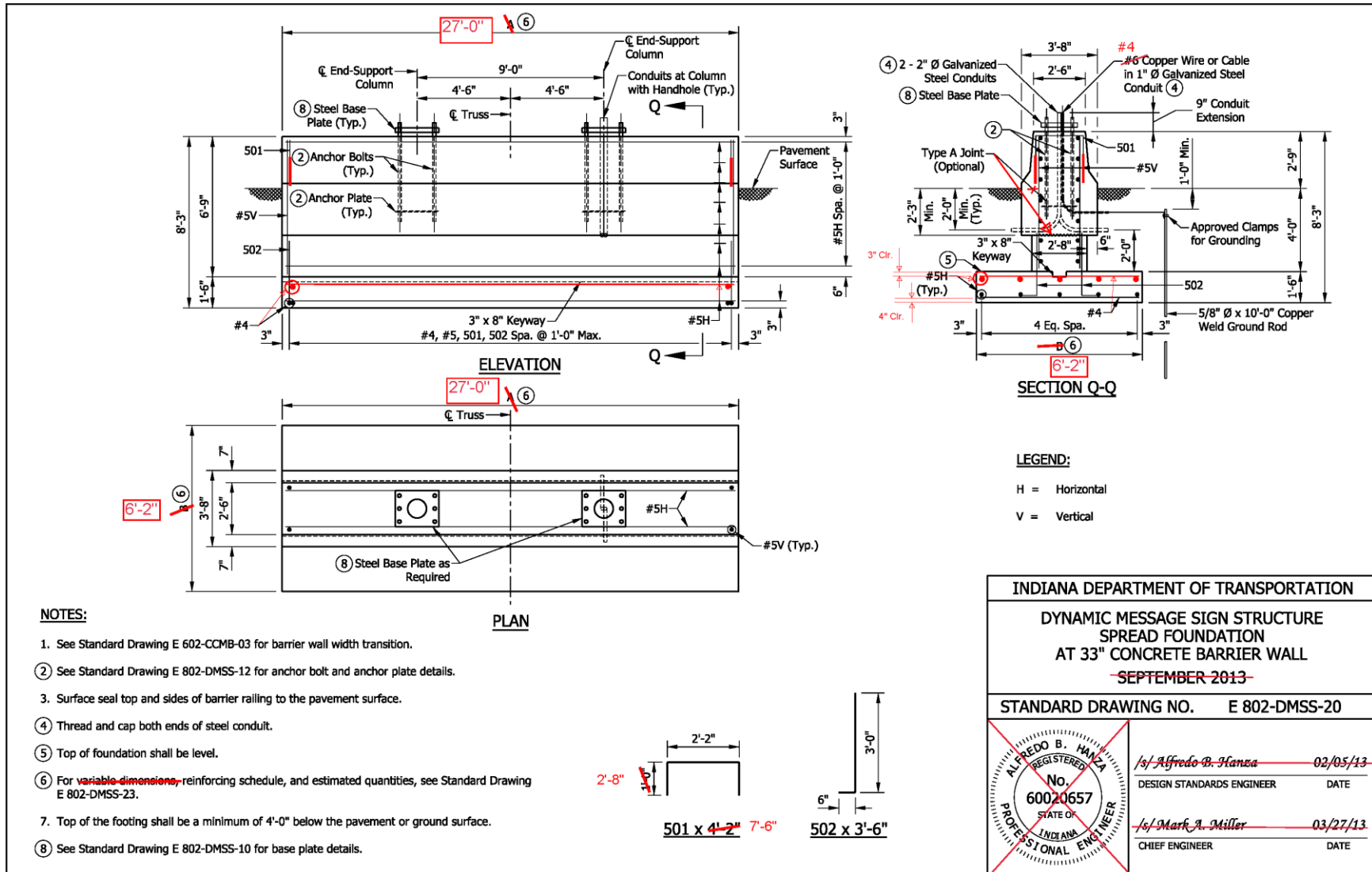
802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



INDIANA DEPARTMENT OF TRANSPORTATION	
DYNAMIC MESSAGE SIGN STRUCTURE WIRING LAYOUT DETAILS	
SEPTEMBER 2013	
STANDARD DRAWING NO. E 802-DMSS-19	
	/s/ Alfredo B. Hanza 02/05/13 DESIGN STANDARDS ENGINEER DATE
	/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER DATE

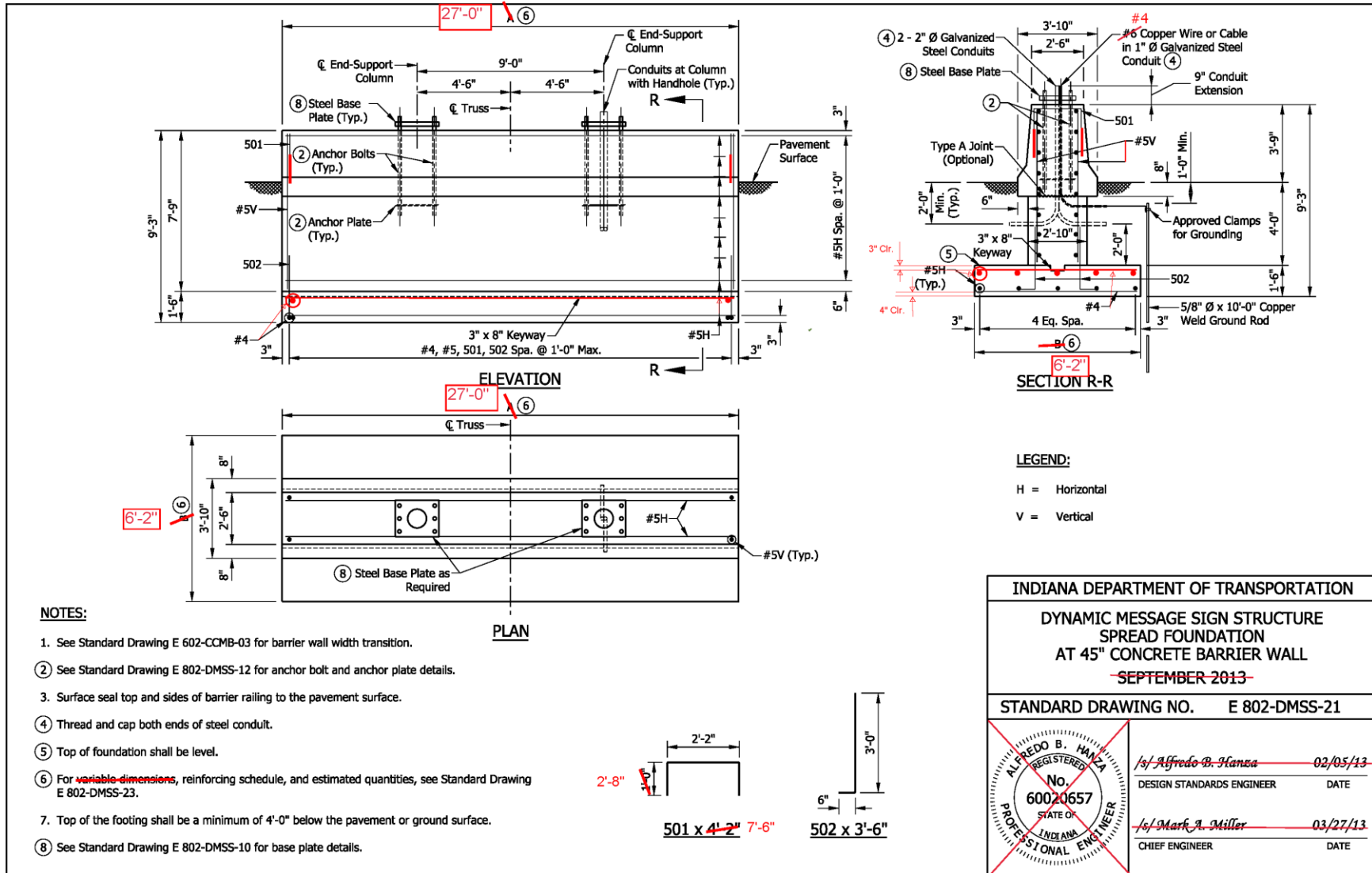
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



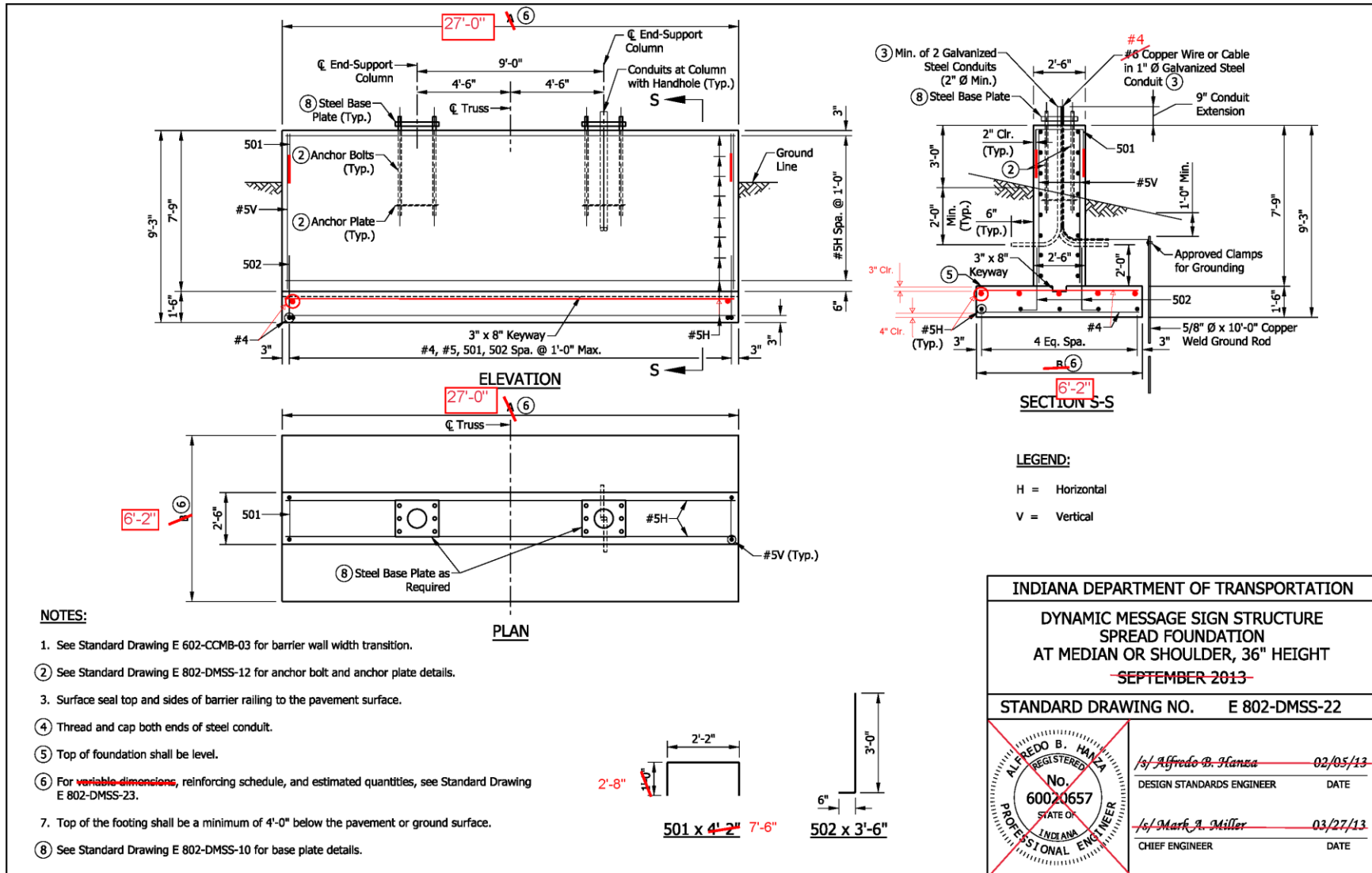
REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE



NOTES:

1. See Standard Drawing E 602-CCMB-03 for barrier wall width transition.
2. See Standard Drawing E 802-DMSS-12 for anchor bolt and anchor plate details.
3. Surface seal top and sides of barrier railing to the pavement surface.
4. Thread and cap both ends of steel conduit.
5. Top of foundation shall be level.
6. For **variable dimensions**, reinforcing schedule, and estimated quantities, see Standard Drawing E 802-DMSS-23.
7. Top of the footing shall be a minimum of 4'-0" below the pavement or ground surface.
8. See Standard Drawing E 802-DMSS-10 for base plate details.

REVISION TO STANDARD DRAWINGS

802-DMSS (existing -01 thru -23, shown markups) DYNAMIC MESSAGE SIGN STRUCTURE

~~TABLE 1: SPREAD FOUNDATIONS FOR DYNAMIC MESSAGE OVERHEAD SIGN STRUCTURE~~

MAX. SIGN AREA (SFT)	ALLOWABLE GROSS SOIL BEARING PRESSURE (PSF)	FOOTING DIMENSION		TYPE OF BARRIER
		LENGTH, A (FT)	WIDTH, B (FT)	
300	1500 - 2499	26'	7'	33", 45" or 36" Median/Shoulder
	2500 - 3499	22'	5'	33", 45" or 36" Median/Shoulder
	> 3499	20'	5'	33", 45" or 36" Median/Shoulder

~~TABLE 2: SPREAD FOUNDATIONS DIMENSIONS AND BILL OF MATERIALS~~

FOOTING DIMENSION		TYPE OF BARRIER	#4		#5H		#5V		501		502		TOTAL EPOXY COATED REINFORCING BARS (LBS)	CONCRETE CLASS A (CYS)	SURFACE SEAL (SYS)									
A (FT)	B (FT)		NO. BARS	LENGTH	NO. BARS	LENGTH	NO. BARS	LENGTH	NO. BARS	LENGTH	NO. BARS	LENGTH												
26'	7'	33" Concrete Barrier	56	3'-8"	24	19'	26'	25'-8"	56	54	6'-6"	28	27	4'-2"	7'-6"	54	56	3'-6"	1309	1685	27.9	30.1	23.9	24.8
		45" Concrete Barrier	56	3'-8"	26	21	26'	25'-8"	56	54	7'-6"	28	27	4'-2"	7'-6"	54	56	3'-6"	1418	1799	30.9	32.3	25.7	30.9
		36" Median or Shoulder Barrier	56	3'-8"	26	21	26'	25'-8"	56	54	7'-6"	28	27	4'-2"	7'-6"	54	56	3'-6"	1418	1799	28.8	28.7	24.6	25.5
22'	5'	33" Concrete Barrier	23	4'-8"	19	21'-8"	46	6'-6"	23	4'-2"	46	3'-6"	1081	21.7	20.2									
		45" Concrete Barrier	23	4'-8"	21	21'-8"	46	7'-6"	23	4'-2"	46	3'-6"	1175	23.7	25.1									
		36" Median or Shoulder Barrier	23	4'-8"	21	21'-8"	46	7'-6"	23	4'-2"	46	3'-6"	1175	21.9	20.8									
20'	5'	33" Concrete Barrier	21	4'-8"	19	19'-8"	42	6'-6"	21	4'-2"	42	3'-6"	984	19.3	18.4									
		45" Concrete Barrier	21	4'-8"	21	19'-8"	42	7'-6"	21	4'-2"	42	3'-6"	1069	21.6	22.9									
		36" Median or Shoulder Barrier	21	4'-8"	21	19'-8"	42	7'-6"	21	4'-2"	42	3'-6"	1069	19.9	18.9									

Delete

NOTES:


- ~~1.~~ ~~Geotechnical recommendations for Allowable Gross Soil Bearing Pressure shall be obtained to determine footing size and reinforcement shown in Tables 1 and 2.~~
- ~~2.~~ If Allowable Gross Soil Bearing Pressure is less than 1500 psf, a drilled shaft or other special foundation shall be used.
- ~~3.~~ See Standard Drawings E 802-DMSS-20 through 22 for locations of dimensions and reinforcing bars.

INDIANA DEPARTMENT OF TRANSPORTATION

DYNAMIC MESSAGE SIGN STRUCTURE
 SPREAD FOUNDATIONS QUANTITIES

~~SEPTEMBER 2013~~

STANDARD DRAWING NO. E 802-DMSS-23

	/s/ Alfredo B. Hanza	02/05/13
	DESIGN STANDARDS ENGINEER	DATE
	/s/ Mark A. Miller	03/27/13
	CHIEF ENGINEER	DATE

REVISION TO STANDARD DRAWINGS

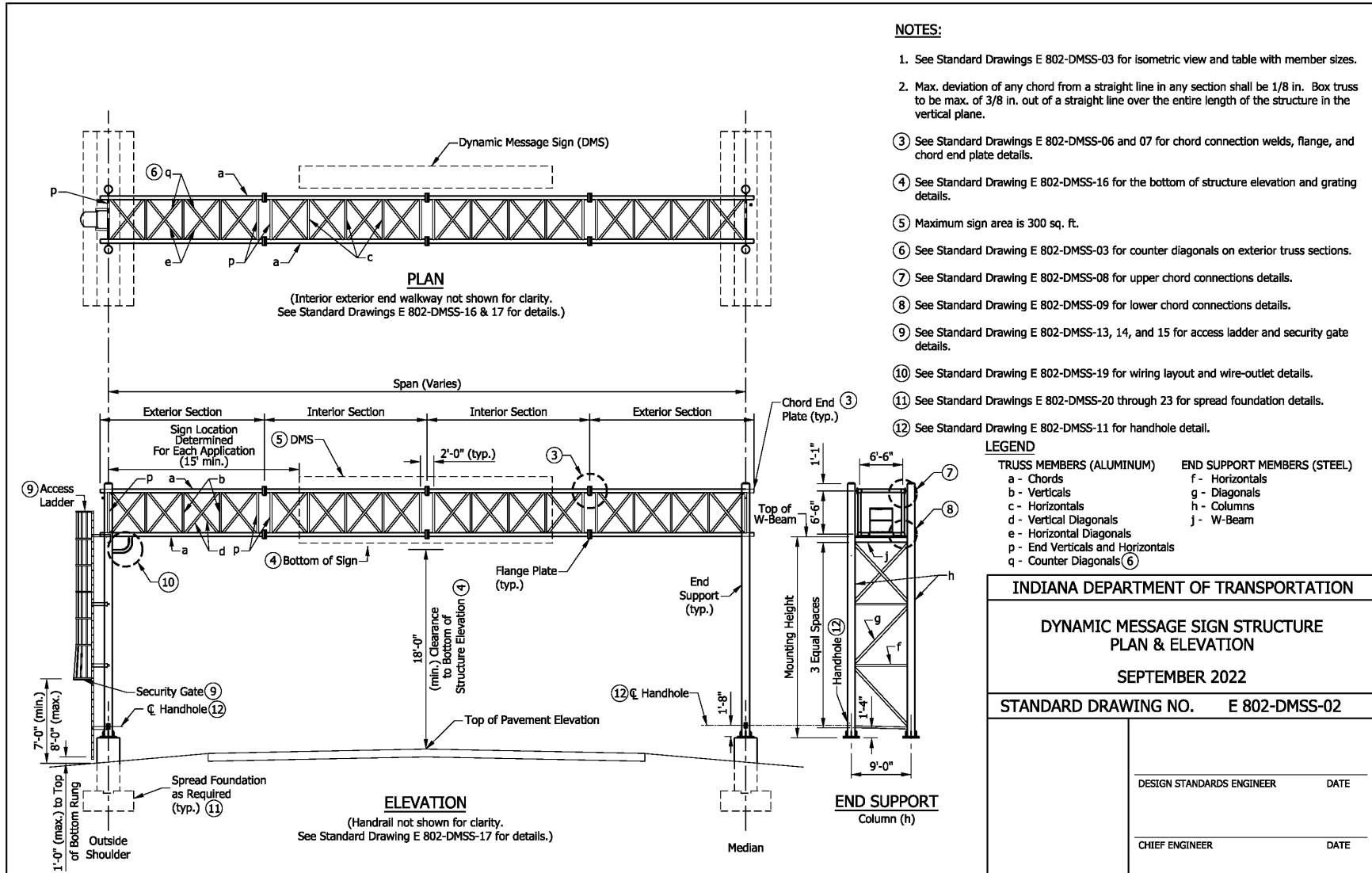
802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE

INDEX	
SHEET NO.	SUBJECT
1	Index
2	Plan & Elevation
3	Truss Sections, Member Size Table
4	Table of Dimensions, Spans 34' thru 81'
5	Table of Dimensions, Spans 82' thru 130' & Camber
6	Chord Connections and Weld Details
7	Flange & Chord End Plate Details
8	End Support Upper Chord Connection Details
9	End Support Lower Chord Connection Details
10	End Support Base Plate and I.D. Plate Details
11	End Support Handhole, Top Cap, and J-Hook Details
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13	Ladder Details
14	Ladder Details
15	Security Gate Details
16	Walkway Grating Details
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20	Spread Foundation at 33" Concrete Barrier Wall
21	Spread Foundation at 45" Concrete Barrier Wall
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INDIANA DEPARTMENT OF TRANSPORTATION	
DYNAMIC MESSAGE SIGN STRUCTURE INDEX	
SEPTEMBER 2022	
STANDARD DRAWING NO.	E 802-DMSS-01
DESIGN STANDARDS ENGINEER	DATE
CHIEF ENGINEER	DATE

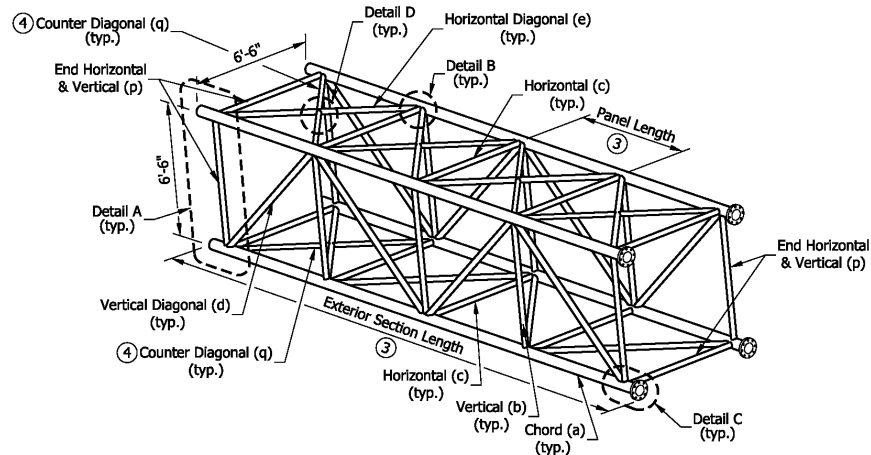
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE

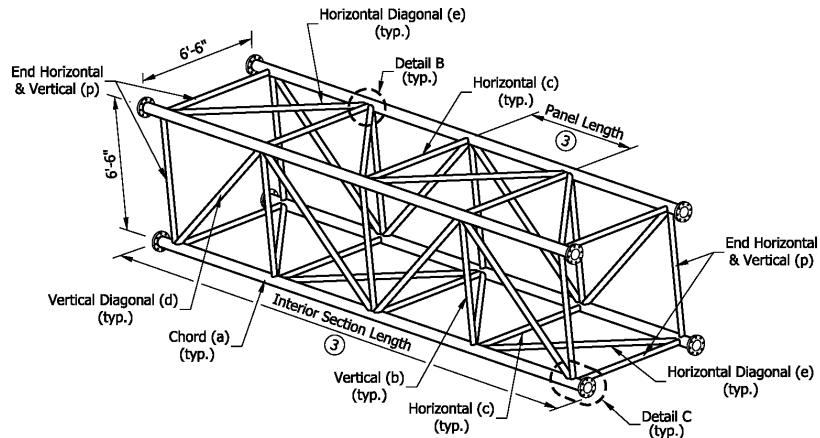


REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



TYPICAL EXTERIOR TRUSS SECTION



TYPICAL INTERIOR TRUSS SECTION

NOTES:

1. See Standard Drawing E 802-DMSS-06 for Details A through D.
2. Truss members to be aluminum. End support members to be steel. Steel pipe diameters shown in table are nominal pipe sizes.
3. Number of panels and sections varies. See Standard Drawing E 802-DMSS-04 and 05 for recommended dimensions.
4. Counter Diagonal (q) shall be provided in exterior sections at the top of each panel and at the bottom of end panel only as shown. It is not required in interior sections.
5. See Standard Drawing E 802-DMSS-02 for end support members.

MAX. SPAN = 130 ft. MAX. SIGN AREA = 300 sq. ft. MAX. MOUNTING HEIGHT = 24'-6"		
ALUMINUM TRUSS MEMBERS		
MEMBER	MARK	O.D. (IN.) x WALL THK. (IN.)
CHORD	a	7 x 0.500
VERTICAL	b	3.5 x 0.375
HORIZONTAL	c	4 x 0.250
VERTICAL DIAGONAL	d	4.5 x 0.500
HORIZONTAL DIAGONAL	e	5.5 x 0.500
END VERTICAL & HORIZONTAL	p	5.5 x 0.500
COUNTER DIAGONAL (SEE NOTE 4)	q	2.5 x 0.500
STEEL END-SUPPORT MEMBERS		
COLUMN	h	14 x 0.375
HORIZONTAL	f	3.5 x 0.216
DIAGONAL	g	5.563 x 0.375
W-BEAM	j	W10 x 68

INDIANA DEPARTMENT OF TRANSPORTATION	
DYNAMIC MESSAGE SIGN STRUCTURE TRUSS SECTIONS, MEMBER SIZE TABLE	
SEPTEMBER 2022	
STANDARD DRAWING NO.	E 802-DMSS-03
DESIGN STANDARDS ENGINEER	DATE
CHIEF ENGINEER	DATE

REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE

NOTES:

1. The table of dimensions for a dynamic message sign structure is divided and put on two Standard Drawings E 802-DMSS-04 and 05. The table shows dimensions with all sections requirements accounted for.
2. All panels on a truss shall be the same length. The minimum panel length for all trusses is 5'-0" and the maximum is 6'-6".
3. A single interior section in a truss shall have an even number of panels to maintain the pattern of the vertical diagonals.
4. Use minimum number of sections for each truss, keeping the maximum section length at 35'-6".
5. See Standard Drawing E 802-DMSS-05 for required camber.

DIMENSIONS FOR DYNAMIC MESSAGE SIGN STRUCTURES (34' THRU 81')									
SPAN	EXTERIOR SECTIONS					INTERIOR SECTIONS			
SPAN-TRUSS LENGTH, (FT)	NO. OF EXT. SECTIONS	NO. OF PANELS PER SECTION	VARIABLE END DIMEN.	PANEL LENGTH	SECTION LENGTH	NO. OF INT. SECTIONS	NO. OF PANELS PER SECTION	PANEL LENGTH	SECTION LENGTH
34	1	6	6"	5'-6"	35'-6"	0			
35	1	6	6"	5'-8"	36'-6"	0			
36	2	3	6"	5'-6"	18'-9"	0			
37	2	3	6"	5'-8"	19'-3"	0			
38	2	3	6"	5'-10"	19'-9"	0			
39	2	3	6"	6'-0"	20'-3"	0			
40	2	3	6"	6'-2"	20'-9"	0			
41	2	3	6"	6'-4"	21'-3"	0			
42	2	3	6"	6'-6"	21'-9"	0			
43	2	4	6"	5'-0"	22'-3"	0			
44	2	4	6"	5'-1 1/2"	22'-9"	0			
45	2	4	6"	5'-3"	23'-3"	0			
46	2	4	6"	5'-4 1/2"	23'-9"	0			
47	2	4	6"	5'-6"	24'-3"	0			
48	2	4	6"	5'-7 1/2"	24'-9"	0			
49	2	4	6"	5'-9"	25'-3"	0			
50	2	4	6"	5'-10 1/2"	25'-9"	0			
51	2	4	6"	6'-0"	26'-3"	0			
52	2	4	6"	6'-1 1/2"	26'-9"	0			
53	2	4	6"	6'-3"	27'-3"	0			
54	2	4	6"	6'-4 1/2"	27'-9"	0			
55	2	4	6"	6'-6"	28'-3"	0			
56	2	5	5 1/4"	5'-3 3/4"	28'-9"	0			
57	2	5	6 1/4"	5'-4 3/4"	29'-3"	0			
58	2	5	6"	5'-6"	29'-9"	0			
59	2	5	5 3/4"	5'-7 1/4"	30'-3"	0			
60	2	5	5 1/2"	5'-8 1/2"	30'-9"	0			
61	2	5	6 1/2"	5'-9 1/2"	31'-3"	0			
62	2	5	6 1/4"	5'-10 3/4"	31'-9"	0			
63	2	5	6"	6'-0"	32'-3"	0			
64	2	5	5 3/4"	6'-1 1/4"	32'-9"	0			
65	2	5	5 1/2"	6'-2 1/2"	33'-3"	0			
66	2	5	5 1/4"	6'-3 3/4"	33'-9"	0			
67	2	5	5"	6'-5"	34'-3"	0			
68	2	5	6"	6'-6"	34'-9"	0			
69	2	4	6"	5'-4"	23'-7"	1	4	5'-4"	23'-4"
70	2	4	6"	5'-5"	23'-11"	1	4	5'-5"	23'-8"
71	2	4	6"	5'-6"	24'-3"	1	4	5'-6"	24'-0"
72	2	4	6"	5'-7"	24'-7"	1	4	5'-7"	24'-4"
73	2	4	6"	5'-8"	24'-11"	1	4	5'-8"	24'-8"
74	2	4	6"	5'-9"	25'-3"	1	4	5'-9"	25'-0"
75	2	4	6"	5'-10"	25'-7"	1	4	5'-10"	25'-4"
76	2	4	6"	5'-11"	25'-11"	1	4	5'-11"	25'-8"
77	2	4	6"	6'-0"	26'-3"	1	4	6'-0"	26'-0"
78	2	4	6"	6'-1"	26'-7"	1	4	6'-1"	26'-4"
79	2	4	6"	6'-2"	26'-11"	1	4	6'-2"	26'-8"
80	2	4	6"	6'-3"	27'-3"	1	4	6'-3"	27'-0"
81	2	4	6"	6'-4"	27'-7"	1	4	6'-4"	27'-4"

INDIANA DEPARTMENT OF TRANSPORTATION	
DYNAMIC MESSAGE SIGN STRUCTURE TABLE OF DIMENSIONS SPANS 34' THRU 81' SEPTEMBER 2022	
STANDARD DRAWING NO.	E 802-DMSS-04
DESIGN STANDARDS ENGINEER	DATE
CHIEF ENGINEER	DATE

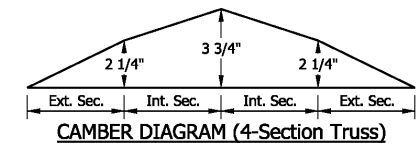
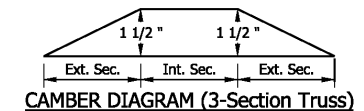
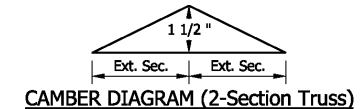
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE

NOTES:

1. Camber diagrams to build truss structures with 2 to 4 sections are shown. Cambers shown are for fabrication only and are measured with trusses fully supported at no-load conditions. Allowable camber tolerance for truss is 25% of specific camber value.
2. See Standard Drawing E 805-DMSS-04 for additional notes.

DIMENSIONS FOR DYNAMIC MESSAGE SIGN STRUCTURES (82' THRU 130')									
SPAN-TRUSS LENGTH, (FT)	EXTERIOR SECTIONS					INTERIOR SECTIONS			
	NO. OF EXT. SECTIONS	NO. OF PANELS PER SECTION	VARIABLE END DIMEN.	PANEL LENGTH	SECTION LENGTH	NO. OF INT. SECTIONS	NO. OF PANELS PER SECTION	PANEL LENGTH	SECTION LENGTH
82	2	4	6"	6'-5"	27'-11"	1	4	6'-5"	27'-8"
83	2	4	6"	6'-6"	28'-3"	1	4	6'-6"	28'-0"
84	2	5	5 3/4"	5'-7 3/4"	30'-5 1/2"	1	4	5'-7 3/4"	24'-7"
85	2	5	6 1/2"	5'-8 1/2"	30'-10"	1	4	5'-8 1/2"	24'-10"
86	2	5	5 1/2"	5'-9 1/2"	31'-2"	1	4	5'-9 1/2"	25'-2"
87	2	5	6 1/4"	5'-10 1/4"	31'-6 1/2"	1	4	5'-10 1/4"	25'-5"
88	2	5	7"	5'-11"	31'-11"	1	4	5'-11"	25'-8"
89	2	5	6"	6'-0"	32'-3"	1	4	6'-0"	26'-0"
90	2	5	5"	6'-1"	32'-7"	1	4	6'-1"	26'-4"
91	2	5	5 3/4"	6'-1 3/4"	32'-11 1/2"	1	4	6'-1 3/4"	26'-7"
92	2	5	6 1/2"	6'-2 1/2"	33'-4"	1	4	6'-2 1/2"	26'-10"
93	2	5	5 1/2"	6'-3 1/2"	33'-8"	1	4	6'-3 1/2"	27'-2"
94	2	5	6 1/4"	6'-4 1/4"	34'-0 1/2"	1	4	6'-4 1/4"	27'-5"
95	2	5	5 1/4"	6'-5 1/4"	34'-4 1/2"	1	4	6'-5 1/4"	27'-9"
96	2	5	6"	6'-6"	34'-9"	1	4	6'-6"	28'-0"
97	2	4	6"	5'-7 1/2"	24'-9"	2	4	5'-7 1/2"	24'-6"
98	2	4	6"	5'-8 1/4"	25'-0"	2	4	5'-8 1/4"	24'-9"
99	2	4	6"	5'-9"	25'-3"	2	4	5'-9"	25'-0"
100	2	4	6"	5'-9 3/4"	25'-6"	2	4	5'-9 3/4"	25'-3"
101	2	4	6"	5'-10 1/2"	25'-9"	2	4	5'-10 1/2"	25'-6"
102	2	4	6"	5'-11 1/4"	26'-0"	2	4	5'-11 1/4"	25'-9"
103	2	4	6"	6'-0"	26'-3"	2	4	6'-0"	26'-0"
104	2	4	6"	6'-0 3/4"	26'-6"	2	4	6'-0 3/4"	26'-3"
105	2	4	6"	6'-1 1/2"	26'-9"	2	4	6'-1 1/2"	26'-6"
106	2	4	6"	6'-2 1/4"	27'-0"	2	4	6'-2 1/4"	26'-9"
107	2	4	6"	6'-3"	27'-3"	2	4	6'-3"	27'-0"
108	2	4	6"	6'-3 3/4"	27'-6"	2	4	6'-3 3/4"	27'-3"
109	2	4	6"	6'-4 1/2"	27'-9"	2	4	6'-4 1/2"	27'-6"
110	2	4	6"	6'-5 1/4"	28'-0"	2	4	6'-5 1/4"	27'-9"
111	2	4	6"	6'-6"	28'-3"	2	4	6'-6"	28'-0"
112	2	5	6"	5'-3"	28'-6"	2	5	5'-3"	28'-3"
113	2	5	7"	5'-3 1/2"	28'-9 1/2"	2	5	5'-3 1/2"	28'-5 1/2"
114	2	5	5 1/2"	5'-4 1/4"	28'-11 3/4"	2	5	5'-4 1/4"	28'-9 1/4"
115	2	5	6 1/2"	5'-4 3/4"	29'-3 1/4"	2	5	5'-4 3/4"	28'-11 3/4"
116	2	5	5"	5'-5 1/2"	29'-5 1/2"	2	5	5'-5 1/2"	29'-3 1/2"
117	2	5	6"	5'-6"	29'-9"	2	5	5'-6"	29'-6"
118	2	5	5"	5'-6 1/2"	29'-10 1/2"	2	5	5'-6 1/2"	29'-8 1/2"
119	2	5	5 1/2"	5'-7 1/4"	30'-2 3/4"	2	5	5'-7 1/4"	30'-0 1/4"
120	2	5	6 1/2"	5'-7 3/4"	30'-6 1/4"	2	5	5'-7 3/4"	30'-2 3/4"
121	2	5	5"	5'-8 1/2"	30'-8 1/2"	2	5	5'-8 1/2"	30'-6 1/2"
122	2	5	6"	5'-9"	31'-0"	2	5	5'-9"	30'-9"
123	2	5	7"	5'-9 1/2"	31'-3 1/2"	2	5	5'-9 1/2"	30'-11 1/2"
124	2	5	5 1/2"	5'-10 1/4"	31'-5 3/4"	2	5	5'-10 1/4"	31'-3 1/4"
125	2	5	6 1/2"	5'-10 3/4"	31'-9 1/4"	2	5	5'-10 3/4"	31'-5 3/4"
126	2	5	5"	5'-11 1/2"	31'-11 1/2"	2	5	5'-11 1/2"	31'-9 1/2"
127	2	5	6"	6'-0"	32'-3"	2	5	6'-0"	32'-0"
128	2	5	7"	6'-0 1/2"	32'-6 1/2"	2	5	6'-0 1/2"	32'-2 1/2"
129	2	5	5 1/2"	6'-1 1/4"	32'-8 3/4"	2	5	6'-1 1/4"	32'-6 1/4"
130	2	5	6 1/2"	6'-1 3/4"	33'-0 1/4"	2	5	6'-1 3/4"	32'-8 3/4"



INDIANA DEPARTMENT OF TRANSPORTATION

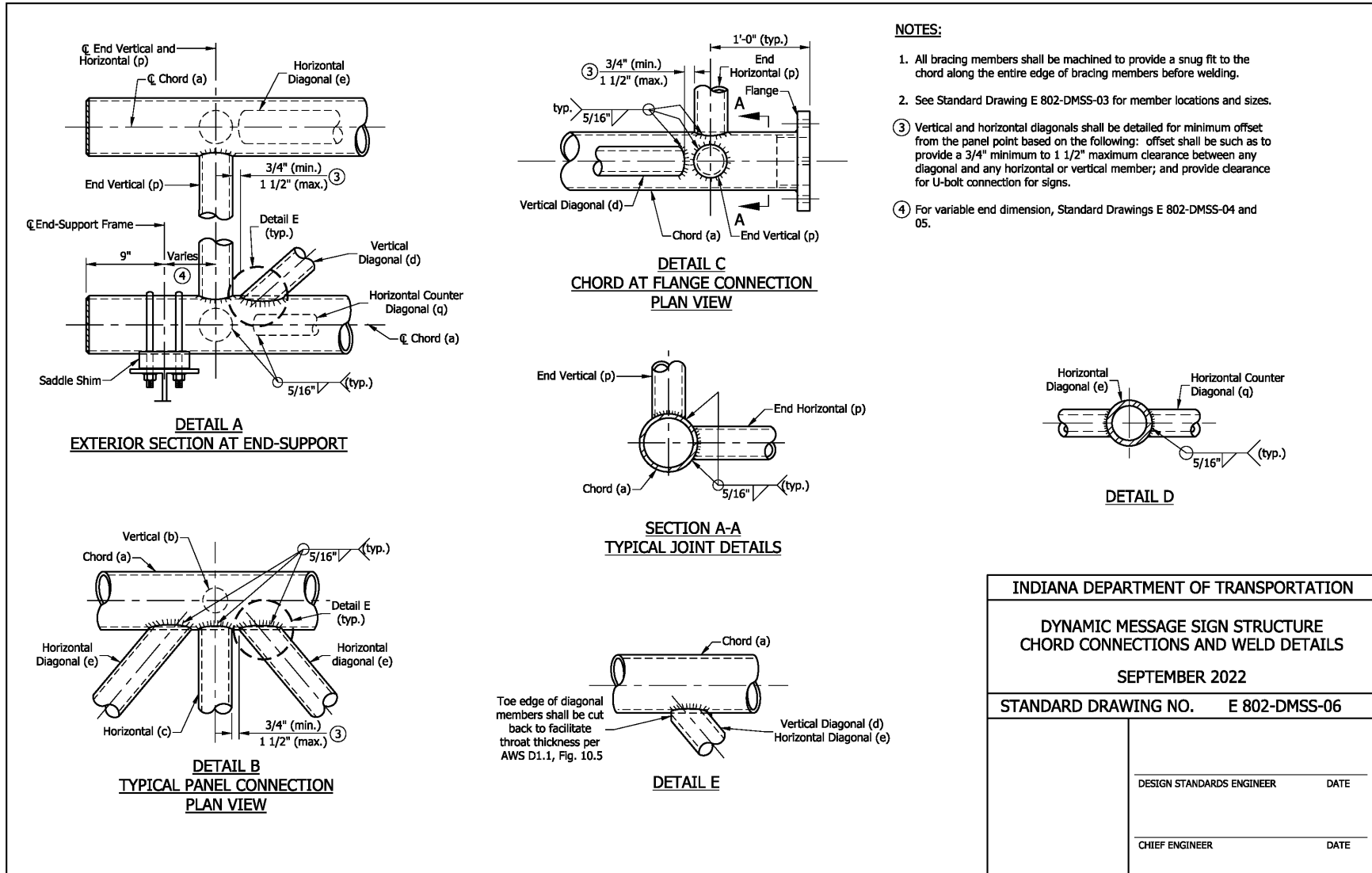
DYNAMIC MESSAGE SIGN STRUCTURE
 TABLE OF DIMENSIONS
 SPANS 82' THRU 130' & CAMBER
 SEPTEMBER 2022

STANDARD DRAWING NO. E 802-DMSS-05

DESIGN STANDARDS ENGINEER	DATE
CHIEF ENGINEER	DATE

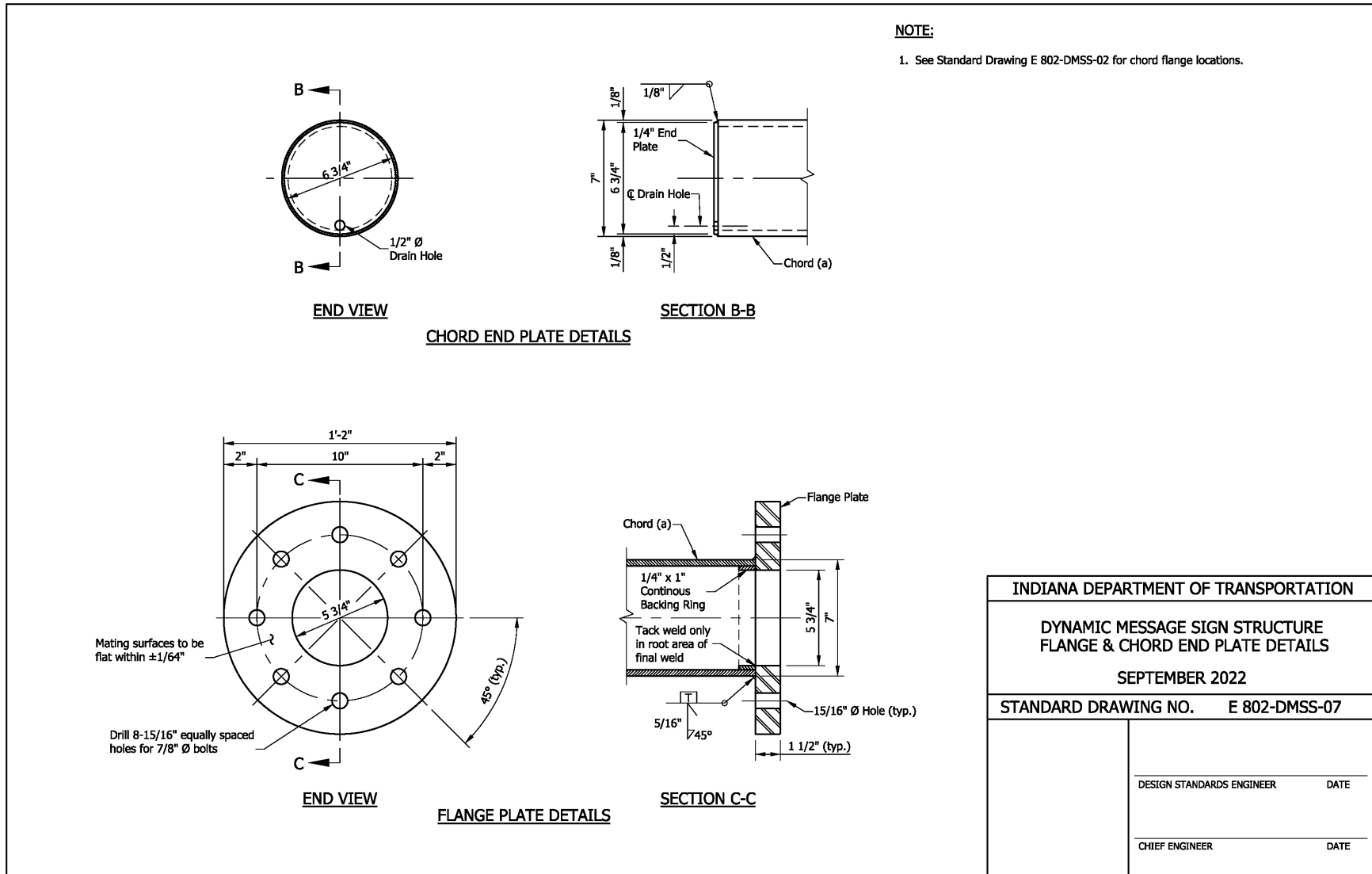
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



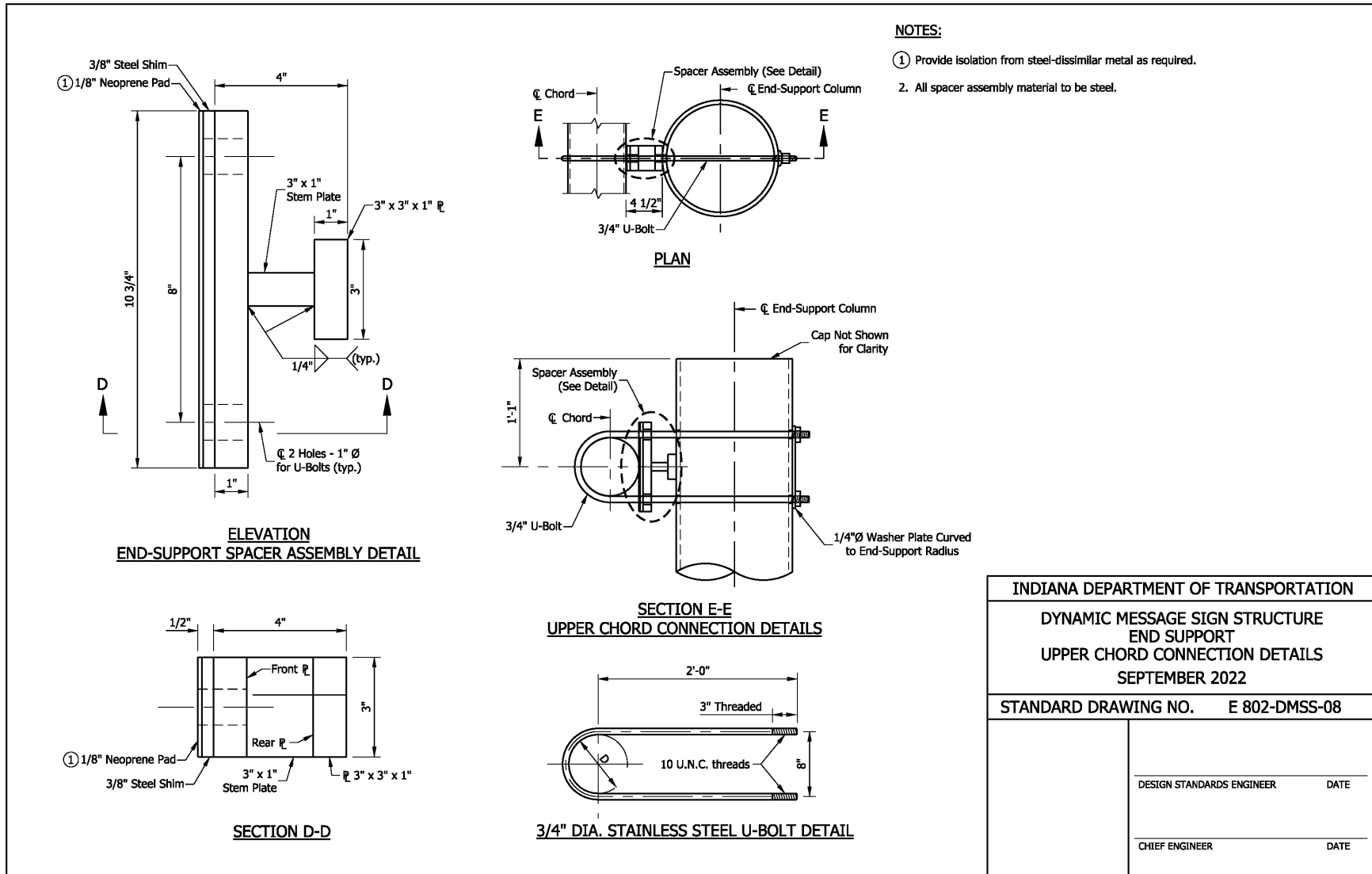
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



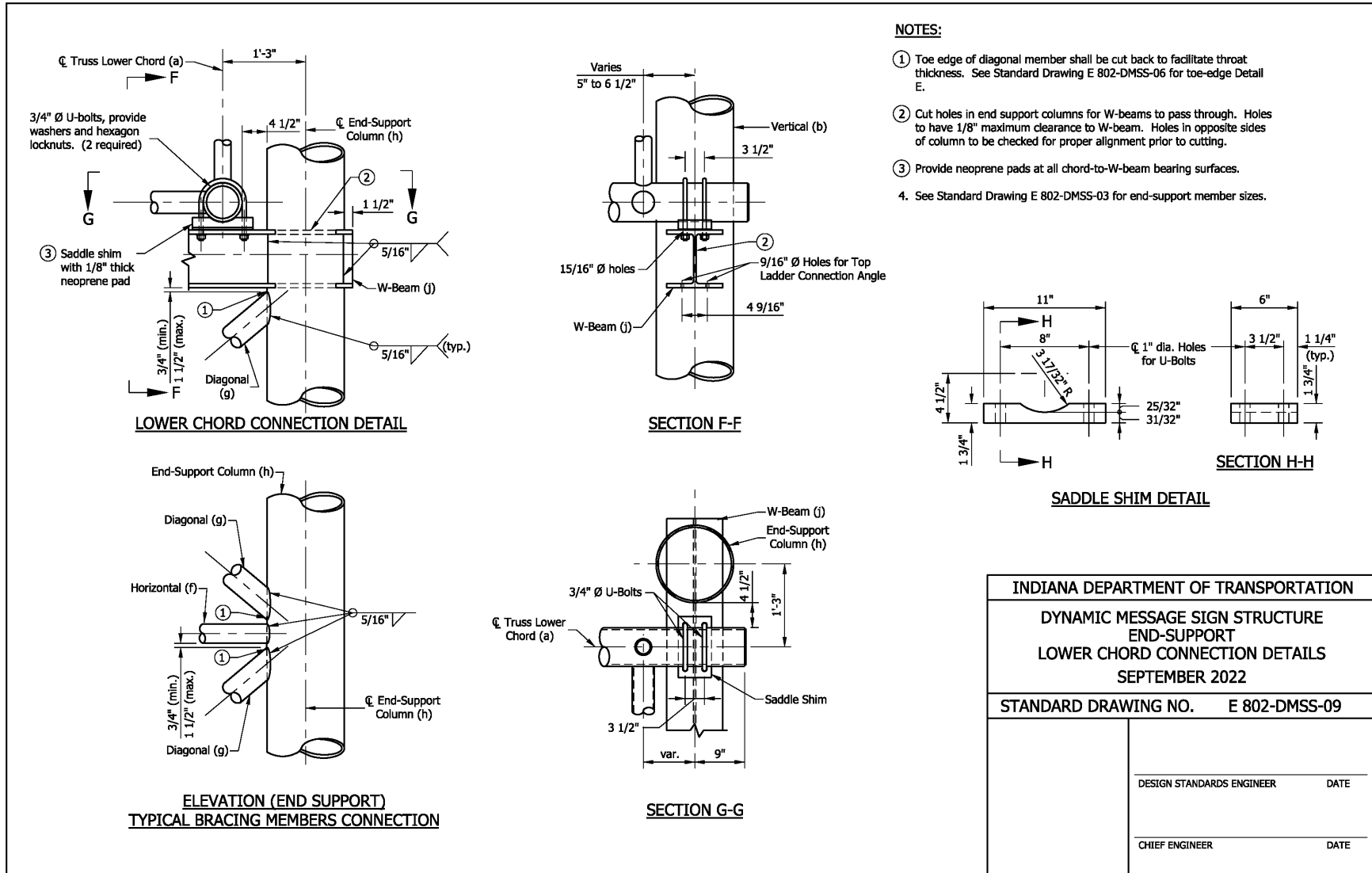
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



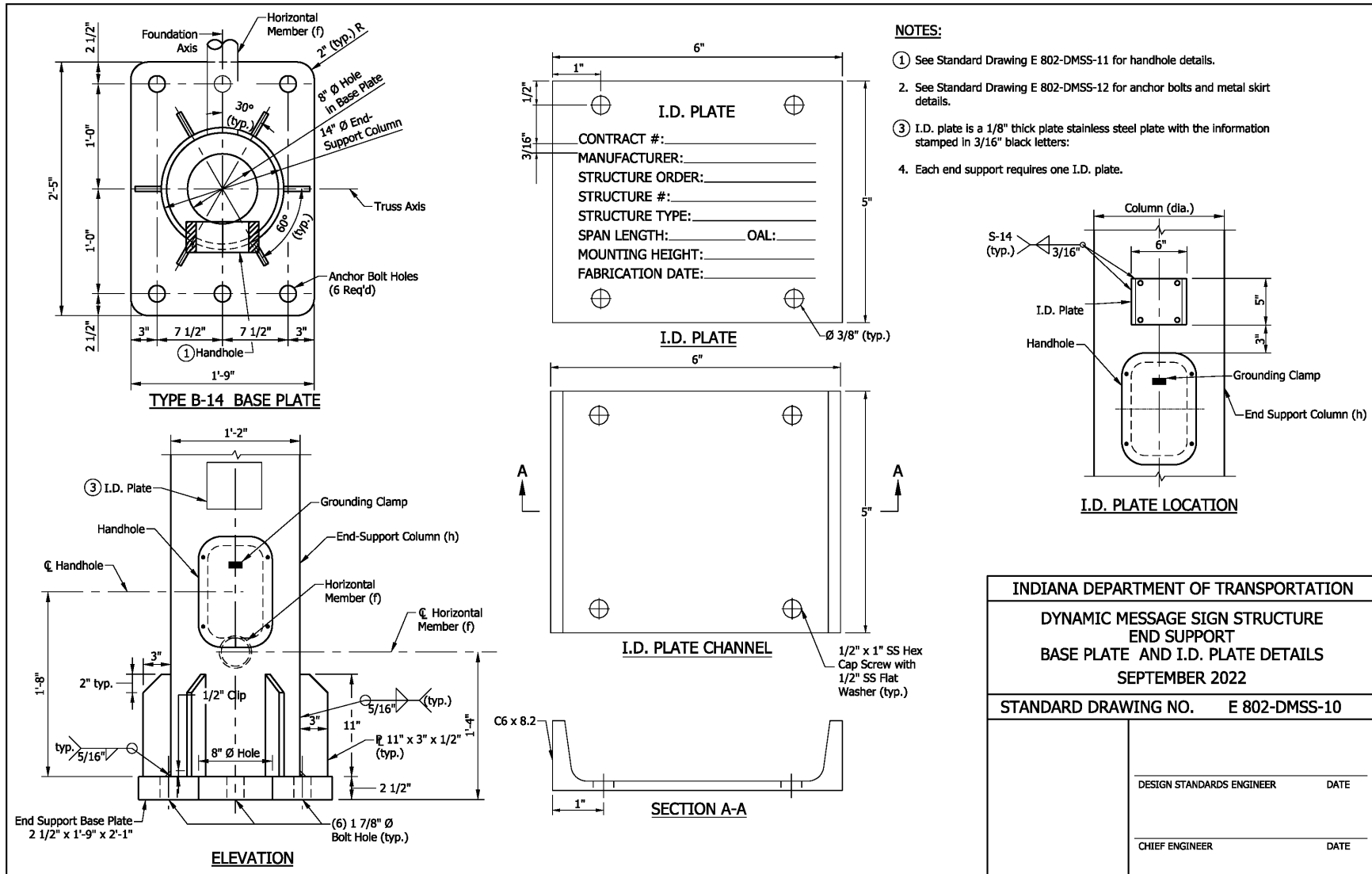
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



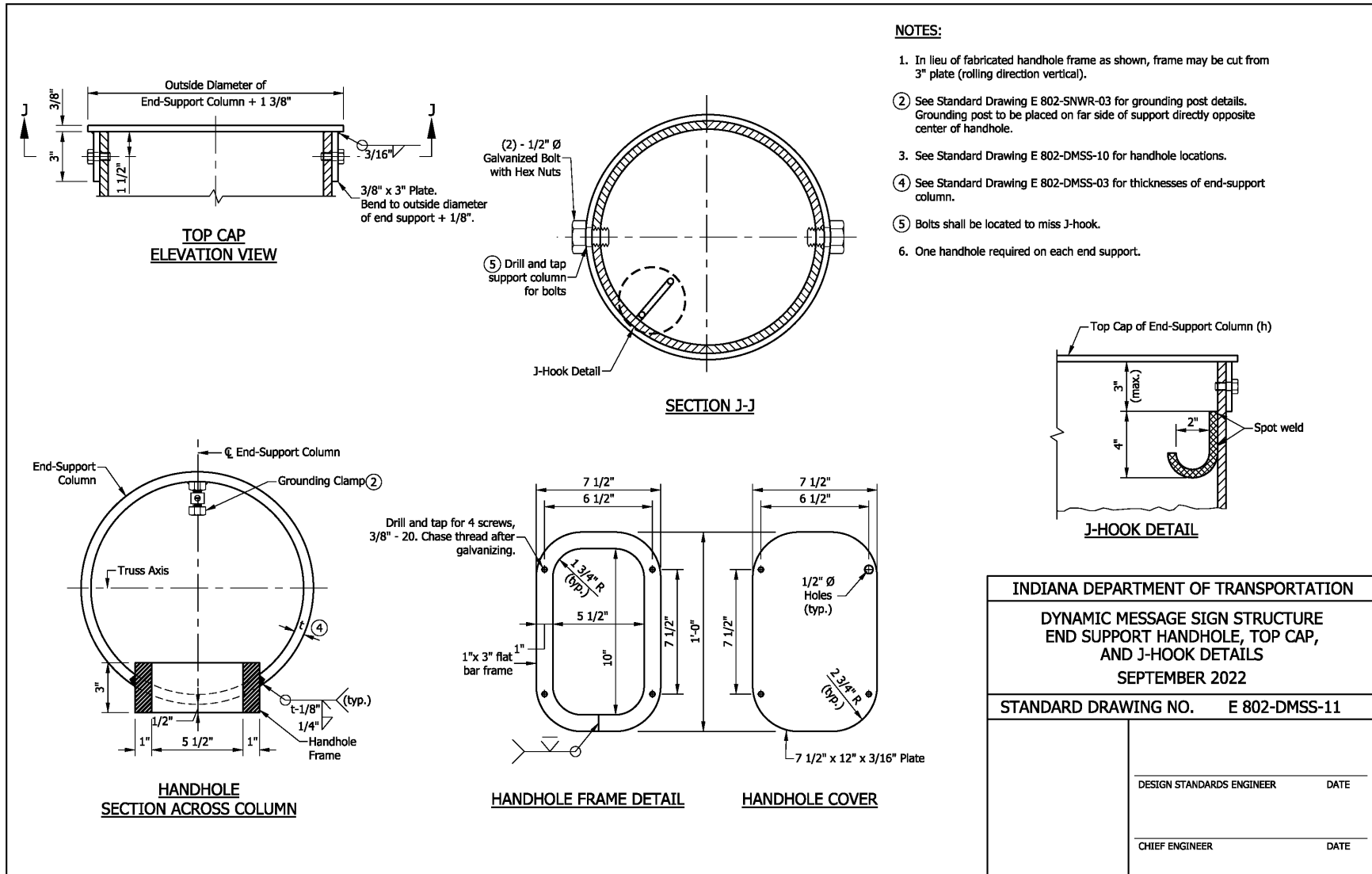
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



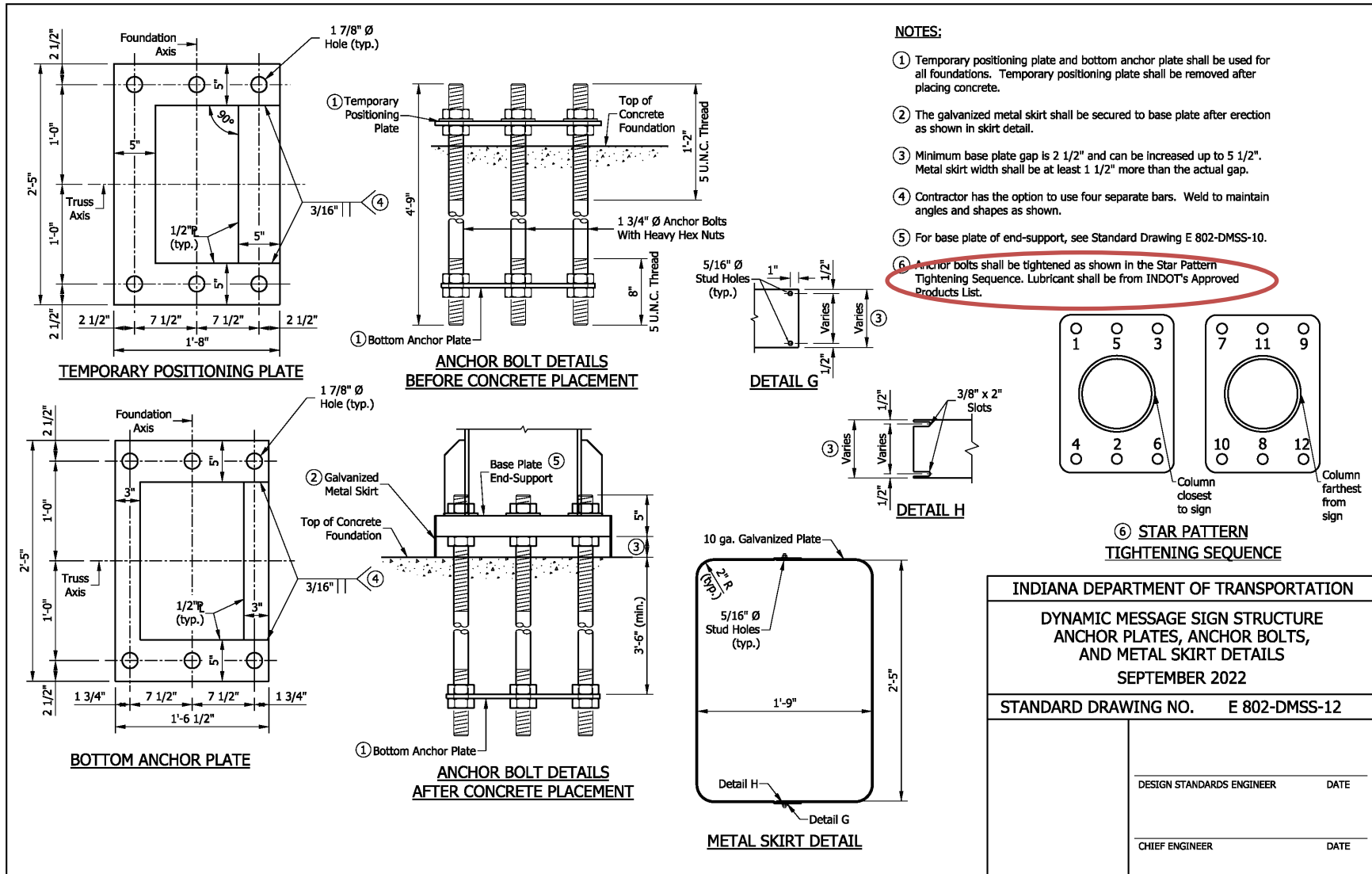
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



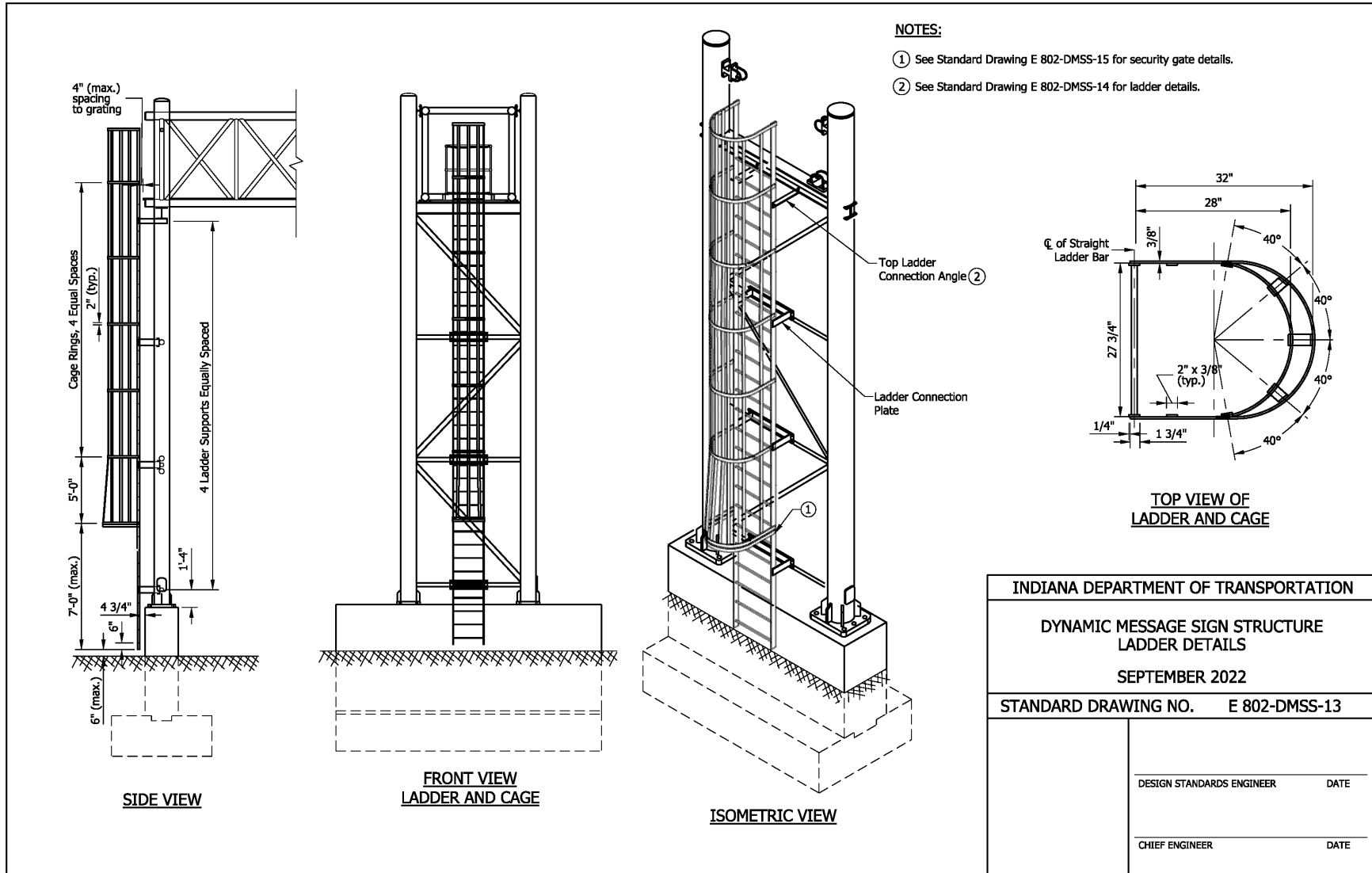
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



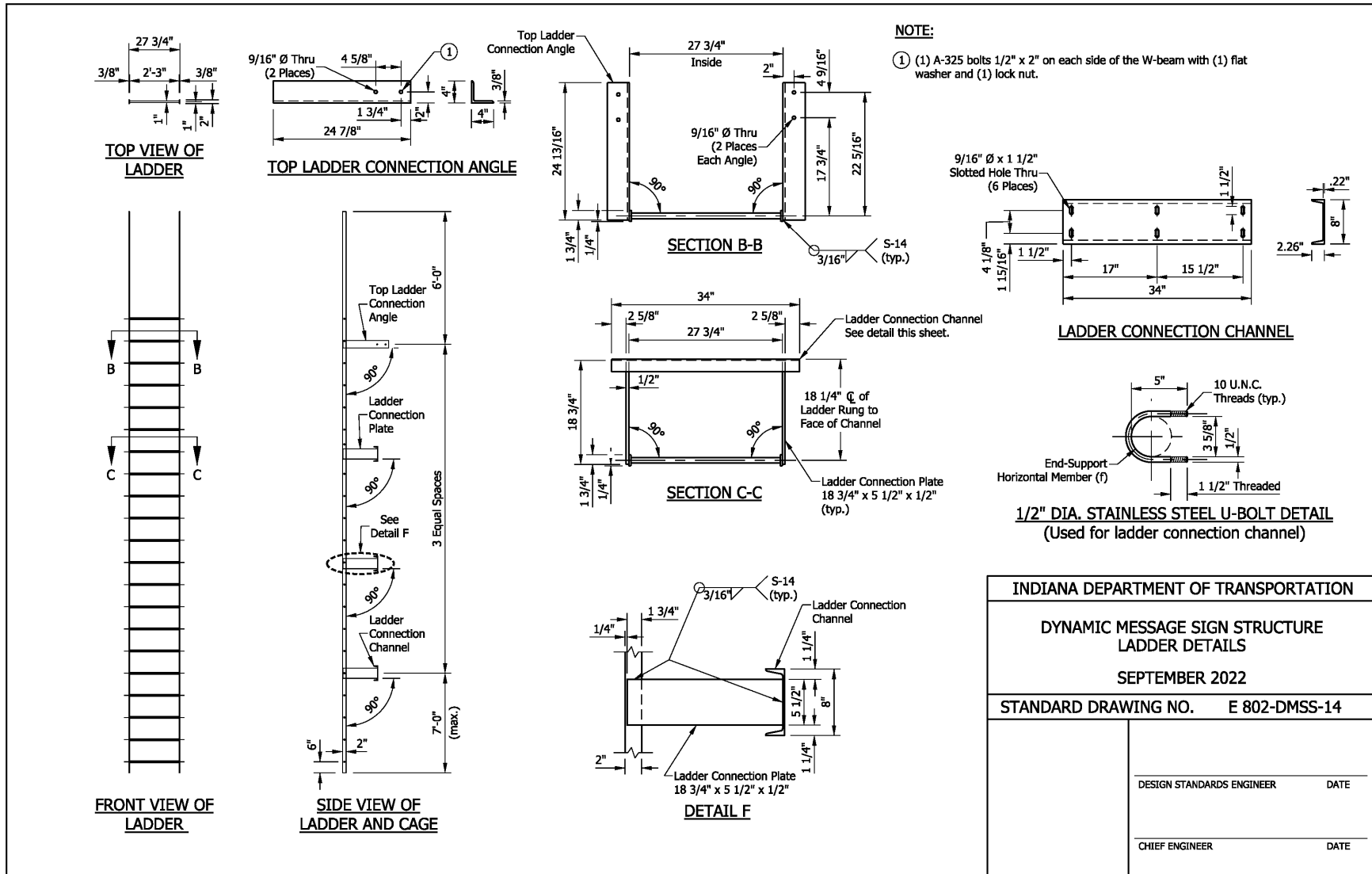
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



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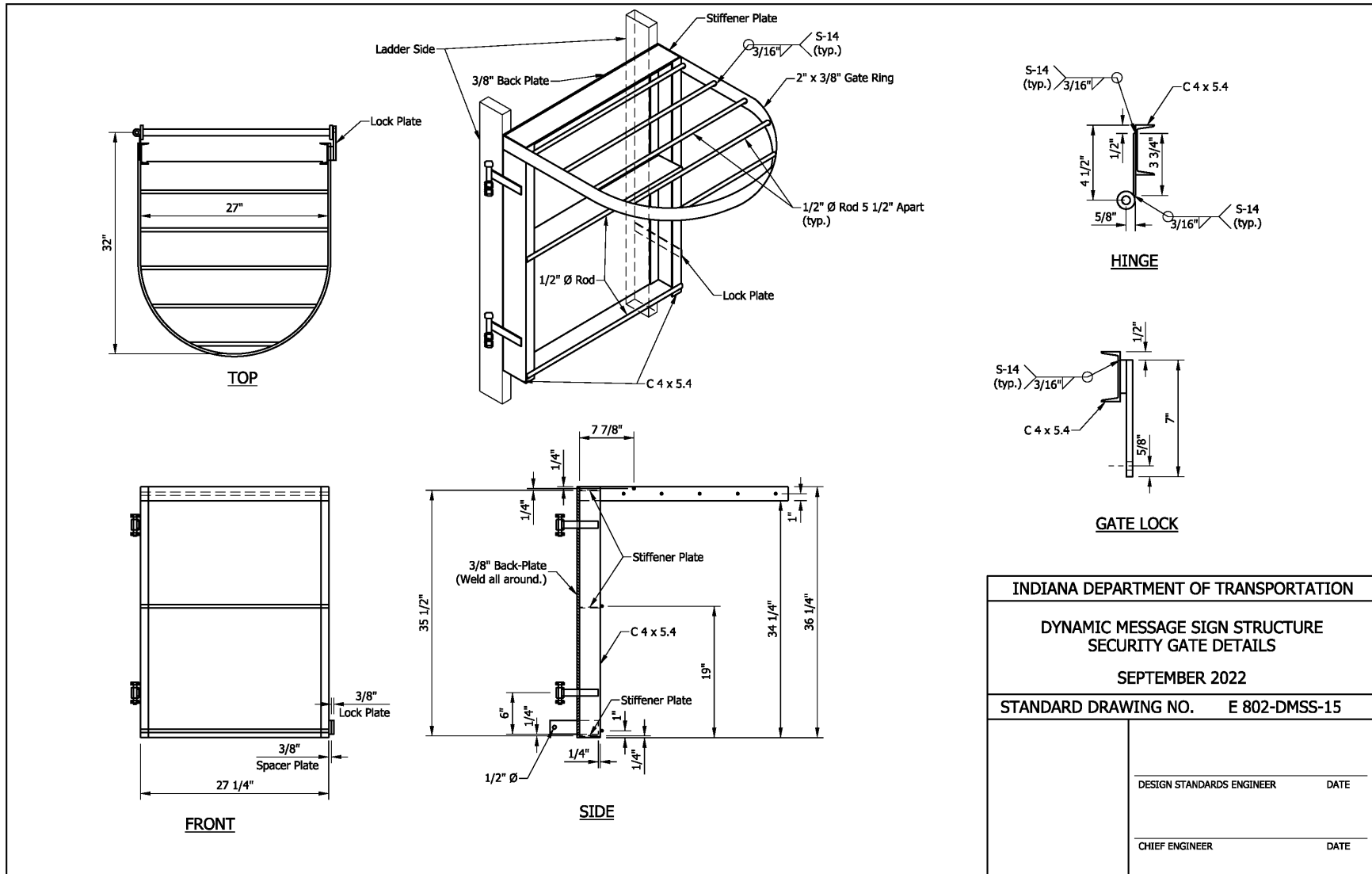
802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



INDIANA DEPARTMENT OF TRANSPORTATION	
DYNAMIC MESSAGE SIGN STRUCTURE LADDER DETAILS	
SEPTEMBER 2022	
STANDARD DRAWING NO.	E 802-DMSS-14
DESIGN STANDARDS ENGINEER	DATE
CHIEF ENGINEER	DATE

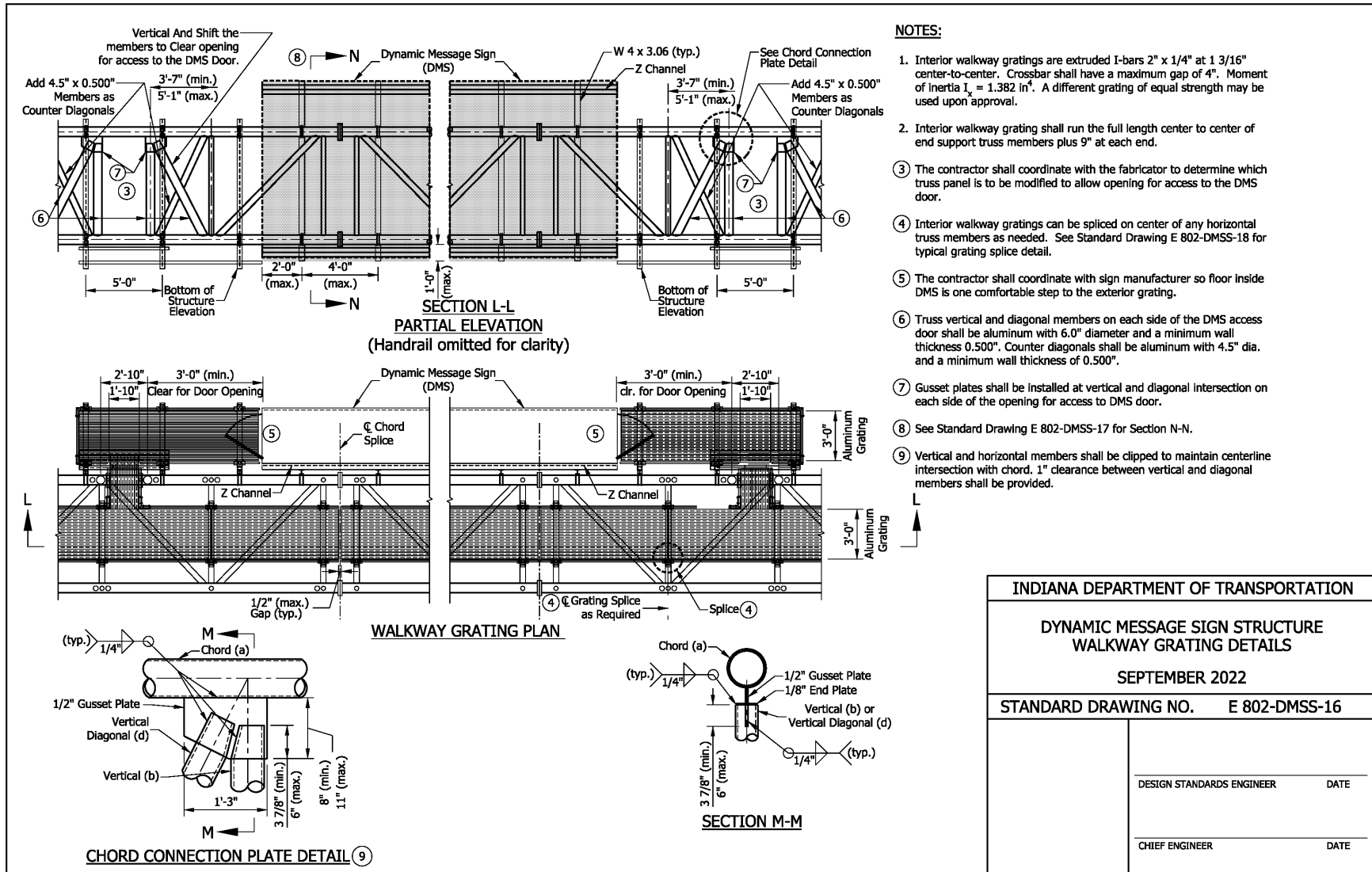
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



REVISION TO STANDARD DRAWINGS

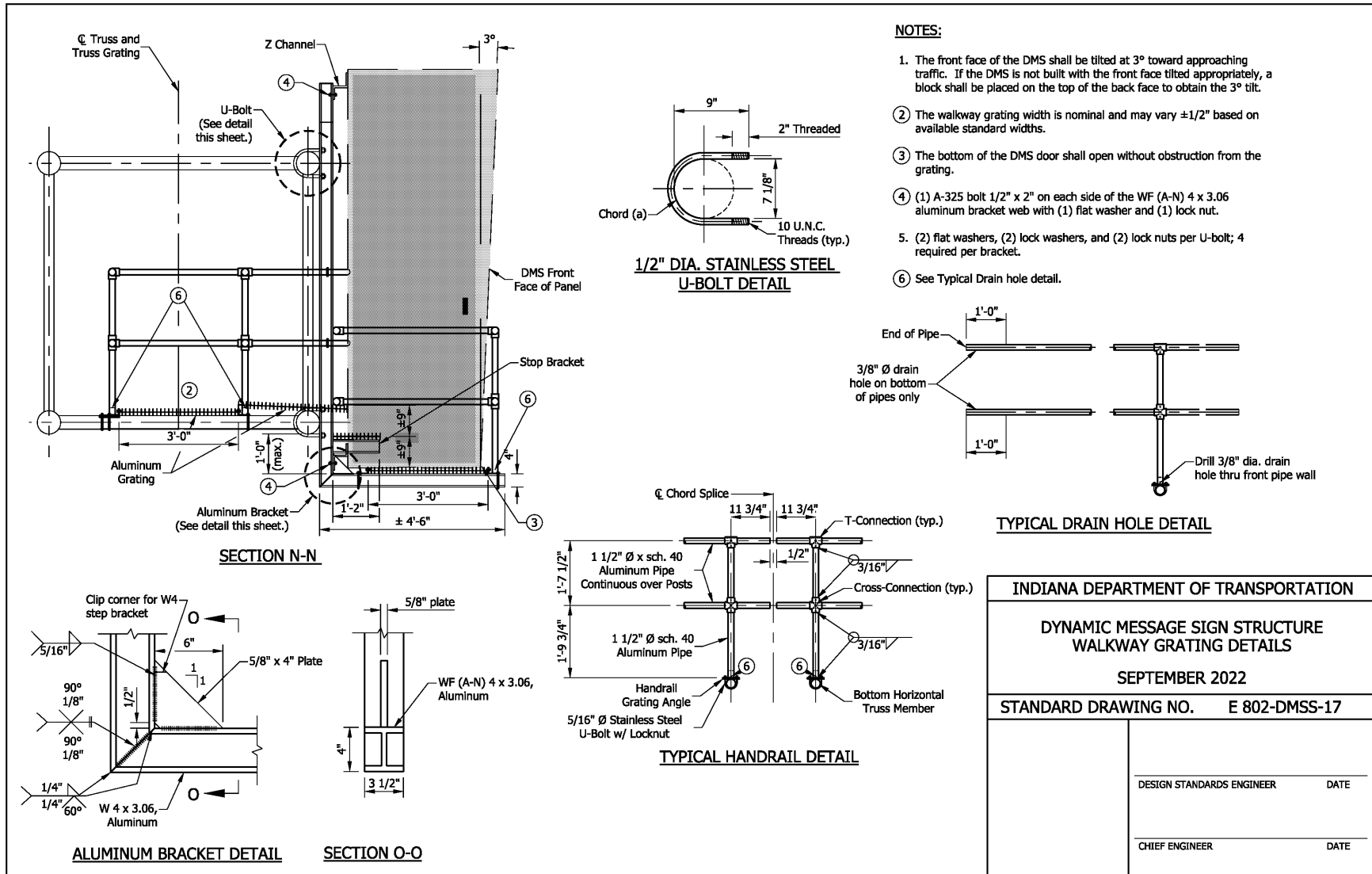
802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



INDIANA DEPARTMENT OF TRANSPORTATION	
DYNAMIC MESSAGE SIGN STRUCTURE WALKWAY GRATING DETAILS	
SEPTEMBER 2022	
STANDARD DRAWING NO. E 802-DMSS-16	
DESIGN STANDARDS ENGINEER	DATE
CHIEF ENGINEER	DATE

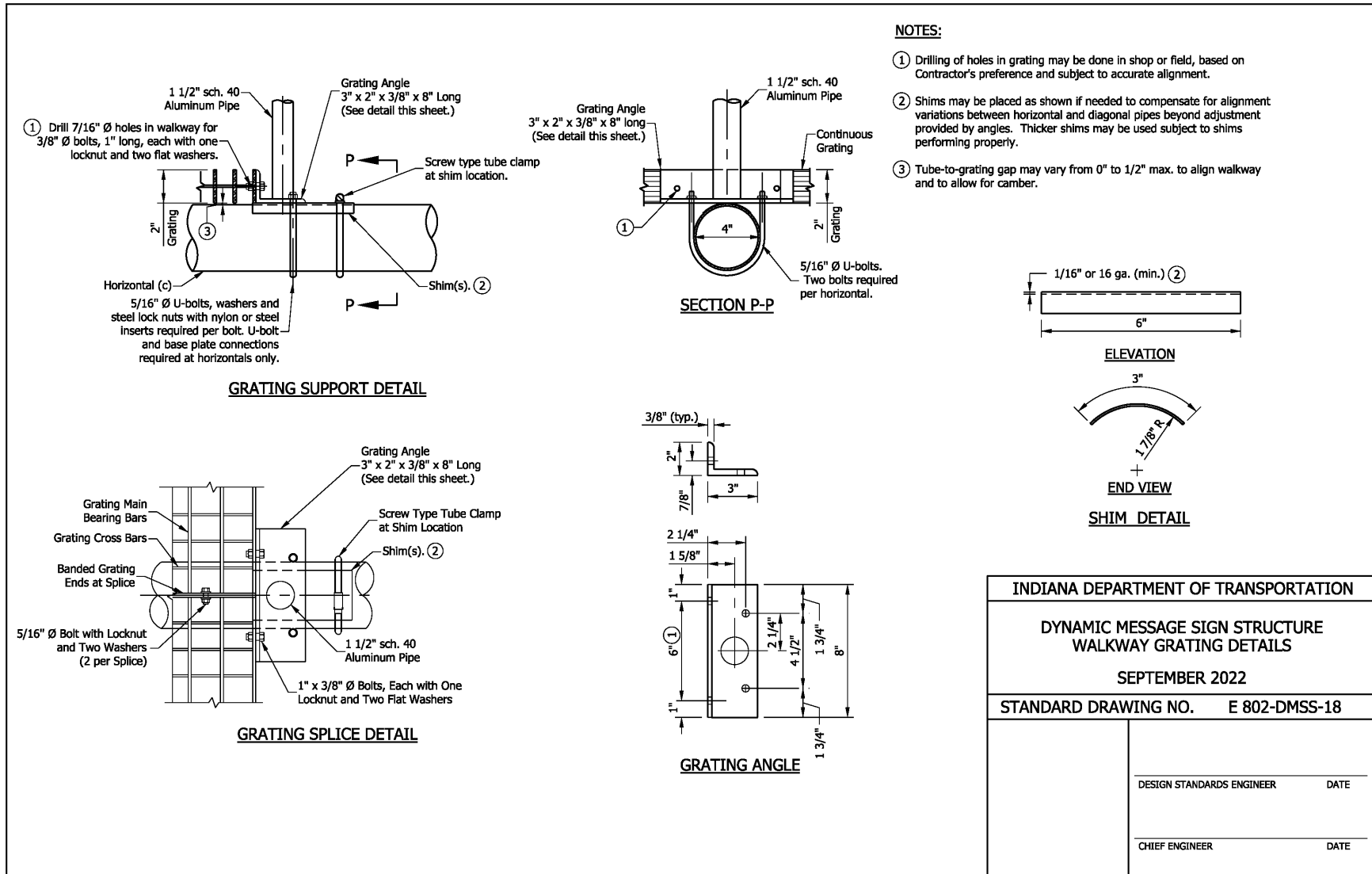
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



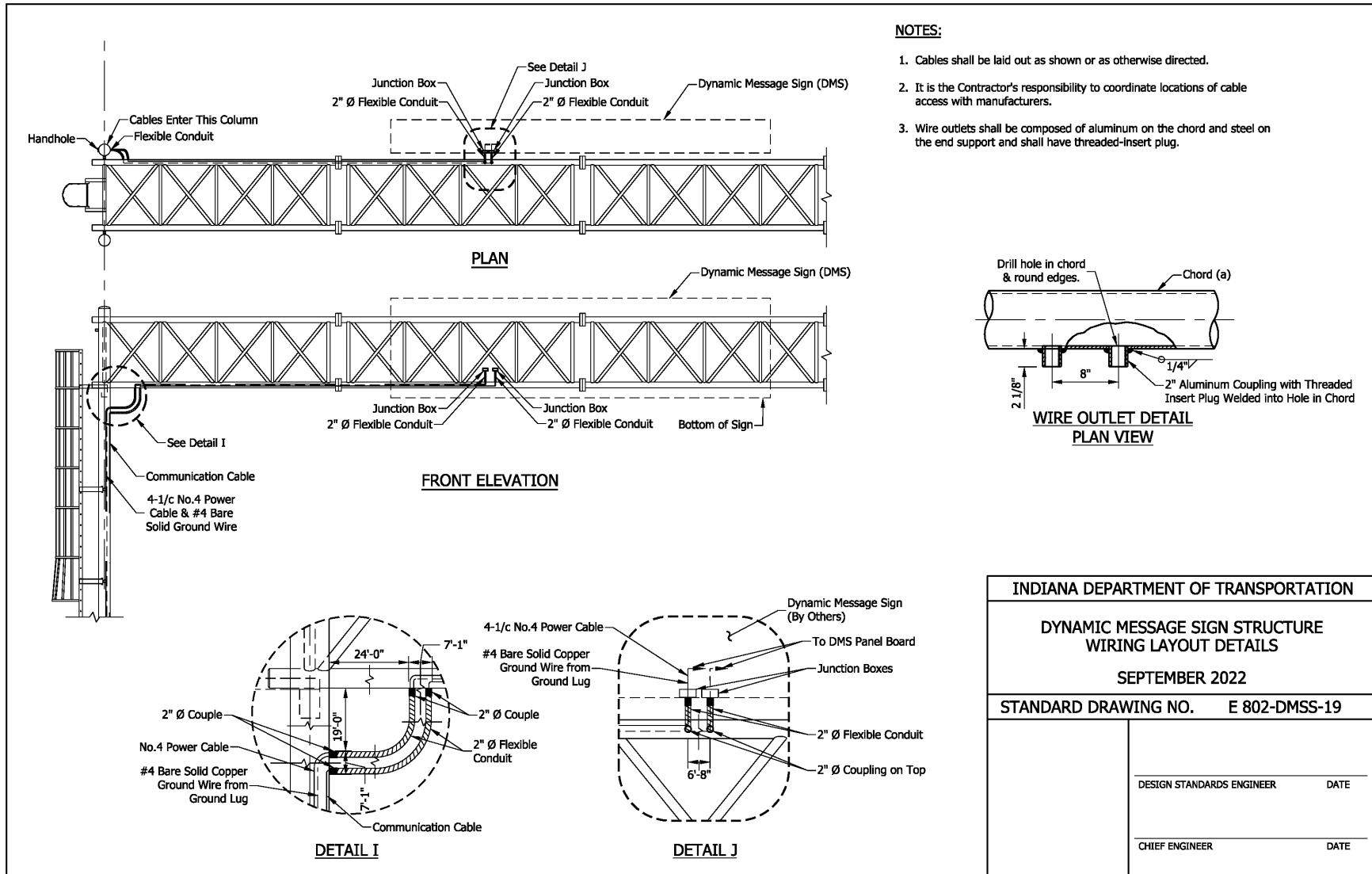
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



REVISION TO STANDARD DRAWINGS

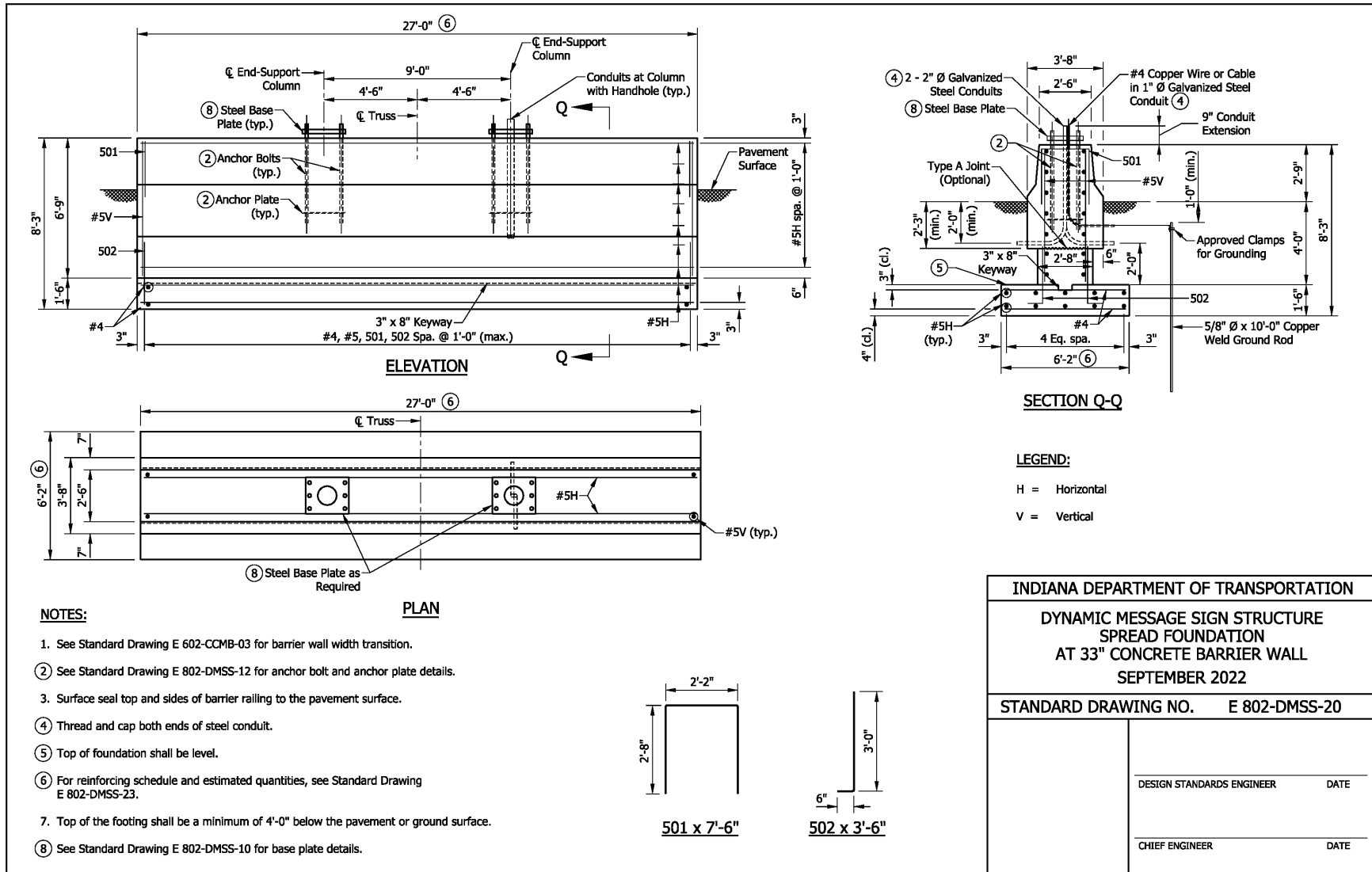
802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



INDIANA DEPARTMENT OF TRANSPORTATION	
DYNAMIC MESSAGE SIGN STRUCTURE WIRING LAYOUT DETAILS	
SEPTEMBER 2022	
STANDARD DRAWING NO. E 802-DMSS-19	
DESIGN STANDARDS ENGINEER	DATE
CHIEF ENGINEER	DATE

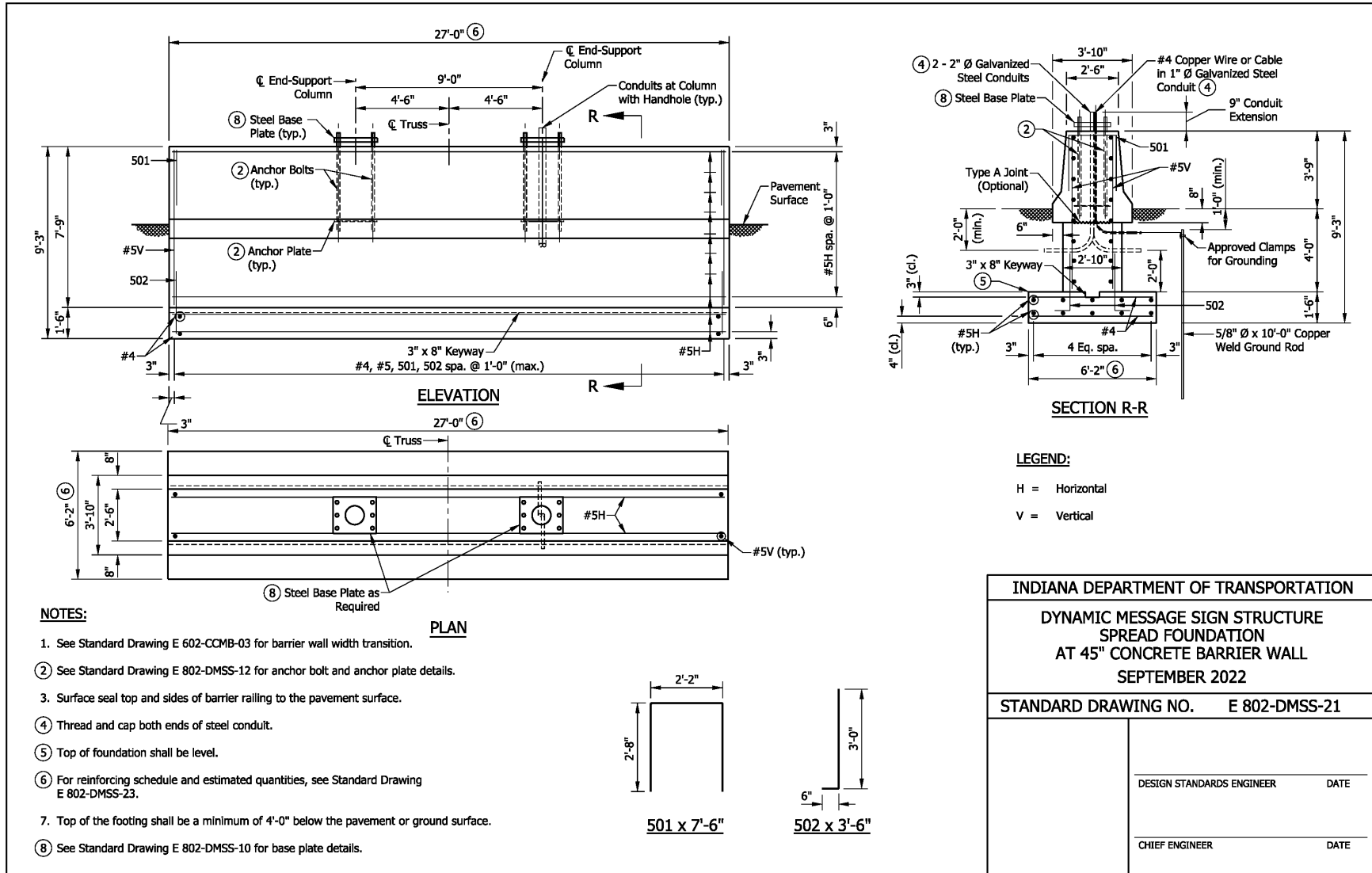
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



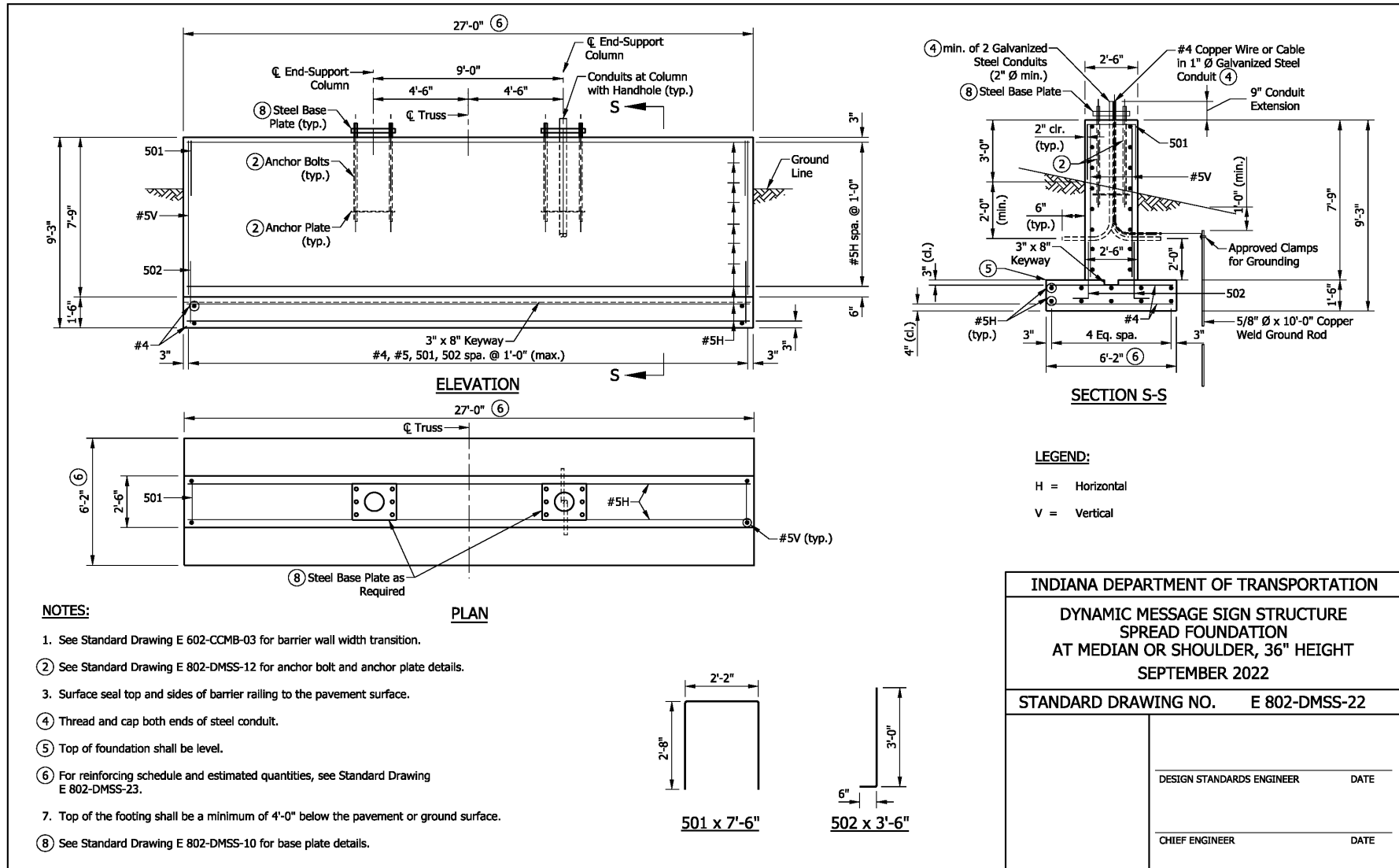
REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE



REVISION TO STANDARD DRAWINGS

802-DMSS (-01 thru -23, proposed draft) DYNAMIC MESSAGE SIGN STRUCTURE

SPREAD FOUNDATIONS BILL OF MATERIALS													
TYPE OF BARRIER	#4		#5H		#5V		501		502		TOTAL EPOXY COATED REINFORCING BARS (LBS)	CONCRETE CLASS A (CYS)	SURFACE SEAL (SYS)
	NO. BARS	LENGTH	NO. BARS	LENGTH	NO. BARS	LENGTH	NO. BARS	LENGTH	NO. BARS	LENGTH			
33" Concrete Barrier	56	5'-8"	24	26'-8"	56	6'-6"	28	7'-6"	56	3'-6"	1685	30.1	24.8
45" Concrete Barrier	56	5'-8"	26	26'-8"	56	7'-6"	28	7'-6"	56	3'-6"	1799	32.3	30.9
36" Median or Shoulder Barrier	56	5'-8"	26	26'-8"	56	7'-6"	28	7'-6"	56	3'-6"	1799	28.7	25.5

NOTES:

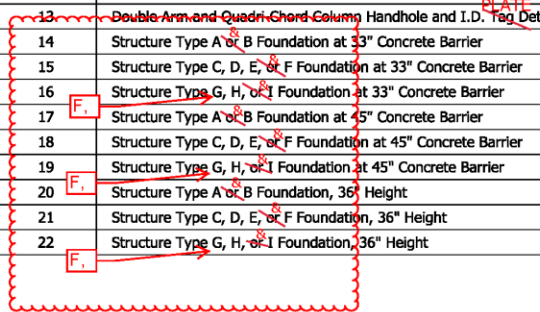
1. If Allowable Gross Soil Bearing Pressure is less than 1500 psf, a drilled shaft or other special foundation shall be used.
2. See Standard Drawings E 802-DMSS-20 through 22 for locations of dimensions and reinforcing bars.

INDIANA DEPARTMENT OF TRANSPORTATION	
DYNAMIC MESSAGE SIGN STRUCTURE SPREAD FOUNDATIONS QUANTITIES	
SEPTEMBER 2022	
STANDARD DRAWING NO. E 802-DMSS-23	
	_____ DESIGN STANDARDS ENGINEER DATE
	_____ CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE

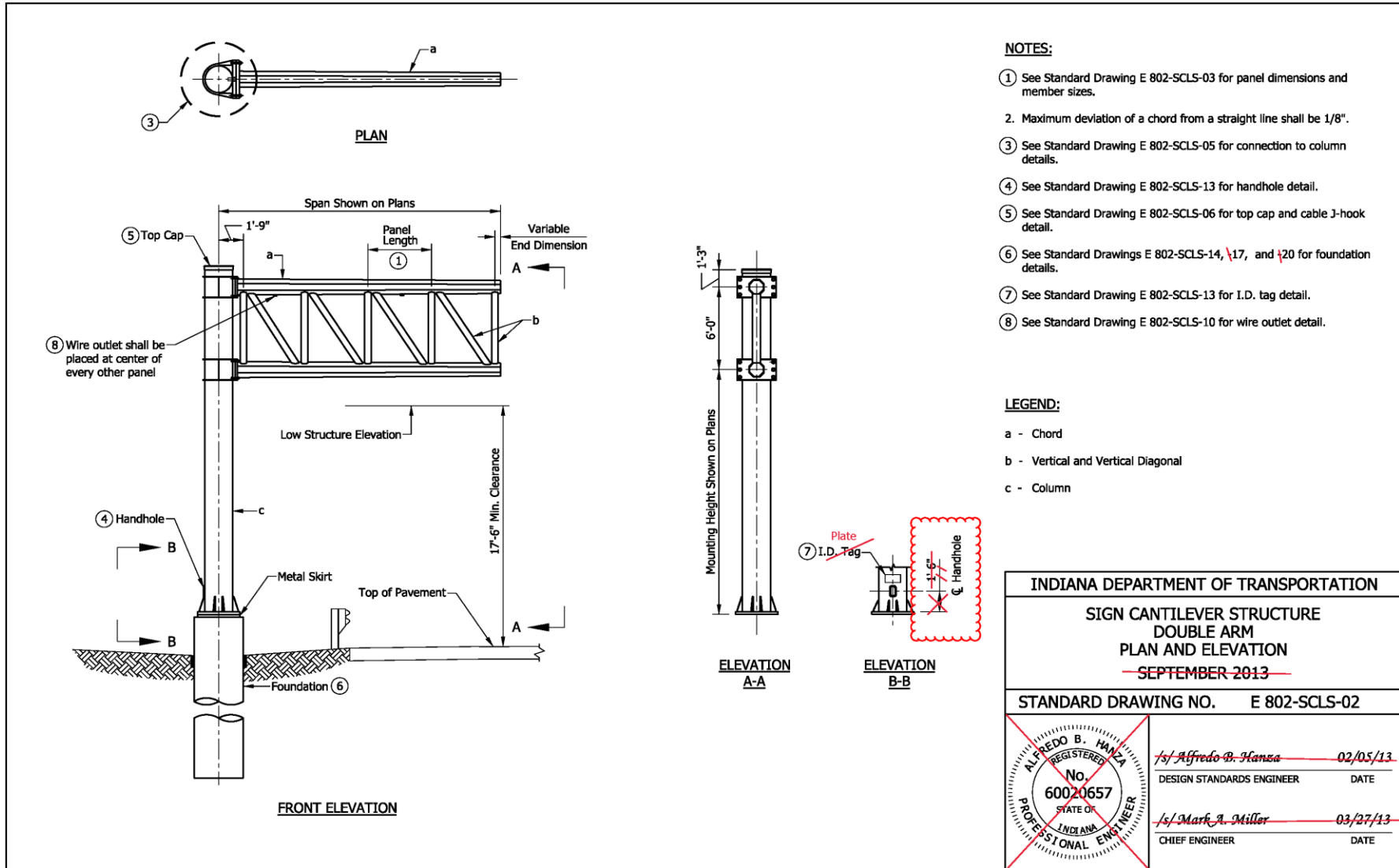
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SHEET NO.	SUBJECT
1	Index
2	Double Arm Plan and Elevation
3	Double Arm Panel Dimensions and Member Sizes
4	Double Arm Connections, Weld Details, Chord End Plate Details, and Camber
5	Double Arm Connection to Column Details
6	Double Arm Column Top Cap and Cable J-Hook
7	Quadri-Chord Plan and Elevation
8	Quadri-Chord Panel Dimensions and Member Sizes
9	Quadri-Chord Connections, Weld Details, Chord End Plate Details, and Camber
10	Quadri-Chord Lower Arm Connection to Column and Wire Outlet Detail
11	Quadri-Chord Upper Arm Connection to Column
12	Double Arm and Quadri-Chord Base Plate, Anchor Bolt, and Metal Skirt Details
13	Double Arm and Quadri-Chord Column Handhole and I.D. Tag Details
14	Structure Type A or B Foundation at 33" Concrete Barrier
15	Structure Type C, D, E, or F Foundation at 33" Concrete Barrier
16	Structure Type G, H, or I Foundation at 33" Concrete Barrier
17	Structure Type A or B Foundation at 45" Concrete Barrier
18	Structure Type C, D, E, or F Foundation at 45" Concrete Barrier
19	Structure Type G, H, or I Foundation at 45" Concrete Barrier
20	Structure Type A or B Foundation, 36" Height
21	Structure Type C, D, E, or F Foundation, 36" Height
22	Structure Type G, H, or I Foundation, 36" Height



INDIANA DEPARTMENT OF TRANSPORTATION	
SIGN CANTILEVER STRUCTURE DRAWING INDEX	
SEPTEMBER 2013	
STANDARD DRAWING NO. E 802-SCLS-01	
	/s/ Alfredo B. Hansa 03/25/13 DESIGN STANDARDS ENGINEER DATE
	/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



REVISION TO STANDARD DRAWINGS

E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE

DOUBLE ARM PANEL DIMENSIONS			
SPAN	NO. OF PANELS	PANEL LENGTH	VARIABLE END DIMENSION
10'	2	4'-0"	0'-3"
11'	3	3'-0"	0'-3"
12'	3	3'-3"	0'-6"
13'	3	3'-6"	0'-9"
14'	3	4'-0"	0'-3"
15'	3	4'-3"	0'-6"
16'	4	3'-6"	0'-3"
17'	4	3'-9"	0'-3"
18'	4	4'-0"	0'-3"
19'	4	4'-3"	0'-3"
20'	4	4'-6"	0'-3"

NOTES:

1. All panels on the double arm shall be the same length. The minimum panel length is 3'-0" and the maximum is 4'-6".
2. See Standard Drawing E 802-SCLS-04 for connections, weld details, and required camber.
3. For base plate and anchor bolt details see Standard Drawing E 802-SCLS-12.
4. See Standard Drawings E 802-SCLS-14, 17, and 20 for foundation details.
5. All member diameters shown are outside diameters.
- ⑥ Double arm chord shape shall be octagonal tubular with 0.14 in./ft. taper, maximum diameter shown in table.



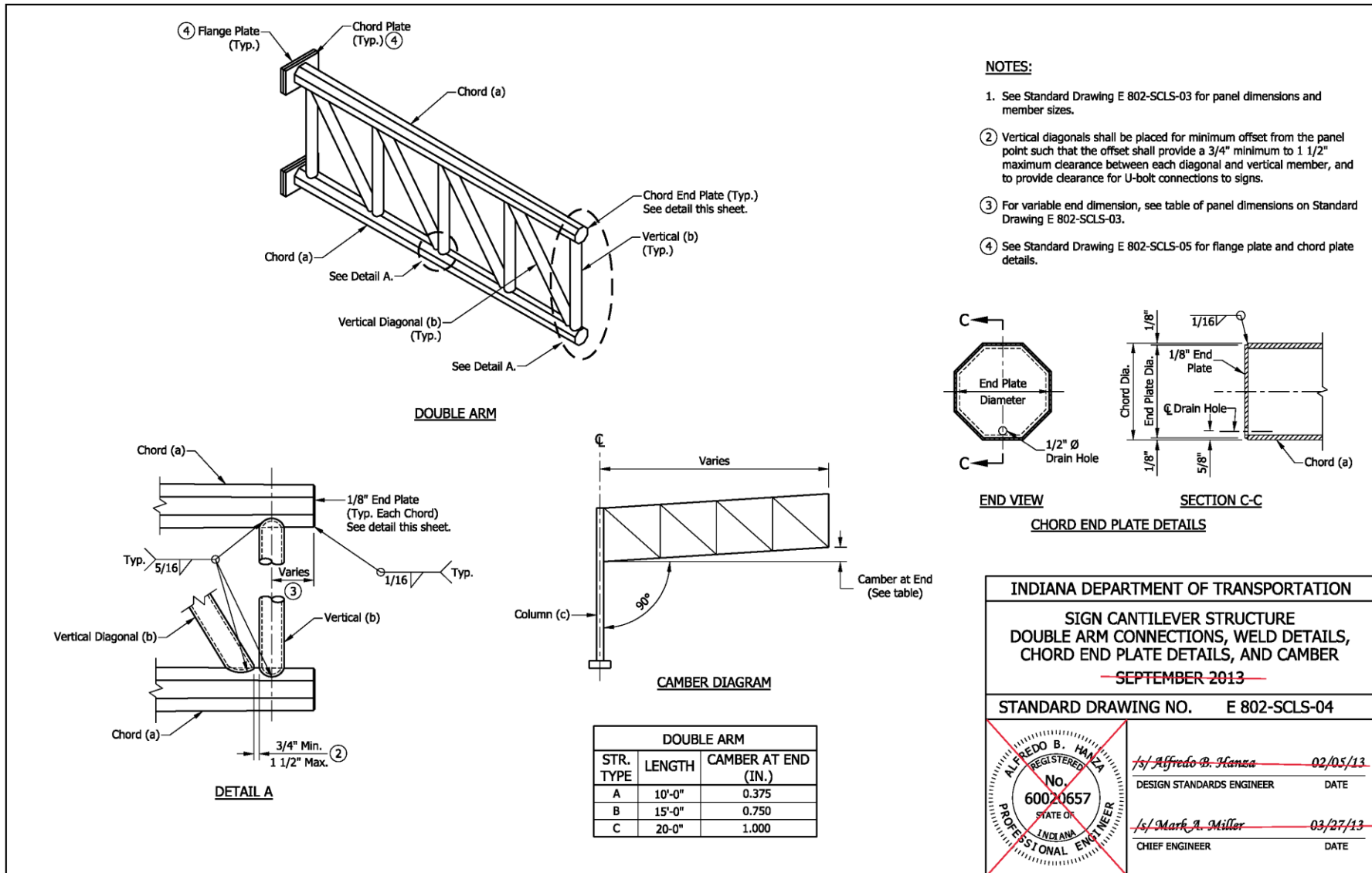
OCTAGON TUBULAR SHAPE

STR. TYPE	MAX SPAN (FT.)	MAX SIGN AREA (FT.)	MAX MOUNTING HEIGHT (FT.)	DOUBLE ARM MEMBER SIZES					
				⑥ CHORD a		VERTICAL/VERTICAL DIAGONAL b		COLUMN c	
				DIAMETER (IN.)	WALL THICK. (IN.)	DIAMETER (IN.)	WALL THICK. (IN.)	DIAMETER (IN.)	WALL THICK. (IN.)
A	10	180	24	7 5/8	0.500	4 1/2 - 5 9/16	0.337 - 0.375	18	0.750
B	15	280	24	10 3/4	0.593	5 9/16	0.500	20	0.812
C	20	380	24	14	0.593	6 5/8	0.719	24	0.968

INDIANA DEPARTMENT OF TRANSPORTATION	
SIGN CANTILEVER STRUCTURE DOUBLE ARM PANEL DIMENSIONS AND MEMBER SIZES SEPTEMBER 2013	
STANDARD DRAWING NO. E 802-SCLS-03	
	/s/ Alfredo B. Hansa 02/05/13 DESIGN STANDARDS ENGINEER DATE
	/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER DATE

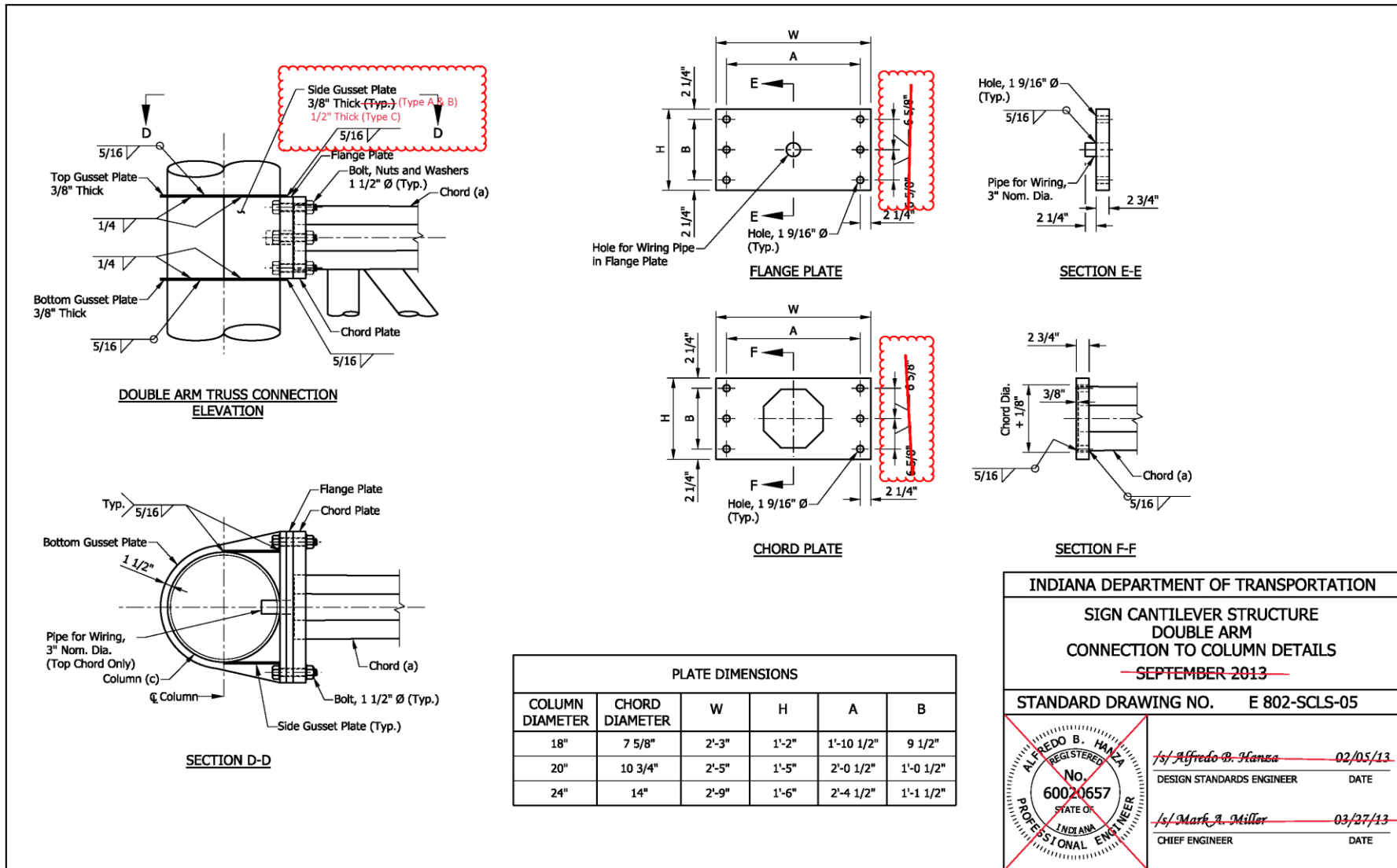
REVISION TO STANDARD DRAWINGS

E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



REVISION TO STANDARD DRAWINGS

E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



INDIANA DEPARTMENT OF TRANSPORTATION

SIGN CANTILEVER STRUCTURE
 DOUBLE ARM
 CONNECTION TO COLUMN DETAILS
 - SEPTEMBER 2013 -

STANDARD DRAWING NO. E 802-SCLS-05

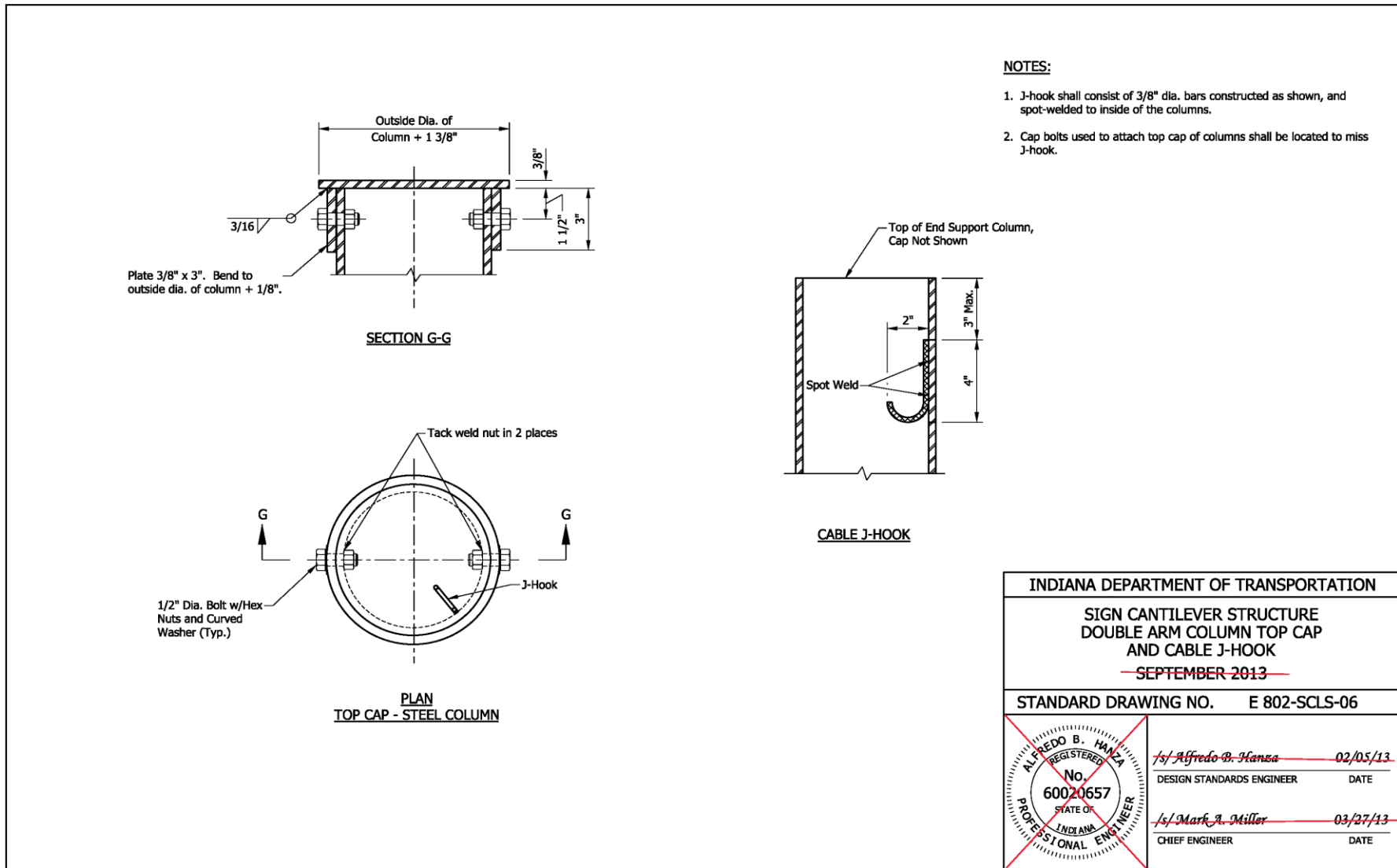
~~ALFREDO B. HANSA~~
 REGISTERED
 No. 60020657
 STATE OF INDIANA
 PROFESSIONAL ENGINEER

~~/s/ Alfredo B. Hansa~~ 02/05/13
 DESIGN STANDARDS ENGINEER DATE

~~/s/ Mark A. Miller~~ 03/27/13
 CHIEF ENGINEER DATE

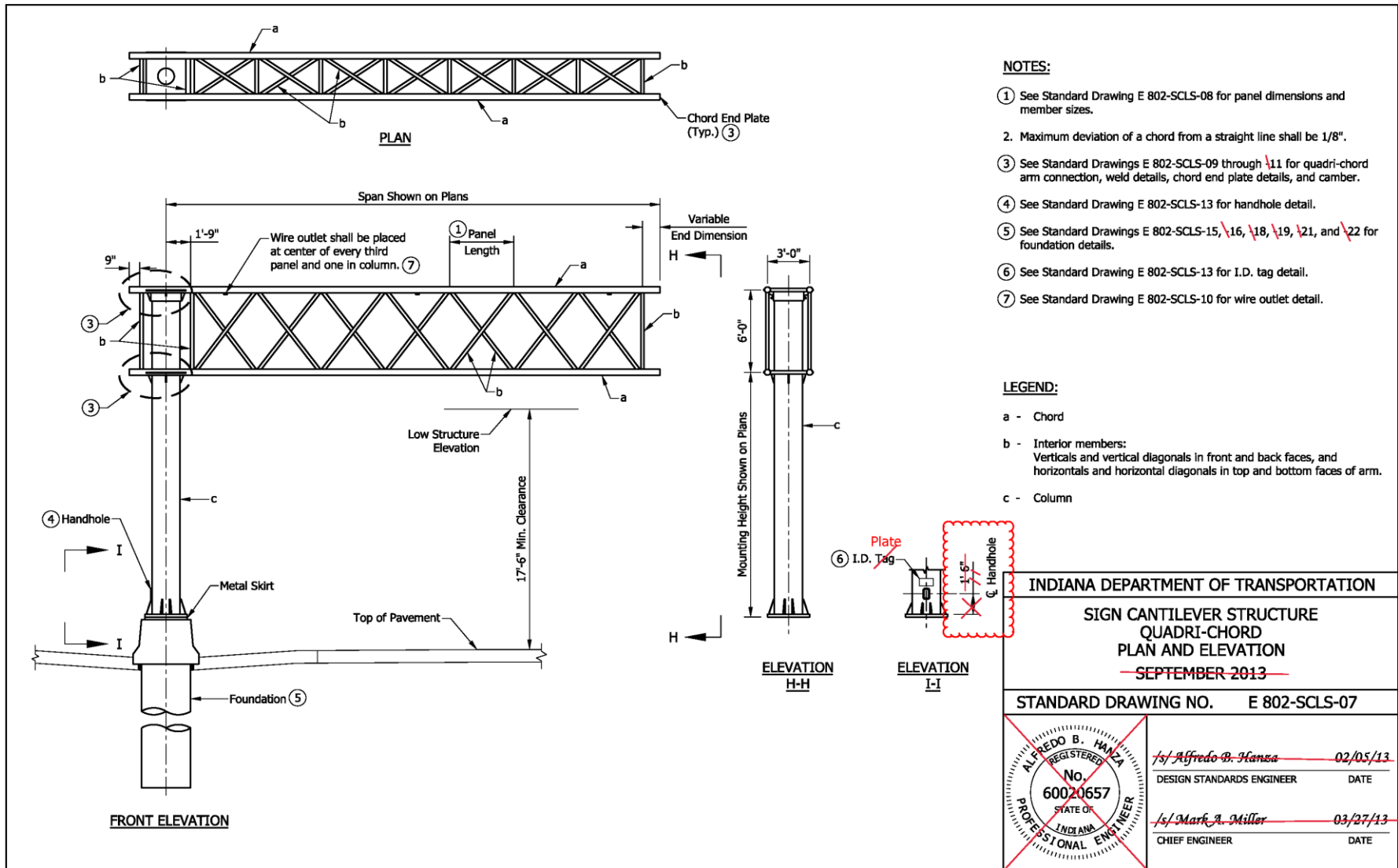
REVISION TO STANDARD DRAWINGS

E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



REVISION TO STANDARD DRAWINGS

E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



REVISION TO STANDARD DRAWINGS


E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE

PANEL DIMENSIONS			
SPAN	NO. OF PANELS	PANEL LENGTH	VARIABLE END DIMENSION
21'	5	3'-9"	0'-6"
22'	5	3'-9"	1'-6"
23'	5	4'-0"	1'-3"
24'	5	4'-3"	1'-0"
25'	5	4'-6"	0'-9"
26'	6	3'-9"	1'-9"
27'	6	4'-0"	1'-3"
28'	6	4'-3"	0'-9"
29'	6	4'-3"	1'-9"
30'	6	4'-6"	1'-3"
31'	7	4'-0"	1'-3"
32'	7	4'-3"	0'-6"
33'	7	4'-3"	1'-6"
34'	7	4'-6"	0'-9"
35'	7	4'-6"	1'-9"

NOTES:

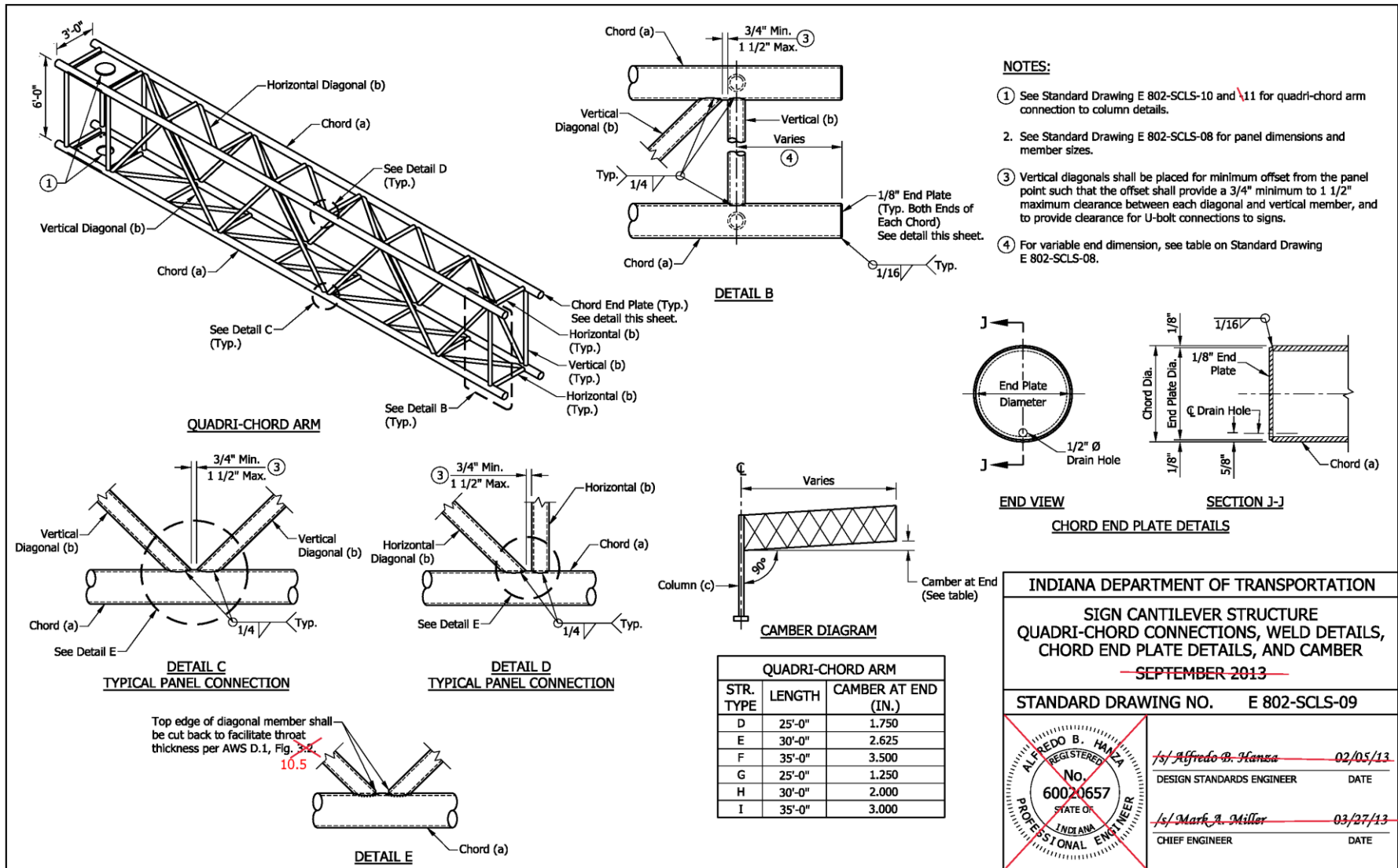
1. All panels in a structure shall be the same length. The minimum panel length is 3'-9" and the maximum is 4'-6".
2. See Standard Drawing E 802-SCLS-09 for connections, weld details, and required camber.
3. For base plate, anchor bolt, and metal skirt details see Standard Drawing E 802-SCLS-12.
4. All member diameters shown are outside diameters.
5. Quadri-chord arm chord shape shall be circular with constant diameter.

QUADRI-CHORD MEMBER SIZES									
STR. TYPE	MAX SPAN (FT.)	MAX SIGN AREA (FT.)	MAX MOUNTING HEIGHT (FT.)	⑤ CHORD a		VERT./HORIZ./DIAG. b		COLUMN c	
				DIAMETER (IN.)	WALL THICK. (IN.)	DIAMETER (IN.)	WALL THICK. (IN.)	DIAMETER (IN.)	WALL THICK. (IN.)
D	25	300	24	5 9/16	0.258	2 7/8	0.276	24	0.562
E	30	300	24	5 9/16	0.258	3 1/2	0.300	24	0.562
F	35	300	24	5 9/16	0.375	3 1/2	0.300	24	0.688
G	25	400	24	5 9/16	0.375	3 1/2	0.300	24	0.968
H	30	400	24	5 9/16	0.375	3 1/2	0.300	24	0.968
I	35	400	24	5 9/16	0.375	4	0.318	24	0.968

INDIANA DEPARTMENT OF TRANSPORTATION	
SIGN CANTILEVER STRUCTURE QUADRI-CHORD PANEL DIMENSIONS AND MEMBER SIZES SEPTEMBER 2013	
STANDARD DRAWING NO. E 802-SCLS-08	
	/s/ Alfredo B. Hansa 02/05/13 DESIGN STANDARDS ENGINEER DATE /s/ Mark A. Miller 03/27/13 CHIEF ENGINEER DATE

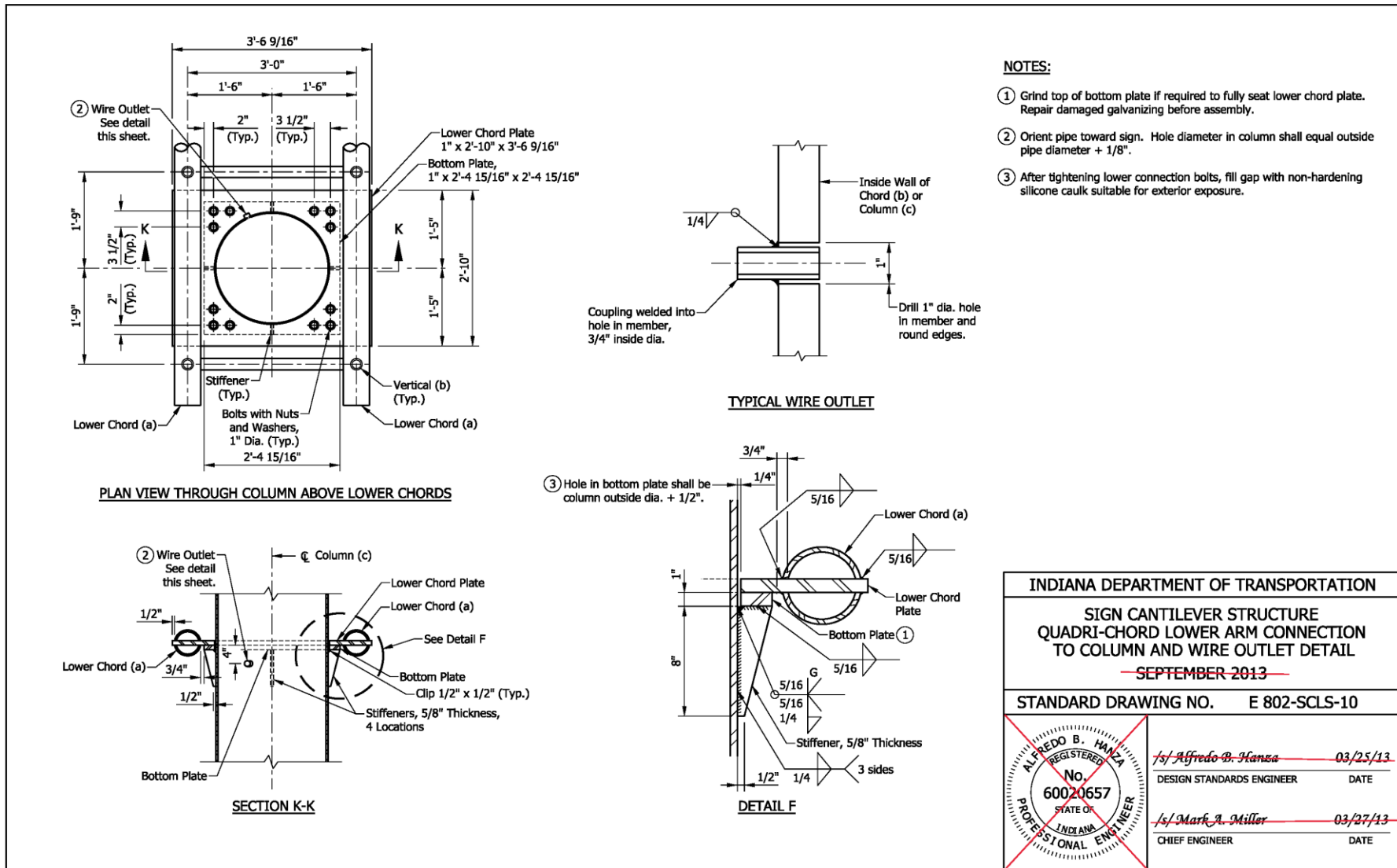
REVISION TO STANDARD DRAWINGS

E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



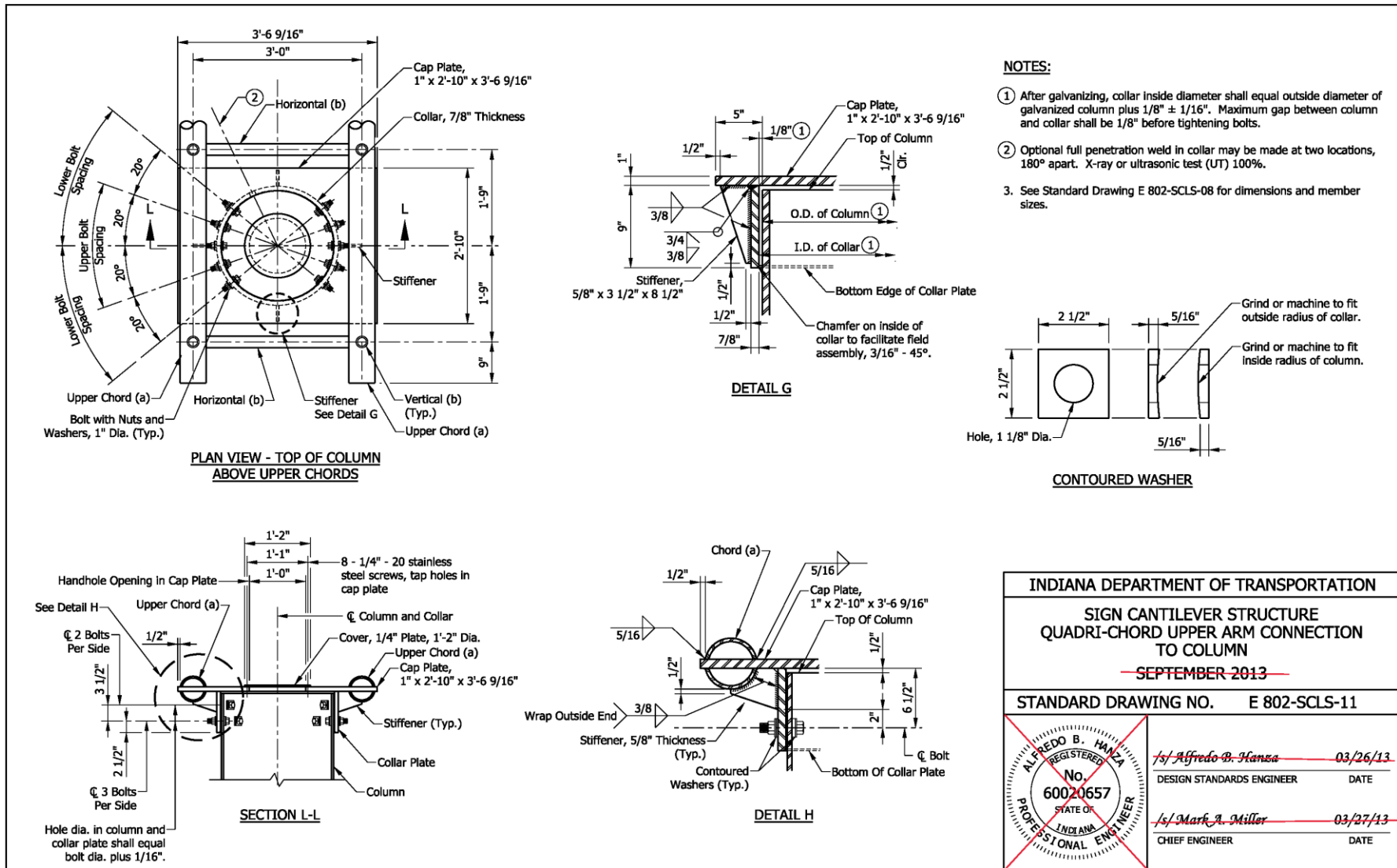
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E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



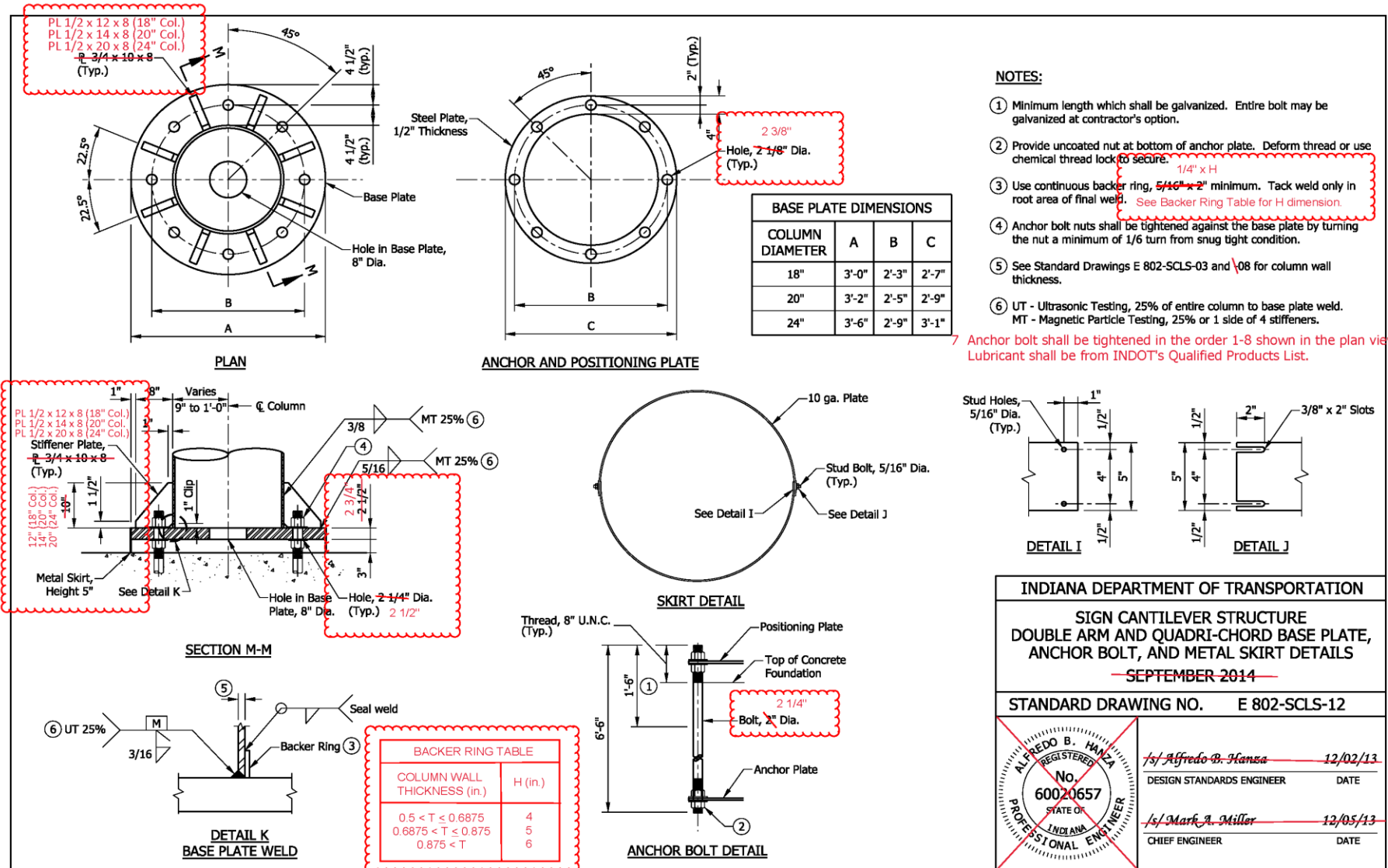
REVISION TO STANDARD DRAWINGS

E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



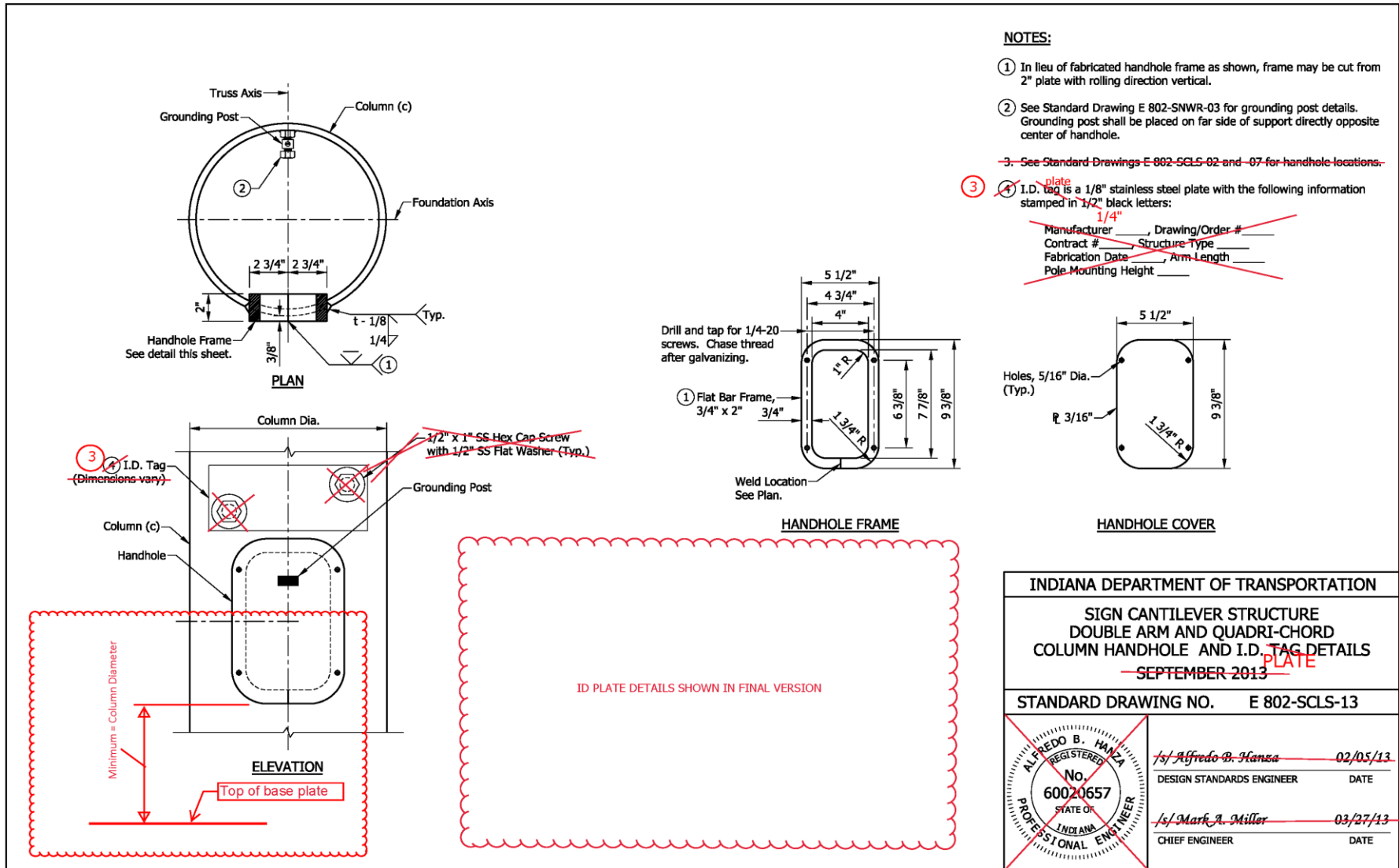
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E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



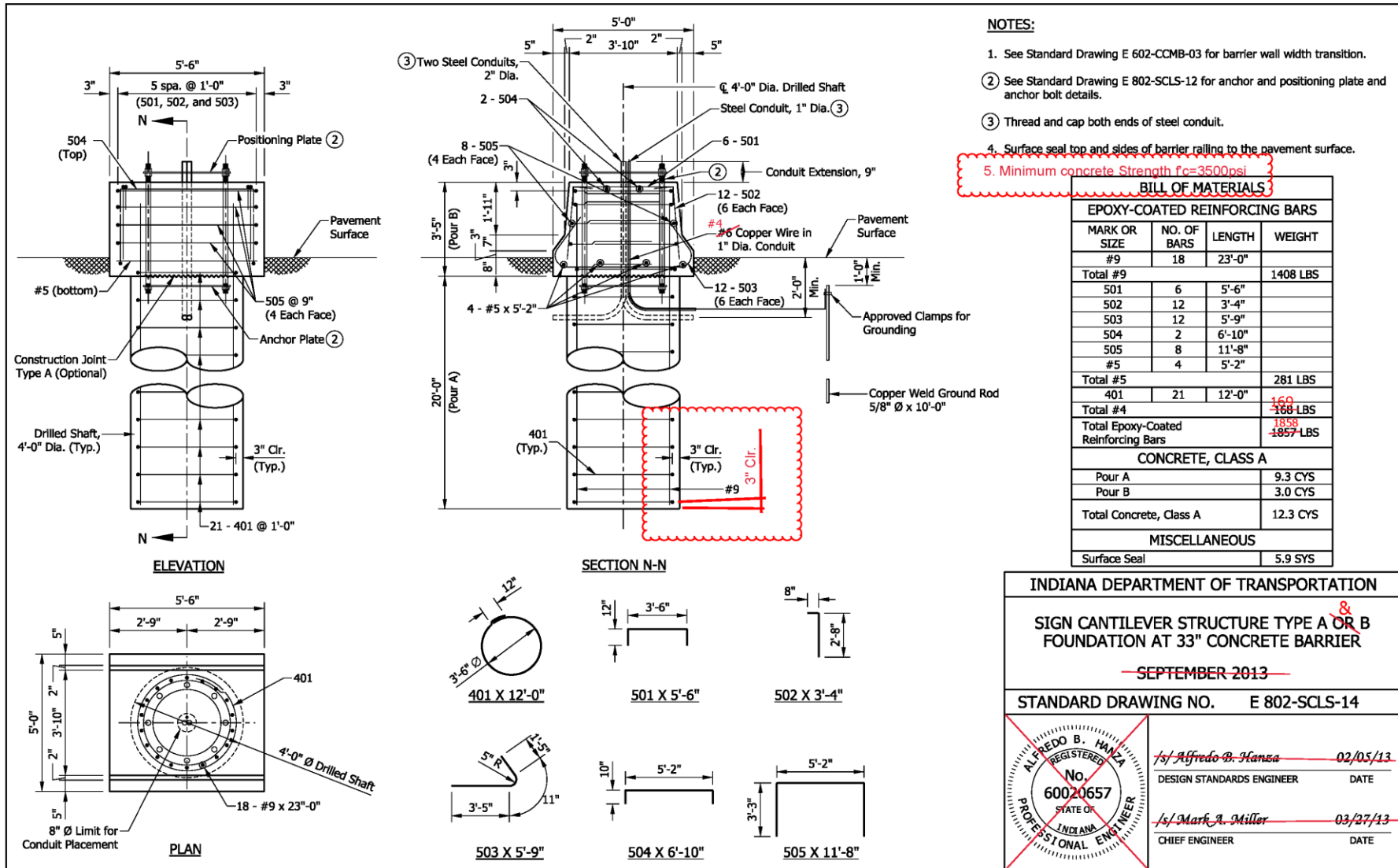
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E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



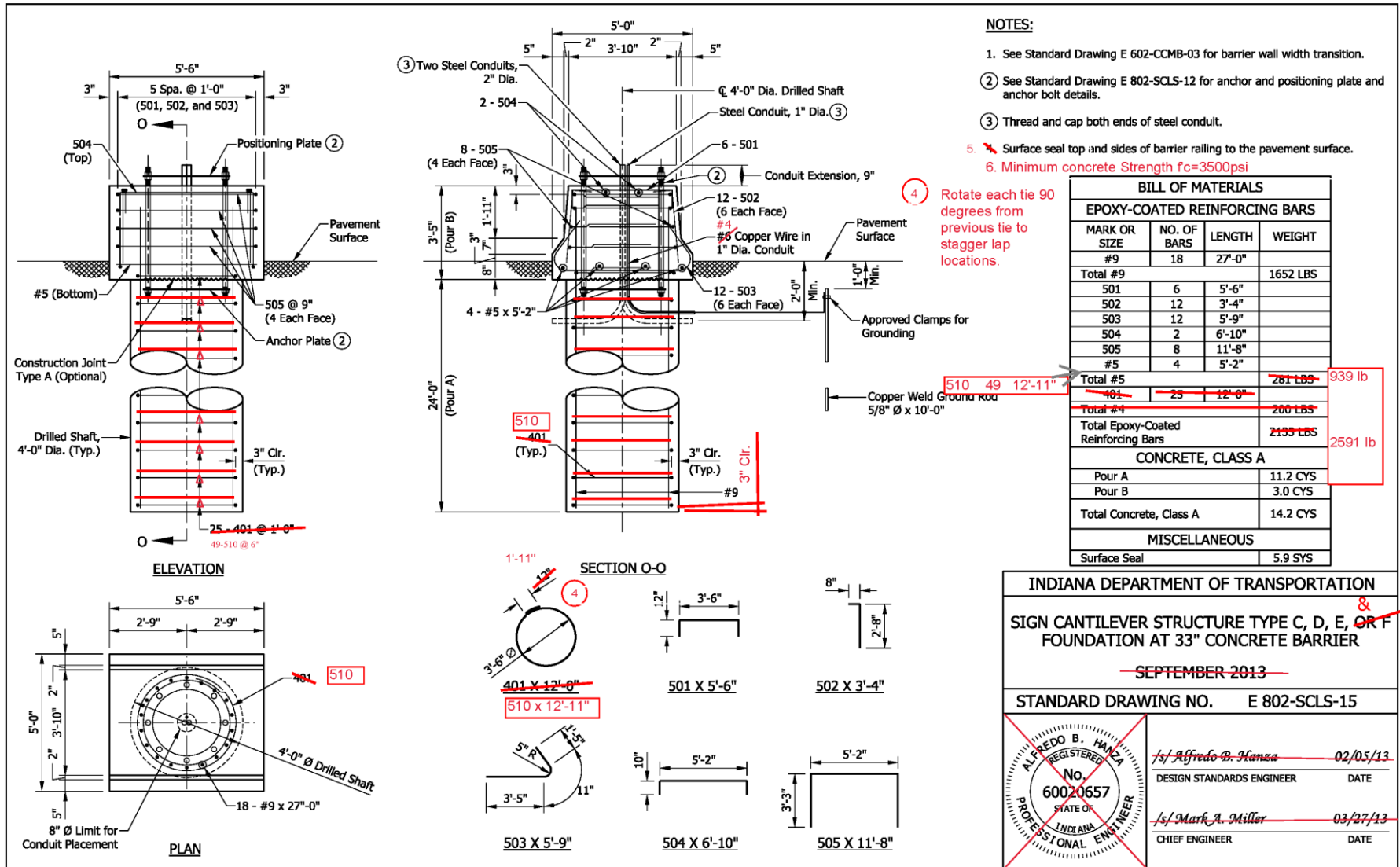
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E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



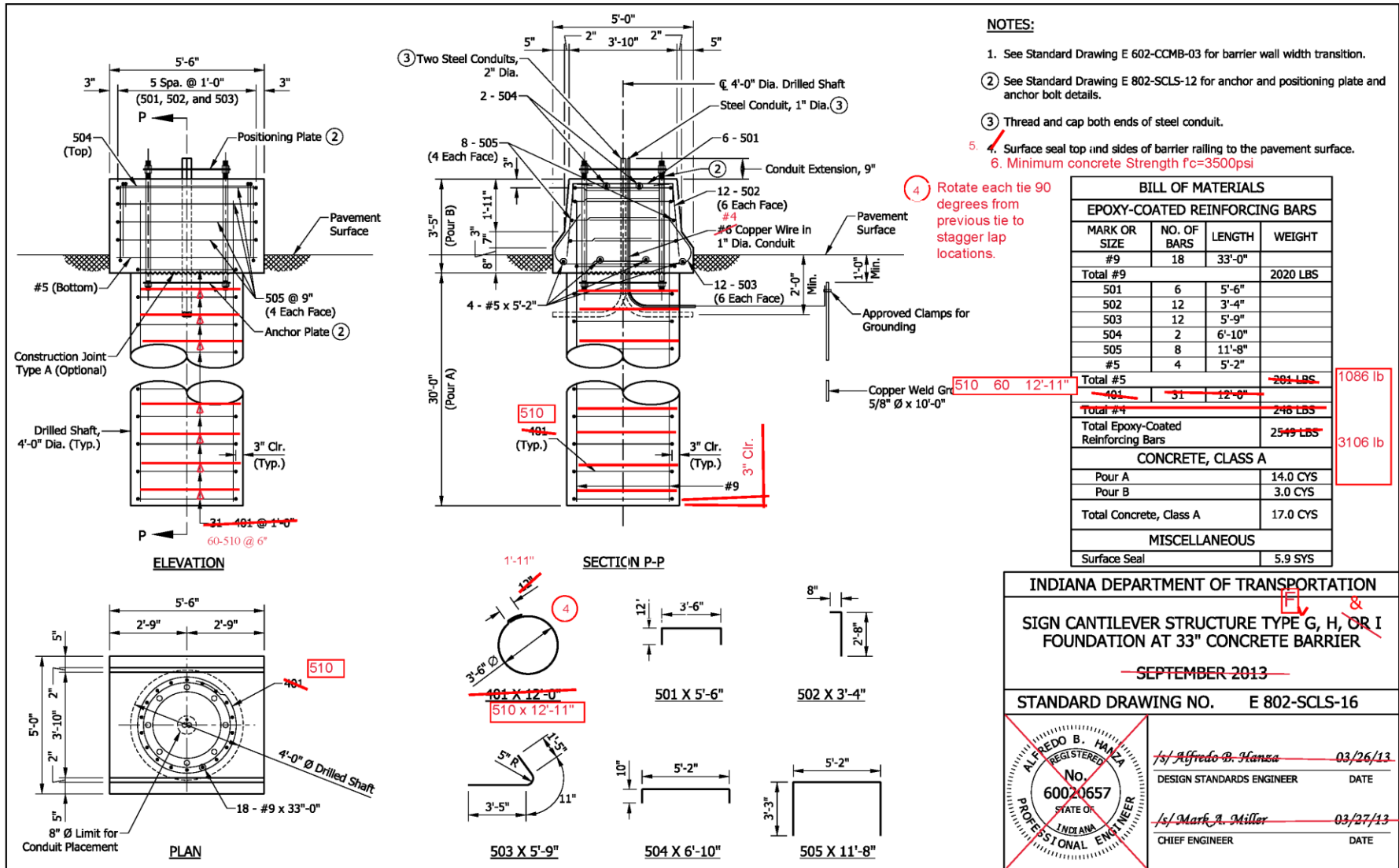
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E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



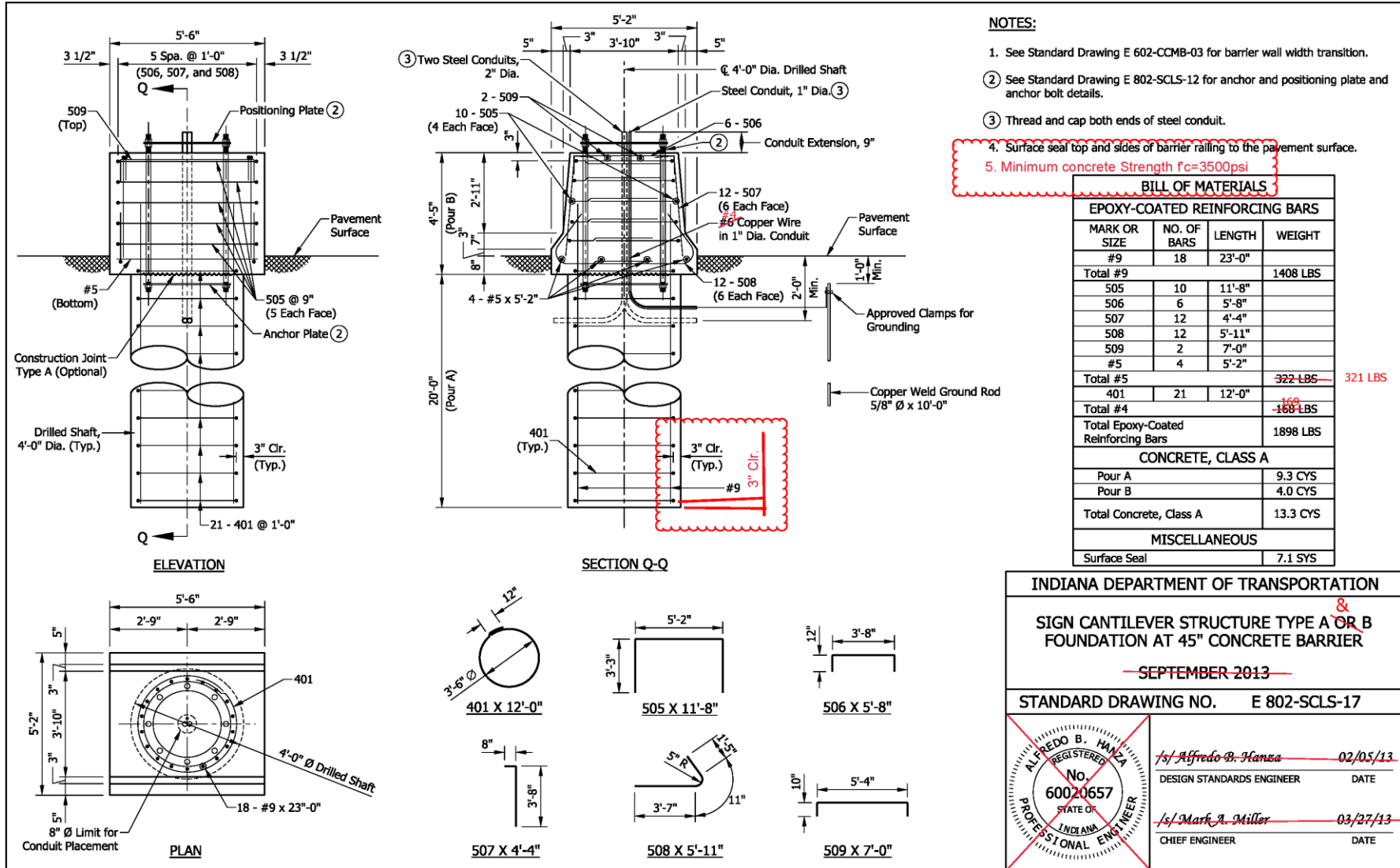
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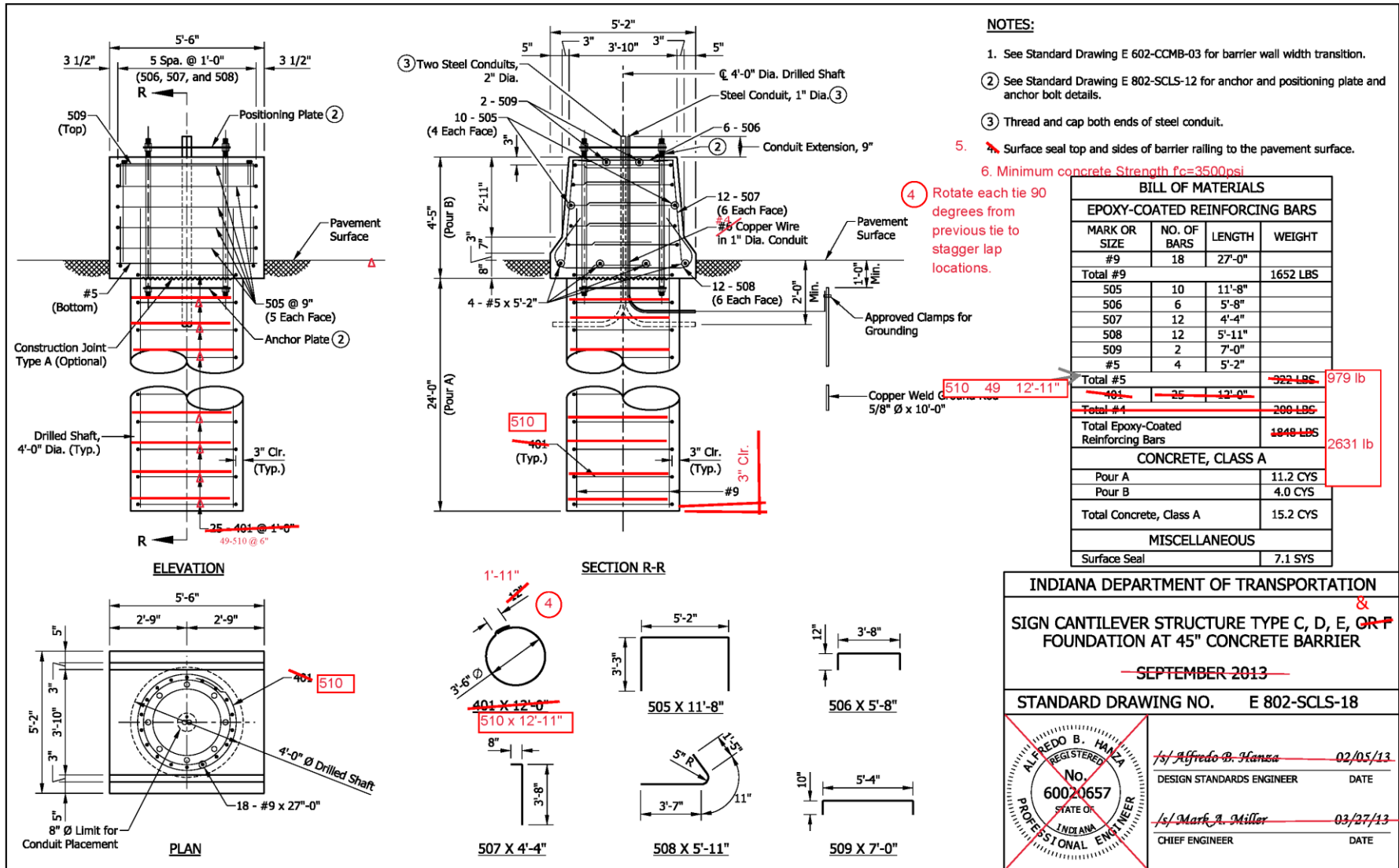
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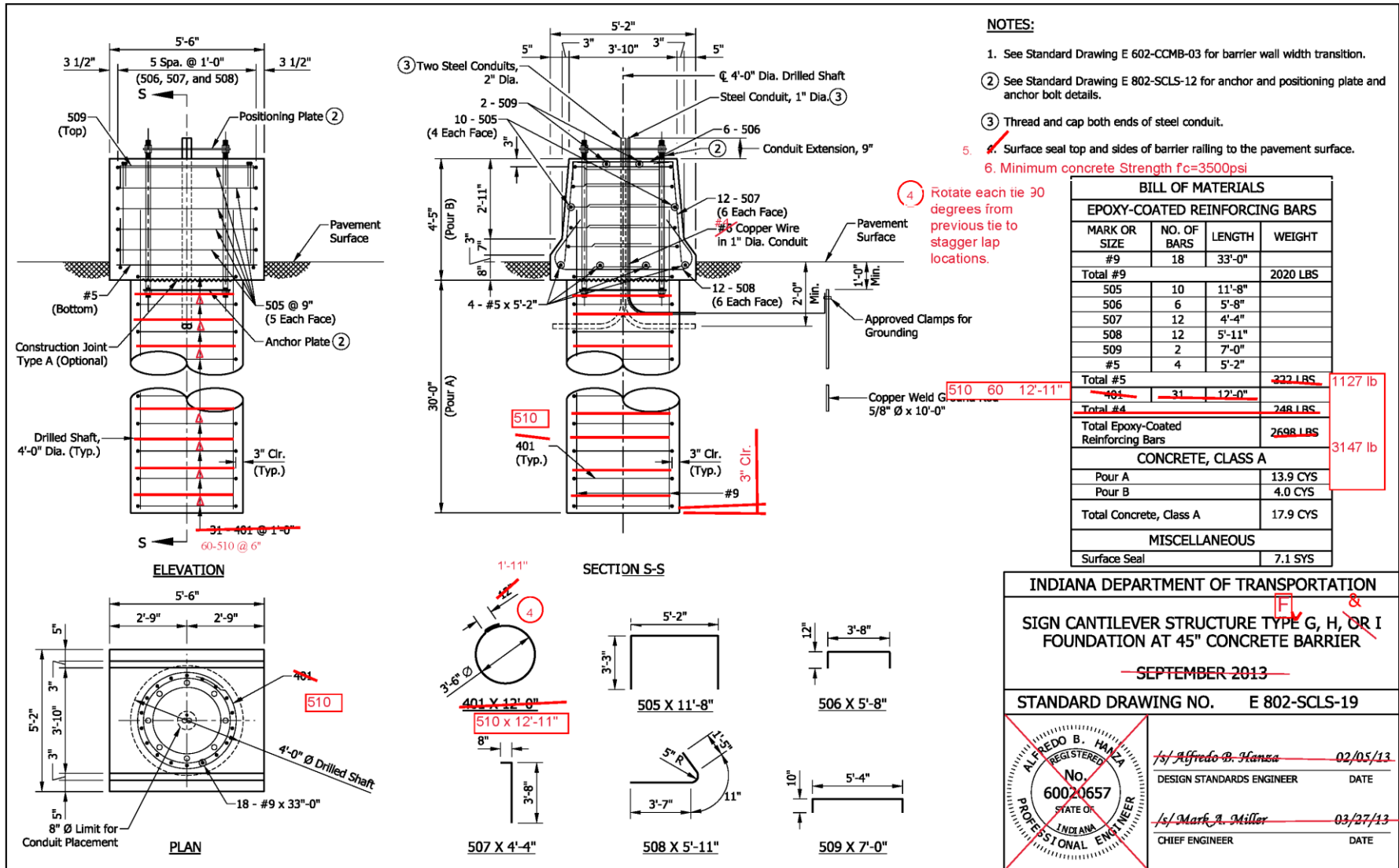
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E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



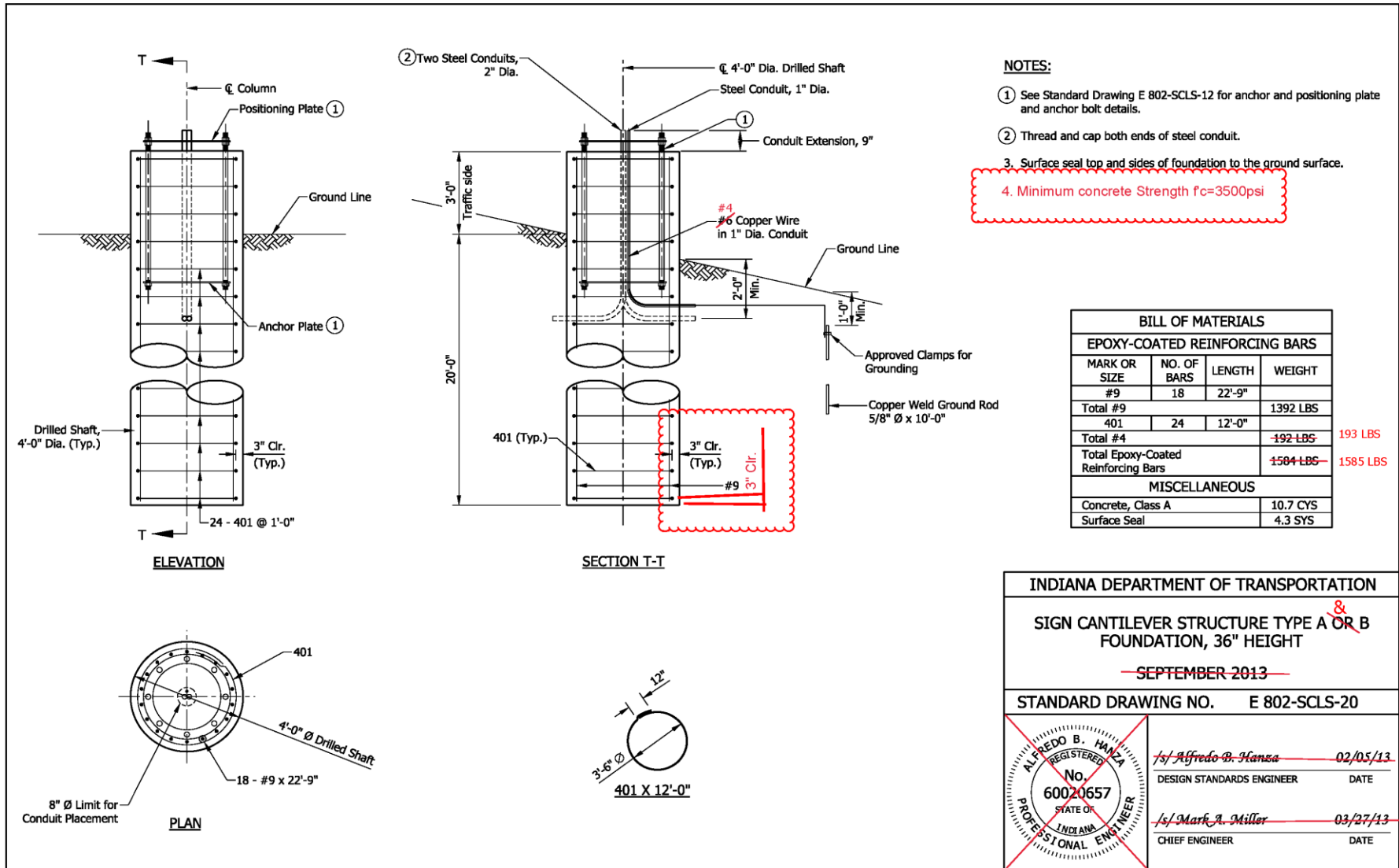
REVISION TO STANDARD DRAWINGS

E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



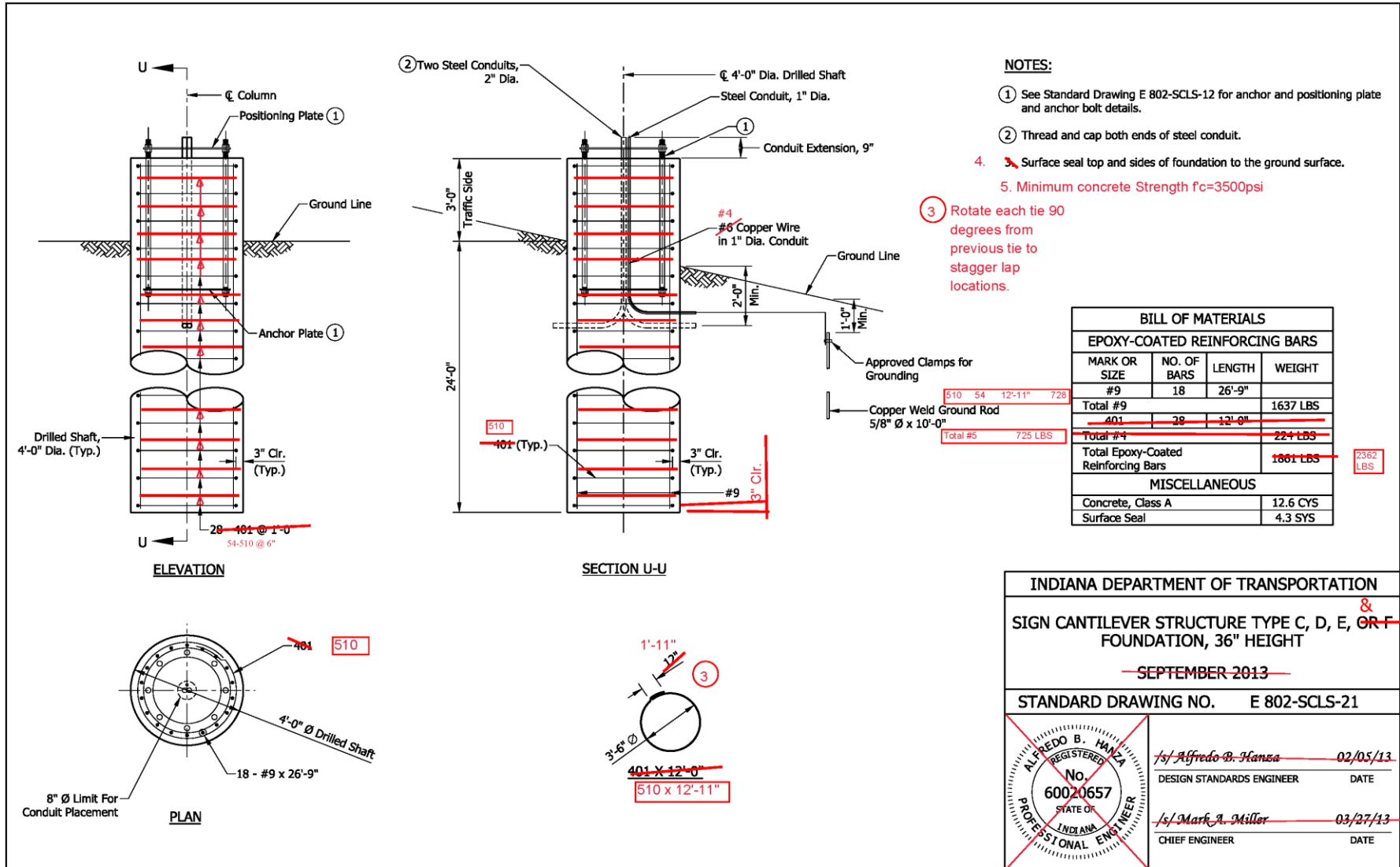
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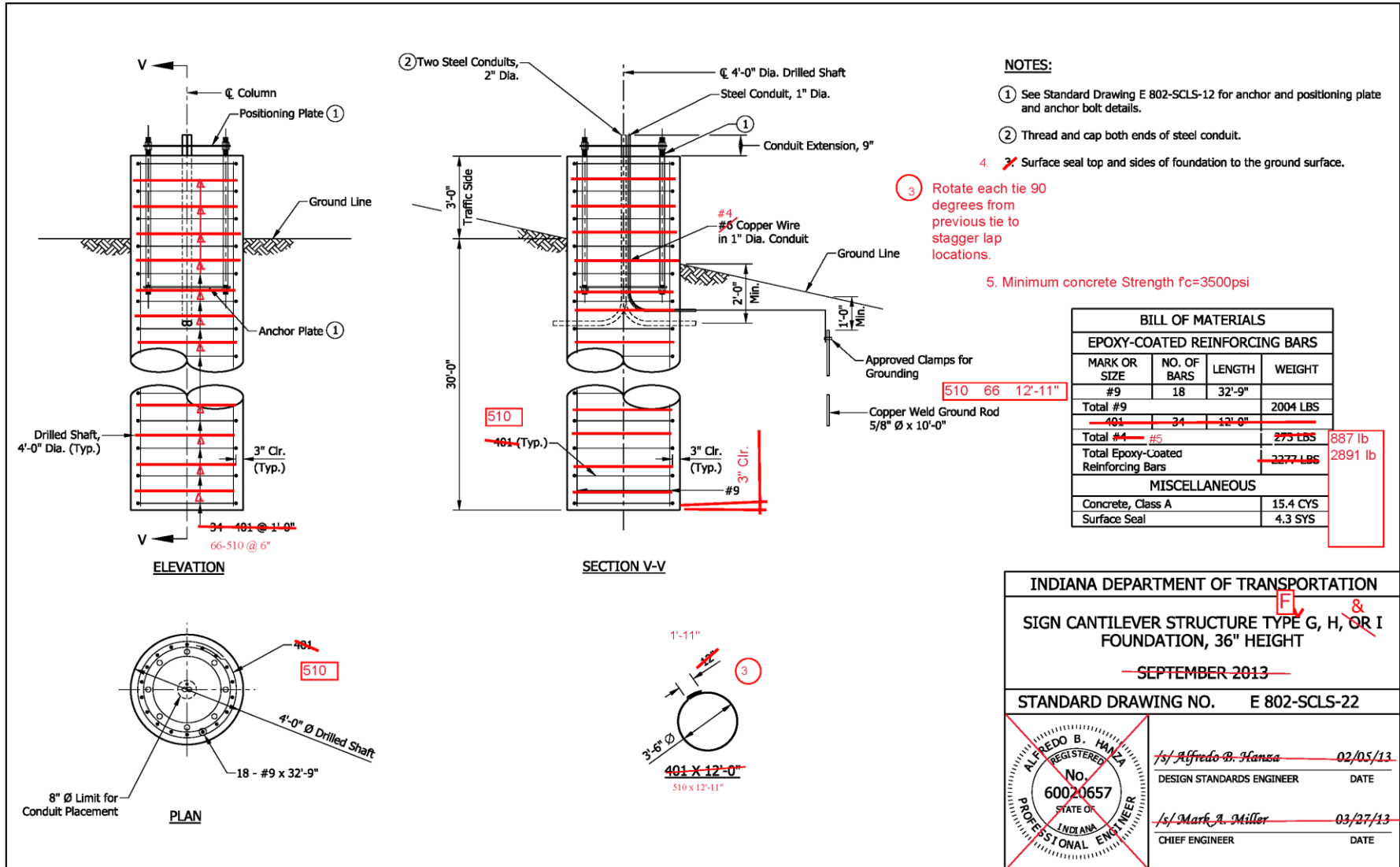
REVISION TO STANDARD DRAWINGS

E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



REVISION TO STANDARD DRAWINGS

E 802-SCLS (existing -01 thru -22, shown markups) SIGN CANTILEVER STRUCTURE



REVISION TO STANDARD DRAWINGS

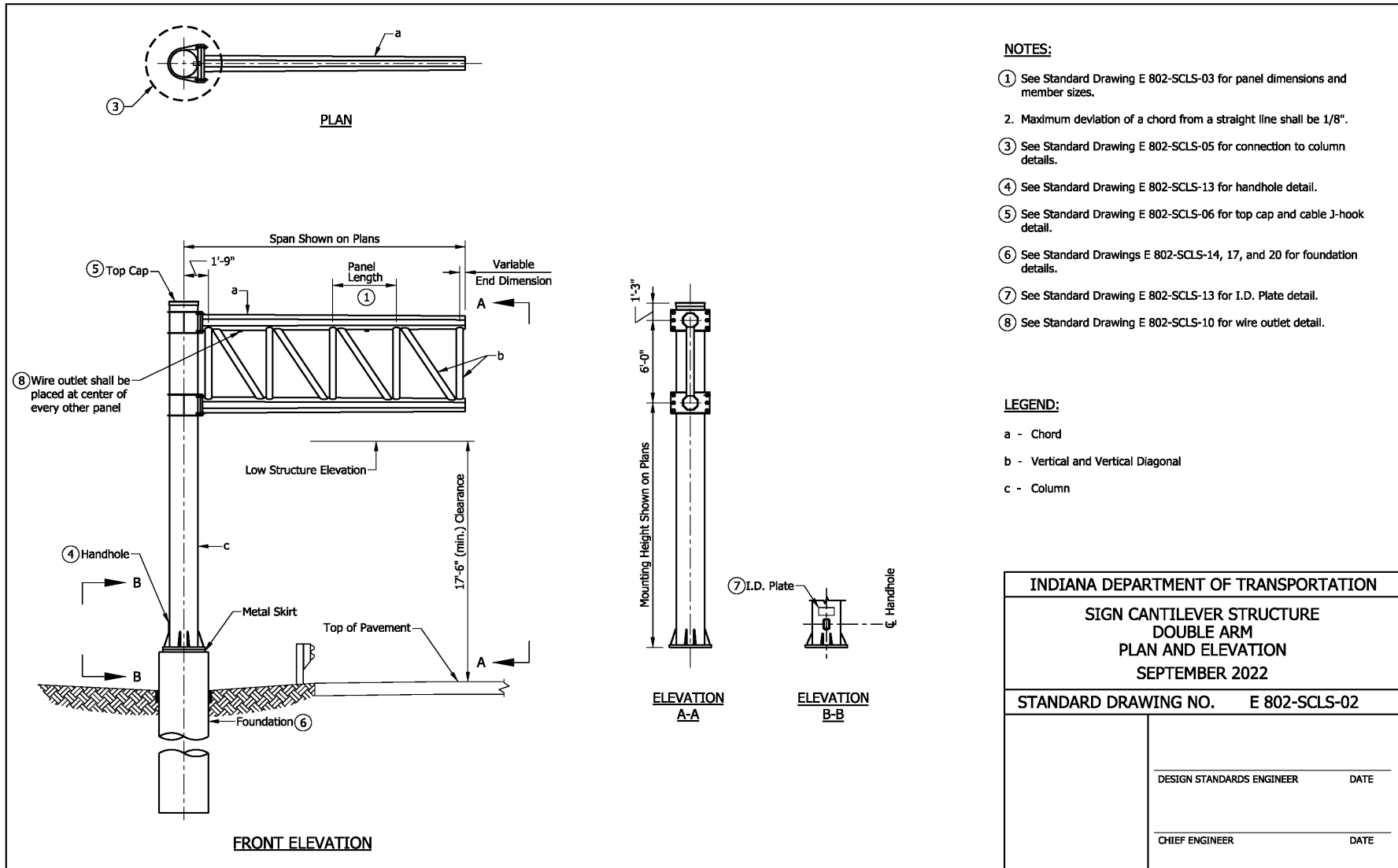
E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE

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7	Quadri-Chord Plan and Elevation
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12	Double Arm and Quadri-Chord Base Plate, Anchor Bolt, and Metal Skirt Details
13	Double Arm and Quadri-Chord Column Handhole and I.D. Plate Details
14	Structure Type A & B Foundation at 33" Concrete Barrier
15	Structure Type C, D, & E Foundation at 33" Concrete Barrier
16	Structure Type F, G, H, & I Foundation at 33" Concrete Barrier
17	Structure Type A & B Foundation at 45" Concrete Barrier
18	Structure Type C, D, & E Foundation at 45" Concrete Barrier
19	Structure Type F, G, H, & I Foundation at 45" Concrete Barrier
20	Structure Type A & B Foundation, 36" Height
21	Structure Type C, D, & E Foundation, 36" Height
22	Structure Type F, G, H, & I Foundation, 36" Height

INDIANA DEPARTMENT OF TRANSPORTATION	
SIGN CANTILEVER STRUCTURE INDEX	
SEPTEMBER 2022	
STANDARD DRAWING NO. E 802-SCLS-01	
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	CHIEF ENGINEER _____ DATE _____

REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



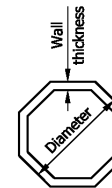
REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE

DOUBLE ARM PANEL DIMENSIONS			
SPAN	NO. OF PANELS	PANEL LENGTH	VARIABLE END DIMENSION
10'	2	4'-0"	0'-3"
11'	3	3'-0"	0'-3"
12'	3	3'-3"	0'-6"
13'	3	3'-6"	0'-9"
14'	3	4'-0"	0'-3"
15'	3	4'-3"	0'-6"
16'	4	3'-6"	0'-3"
17'	4	3'-9"	0'-3"
18'	4	4'-0"	0'-3"
19'	4	4'-3"	0'-3"
20'	4	4'-6"	0'-3"

NOTES:

1. All panels on the double arm shall be the same length. The minimum panel length is 3'-0" and the maximum is 4'-6".
2. See Standard Drawing E 802-SCLS-04 for connections, weld details, and required camber.
3. For base plate and anchor bolt details see Standard Drawing E 802-SCLS-12.
4. See Standard Drawings E 802-SCLS-14, 17, and 20 for foundation details.
5. All member diameters shown are outside diameters.
- ⑥ Double arm chord shape shall be octagonal tubular with 0.14 in./ft. taper, maximum diameter shown in table.



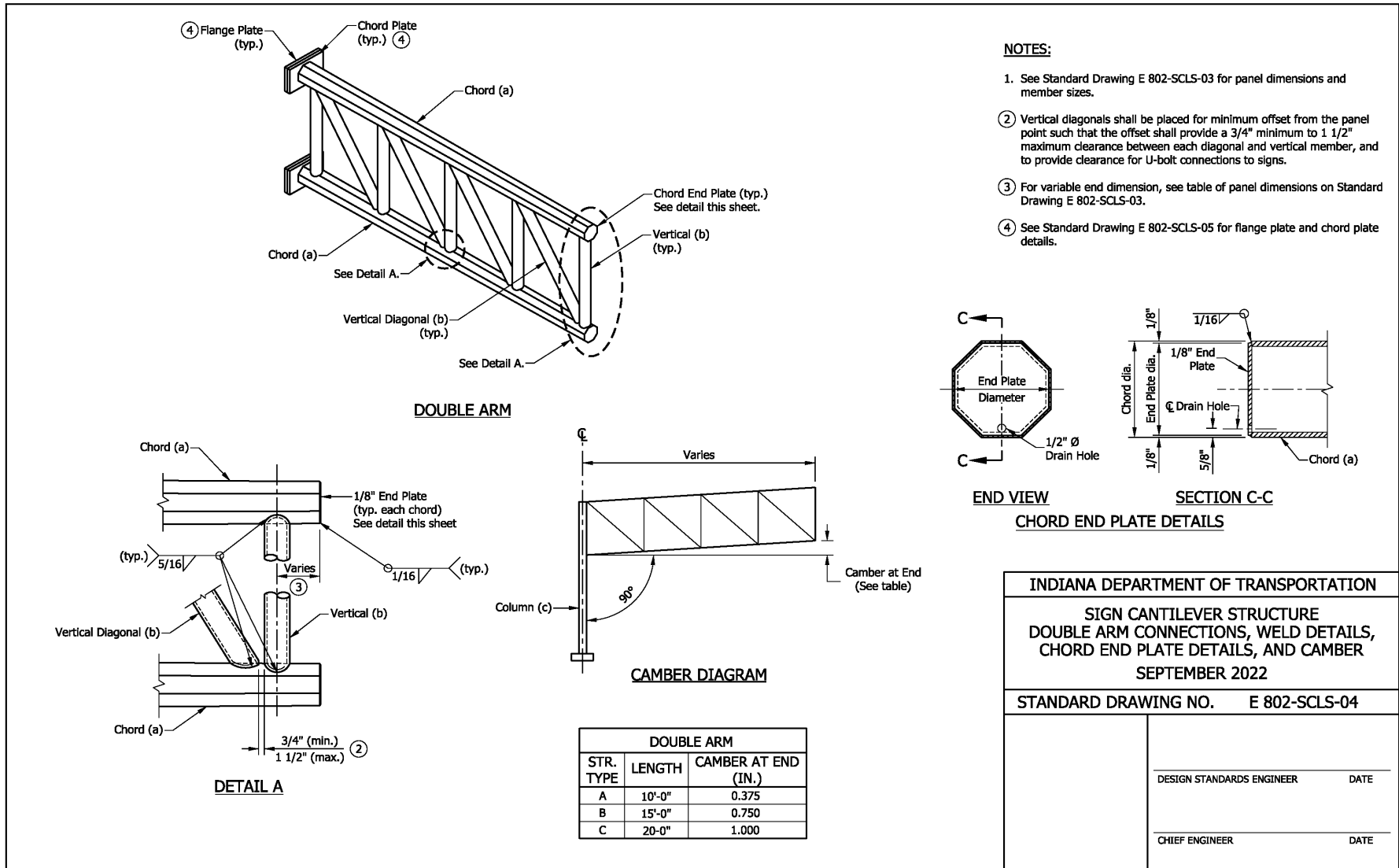
OCTAGON TUBULAR SHAPE

DOUBLE ARM MEMBER SIZES									
STR. TYPE	MAX SPAN (FT.)	MAX SIGN AREA (FT.)	MAX MOUNTING HEIGHT (FT.)	⑥ CHORD a		VERTICAL/VERTICAL DIAGONAL b		COLUMN c	
				DIAMETER (IN.)	WALL THICK. (IN.)	DIAMETER (IN.)	WALL THICK. (IN.)	DIAMETER (IN.)	WALL THICK. (IN.)
A	10	180	24	7 5/8	0.500	5 9/16	0.375	18	0.750
B	15	280	24	10 3/4	0.593	5 9/16	0.500	20	0.812
C	20	380	24	14	0.593	6 5/8	0.719	24	0.968

INDIANA DEPARTMENT OF TRANSPORTATION	
SIGN CANTILEVER STRUCTURE DOUBLE ARM PANEL DIMENSIONS AND MEMBER SIZES SEPTEMBER 2022	
STANDARD DRAWING NO. E 802-SCLS-03	
DESIGN STANDARDS ENGINEER	DATE
CHIEF ENGINEER	DATE

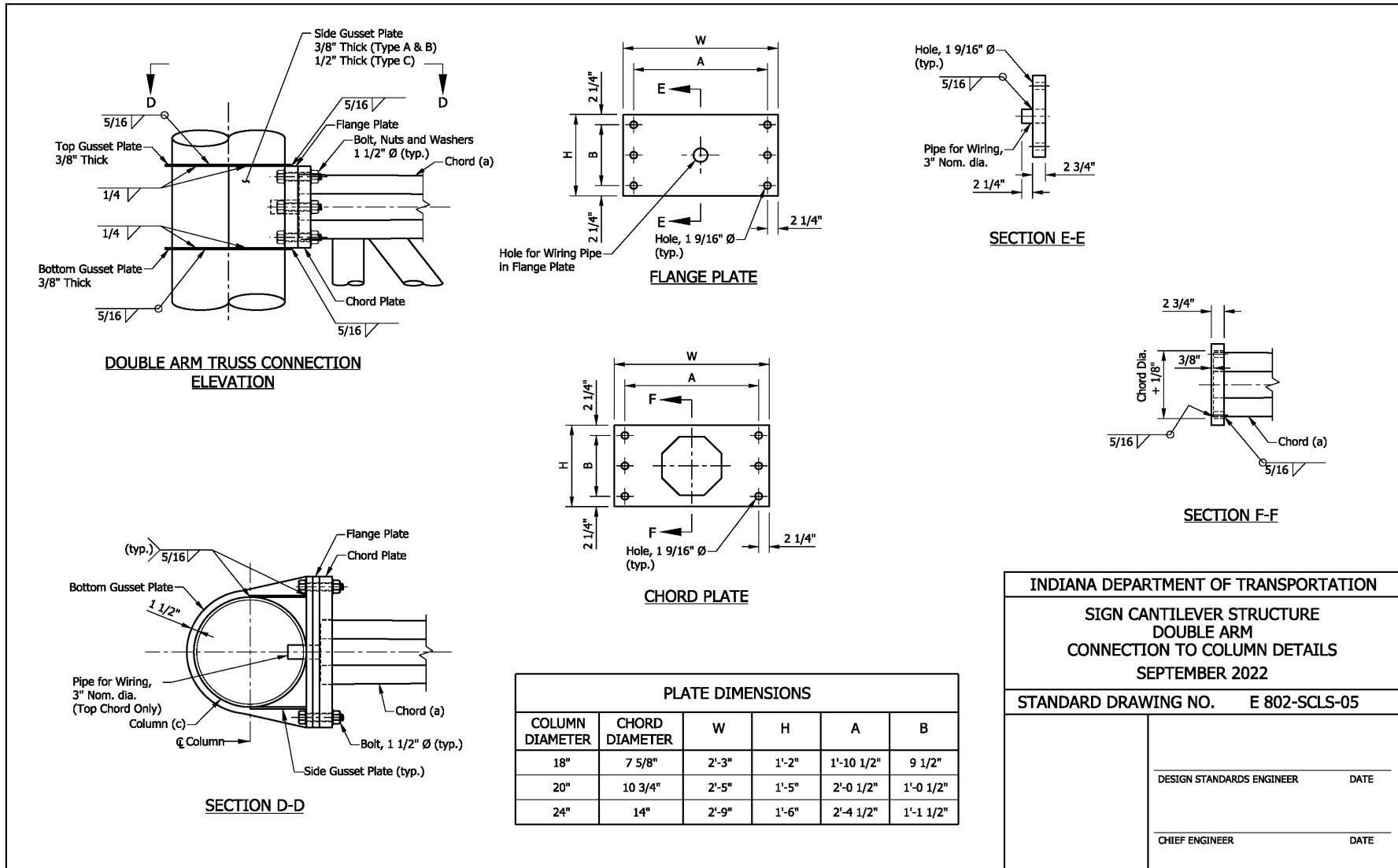
REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



INDIANA DEPARTMENT OF TRANSPORTATION

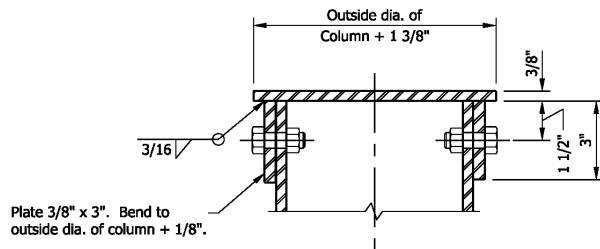
SIGN CANTILEVER STRUCTURE
 DOUBLE ARM
 CONNECTION TO COLUMN DETAILS
 SEPTEMBER 2022

STANDARD DRAWING NO. E 802-SCLS-05

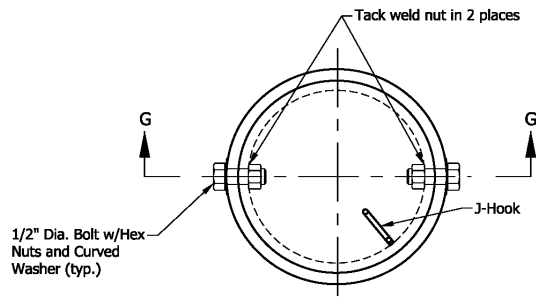
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CHIEF ENGINEER	DATE

REVISION TO STANDARD DRAWINGS

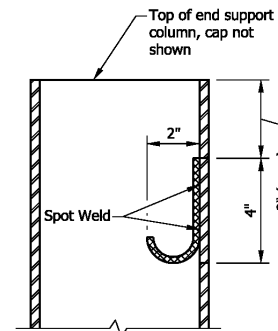
E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



SECTION G-G



PLAN
TOP CAP - STEEL COLUMN



CABLE J-HOOK

NOTES:

1. J-hook shall consist of 3/8" dia. bars constructed as shown, and spot-welded to inside of the columns.
2. Cap bolts used to attach top cap of columns shall be located to miss J-hook.

INDIANA DEPARTMENT OF TRANSPORTATION

SIGN CANTILEVER STRUCTURE
DOUBLE ARM COLUMN TOP CAP
AND CABLE J-HOOK
SEPTEMBER 2022

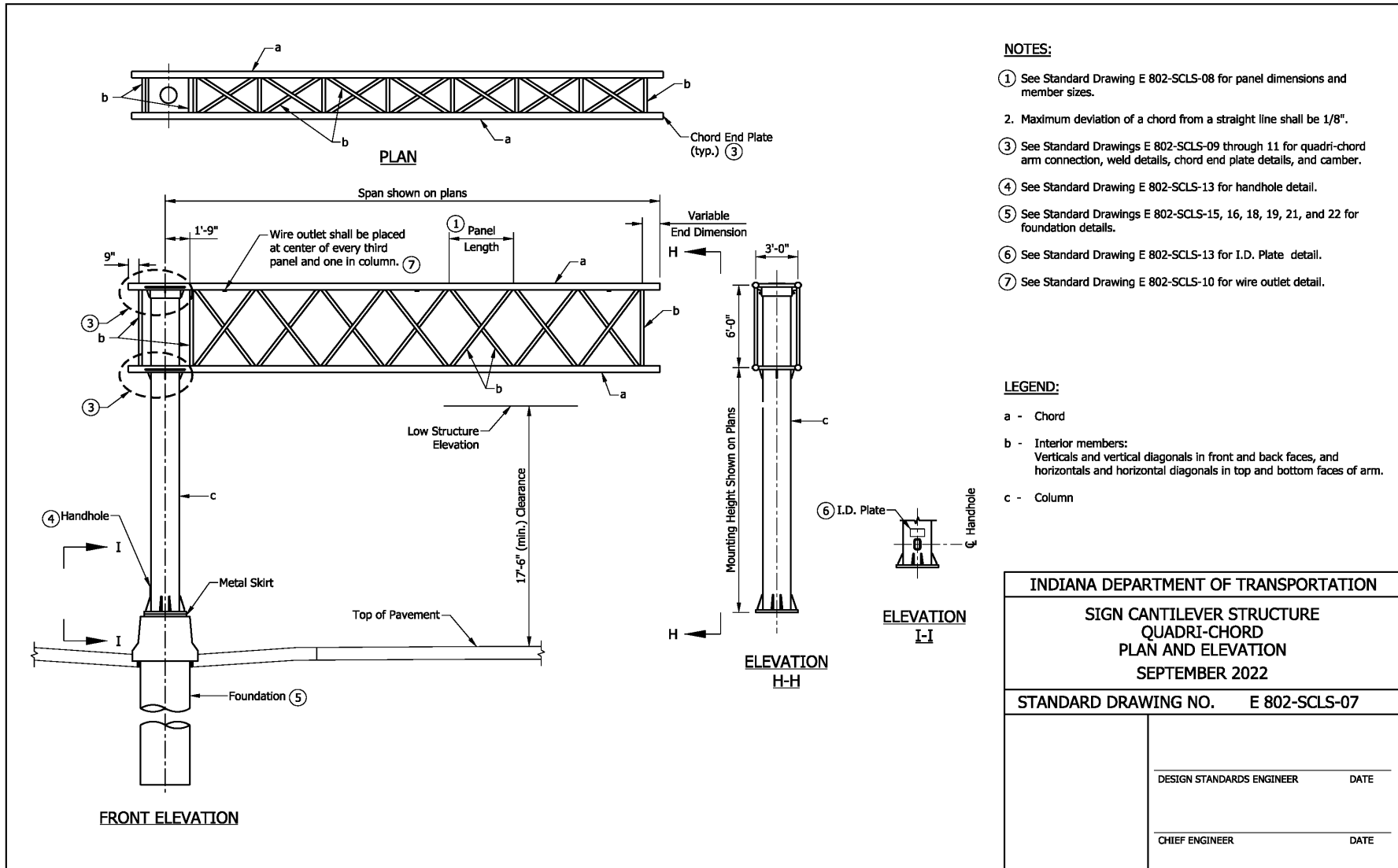
STANDARD DRAWING NO. E 802-SCLS-06

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE

PANEL DIMENSIONS			
SPAN	NO. OF PANELS	PANEL LENGTH	VARIABLE END DIMENSION
21'	5	3'-9"	0'-6"
22'	5	3'-9"	1'-6"
23'	5	4'-0"	1'-3"
24'	5	4'-3"	1'-0"
25'	5	4'-6"	0'-9"
26'	6	3'-9"	1'-9"
27'	6	4'-0"	1'-3"
28'	6	4'-3"	0'-9"
29'	6	4'-3"	1'-9"
30'	6	4'-6"	1'-3"
31'	7	4'-0"	1'-3"
32'	7	4'-3"	0'-6"
33'	7	4'-3"	1'-6"
34'	7	4'-6"	0'-9"
35'	7	4'-6"	1'-9"

NOTES:

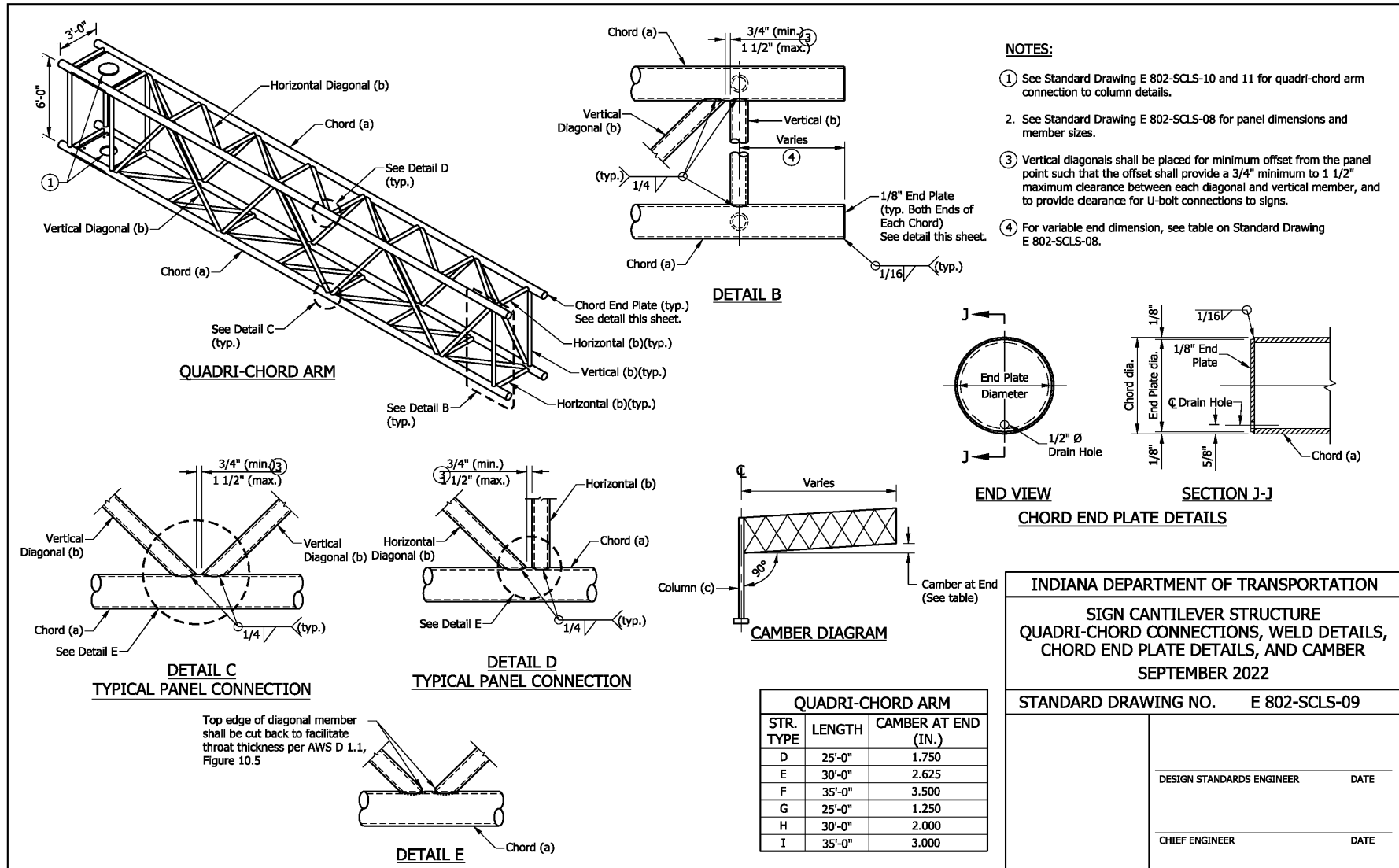
1. All panels in a structure shall be the same length. The minimum panel length is 3'-9" and the maximum is 4'-6".
2. See Standard Drawing E 802-SCLS-09 for connections, weld details, and required camber.
3. For base plate, anchor bolt, and metal skirt details see Standard Drawing E 802-SCLS-12.
4. All member diameters shown are outside diameters.
5. Quadri-chord arm chord shape shall be circular with constant diameter.

QUADRI-CHORD MEMBER SIZES									
STR. TYPE	MAX SPAN (FT.)	MAX SIGN AREA (FT.)	MAX MOUNTING HEIGHT (FT.)	⑤ CHORD a		VERT./HORIZ./DIAG. b		COLUMN c	
				DIAMETER (IN.)	WALL THICK. (IN.)	DIAMETER (IN.)	WALL THICK. (IN.)	DIAMETER (IN.)	WALL THICK. (IN.)
D	25	300	24	5 9/16	0.258	2 7/8	0.276	24	0.562
E	30	300	24	5 9/16	0.258	3 1/2	0.300	24	0.562
F	35	300	24	5 9/16	0.375	3 1/2	0.300	24	0.688
G	25	400	24	5 9/16	0.375	3 1/2	0.300	24	0.968
H	30	400	24	5 9/16	0.375	3 1/2	0.300	24	0.968
I	35	400	24	5 9/16	0.375	4	0.318	24	0.968

INDIANA DEPARTMENT OF TRANSPORTATION	
SIGN CANTILEVER STRUCTURE QUADRI-CHORD PANEL DIMENSIONS AND MEMBER SIZES SEPTEMBER 2022	
STANDARD DRAWING NO. E 802-SCLS-08	
DESIGN STANDARDS ENGINEER	DATE
CHIEF ENGINEER	DATE

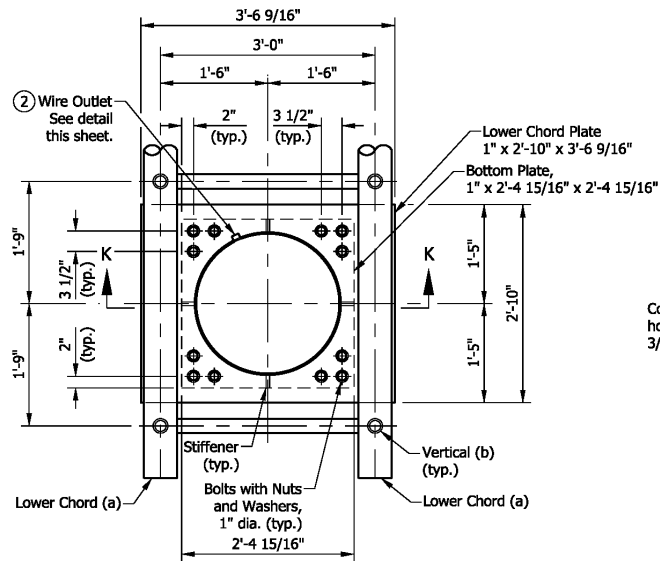
REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE

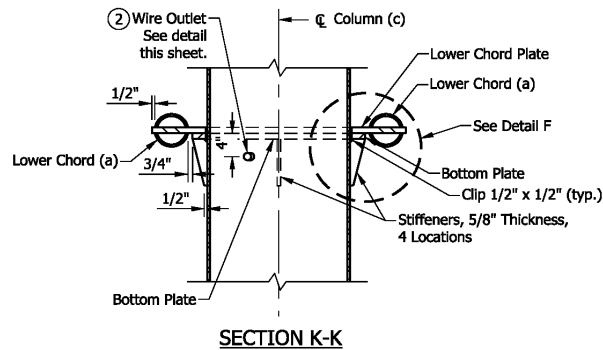


REVISION TO STANDARD DRAWINGS

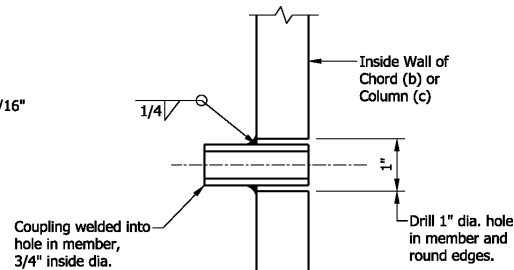
E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



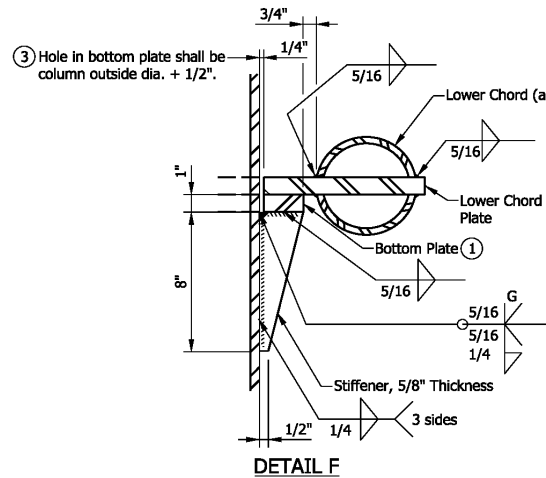
PLAN VIEW THROUGH COLUMN ABOVE LOWER CHORDS



SECTION K-K



TYPICAL WIRE OUTLET



DETAIL F

NOTES:

- ① If necessary, the top bottom plate shall be ground to fully seat lower chord plate. Any damages galvanizing shall be repaired before assembly.
- ② Pipe shall be oriented towards sign. Hole diameter in column shall equal outside pipe diameter + 1/8".
- ③ After tightening lower connection bolts, gap shall be filled with non-hardening silicone caulk suitable for exterior exposure.

INDIANA DEPARTMENT OF TRANSPORTATION

SIGN CANTILEVER STRUCTURE
 QUADRI-CHORD LOWER ARM CONNECTION
 TO COLUMN AND WIRE OUTLET DETAIL
 SEPTEMBER 2022

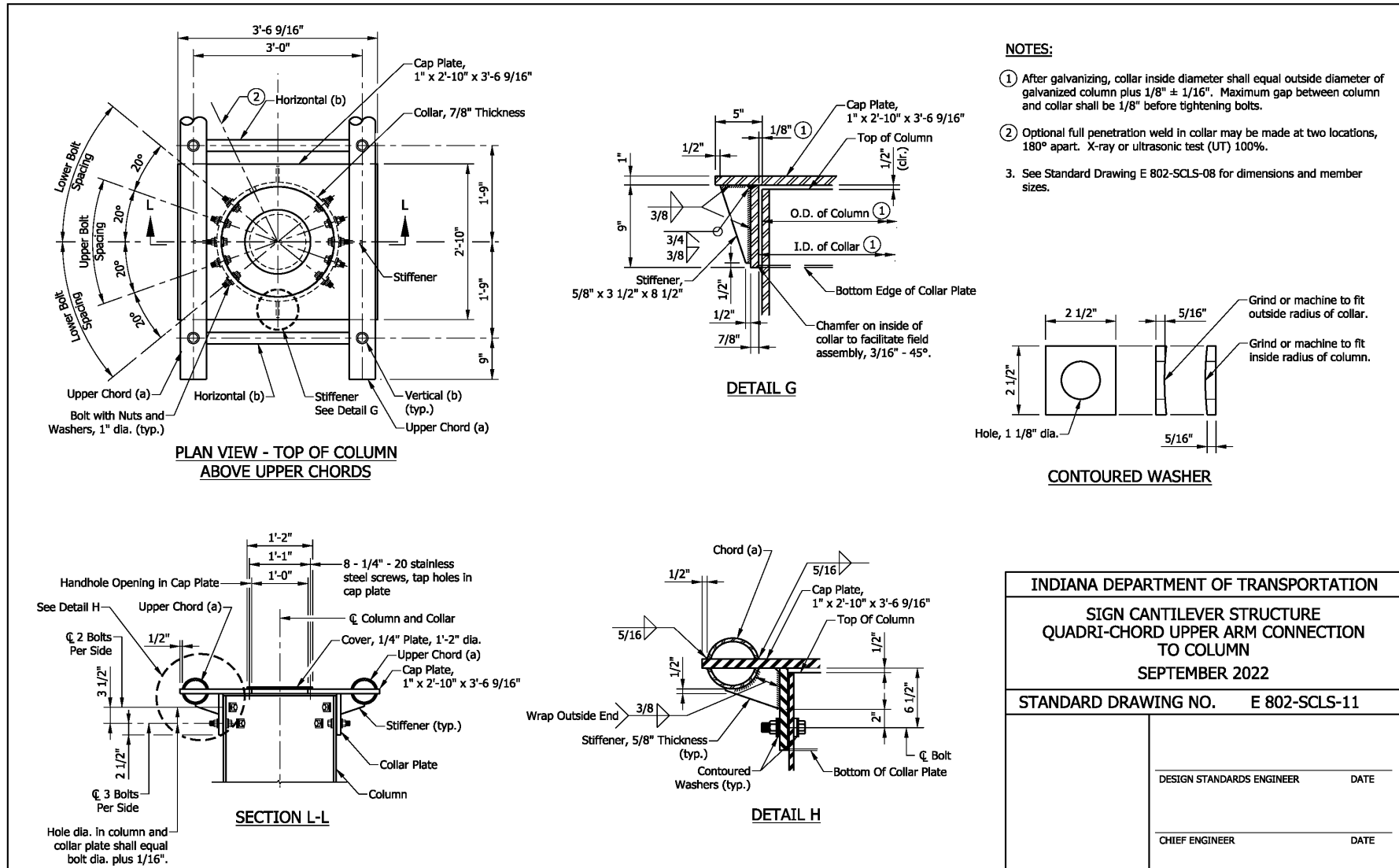
STANDARD DRAWING NO. E 802-SCLS-10

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

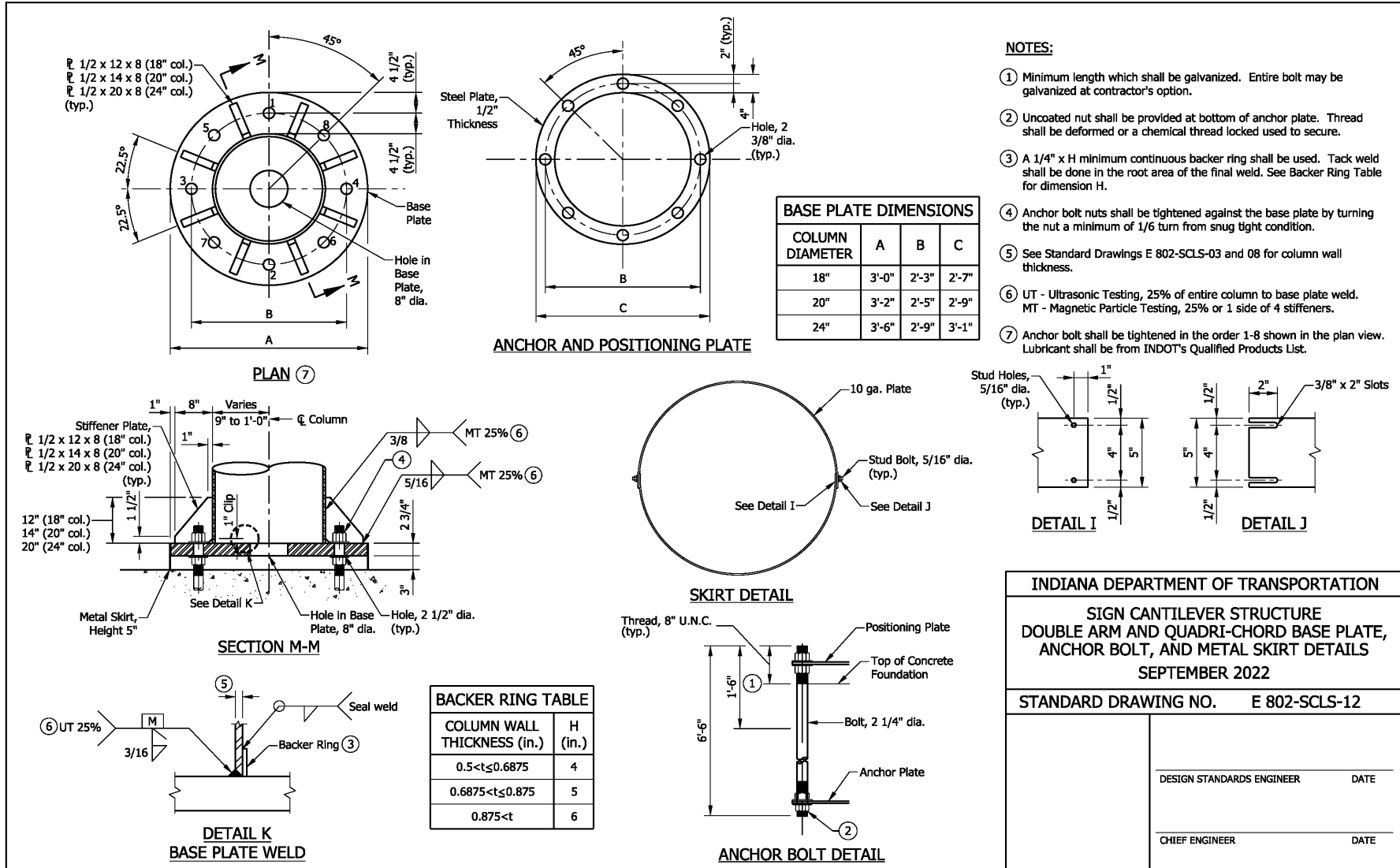
REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



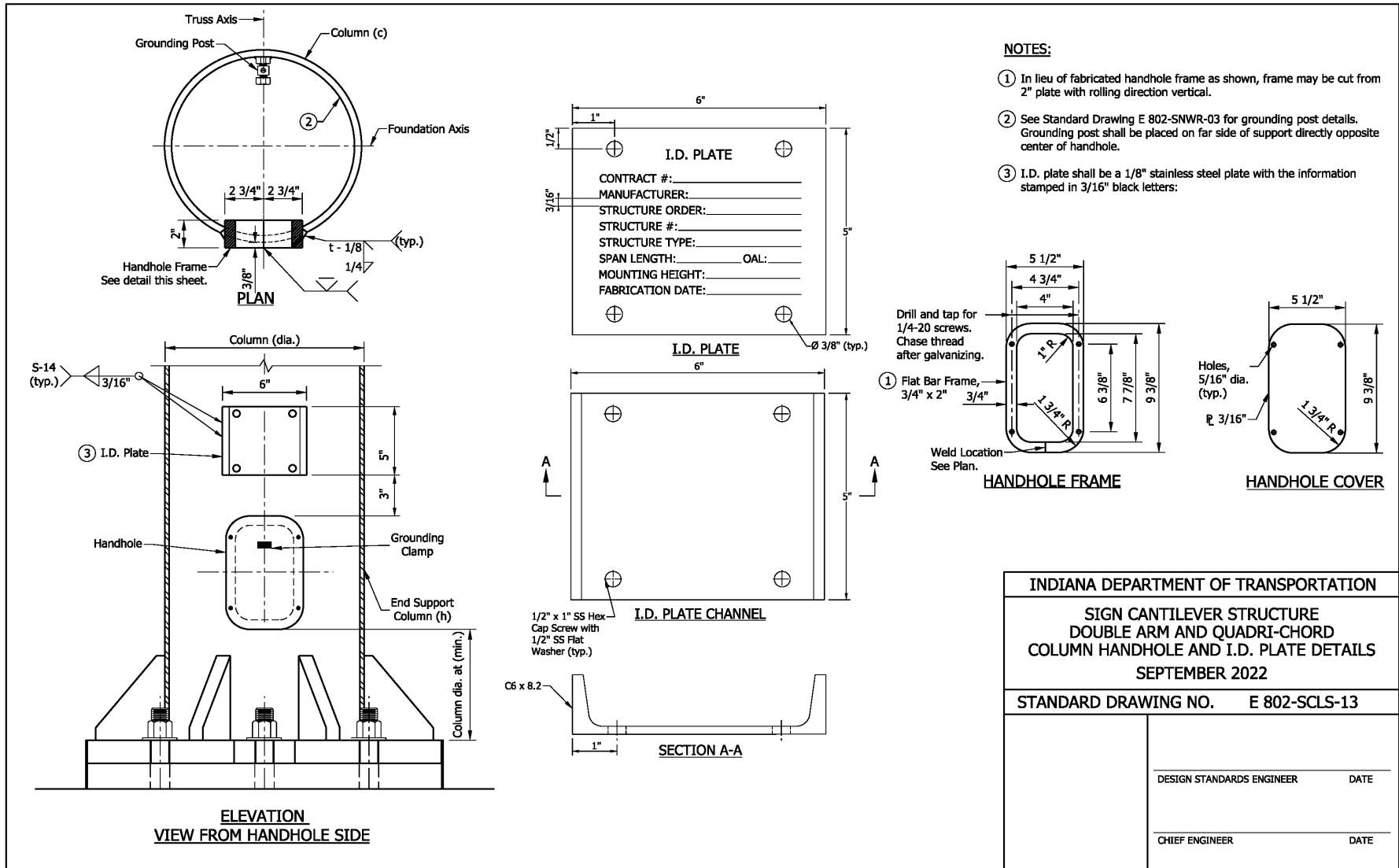
REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



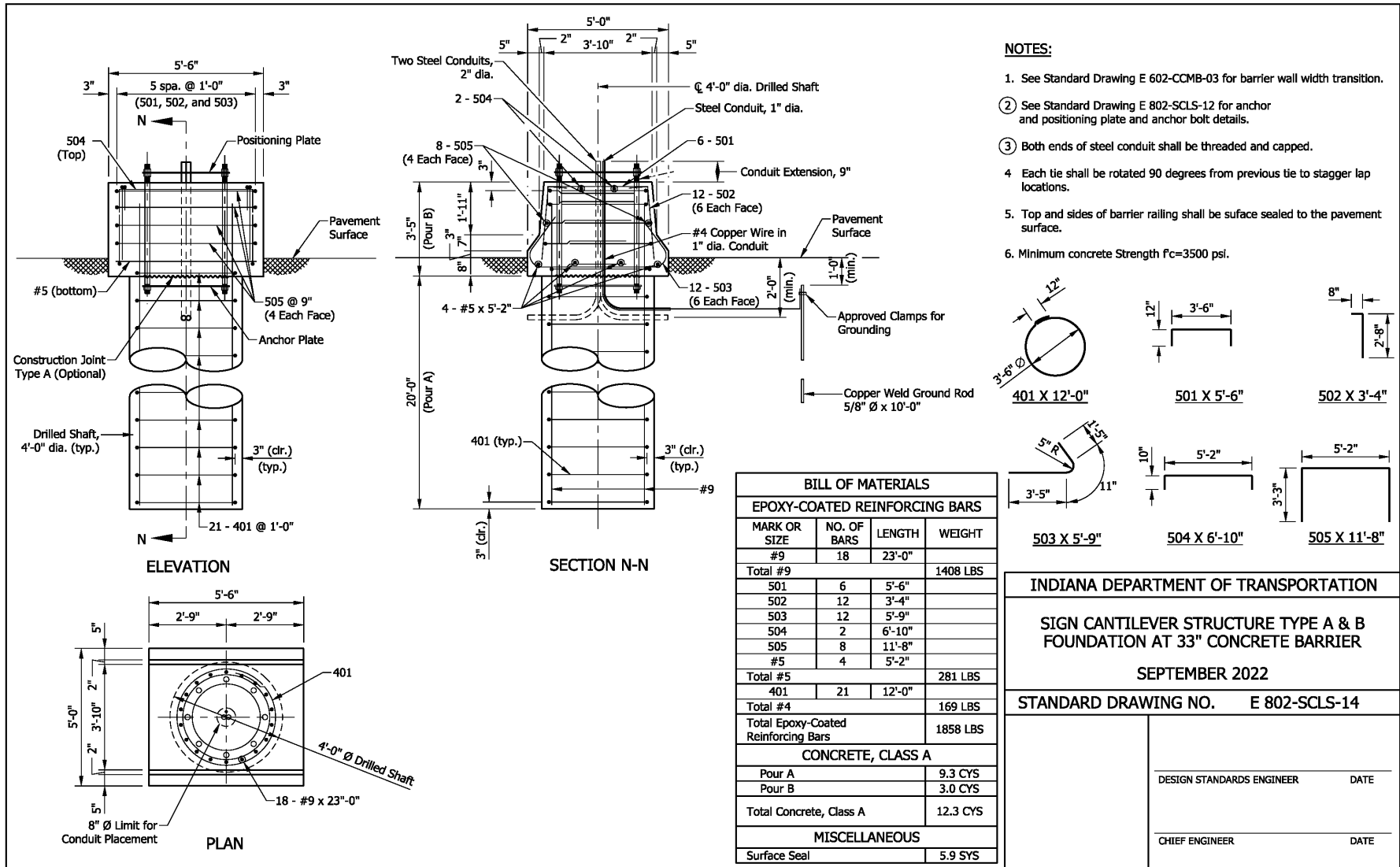
REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



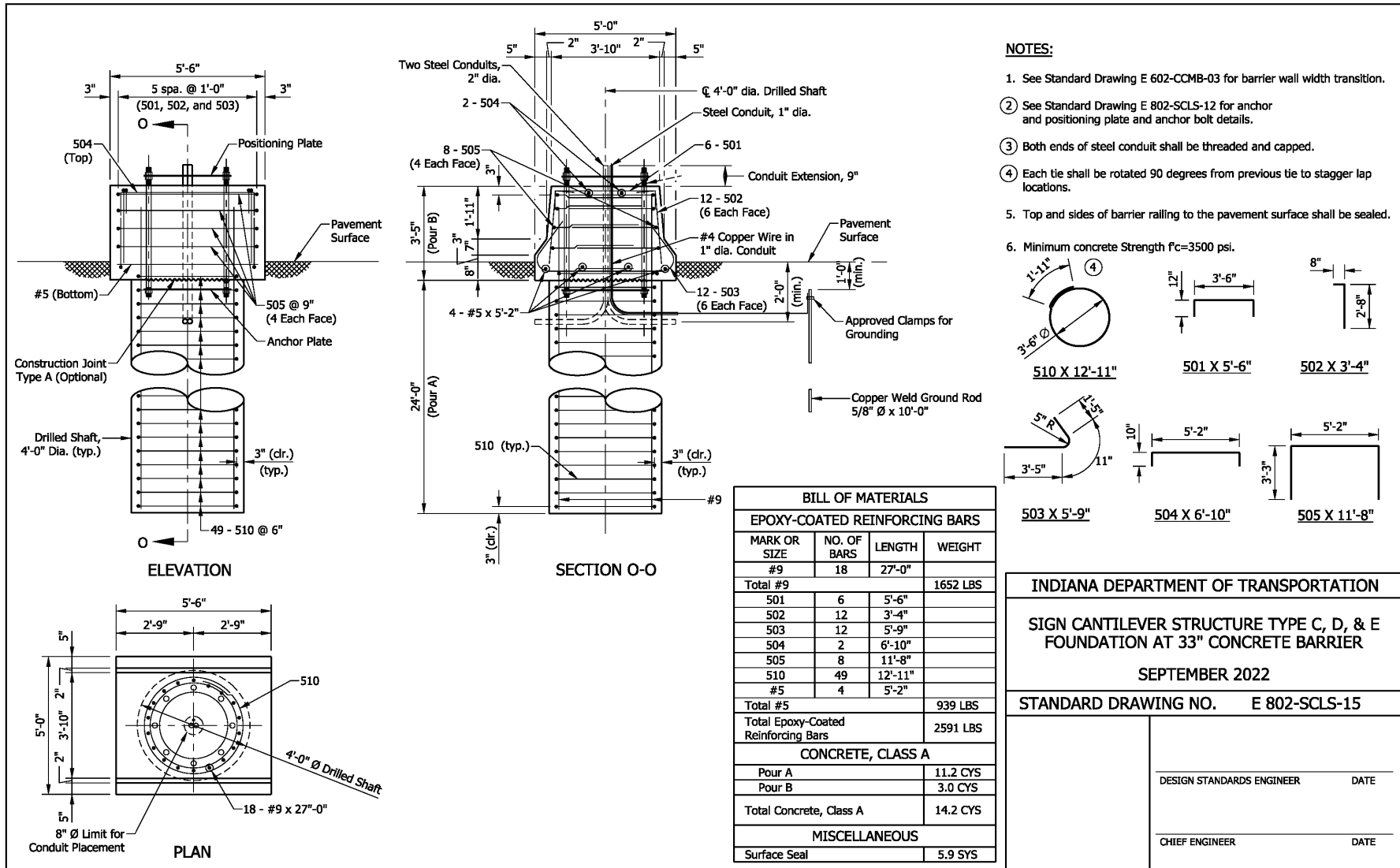
REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



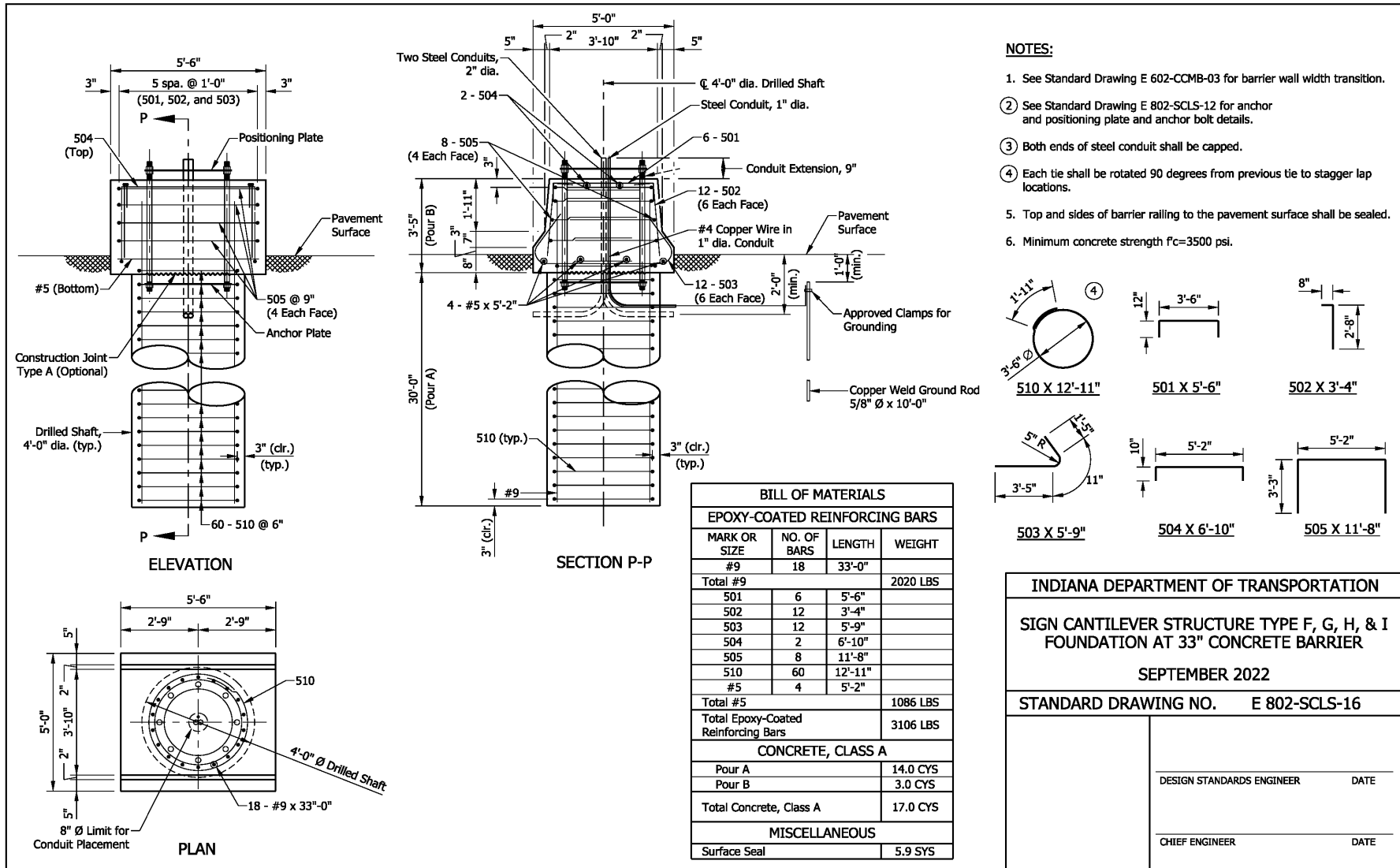
REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



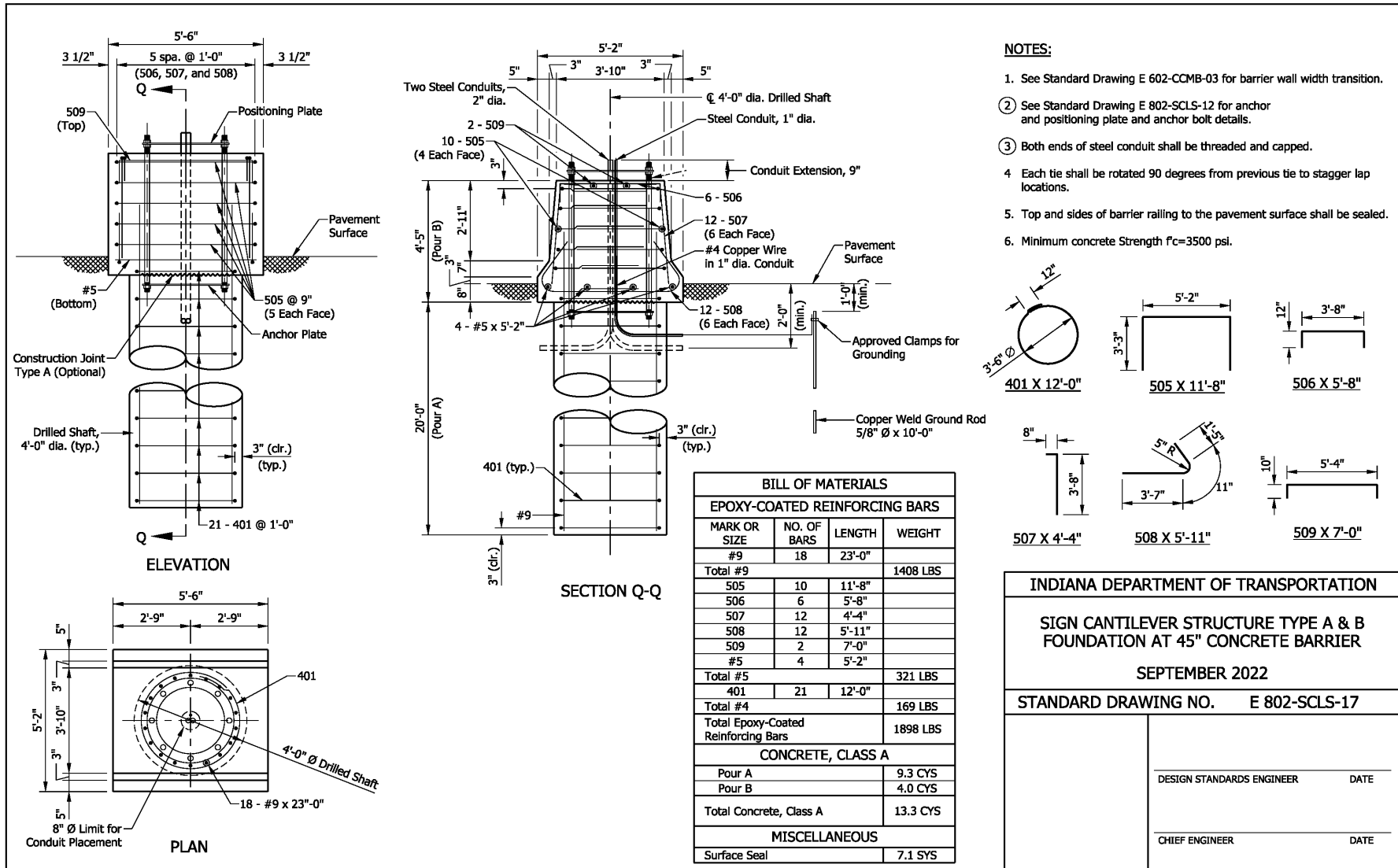
REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



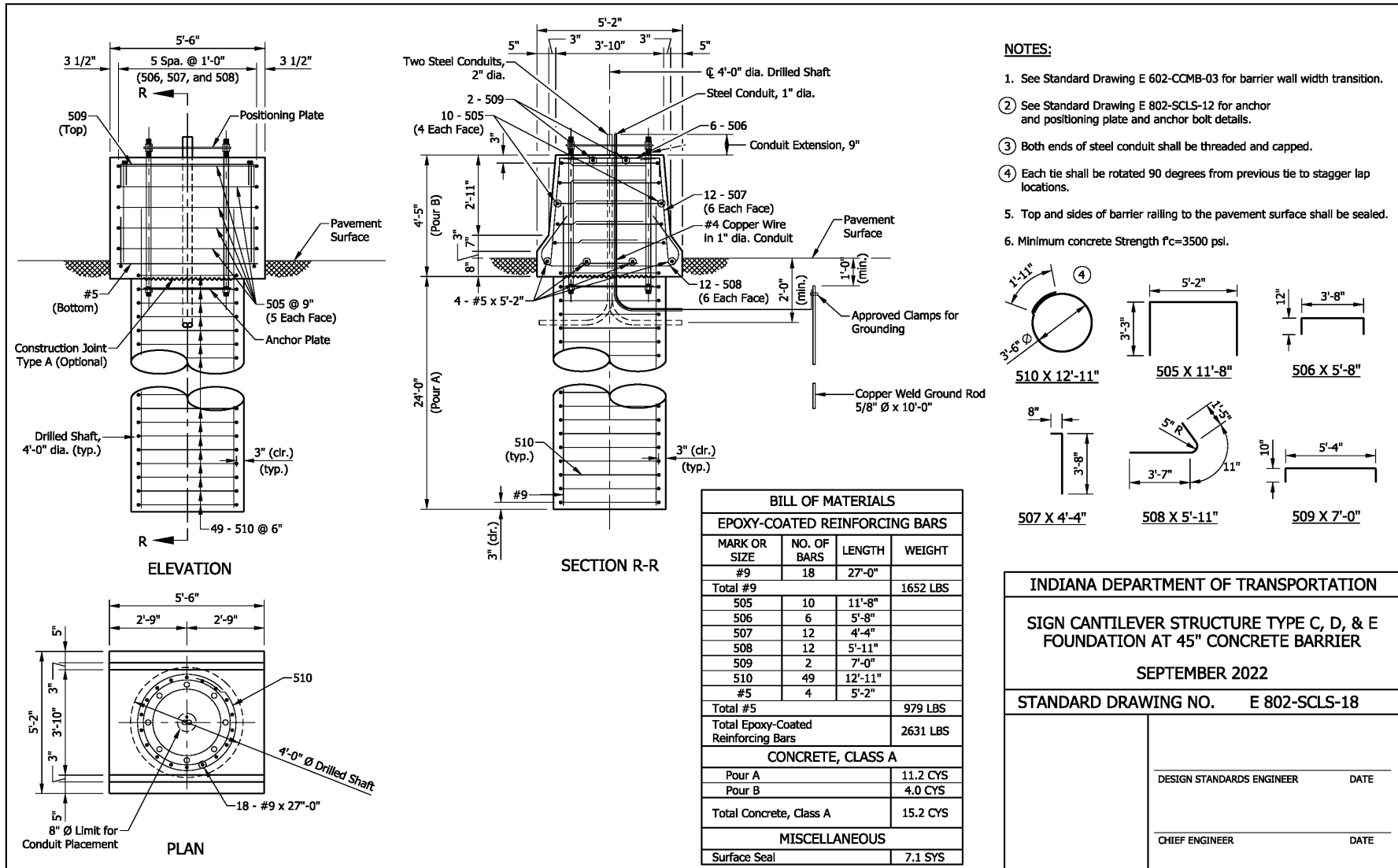
REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



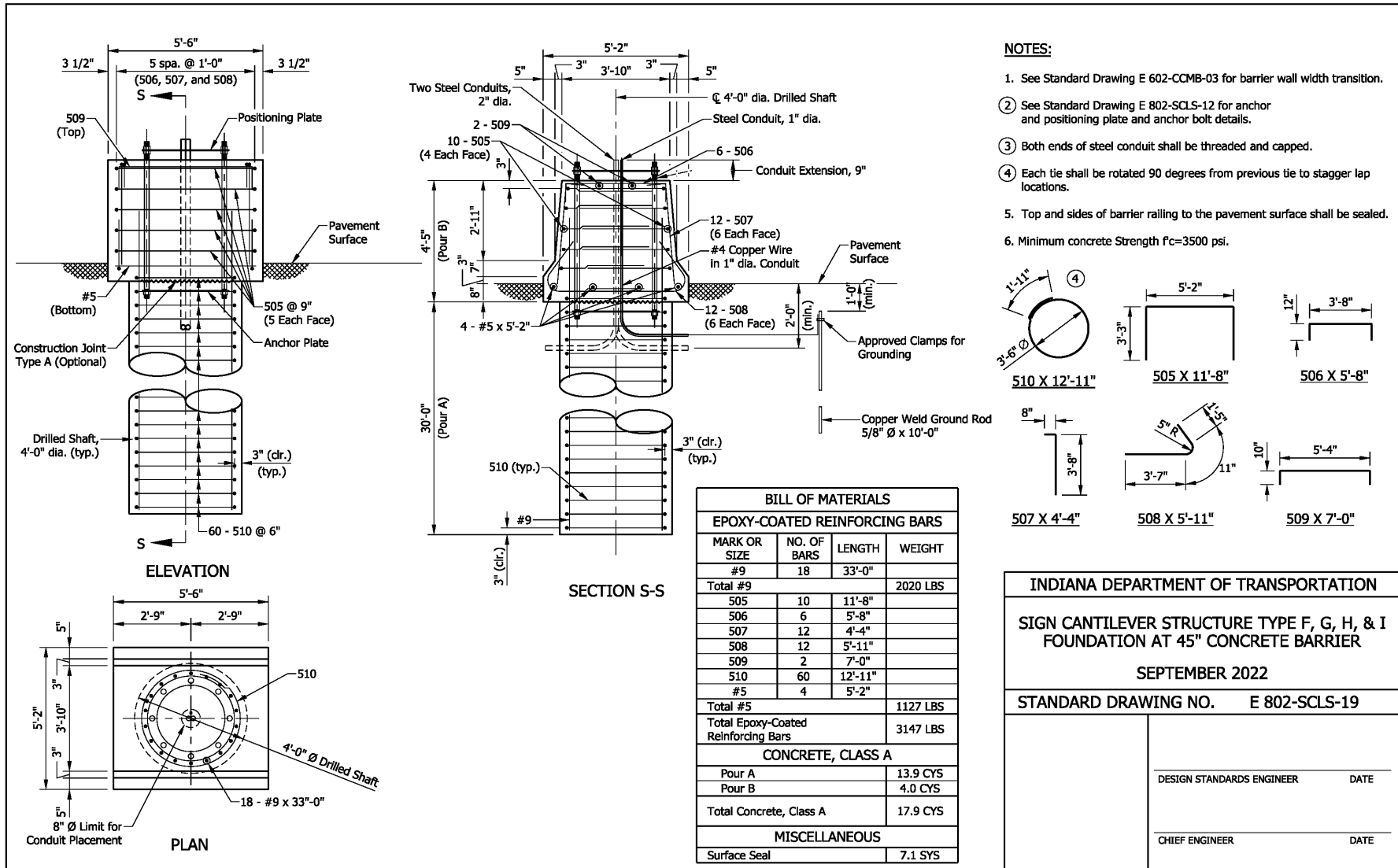
REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



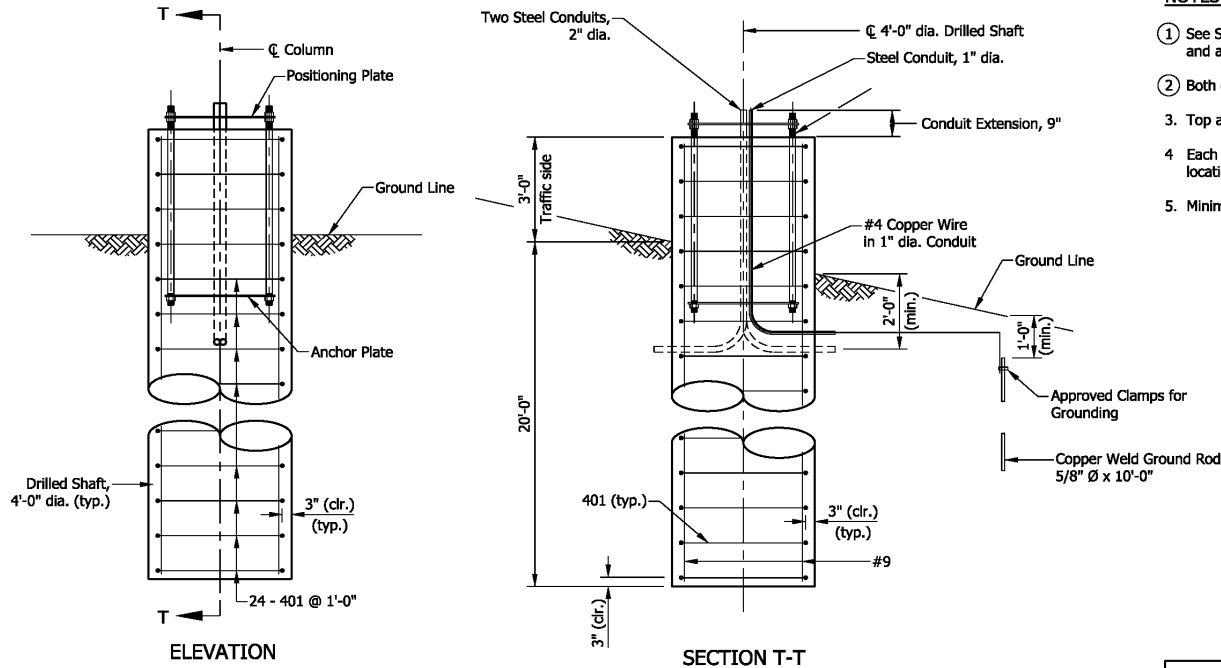
REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



NOTES:

- ① See Standard Drawing E 802-SCLS-12 for anchor and positioning plate and anchor bolt details.
- ② Both ends of steel conduit shall be threaded and capped.
3. Top and sides of foundation to the ground surface shall be sealed.
4. Each tie shall be rotated 90 degrees from previous tie to stagger lap locations.
5. Minimum concrete strength $f_c=3500$ psi.

BILL OF MATERIALS			
EPOXY-COATED REINFORCING BARS			
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
#9	18	22'-9"	
Total #9			1392 LBS
401	24	12'-0"	
Total #4			193 LBS
Total Epoxy-Coated Reinforcing Bars			1585 LBS
MISCELLANEOUS			
Concrete, Class A			10.7 CYS
Surface Seal			4.3 SYS

INDIANA DEPARTMENT OF TRANSPORTATION

SIGN CANTILEVER STRUCTURE TYPE A & B
 FOUNDATION, 36" HEIGHT

SEPTEMBER 2022

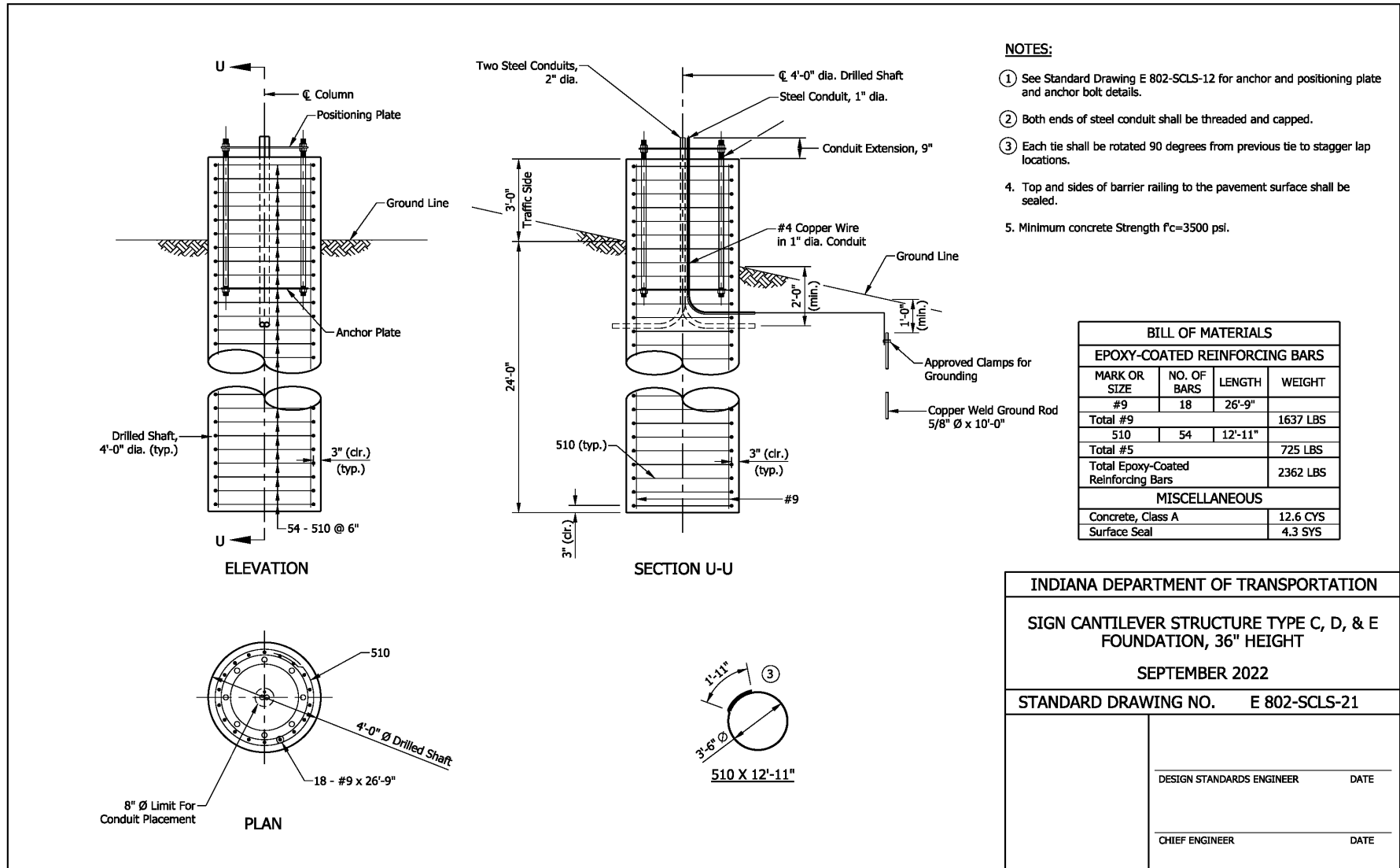
STANDARD DRAWING NO. E 802-SCLS-20

DESIGN STANDARDS ENGINEER _____ DATE _____

CHIEF ENGINEER _____ DATE _____

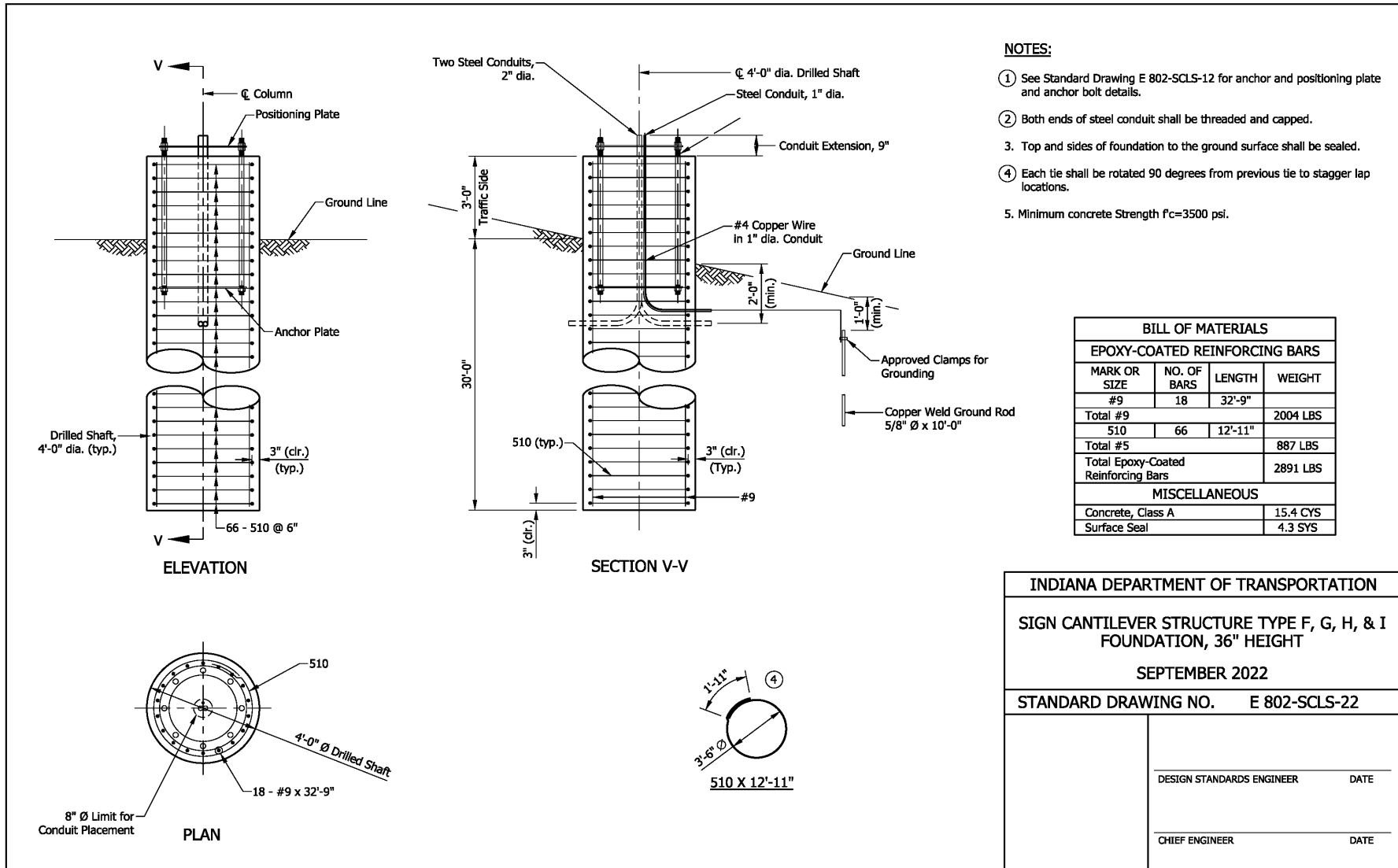
REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



REVISION TO STANDARD DRAWINGS

E 802-SCLS (-01 thru -22, proposed draft) SIGN CANTILEVER STRUCTURE



COMMENTS AND ACTION

E 802-DMSS (-01 thru -22)

E 802-SCLS (-01 thru -23)

DISCUSSION:

Mr. Boruff introduced and presented this item stating that the current standard Dynamic Message Sign and Sign Cantilever Structures are not designed per the current AASHTO LRFD code. During inspections, anchor bolt hardware is frequently found to be loose or seized out of position. Walkway handrail posts on DMS structures have failed due to freeze/thaw of water accumulating inside the post.

Mr. Boruff proposed to design the structures per latest AASHTO LRFD 2015 code, and revise the standard drawings accordingly. Mr. Boruff also proposed to add details on the proper anchor bolt hardware tightening order, "star pattern", and add a detail for drain holes in the handrail post, DMSS series, as shown illustrated above.

Mr. Pankow mentioned that some language varies between using QPL vs. Approved Products list. Mr. Boruff will have those corrected.

There was no further discussion and this item passed as submitted.

Motion: Mr. Boruff Second: Mr. White Ayes: 10 Nays: 0 FHWA Approval: YES	Action: <input checked="" type="checkbox"/> Passed as Submitted <input type="checkbox"/> Passed as Revised <input type="checkbox"/> Withdrawn
Standard Specifications Sections referenced and/or affected: Section 802.	<input type="checkbox"/> 2024 Standard Specifications <input type="checkbox"/> Revise Pay Items List <input type="checkbox"/> Create RSP (No. __) Effective: RSP Sunset Date: <input type="checkbox"/> Revise RSP (No. __) Effective: RSP Sunset Date:
Recurring Special Provision references in: NONE	<input type="checkbox"/> Create RPD (No. __) Effective:
Standard Drawing affected: E 802-DMSS (-01 thru -22) E 802-SCLS (-01 thru -23)	<input checked="" type="checkbox"/> Standard Drawings: <u>E 802-DMSS</u> and <u>E 802-SCLS</u> Effective: <u>September 1, 2022</u>
Design Manual Sections affected: NONE	<input type="checkbox"/> Create RPD (No. __) Effective:
GIFE Sections cross-references: NONE	<input type="checkbox"/> GIFE Update <input type="checkbox"/> Frequency Manual Update <input type="checkbox"/> SiteManager Update