

INDIANA DEPARTMENT OF TRANSPORTATION

100 North Senate Avenue Room N925 - CM Indianapolis, Indiana 46204 PHONE: (317) 232-5456 FAX: (317) 232-5551 Michael R. Pence, Governor Brandye L. Hendrickson, Commissioner

AGENDA

July 21, 2016 Standards Committee Meeting

MEMORANDUM

July 05, 2016

TO: Standards Committee

FROM: Scott Trammell, Secretary

RE: Agenda for the July 21, 2016 Standards Committee Meeting

A Standards Committee meeting is scheduled for 09:00 a.m. on July 21, 2016 in the N955 Bay Window Conference Room. Please enter meeting through the double doors directly in front of the conference room.

The following items are listed for consideration:

A. GENERAL BUSINESS ITEMS

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

1. Approval of the Minutes from the June 16, 2016 meeting

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

(No items on this agenda)

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

Item No. 1 (2016 SS)	Ms. Phillips pg 3
Standard Drawings:	
604-NVUF-01	NON-MOTORIZED VEHICLE USE FACILITY
	HMA PAVEMENT SECTION
604-NVUF-02	NON-MOTORIZED VEHICLE USE FACILITY
	HMA PAVEMENT SECTION ON ABANDONED
	RAILROAD CORRIDOR
610-UTMO-01	U-TURN MEDIAN OPENING
Item No. 2 (2016 SS)	Mr. Pankow pg 12
702.13(h)	Test Beams
702.14(B)	Removal
702.22	Curing Concrete
Item No. 3 (2016 SS)	Ms. Phillips pg 17
715.02	Materials
715.05	Laying Pipe
715.07	Tee and Stub-Tee Connections
715.09	Backfilling
	Backilling
715.13	Method of Measurement
715.13 715.14	
	Method of Measurement
715.14	Method of Measurement Basis of Payment
715.14 907.16	Method of Measurement Basis of Payment Thermoplastic Pipe Requirements
715.14 907.16 907.20	Method of Measurement Basis of Payment Thermoplastic Pipe Requirements Ribbed Polyethylene Pipe
715.14 907.16 907.20	Method of Measurement Basis of Payment Thermoplastic Pipe Requirements Ribbed Polyethylene Pipe Corrugated Steel Pipe and
715.14 907.16 907.20 908.02	Method of Measurement Basis of Payment Thermoplastic Pipe Requirements Ribbed Polyethylene Pipe Corrugated Steel Pipe and Pipe-Arches Polymer Precoated Galvanized
715.14 907.16 907.20 908.02	Method of Measurement Basis of Payment Thermoplastic Pipe Requirements Ribbed Polyethylene Pipe Corrugated Steel Pipe and Pipe-Arches Polymer Precoated Galvanized Corrugated Steel Culvert Pipe and
715.14 907.16 907.20 908.02 908.08	Method of Measurement Basis of Payment Thermoplastic Pipe Requirements Ribbed Polyethylene Pipe Corrugated Steel Pipe and Pipe-Arches Polymer Precoated Galvanized
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715.14 907.16 907.20 908.02 908.08 Standard Drawings Series:	Method of Measurement Basis of Payment Thermoplastic Pipe Requirements Ribbed Polyethylene Pipe Corrugated Steel Pipe and Pipe-Arches Polymer Precoated Galvanized Corrugated Steel Culvert Pipe and Pipe-Arches
715.14 907.16 907.20 908.02 908.08 Standard Drawings Series: 715-PSLC-01 THRU -03	Method of Measurement Basis of Payment Thermoplastic Pipe Requirements Ribbed Polyethylene Pipe Corrugated Steel Pipe and Pipe-Arches Polymer Precoated Galvanized Corrugated Steel Culvert Pipe and Pipe-Arches PIPE SERVICE LIFE CRITERIA

cc: Committee Members

FHWA ICI

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD DRAWINGS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: HMA Type A Mixture eliminated from Standard Specifications effective October 2016 lettings.

 $\frac{\texttt{PROPOSED SOLUTION:}}{Type \ B} \ revise \ Standard \ Drawings \ that \ call \ out \ HMA \ Type \ A \ to \ HMA$

APPLICABLE STANDARD SPECIFICATIONS: n/a

APPLICABLE STANDARD DRAWINGS: series 610-UTMO and 604-NVUF

APPLICABLE DESIGN MANUAL SECTION: n/a

APPLICABLE SECTION OF GIFE: n/a

APPLICABLE RECURRING SPECIAL PROVISIONS: n/a

PAY ITEMS AFFECTED: n/a

APPLICABLE SUB-COMMITTEE ENDORSEMENT: none

IMPACT ANALYSIS (attach report):

Submitted By: Elizabeth Phillips

Title: Standards and Policy Manager

Organization: Bridges Division

Phone Number: 232-6775

Date: June 16, 2016

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? \boldsymbol{n}

Will approval of this item affect the Approved Materials List? \boldsymbol{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? ${f n}$

Will this item improve safety:

For motorists? n

For construction workers? n

Will this proposal improve quality for:

Construction procedures/processes? n

Asset preservation? n

Design process? n

Will this change provide the contractor more flexibility? n
Will this proposal provide clarification for the Contractor and field
personnel? n

 $\underline{\text{Can this item improve/reduce the number of potential change orders?}}\ y$ Is this proposal needed for compliance with:

Federal or State regulations? n

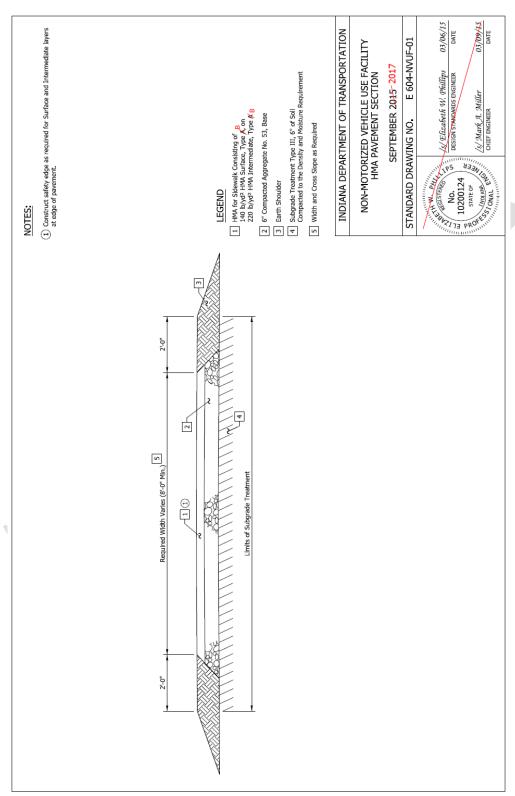
AASHTO or other design code? \boldsymbol{n}

Is this item editorial? \boldsymbol{n}

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

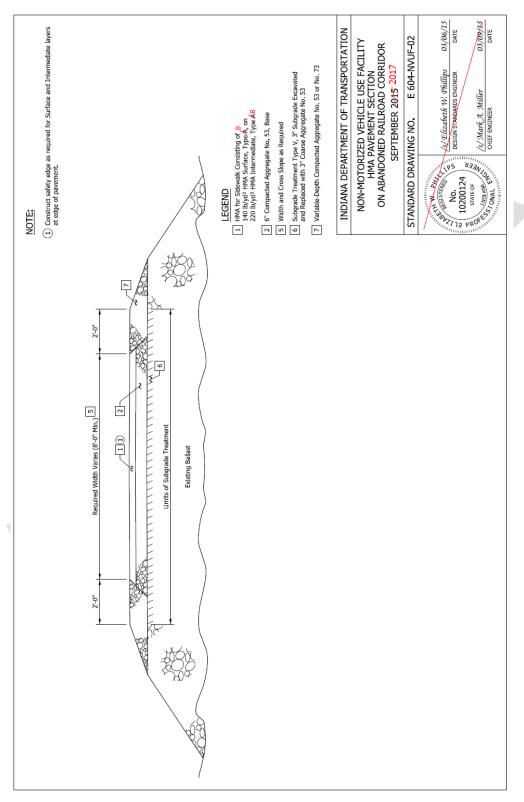
REVISION TO STANDARD DRAWINGS

604-NVUF-01 NON-MOTORIZED VEHICLE USE FACILITY HMA PAVEMENT SECTION (WITH MARKUPS)



REVISION TO STANDARD DRAWINGS

604-NVUF-02 NON-MOTORIZED VEHICLE USE FACILITY HMA PAVEMENT SECTION ON ABANDONED RAILROAD CORRIDOR (WITH MARKUPS)

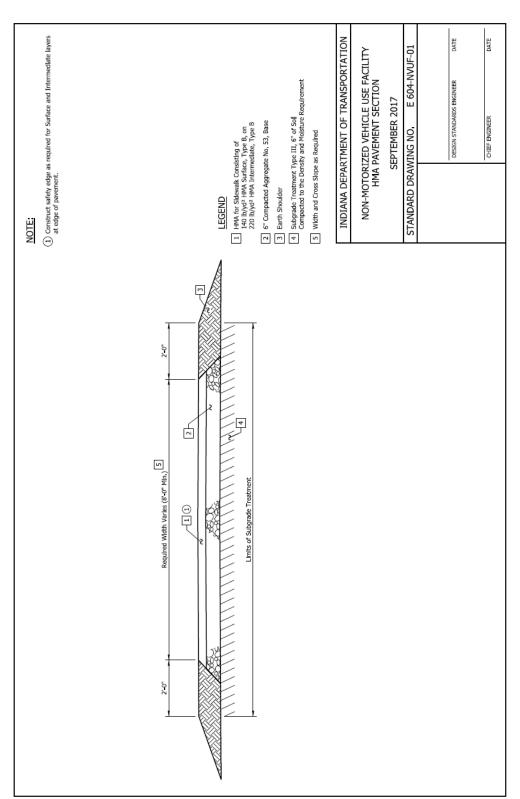


Ms. Phillips

Date: 07/21/16

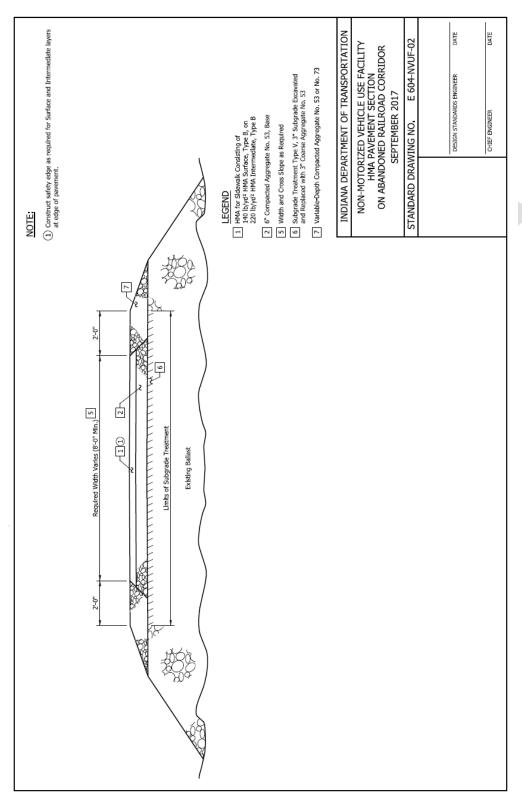
REVISION TO STANDARD DRAWINGS

604-NVUF-01 NON-MOTORIZED VEHICLE USE FACILITY HMA PAVEMENT SECTION (DRAFT)



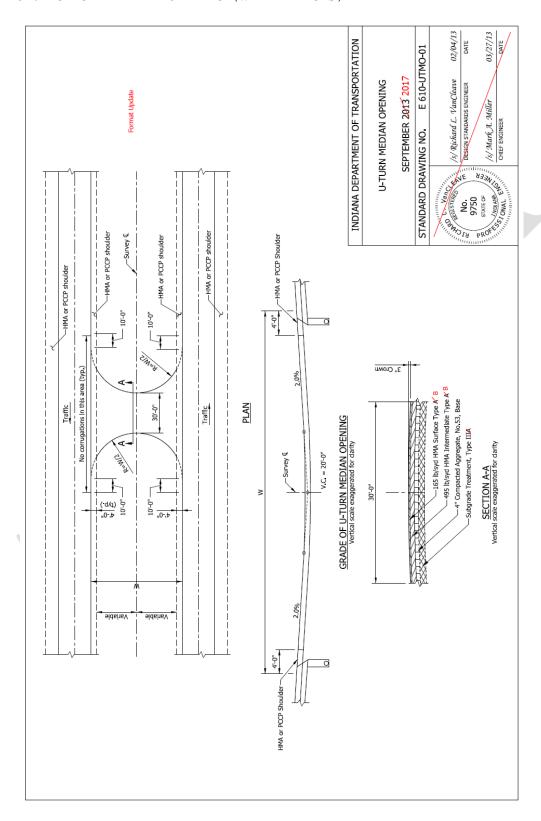
REVISION TO STANDARD DRAWINGS

604-NVUF-02 NON-MOTORIZED VEHICLE USE FACILITY HMA PAVEMENT SECTION ON ABANDONED RAILROAD CORRIDOR (DRAFT)



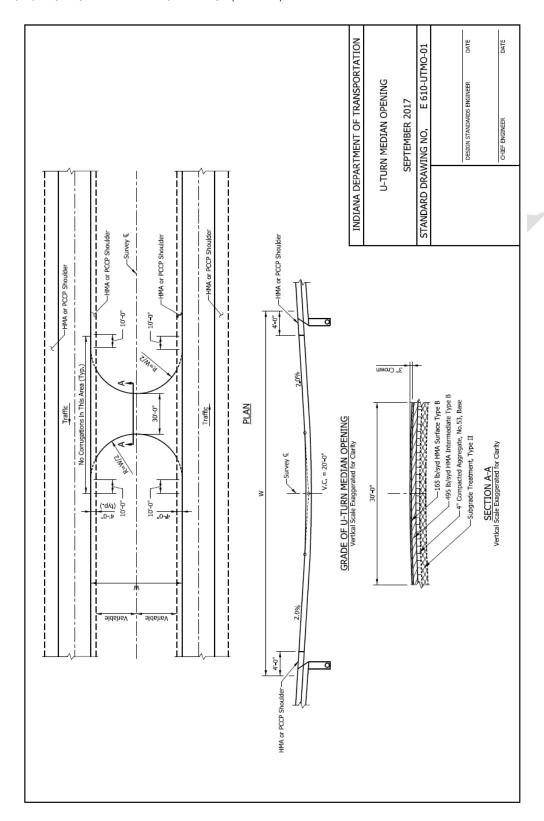
REVISION TO STANDARD DRAWINGS

610-UTMO-01 U-TURN MEDIAN OPENING (WITH MARKUPS)



REVISION TO STANDARD DRAWINGS

610-UTMO-01 U-TURN MEDIAN OPENING (DRAFT)



Ms. Phillips
Date: 07/21/16

COMMENTS AND ACTION

604-NVUF-01 NON-MOTORIZED VEHICLE USE FACILITY HMA PAVEMENT SECTION 604-NVUF-02 NON-MOTORIZED VEHICLE USE FACILITY HMA PAVEMENT SECTION ON ABANDONED RAILROAD CORRIDOR 610-UTMO-01 U-TURN MEDIAN OPENING

DISCUSSION:

Motion: Second: Ayes: Nays: FHWA Approval:	Action:	Passed as Submitted Passed as Revised Withdrawn
Standard Specifications Sections referenced and/or affected: section 604 and section 610		2018 Standard Specifications Revise Pay Items List
Recurring Special Provision affected: NONE		Create RSP (No) Effective Letting RSP Sunset Date:
Standard Drawing affected: 604-NVUF-01, -02 and 610-UTMO-01		Revise RSP (No) Effective Letting RSP Sunset Date:
Design Manual Sections affected: NONE		Standard Drawing Effective
GIFE Sections cross-references: NONE		Create RPD (No) Effective Letting GIFE Update SiteManager Update

Mr. Pankow Date: 07/21/16

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Concerns between Industry and INDOT on when falsework removal should be executed for structural concrete.

PROPOSED SOLUTION: Change the requirements of when to remove falsework for structural concrete. Requirements consist of either remain in-place duration, achievement of flexural strength, or both.

APPLICABLE STANDARD SPECIFICATIONS: 702 - Structural Concrete

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: N/A

APPLICABLE SUB-COMMITTEE ENDORSEMENT: N/A

IMPACT ANALYSIS (attach report): Yes

Submitted By: Greg Pankow

Title: State Construction Engineer

Organization: Construction Management

Phone Number: (307) 232-5502

Date: 6/20/2016

Mr. Pankow Date: 07/21/16

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? Yes
Customer satisfaction? N/A
Congestion/travel time? N/A
Ride quality? N/A

Will this proposal reduce operational costs or maintenance effort? N/A Will this item improve safety:

For motorists? N/AFor construction workers? N/A

Will this proposal improve quality for:

Construction procedures/processes? N/A

Asset preservation? N/A

Design process? N/A

Will this change provide the contractor more flexibility? Yes

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

Can this item improve/reduce the number of potential change orders? N/A Is this proposal needed for compliance with:

Federal or State regulations? N/AAASHTO or other design code? N/A

Is this item editorial? No Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda:

Mr. Pankow Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS

SECTION 702 - STRUCTURAL CONCRETE 702.13(h) TEST BEAMS

702.14(b) REMOVAL

702.22 CURING CONCRETE

The Standard Specifications are revised as follows:

SECTION 702, BEGIN LINE 758, DELETE AS FOLLOWS:

(h) Test Beams

When portland-pozzolan cement, type IP or IP-A, is incorporated into the structural concrete elements listed below, when fly ash or ground granulated blast furnace slag is incorporated into the structural concrete elements listed below, or when field operations are being controlled by beam tests, the removal of forms, supports, and housings, and the discontinuance of heating and curing will be allowed when the modulus of rupture reaches or exceeds the following values:

SECTION 702, BEGIN LINE 840, DELETE AND INSERT AS FOLLOWS:

(b) Removal

Unless otherwise specified, the following shall apply to the removal of falsework and centering:

- 1. Falsework under a reinforced concrete slab, commonly referred to as a slab top, not supported by beams, slabs or girders, interior bent or pier caps, and arches shall, in warm weather, remain in place at least 15seven days after the concrete is poured except, if directed, this period shall be increased placement and until attaining or exceeding 480 psi flexural strength. Operations on the slab may continue after achieving the required flexural strength.
- 2. Falsework under a bridge deck supported by beams or girders including the bridge deck overhang shall remain in place at least three days post concrete placement and until attaining or exceeding 480 psi flexural strength. Falsework jacks may be loosened, but not removed, and operations may continue on overhangs after three days after concrete placement and after achieving the required flexural strength. Falsework jacks may be removed after seven days.
- 3. Falsework for substructure concrete, such as interior bents and pier caps, shall remain in place at least three days following concrete placement and until attaining or exceeding 480 psi flexural strength.
- 24. Falsework and arch centering under multiple-span arch bridges shall not be released from any one span until the adjacent and spandrel walls have cured for the required time and the next adjacent arch ring has been poured for at least 48 h.

Mr. Pankow Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS

SECTION 702 - STRUCTURAL CONCRETE 702.13(h) TEST BEAMS 702.14(b) REMOVAL 702.22 CURING CONCRETE

- 35. Falsework under continuously reinforced concrete slab and girder units shall not be released from any span until the entire continuous unit has been completed and all concrete cured for the required period.
- 46. For concrete poured during March, April, October, and November, or any time between April and October when the average temperature is less than 50°F, the above periods shall be increased 20%. For concrete poured during December, January, and February, they shall be increased 40%.
- 5. If field operations are controlled by beam tests, the provisions of 702.13(h) shall apply to the time of removal of falsework unless other provisions of these specifications prohibit removal.
- 67. Removal of supports shall be such that it enables the concrete to take the stresses, due to its own weight, uniformly and gradually.
- 78. The removal of falsework shall be at the risk of the Contractor. Permission for removal may be refused if it is determined that there may be resulting damage to the structure.

SECTION 702, BEGIN LINE 1172, INSERT AS FOLLOWS:

702.22 Curing Concrete

Concrete in bridge decks or the top surface of reinforced concrete slab bridges shall be cured continuously for a minimum of 168 h commencing immediately after the surface is able to support the protective covering without deformation. Curing time for bridge decks and the top surface of reinforced concrete slab bridges are not controlled by beam tests and the cure time shall not be reduced. However, in addition to the minimum of 168 h cure period, curing shall continue until a flexural strength of 550 psi has been attained. Curing of patches or small full depth deck replacement areas on existing bridge decks that are to be overlaid, may be controlled by test beams in accordance with 702.24(a).

Unless otherwise specified, all other concrete shall be cured for at least 96 h commencing immediately after the surface is able to support the protective covering without deformation. If portland-pozzolan cement, type IP or IP-A, or fly ash is used, the concrete shall be cured for at least 120 h. *In addition to the required hours*, curing shall continue until the flexural strength stated in 702.13(h) has been attained.

Mr. Pankow Date: 07/21/16

COMMENTS AND ACTION

702.13(h) TEST BEAMS 702.14(b) REMOVAL 702.22 CURING CONCRETE

DISCUSSION:

Motion: Second: Ayes: Nays: FHWA Approval:	Action:	Passed as Submitted Passed as Revised Withdrawn
Standard Specifications Sections referenced and/or affected: 702 pg 534, 535 and 543.		2018 Standard Specifications Revise Pay Items List
Recurring Special Provision affected: NONE		Create RSP (No) Effective Letting RSP Sunset Date:
Standard Drawing affected: NONE		Revise RSP (No) Effective Letting RSP Sunset Date:
Design Manual Sections affected: NONE		Standard Drawing Effective
GIFE Sections cross-references: NONE		Create RPD (No) Effective Letting GIFE Update
		SiteManager Update

STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Requests from industry to incorporate new pipe materials. Height of cover values for reinforced concrete pipe need updating.

PROPOSED SOLUTION: Incorporate new pipe material into applicable Pipe Types (715). Specifications. New materials include spiral rib, polypropylene, and profile wall (closed). Incorporate minimum and maximum height of cover values from research (SPR-3857 Assessment of Pipe Fill Heights) into the *Standard Drawings*.

INDOT uses finite element software CANDE to determine minimum and maximum values.

APPLICABLE STANDARD SPECIFICATIONS: 715, 907, and 908

APPLICABLE STANDARD DRAWINGS: 715-PIPE, 715-PHCL, 715-PSLC

APPLICABLE DESIGN MANUAL SECTION: 203-2.02

APPLICABLE SECTION OF GIFE:

APPLICABLE RECURRING SPECIAL PROVISIONS:

PAY ITEMS AFFECTED:

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Pipe Committee

IMPACT ANALYSIS (attach report):

Submitted By: Elizabeth Phillips

Title: Standards and Policy Manager

Organization: Bridges Division

Phone Number: 232-6775

Date: June 30, 2016

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? 715, 907, 908

Will approval of this item affect the Approved Materials List? Yes Will this proposal improve:

Construction costs? yes

Construction time? NO

Customer satisfaction? no

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 construction workers? no

Will this proposal improve quality for:

Construction procedures/processes? no

Asset preservation? no

Design process? no

Will this change provide the contractor more flexibility? yes

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? 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:

Ms. Phillips
Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS
715.02 MATERIALS
715.05 LAYING PIPE
715.07 TEE AND STUB-TEE CONNECTIONS
715.09 BACKFILLING
715.13 METHOD OF MEASUREMENT
715.14 BASIS OF PAYMENT
SECTION 907 - CONCRETE, CLAY, AND PLASTIC DRAINAGE COMPONENTS
907.16 THERMOPLASTIC PIPE REQUIREMENTS
907.20 RIBBED POLYETHYLENE PIPE
SECTION 908 - METAL PIPE
908.02 CORRUGATED STEEL PIPE AND PIPE-ARCHES
908.08 POLYMER PRECOATED GALVANIZED CORRUGATED STEEL CULVERT PIPE AND
PIPE-ARCHES

(Note: Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 715 BEGIN LINE 36, DELETE AND INSERT AS FOLLOWS:

The maximum particle size of backfill material for corrugated pipe shall be less than 1/2 the corrugation depth.

(a) Type 1 Pipe

Type 1 pipe shall be used for culverts under mainline pavement and public road approaches and shall be in accordance with the following:

Clay Pipe, Extra Strength907.08
Corrugated Aluminum Alloy Pipe and Pipe-Arches908.04
Corrugated Polyethylene Pipe, Type S*
Corrugated Polypropylene Pipe*
Corrugated Steel Pipe and Pipe-Arches908.02
Non-Reinforced Concrete Pipe, Class 3907.01
Polymer Precoated Galvanized Corrugated Steel
Pipe and Pipe-Arches908.08
Profile Wall (Closed) Polyethylene Pipe*
Profile Wall (Ribbed) Polyethylene Pipe*
Profile Wall PVC Pipe*
Reinforced Concrete Horizontal Elliptical Pipe907.03
Reinforced Concrete Pipe907.02
Ribbed Polyethylene Pipe*
Smooth Wall Polyethylene Pipe*
Smooth Wall PVC Pipe*
Spiral Rib Steel Pipe908.02
Structural Plate Pipe and Pipe-Arches908.09
* All thermoplastic pipes shall be from the Department's list of approved thermoplastic pipe and liner pipe in accordance with 907.16

Ms. Phillips
Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS
715.02 MATERIALS
715.05 LAYING PIPE
715.07 TEE AND STUB-TEE CONNECTIONS
715.09 BACKFILLING
715.13 METHOD OF MEASUREMENT
715.14 BASIS OF PAYMENT
SECTION 907 - CONCRETE, CLAY, AND PLASTIC DRAINAGE COMPONENTS
907.16 THERMOPLASTIC PIPE REQUIREMENTS
907.20 RIBBED POLYETHYLENE PIPE
SECTION 908 - METAL PIPE
908.02 CORRUGATED STEEL PIPE AND PIPE-ARCHES
908.08 POLYMER PRECOATED GALVANIZED CORRUGATED STEEL CULVERT PIPE AND
PIPE-ARCHES

(b) Type 2 Pipe

Type 2 pipe shall be used for storm sewers and shall be in accordance with the following:

Clay Pipe, Extra Strength	.907.08
Corrugated Polyethylene Pipe, Type S	.*
Corrugated Polypropylene Pipe	.*
Fully Bituminous Coated and Lined Corrugated Steel	
Pipe and Pipe-Arches	.908.07
Non-Reinforced Concrete Pipe, Class 3	.907.01
Polymer Precoated Galvanized Corrugated Steel	
Pipe and Pipe-Arches Type IA and Type IIA	.908.08
Profile Wall PVC Pipe	*
Profile Wall (Closed) Polyethylene Pipe	.*
Profile Wall (Ribbed) Polyethylene Pipe	.*
Reinforced Concrete Horizontal Elliptical Pipe	.907.03
Reinforced Concrete Pipe	.907.02
Ribbed Polyethylene Pipe	*
Smooth Wall Polyethylene Pipe	.*
Smooth Wall PVC Pipe	.*
* All thermoplastic pipes shall be from the Department's list of app thermoplastic pipe and liner pipe in accordance with 907.16	proved

SECTION 715 BEGIN LINE 101, DELETE AND INSERT AS FOLLOWS:

(e) Type 5 Pipe

Type 5 pipe shall be used for broken-back pipe runs where coupled or jointed pipe is desirable and shall be in accordance with the following:

Corrugated Aluminum Alloy Pipe and Pipe-Arches	908.04
Corrugated Polyethylene Pipe, Type S	*
Corrugated Polypropylene Pipe	*
Corrugated Steel Pipe and Pipe-Arches	908.02
Fully Bituminous Coated and Lined Corrugated	
Steel Pipe and Pipe-Arches	908.07

Ms. Phillips
Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS
715.02 MATERIALS
715.05 LAYING PIPE
715.07 TEE AND STUB-TEE CONNECTIONS
715.09 BACKFILLING
715.13 METHOD OF MEASUREMENT
715.14 BASIS OF PAYMENT
SECTION 907 - CONCRETE, CLAY, AND PLASTIC DRAINAGE COMPONENTS
907.16 THERMOPLASTIC PIPE REQUIREMENTS
907.20 RIBBED POLYETHYLENE PIPE
SECTION 908 - METAL PIPE
908.02 CORRUGATED STEEL PIPE AND PIPE-ARCHES
908.08 POLYMER PRECOATED GALVANIZED CORRUGATED STEEL CULVERT PIPE AND
PIPE-ARCHES

Polymer Precoated Galvanized Corrugated Steel	
Pipe and Pipe-Arches	.908.08
Profile Wall PVC Pipe	.*
Profile Wall (Closed) Polyethylene Pipe	.*
Profile Wall (Ribbed) Polyethylene Pipe	
Ribbed Polyethylene Pipe	
Smooth Wall Polyethylene Pipe	
Smooth Wall PVC Pipe	
Spiral Rib Steel Pipe	
* All thermoplastic pipes shall be from the Department's list of app thermoplastic pipe and liner pipe in accordance with 907.16	

SECTION 715, BEGIN LINE 224, INSERT AS FOLLOWS:

715.05 Laying Pipe

Each section of pipe shall have a full firm bearing throughout its length, true to the line and grade given. All pipes which settle or which are not in alignment shall be taken up and re-laid. Pipe shall not be laid on a frozen trench bottom. Fully bituminous coated and lined corrugated *or ribbed* steel pipe and *corrugated steel* pipe-arches shall only be placed when the ambient temperature is 35°F or above.

SECTION 715, BEGIN LINE 264, INSERT AS FOLLOWS:

715.06 Joining Pipe

Band couplers for AASHTO M 36 type I and type II corrugated steel pipe and pipe-arches shall have corrugations that mesh with the corrugations of the pipe sections being joined or the annular rerolled ends of those pipe sections. Band couplers with projections or dimples may be used with pipe having either annular or helical corrugations only when corrugated band couplers will not provide a matching connection to both pipes. Band couplers for AASHTO M 36 type IA and IIA corrugated steel pipe and pipe-arches shall have corrugations that mesh with the corrugations of the pipe or shall be gasketed flat bands. Couplers for AASHTO M 36 type IR ribbed steel pipe shall be in accordance with AASHTO M 36 and the manufacturer's recommendations.

SECTION 715, BEGIN LINE 294, INSERT AS FOLLOWS:

715.07 Tee and Stub-Tee Connections

Ms. Phillips
Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

PIPE-ARCHES

SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS
715.02 MATERIALS
715.05 LAYING PIPE
715.07 TEE AND STUB-TEE CONNECTIONS
715.09 BACKFILLING
715.13 METHOD OF MEASUREMENT
715.14 BASIS OF PAYMENT
SECTION 907 - CONCRETE, CLAY, AND PLASTIC DRAINAGE COMPONENTS
907.16 THERMOPLASTIC PIPE REQUIREMENTS
907.20 RIBBED POLYETHYLENE PIPE
SECTION 908 - METAL PIPE
908.02 CORRUGATED STEEL PIPE AND PIPE-ARCHES
908.08 POLYMER PRECOATED GALVANIZED CORRUGATED STEEL CULVERT PIPE AND

At locations shown on the plans, or where directed, a stub-tee connection of the size specified shall be furnished and placed as a tee connection to corrugated *or ribbed* metal pipe, corrugated metal pipe-arch, concrete pipe, reinforced concrete pipe, or reinforced concrete horizontal elliptical pipe.

The stub-tee connection to a corrugated metal pipe, *ribbed metal pipe*, or *corrugated metal* pipe-arch shall be constructed of corrugated *or ribbed* metal and the length of the stub shall be no less than that which readily accommodates the connecting band. It shall be made by shop welding a stub of corrugated *or ribbed* metal pipe to the *respective* corrugated metal pipe or pipe-arch *or ribbed metal pipe* at the time of fabrication. Where field conditions warrant, stub-tee or other connections may be field connected by using shop fabricated saddle connectors. Welds, flame cut edges, and damaged spelter coating shall be regalvanized or painted with zinc dust-zinc oxide paint in accordance with Federal Specification TT-P-641, type II or MIL-P-21035. Where applicable, damaged bituminous coating shall be repaired with asphalt mastic in accordance with AASHTO M 243. The pipe connection to the stub shall be made by means of connecting bands of required size or by means of concrete collars as directed.

The stub-tee connection to concrete pipe, reinforced concrete pipe, or reinforced concrete horizontal elliptical pipe may be field constructed or factory constructed. The concrete used in the stub shall be of the same proportions as that used in the construction of such pipe. The length of the concrete stub shall be no less than 6 in. and no more than 12 in. The pipe connection to the concrete stub shall be made by means of a cement mortar bead or concrete collar or as directed.

SECTION 715, BEGIN LINE 348, DELETE AND INSERT AS FOLLOWS:

After the visual or video inspection, the Contractor shall check pipe deflection by performing a mandrel test for all pipes manufactured from materials listed in the following table or as otherwise directed.

PIPES REQUIRED TO BI	E MANDREL TI	ESTED	
Pipe Material	Standard Specifications	AASHTO	ASTM
Corrugated Polyethylene Pipe	907.17(b)	M 294	

Ms. Phillips Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS

715.02 MATERIALS

715.05 LAYING PIPE

715.07 TEE AND STUB-TEE CONNECTIONS

715.09 BACKFILLING

715.13 METHOD OF MEASUREMENT

715.14 BASIS OF PAYMENT

SECTION 907 - CONCRETE, CLAY, AND PLASTIC DRAINAGE COMPONENTS

907.16 THERMOPLASTIC PIPE REQUIREMENTS

907.20 RIBBED POLYETHYLENE PIPE

SECTION 908 - METAL PIPE

908.02 CORRUGATED STEEL PIPE AND PIPE-ARCHES

908.08 POLYMER PRECOATED GALVANIZED CORRUGATED STEEL CULVERT PIPE AND

PIPE-ARCHES

Ribbed Profile Wall Polyethylene Pipe	907.20		F 894
Smooth Wall Polyethylene Pipe	907.21		F 714
Profile Wall PVC Pipe*	907.22	M 304	
Smooth Wall PVC Pipe	907.23	M 278	F 679

Mandrel testing will not be required for profile wall PVC pipe in accordance with 907.22 that also is in accordance with ASTM F 949.

SECTION 715, BEGIN LINE 454, INSERT AS FOLLOWS:

715.13 Method of Measurement

The accepted quantities of circular pipe, deformed pipe, slotted drain pipe, slotted vane drain pipe, end bent drain pipe, sanitary sewer pipe, and pipe extensions will be measured by the linear foot, complete in place. The length of pipe to be measured for payment will be based on the net length of pipe used, which will be obtained by multiplying the nominal length of each pipe section by the number of sections used. If the pipe connects to manholes, inlets, or catch basins, the terminal sections will be field measured to the outside face of the structure. The length of beveled or skewed terminal sections of circular corrugated or ribbed metal pipe to be measured for payment will be the average of the top and bottom centerline lengths for beveled ends or of the sides for skewed ends. Measurement of deformed pipe will be made along the bottom centerline of the pipe.

SECTION 715, BEGIN LINE 510, INSERT AS FOLLOWS:

For structures for which the plans show pipes of differing sizes for either smooth, semi*smooth* or corrugated interiors, and *either* the *semi-smooth* corrugated interior alternate is installed, measurement of structure backfill or flowable backfill will be based on the neat line dimensions shown on the plans for the smooth interior alternate.

Grated box end sections will be measured per each for the specified type, surface slope, and pipe size.

Video inspection for pipe will be measured by the linear foot as determined by the electronic equipment.

Geotextile used to wrap backfill material will not be measured for payment.

Ms. Phillips
Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS

715.02 MATERIALS

715.05 LAYING PIPE

715.07 TEE AND STUB-TEE CONNECTIONS

715.09 BACKFILLING

715.13 METHOD OF MEASUREMENT

715.14 BASIS OF PAYMENT

SECTION 907 - CONCRETE, CLAY, AND PLASTIC DRAINAGE COMPONENTS

907.16 THERMOPLASTIC PIPE REQUIREMENTS

907.20 RIBBED POLYETHYLENE PIPE

SECTION 908 - METAL PIPE

908.02 CORRUGATED STEEL PIPE AND PIPE-ARCHES

908.08 POLYMER PRECOATED GALVANIZED CORRUGATED STEEL CULVERT PIPE AND

PIPE-ARCHES

SECTION 715, BEGIN LINE 556, DELETE AND INSERT AS FOLLOWS:

For structures for which the plans show pipes of differing sizes for entireeither smooth, semi-smooth or corrugated interiors, and either the semi-smooth the corrugated interior alternate is installed, payment for pipe backfill will be made based on the neat line dimensions shown on the plans for the smooth interior alternate.

Grated box end sections will be paid for at the contract unit price per each for the specified type, surface slope, and pipe size.

Video inspections for pipe will be paid for at the contract unit price per linear foot completed.

SECTION 907, BEGIN LINE 231, DELETE AND INSERT AS FOLLOWS:

907.16 Thermoplastic Pipe Requirements

A list of approved thermoplastic pipe and liner pipe will be maintained by the Department. The list will specify the manufacturer and thermoplastic pipe designation. All of these materials shall comply with the applicable AASHTO or ASTM requirements listed in the following table and will only be accepted from qualified manufacturers. The manufacturer is defined as the plant which produces the thermoplastic pipe. The manufacturer shall become qualified by establishing a history of satisfactory quality control of these materials as evidenced by the test results performed by the manufacturer's testing laboratory.

SUMMARY OF THERMO	PLASTIC PIPE SPE	CIFICATION	REQUIREMEN	ITS
Pipe Material	Standard Specifications	AASHTO	ASTM	Manufacturer Requirements
Corrugated Polyethylene Drainage	907.17(a)	M 252		ITM 806,
Tubing				Procedure O
Corrugated Polyethylene Pipe	907.17(b)	M 294		ITM 806, Procedure O
Corrugated Polypropylene Pipe	907.19	M 330		ITM 806, Procedure O
Perforated PVC Semicircular Pipe	907.18		D 3034	ITM 806, Procedure A

Ms. Phillips
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REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

SECTION 715 - PIPE CULVERTS, AND STORM AND SANITARY SEWERS

715.02 MATERIALS

715.05 LAYING PIPE

715.07 TEE AND STUB-TEE CONNECTIONS

715.09 BACKFILLING

715.13 METHOD OF MEASUREMENT

715.14 BASIS OF PAYMENT

SECTION 907 - CONCRETE, CLAY, AND PLASTIC DRAINAGE COMPONENTS

907.16 THERMOPLASTIC PIPE REQUIREMENTS

907.20 RIBBED POLYETHYLENE PIPE

SECTION 908 - METAL PIPE

908.02 CORRUGATED STEEL PIPE AND PIPE-ARCHES

908.08 POLYMER PRECOATED GALVANIZED CORRUGATED STEEL CULVERT PIPE AND

PIPE-ARCHES

Profile Wall PVC Pipe	907.22	M 304	F 949	ITM 806,
	, , , ,		- , .,	Procedure O
Ribbed-Profile Wall Polyethylene Pipe	907.20		F 894	ITM 806,
Ribbed 1 rojue wan 1 oryemytene 1 ipc	907.20		1 894	Procedure A
Schodulo 40 DVC Dina	907.24(b)		D 1785 or D	916,
Schedule 40 PVC Pipe	907.24(0)		2665	Type C Cert.
Smooth Wall Polyethylene Pipe	907.21		F 714	ITM 806,
Smooth wan Forgettiylene Fipe	907.21		Г/14	Procedure A
Smooth Wall DVC Ding	907.23	M 278	F 679	ITM 806,
Smooth Wall PVC Pipe	907.23	WI 278	F 0/9	Procedure A
Type DSM DVC Dine and Eittings	007.24(a)		D 3034	ITM 806,
Type PSM PVC Pipe and Fittings	907.24(a)		D 3034	Procedure A

SECTION 907, BEGIN LINE 271, DELETE AND INSERT AS FOLLOWS:

907.20 Ribbed Profile Wall Polyethylene Pipe

Pipe and fittings shall be *either closed profile or ribbed open profile* in accordance with ASTM F 894. Qualification requirements for the manufacturers shall be in accordance with ITM 806. Procedure A.

SECTION 908, BEGIN LINE 5, INSERT AS FOLLOWS:

908.02 Corrugated Steel Pipe and Pipe-Arches

Corrugated steel pipe and pipe-arches shall be type I, IA, IR, II, or IIA in accordance with AASHTO M 36.

Corrugated steel pipe, pipe-arches, and coupling bands shall be zinc coated steel or aluminum coated steel in accordance with AASHTO M 36, except as noted herein. They may be fabricated with circumferential corrugations and riveted lap joint construction or with helical corrugations *or ribs* with continuous lock or welded seam extending from end to end of each length of pipe. Reforming the ends of helical corrugated pipe to form circumferential corrugations will be allowed to enable use of circumferential corrugated coupling bands. The reforming shall be limited to the length required to accommodate the coupling bands and in such a manner that there is not appreciable slippage of the seam or a plane of weakness created.

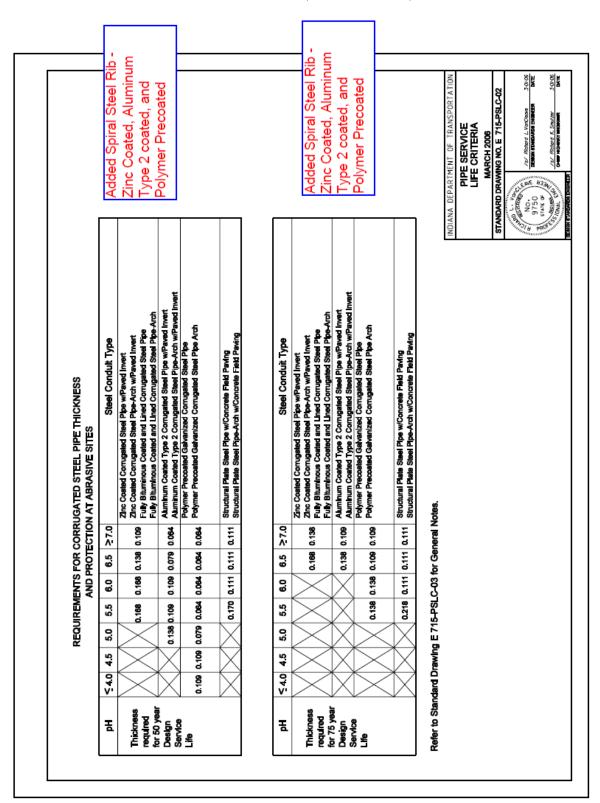
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PSLC-01 PIPE SERVICE LIFE CRITERIA (WITH MARKUPS)

	Added Spiral Steel Rib -	Zinc Coated, Aluminum	Type 2 coated, and Polymer Precoated						Added Spiral Steel Rib -	Zinc Coated, Aluminum	Polymer Precoated	INDIANA DEPARTMENT OF TRANSPORTATION	PIPE SERVICE LIFE CRITERIA	MARCH 2006 STANDARD DRAWING NO. E 715-PSLC-01	A RICHARD BACKER DATE DATE
EMENTS FOR CORRUGATED STEEL PIPE THICKNESS AND PROTECTION AT NON-ABRASIVE SITES	Steel Conduit Type	Zinc Coated Comugated Steel Pipe Zinc Coated Comugated Steel Pipe-Arch	Zinc Coated Corrugated Steel Pipe w/Paved Invert Zinc Coated Corrugated Steel Pipe-Arch w/Paved Invert Fully Bituminous Coated and Lined Corrugated Steel Pipe Fully Bituminous Coated and Lined Corrugated Steel Pipe Arch Bituminous Coated and Lined Corrugated Steel Pipe-Arch	Aluminum Coated Type 2 Corrugated Steel Pipe Aluminum Coated Type 2 Corrugated Steel Pipe-Arch	Polymer Precoated Galvanized Corrugated Steel Pipe Polymer Precoated Galvanized Corrugated Steel Pipe-Arch	Structural Plate Steel Pipe Structural Plate Steel Pipe-Arch	A LANGE TO L	Steel Conduit Type	Zinc Coated Comugated Steel Pipe Zinc Coated Comugated Steel Pipe-Arch Zinc Coated Comugated Steel Pipe wiPaved Invert	Zho Coated Comugated Steel Pipe-Arch w/Paved Invert Fully Bituminous Coated and Lined Comugated Steel Pipe	Fully Bituminous Coated and Lined Comparied Steel Pipe-Arch Alumhum Coated Type 2 Comparied Steel Pipe Alumhum Coated Type 3 Comparied Steel Pipe Alumhum Coated Type 3 Comparied Steel Disc Amst	Polymer Precoated Galvanized Corrugated Steel Pipe Polymer Precoated Galvanized Corrugated Steel Pipe-Arch	Structural Plate Steel Plpe	Structural Plate Steel Pipe-Arch	neral Notes.
ORRU	>7.0				790.0		3	D./				901.0			for Ge
RECT	6.5	0.168 0.168 0.138 0.109	0.109 0.079 0.064	0.109 0.109 0.079 0.064	.084 0.084 0.084	170 0111 0111		0.0	0.168 0.138	168 0.168 0.138 0.109	0.138 0.109	138 0.138 0.109 0.109	410	,	ဗို
NTS F	0.0	0.168	0.109	0.109	0.064	0.111		<u>0</u>	X	0.168	X	0.138	-	,	5-PS
ZEME AND	5.5	0.168	8	0.109	0.084	0.170	eline	0.0	X	0.168	X	0.138	970	2	Fed F 71
REQUIR	9.0	X	0.1380.1	0.138	0.079	0.111	Mng re	0.0	X	\times	\searrow	\searrow	(;	,	g requ rawing
œ	4.5	X	X	X	0.109 0.109 0.079 0.	0111 0111 0111 0	leid par	c 4	X	\times	\times	\geq		5	pavin dard D
	pH <4.0	X	required for 50 year Design	Service Life	0.106	0.11	Sonce	PH -4.0		required for 75 year	Service	\searrow	();	5	 Concrete field paving required Refer to Standard Drawing E 715-PSLC-03 for General Notes.

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PSLC-02 PIPE SERVICE LIFE CRITERIA (WITH MARKUPS)



INDIANA DEPARTMENT OF TRANSPORTATION

STANDARD DRAWING NO. E. 715-PSLC-03

PIPE SERVICE LIFE CRITERIA

Ms. Phillips
Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PSLC-03 PIPE SERVICE LIFE CRITERIA (WITH MARKUPS)

GENERAL NOTES

Updated format Only

- "X" entries in the table indicate that a thickness which satisfies the required design service life is not available.
- The tabulated plate thickness for Structural Plate Steel Pipe and Pipe-Arches reflects the required thickness for the top and side plates. If the tabulated plate thickness is less than 0.280 in. the bottom plates shall be of the next greater available thickness.
- Corrugated Aluminum Alloy Pipe and Pipe-Arches and Aluminum Alloy Structural Plate Pipe and Pipe-Arches are acceptable with the minimum thickness required to satisfy cover conditions for all non-abrasive sites with a structure pH≥5.0.
- 4. Corrugated Aluminum Alloy Pipe and Pipe-Arches with bituminous paved invert and Aluminum Alloy Structural Plate Pipe and Pipe-Arches with concrete field paving are acceptable with the minimum thickness required to satisfy cover conditions for all abrasive sites with a structure pH≥5.0.
- Service life criteria apply to only reinforced concrete, corrugated metal, and structural plate metal pipe. Other materials which conform to the designated pipe type and height of cover parameters are acceptable for installation.
- Service life criteria do not apply to Type 4 pipe.

6.

REQUIREMENTS FOR REINFORCED CONCRETE

PIPE PROTECTION

Pipe Slope	Minimum pl Design Ser	Minimum pH to Attain Design Service Life
	50 Year	75 Year
Less than 3%	4.0	4.5
3% to 10%	4.5	5.0
Cucaton than 100	0	2

For a structure pH lower than the minimums listed above, reinforced concrete pipe shall not be used. 7-27-99 DATE

/8/ Firoes Zandi

No. 18095 STATE OF STATE OF

(a) Anthony L. Uremovich 7-27-89
DESIGN STANDARDS ENGINEER DATE

28

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PSLC-01 PIPE SERVICE LIFE CRITERIA NON-ABRASIVE SITES (DRAFT)

NOTE:	1. See Standard Drawing E 715-PSLC-03 for General Notes.											INDIANA DEPARTMENT OF TRANSPORTATION	PIPE SERVICE LIFE CRITERIA NON-ABRASIVE SITES	SEPTEMBER 2017	STANDARD DRAWING NO. E 715-PSLC-01	DESIGN STANDARDS ENGINEER DATE	CHIEF ENGINEER DATE
	REQUIREMENTS FOR CORRUGATED STEEL PIPE THICKNESS AND PROTECTION AT NON-ABRASIVE SITES	Steel Condult Type	Zinc-Coated Corrugated and Spiral Ribbed Steel Pipe Zinc-Coated Corrugated Steel Pipe-Arch	Zinc-Coated Corrugated and Spria Ribbed Steel Pipe w/Paved Invert Zinc-Coated Corrugated Steel Pipe Acts w/Braved Invert Fully Bituminous-Coated and Lined Corrugated Steel Pipe Fully Bituminous-Coated and Lined Corrugated Steel Pipe Fully Bituminous-Coated and Lined Corrugated Steel Pipe Acts	Aluminum-Coated Type 2 Corrugated and Spiral Ribbed Steel Pipe Aluminum-Coated Type 2 Corrugated Steel Pipe-Arch	Polymer Precoated Galvanized Corrugated and Sprial Ribbed Steel Pipe Polymer Precoated Galvanized Corrugated Steel Pipe-Arch	Structural Plate Steel Pipe Structural Plate Steel Pipe-Arch		Steel Conduit Type	Zinc-Coated Corrugated and Spiral Ribbed Steel Pipe Zinc-Coated Corrugated Steel Pipe-Arch	Zinc-Coated Corrugated and Spiral Ribbed Steel Pipe w/Paved Invert Zinc-Coated Corrugated Steel Pipe Acts w/Braved Invert Fully Blummous-Coated and Lined Corrugated Steel Pipe Fully Blummous-Coated and Lined Corrugated Steel Pipe Fully Blummous-Coated and Lined Corrugated Steel Pipe Acts Pily Blummous-Coated and Lined Corrugated Steel Pipe Acts	Aluminum-Coated Type 2 Corrugated and Spiral Ribbed Steel Pipe Aluminum-Coated Type 2 Corrugated Steel Pipe-Arch	Polymer Precoated Galvanized Corrugated and Sprial Ribbed Steel Pipe Polymer Precoated Galvanized Corrugated Steel Pipe-Arch	Structural Plate Steel Pipe Structural Plate Steel Pipe-Arch			
	VTED S	7.0	0.109	0,064	0.064	0,064	0.111		7.0	0,138	0,109	0,109	0,109	0.111			
	RRUG/	6.5	0.138	0,079	620'0	0,064	0.111		6.5	0,168	0,138	0,138	0,109	0.111			
	OR CO ECTIO	0.9	0.168	0,109	0,109	0,064	0.111		0.9	X	0,168	X	0,138	0.111			
	PROT	5.5	0.168	0,109	0.109	0,064	0.170		5.5	X	0,168	\times	0.138	0.111* 0.218			
	IREME	5.0	X	0,138	0,138	0,079	0.111*		5.0	X	\times	X	X	0.111*			
	REQU	4.5	X	\times	X	0,109	0.111*	lred,	4.5	X	\times	X	X	0.111*	lred,		
		≥ 4.0	X	\times	X	0,109	0.111*	ılng requ	≥ 4.0	X	\times	\times	X	0.111*	ılng requ		
		Æ		Thickness required	for 50-year Design Service Life			* Concrete field paving required.	玉		Thickness required	for 75-year Design Service Life			 Concrete field paving required, 		

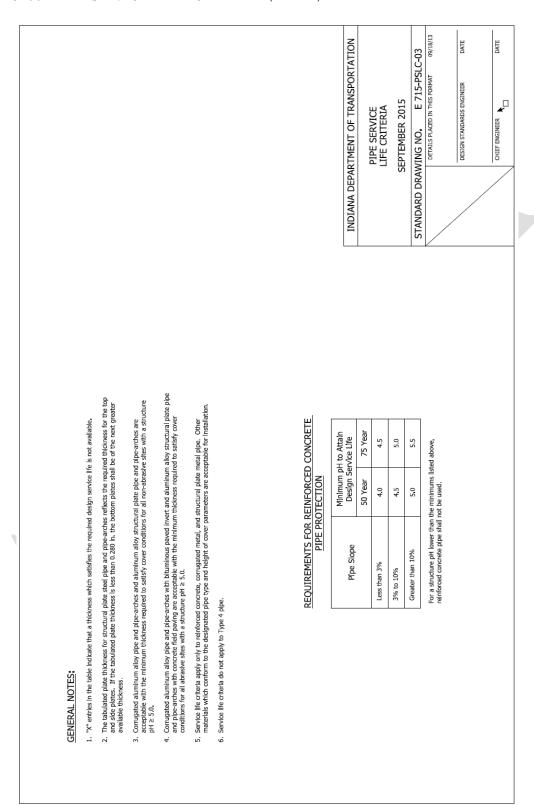
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PSLC-02 PIPE SERVICE LIFE CRITERIA ABRASIVE SITES (DRAFT)

NOTE:	1, See Standard Drawing E 715-PSLC-03 for General Notes.											INDIANA DEPARTMENT OF TRANSPORTATION	PIPE SERVICE LIFE CRITERIA ABRASIVE SITES	SEPTEMBER 2017	STANDARD DRAWING NO. E 715-PSLC-02	DESIGN STANDARDS ENGINEER DATE	CHIEF ENCINEED DATE
	IENTS FOR CORRUGATED STEEL PIPE THICKNESS AND PROTECTION AT ABRASIVE SITES	Steel Condult Type	Zinc-Coated Corrugated and Spiral Ribbed Steel Pipe w/Paved Invert Zinc-Coated Corrugated Steel Pipe-Arch w/Paved Invert Fully Bituminous-Coated and Lined Corrugated Steel Pipe Fully Bituminous-Coated and Lined Corrugated Steel Pipe-Arch	Aluminum-Coated Type 2 Corrugated Steel and Spiral Ribbed Pipe w/Paved Invert Aluminum-Coated Type 2 Corrugated Steel Pipe-Arch w/Paved Invert	Polymer Precoated Galvanized Corrugated and Sprial Ribbed Steel Pipe Polymer Precoated Galvanized Corrugated Steel Pipe-Arch	Structural Plate Steel Plpe w/Concrete Fleld Paving Structural Plate Steel Plpe-Arch w/Concrete Field Paving	Steel Conduit Type	Zinc-Coated Corrugated and Spiral Ribbed Steel Pipe w/Paved Invert Zinc-Coated corrugated Steel [Ple-Actor Myded Invert Earls Binated Corrugated Steel [Ple-Actor Myded Invert Earls Binated Corrugated Steel [Ple-Actor Myded Invert Coated Steel Invert	fully Bituminous-Coated and Lined Corrugated Steel Pipe-Arch	Aluminum-Coated Type 2 Corrugated and Spiral Kibbed Steel Pipe W/Paved Invert Aluminum-Coated Type 2 Corrugated Steel Pipe-Arch w/Paved Invert	Polymer Precoated Galvanized Corrugated and Sprial Ribbed Steel Pipe Polymer Precoated Galvanized Corrugated Steel Pipe-Arch	Structural Plate Steel Pipe w/Concrete Field Paving Structural Plate Steel Pipe-Arrh w/Concrete Field Paving	Ď.				
	ATED ST T ABRA	7.0	2 Z 0,109 Z	0,064 A	0.064 P	0,111 S	7.0	Z 0.138	-	0.109 A	0,109 P	0,111					
	DRRUG TION A	6.5	0,138	0,079	0,064	0,111	6.5	0.168		0,138	0,109	0,111					
	OR CC	6.0	0,168	0,109	0,064	0,111	6.0	\geq		X	0,138	0,111					
		5.5	0,168	0,109	0,064	0.170	5.5	\geq		X	0,138	0,218					
	REQUIREMENTS AND P	5.0	\times	0,138	0,079	X	5.0	\geq	$\sqrt{}$	\times	X	X	\				
	REOL	4.5	\times	X	0,109	X	4.5	\geq	$\sqrt{}$	X	X	X	\				
		≥ 4.0	\times	X	0,109	X	≥ 4.0	\geq		X	X	X					
		Hd	Thickness required	for 50-year Design Service Life			표		Thickness required for 75-year Design	Service Life							

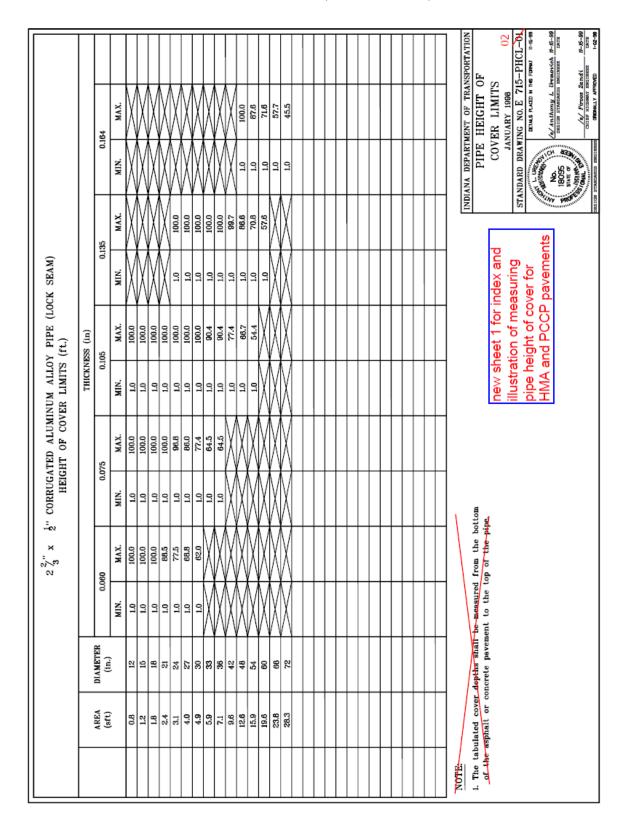
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PSLC-03 PIPE SERVICE LIFE CRITERIA (DRAFT)



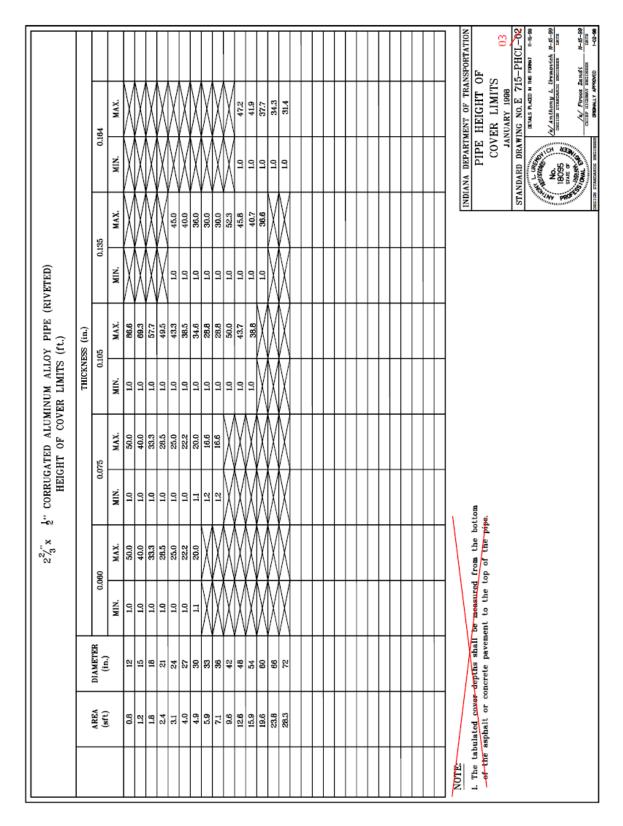
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-01 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)



REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-02 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)



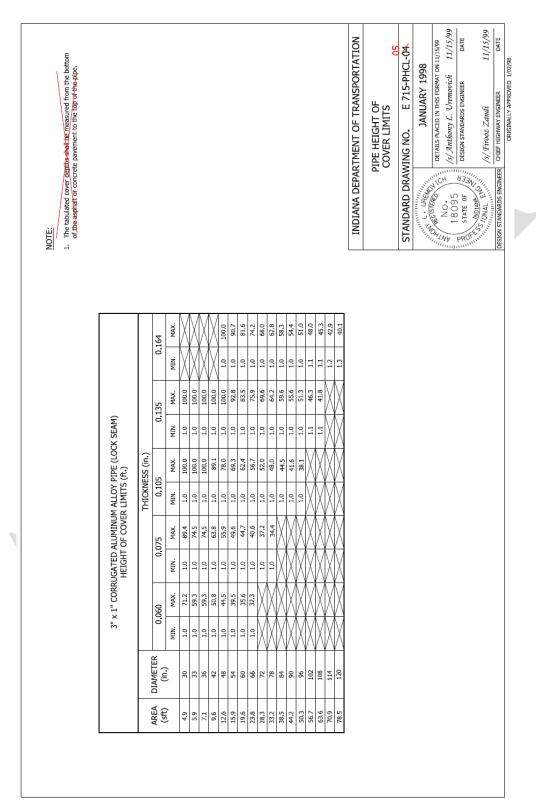
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-03 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)

Course Stray Risg Area Lib Course				2%" x	½" CORRUGATED ALUMINUM ALLOY PIPE—ARCH (RIVETED OR LOCK SEAM) HEIGHT OF COVER LIMITS (ft.)	ATED ALUN	HT OF CO	HEIGHT OF COVER LIMITS (ft.)	(ft.)	;				
1974 1975	CORNER								THICKN	SS (in.)				
1	RADIUS	SPAN (in.)	RISE (in.)	AREA (sft)	0.0	80	0.0	75	0.1	05	0.1	35	0.10	34
15 15 15 15 15 15 15 15	(in.)	Ì	Ì	6	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
14 21 15 15 15 15 15 15 15	3/35	17	13	1.1	1.5	13.7	1.5	13.7	1.5	13.7	\bigvee	\bigvee	\setminus	M
15 15 15 15 15 15 15 15	3/48	21	15	1.6	1.6	13.0	1.6	13.0	1.6	13.0	\bigvee	\mathbb{N}	\mathbb{N}	M
1,000 1,00	3/48	24	18	2.2	1.5	13.5	1.5	13.5	1.5	13.5	N	\mathbb{N}	\bigvee	\mathbb{N}
15 15 15 15 15 15 15 15	3/25	28	30	2.9	1.6	13.0	1.6	13.0	1.6	13.0	1.6	13.0	\bigvee	M
15 15 15 15 15 15 15 15	3/68	35	24	4.5	\bigvee	M	1.6	13.0	1.6	13.0	1.6	13.0	\bigvee	M
150 150	35/84	42	82	6.5	\bigvee	\bigvee	1.6	13.0	1.6	13.0	1.6	13.0	\bigvee	\mathbb{N}
15	4/98	49	33	8.9	\bigvee	\bigvee	1.6	13.0	1.6	13.0	1.6	13.0	\bigvee	\mathbb{N}
The thunked cover deglits shall be measured from the bettom of the sayle, several deglits shall be measured from the bettom of the sayle, several deglits shall be measured from the pipe. The thunked cover deglits shall be measured from the bettom of the sayle, several deglits shall be measured from the pipe. The thunked cover deglits shall be measured from the pipe. The thunked cover deglits shall be measured from the pipe. The thunked cover deglits reflect pipe-scribe with typically available corner radius allowed by AASHTO M 1906. The thunked cover deglits reflect pipe-scribe with typically available corner radius to be used, a specific design shall be performed to verify structural adequacy.	5/11	57	88	11.6	\langle	\bigvee	M	\langle	1.6	12.8	1.6	12.8	1.6	12.8
TIE. The tabilities exert depths shall be measured from the bottom of the supplies to the supplies the following a substant the following the following and the following the following the following the following the following and the following the following the following and the following and the following the following the following the following a substant the following the following the following a substant following the following a substant following a substant following a specific design shall be performed to verify structural adequacy. The tabilities is to be used, a specific design shall be performed to verify structural adequacy.	6/123	64	43	14.7	\bigvee	V	M	\bigvee	\bigvee	\bigvee	1.6	12.8	1.6	12.8
TTE. The labulated sever depths shall be measured from the bottom of the suplant or congrate—percental to flow the color of the pipe. The labulated cover the following a sale of the pipe. 34 - corner radius typically available. The labulated cover the pipe-arche with typically available cover the radius followed by ASSITO M 196. The labulated cover the pipe-arche with typically available cover the radius follower than what is to be used, a specific design shall be performed to verify structural adequacy. The labulated cover the radius follower than what is to be used, a specific design shall be performed to verify structural adequacy.	7/133	71	47	18.1	\bigvee		\setminus	\setminus	\setminus	\bigvee	\setminus	\setminus	1.6	12.9
TTE: The tabulated excet degths shall be measured from the bottom of the appliant or conscribe prevents to the pipe. Dual entries in the "Corner Radius" column, such as 3/3g, represent the following represent the following. 3g - corner radius allowed by AASHTO M 196. 3g - corner radius typically available. The tabulated cover heights readine play—arches with typically available corner radii. If a pipe-arche with typically available corner radii the performed by the structural adequacy. The tabulated cover heights readine play available corner radii the performed content radii and the performed to verify structural adequacy.														
TTE: The tabulated ever depths shall be measured from the bottom of the asphalt or concrete depths shall be measured from the bottom of the asphalt or concrete depths shall be measured from the bottom of the asphalt or concrete depths shall be performed the following: 3 - minimum corner radius typically available 3 - corner radius typically available 4 - corner radius typically available 5 - corner radius typically available 6 - corner radius typically available 7 - corner radius typically available 8 - corner radius typically available 8 - corner radius typically available 9 - corner radius typically available 10 - corner radius typically available 11 - corner radius typically available 12 - corner radius typically available 13 - corner radius typically available 14 - corner radius typically available 15 - corner radius typically available 16 - corner radius typically available 17 - corner radius typically available 18 - corner radius typically available 19 - corner radius typically available 10 - corner radius typically available 11 - corner radius typically available 12 - corner radius typically available 13 - corner radius typically available 14 - corner radius tradius tradius 15 - corner radius tradius 16 - corner radius tradius 17 - corner radius 18 - corner radius 18 - corner radius 19 - corner radius 10 - corne														
TTE: The tabulated cover depths shall be measured from the bottom The tabulated cover depths shall be measured from the bottom The tabulated cover legits shall be measured from the bottom The tabulated cover radius allowed by AASHTO M 196. 3 - minimum corner radius allowed by AASHTO M 196. 3 - minimum corner radius typically available COVER LIMITS ALANDARD DANNING DEPTHEET OF ALANDARD DANNING DEPTHEET OF ALANDARD DANNING DEPTHEET OF ALANDARD DANNING DEPTHEET OF ALANDARD DANNING DEPTHEET ALA						1	1							
TTE: The tabulated occur depths shall be measured from the bottom of the supplied to the top of the pipe. 3 - minimum corner radius typically available 3 - corner radius typically available The tabulated cover heights reflect pipe-arches with typically available corner radii of a pipe-arch with corner radii of the preformed to be used, a specific design shall be performed to verify structural adequacy.														
The tabulated cover depths shall be measured from the bottom of the asphalt or concrete percent the following: The tabulated cover depths shall be measured from the bottom of the asphalt or concrete percent the following: S														
The tabulated eaver depths shall be measured from the bottom of the asphalt or concerte percent the footom. The tabulated eaver depths shall be measured from the bottom of the asphalt or concerte percent the footome. Such as 3/3½. INDIANA DEPARTMENT OF TRANSPORT 3 — inhitum concert radius allowed by AASHTO M 196. 3 — inhitum concert radius typically available. 3 — inhitum concert radius typically available. The tabulated cover heights reflect pipe-arches with typically available occurs radii. If a pipe-arch with corner radii other than what is processed a specific design shall be performed to verify structural adequacy. International concertain adequacy.														
The tabulated cover depths shall be measured from the bottom of the asphalt or congrete perement to the pipe. Dual entries in the "Corner Radius" column, such as 3/32, represent the following: 3 — animamum corner radius allowed by AASHTO M 196. 3 — corner radius typically available. The tabulated cover heights reflect pipe-arches with typically available corner radii. If a pipe-arch with corner radii other than what is corner radii. If a pipe-arch with corner radii other than what is corner radii. If a pipe-arch with corner radii other than what is corner radii. If a pipe-arch with corner radii other than what is corner radii. If a pipe-arch with corner radii other than what is corner radii. If a pipe-arch with corner radii other than what is corner radii. If a pipe-arch with corner radii other than what is corner radii. If a pipe-arch with corner radii other than what is corner radii. If a pipe-arch with corner radii other than what is corner radii. If a pipe-arch with corner radii other than what is corner radii. If a pipe-arch with corner radii other than what is corner radii. If a pipe-arch with corner radii other than what is corner radii. If a pipe-arch with corner radii other was a precific design shall be performed to verify structural adequacy.														
TTE: The tabulated cover depths shall be measured from the bottom The tabulated cover depths shall be measured from the bottom The tabulated cover heights shall be measured from the bottom Dual entries in the "Corner Radius" column, such as 3/3½, Dual entries in the "Corner Radius" column, such as 3/3½, The tabulated cover radius showed by AASHTO M 196, 3 — minimum corner radius typically available 3 — corner radius typically available The tabulated cover heights reflect pipe-arches with typically available is to be used, a specific design shall be performed to verify structural adequacy. The tabulated cover heights reflect pipe-arches with typically available is to be used, a specific design shall be performed to verify structural adequacy. Alternation to the pipe arches are the present the properties of the pipe arches are the pip						1								
TTE. The tabulated excer depths shall be measured from the bottom of the asphalt or concrete—percent to the top of the pipe. Dual entries in the "Corner Radius" column, such as 3/3½, Dual entries in the "Corner Radius" column, such as 3/3½, S — minimum corner radius allowed by AASHTO M 196. 3 — minimum corner radius typically available. The tabulated cover heights reflect pipe—arches with typically available corner radii ther than what is corner radii to be used, a specific design shall be performed to verify structural adequacy. The tabulated cover heights reflect pipe—arches with typically available cover radii other than what is corner radii to be used, a specific design shall be performed to verify structural adequacy. The tabulated cover heights reflect pipe—arches with typically available cover radii other than what is corner radii othe														
TTE: The tabulated cover depths shall be measured from the bottom of the pipe. Dual entries in the "Corner Radius" column, such as 3/32, represent the following: 3 — minimum corner radius allowed by AASHTO M 196. 3 — minimum corner radius allowed by AASHTO M 196. 3 — minimum corner radius allowed by AASHTO M 196. 3 — minimum corner radius pipe—arches with typically available. COVER LIMITS JANUARY 1896 STANDARD DRAWING NO.E 715—PHC The tabulated cover heights reflect pipe—arch with corner radii other than what is corner radii. If a pipe—arch with corner radii other than what is going to verify structural adequacy. No. 2 Actual to be used, a specific design shall be performed to verify structural adequacy. No. 2 Actual to be used a specific design shall be measured and the properties of the properties														
The tabulated cover depths shall be measured from the bottom of the asphalt or concrete—pervenced to the top of the pipe. Dual entries in the "Corner Radius" column, such as 3/3½, represent the following: 3 — minimum corner radius allowed by AASHTO M 196. 3½ — corner radius prically available. The tabulated cover heights reflect pipe—arches with typically available cover heights reflect pipe—arches with typically available as pecific design shall be performed to verify structural adequacy. The tabulated cover heights reflect pipe—arches with typically available is to be used, a specific design shall be performed to verify structural adequacy. The tabulated cover heights reflect pipe—arches with typically available is to be used, a specific design shall be performed to verify structural adequacy.														
The tabilited sever depths shall be measured from the bottom of the applied to concrete percenced to the top of the pipe. Dual entries in the "Corner Radius" column, such as 3/3½, represent the following: 3 — minimum corner radius allowed by AASHTO M 196. 3 — minimum corner radius allowed by AASHTO M 196. 3 — corner radius typically available. The tabulated cover heights reflect pipe—arches with typically available corner radii other than what is corner radii. If a pipe—arch with corner radii other than what is typically available is to be used, a specific design shall be performed to verify structural adequacy.)TE:					\								
INDIANA DEPARTMENT OF TRANSPORT 3 - minimum corner radius allowed by AASHTO M 196. 3 - minimum corner radius typically available. 3 - corner radius typically available. COVER LIMITS JANUARY 1996 STANDARD DRAWING NO.E 715-PHC COVER LIMITS JANUARY 1996 STANDARY 1996 STANDARD DRAWING NO.E 715-PHC STANDARY 1996 STANDARY 1	The tab	ulated cover asphalt or co	depths shall	be measure reat to the	d from the b top of the pi	ottom ipe.								
INDIANA DEPARTMENT OF TRANSPORT 3 - minimum corner radius allowed by AASHTO M 196. 3 - minimum corner radius allowed by AASHTO M 196. 3 - corner radius typically available. COVER LIMITS JANUARY 1996 STANDARD DRAWING NO.E 715-PHC COVER LIMITS JANUARY 1996 STANDARD DRAWING NO.E 715-PHC COVER LIMITS JANUARY 1996 STANDARD DRAWING NO.E 715-PHC CANDON LIMITS AND LIMITS JANUARY 1996 STANDARD DRAWING NO.E 715-PHC CANDON LIMITS MAN PROPER MAN IN THE PROPER DRAWING NO.E 715-PHC CANDON LIMITS AND	Dual en	tries in the	"Corner Radi	us" column,	such as 3/3	1								
3 — minimum corner radius allowed by AASHTO M 196. 3 — minimum corner radius typically available. The tabulated cover heights reflect pipe—arches with typically available STANDARD BRAWING NO.E 715—PHC Lowerify structural adequacy. Lowerify structural adequacy.	represen	it the followi	ng:								Ž	DIANA DEPAR	TMENT OF TRA	NSDOPTATIO
The tabulated cover heights reflect pipe-arches with typically available conner radii. If a pipe-arch with corner radii other than what is conner radii. If a pipe-arch with corner radii other than what is typically available is to be used, a specific design shall be performed to verify structural adequacy.	8 E	ninimum corn corner radius	ner radius al s typically a	llowed by AA vailable.	SHT0 M 196.						[PIPF	HEIGHT	OF
The tabulated cover heights reflect pipe—arches with typically available corner radii. If a pipe—arch with corner radii other than what is conner radii. If a pipe—arch with corner radii other than what is typically available is to be used, a specific design shall be performed to verify structural adequacy.	3											S	VED LIMIT	
STANDARD DRAWING NO. E. 715-PHC LUMB RANGE NO.	The tab	ulated cover	heights refl	ect pipe-arcl	hes with typic	cally available	e					3 -	ANUARY 1998	
NO OTHER PARTO N THE FORMAT AND N THE FO	typicall	radii. II a p y available is	to be used.	n corner ra a specific o	dii otner tha: lesign shall b	e performed					S.	TANDARD DRA	WING NO.E 7	15-PHCL-8
10/Anthony L. Ibranotch Desire stranaene susinere 10/Arthony L. Ibranotch 10/Froot Zandi Outpristment susinere	to verif	y structural	adequacy.	-	,							Community of the Commun	DETALS PLACED IN	
/s/ Fivor Zandi											*ariana	No.	/s/ Anthony L.	Pemovieh #-15-5
- 1											and the same	18095 sraft of		
											-	SOME TO	CHIEF HIGHWAY	- 1

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-04 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)



REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-05 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)

AREA DIAMETER COOR COVER LUMITS (ft.)	MIN. MAX. MIN. MAX. MAX. MIN. MAX. MIN. MAX. MIN. MAX. MIN. MAX. MIN. MAX. MAX.	STANDARD DRAWING NO.E. 130-FFILL-UNG THE PROPERTY 11-15-99 A Anthony L. Livenovich 11-15-99 A Antho	KEER
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REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-06 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)

	_	_	_	_	_	_	_		_	_	_	_	 _	_	_	_	_	_	_	 _	N
	,	277	MAA.	20.8	20.9	20.8	17.1	17.3	17.1	16.9	16.5										OF S O7 5 C5 C5 C7 C6 C6 C7 C7 C7 C7 C7 C7 C7
		0.164	MIN.	11	171	1.1	1.2	1.2	1.2	1.2	1.3										DEPARTMENT OF TRANSPORTATION PIPE HEIGHT OF COVER LIMITS JANUARY 1996 DRAWING NO. E. 715-PHCL-06 TEATA FLORD N THE TORM! 1-15-20 TOWN TO THE TORM! 1-15-20 TOWN TO THE TORM! 1-15-20 TOWN TOWN THE TORM! 1-15-20 TOWN TOWN THE TORM! 1-15-20 TOWN TOWN THE TORM! 1-15-20 TOWN THE TORM! 1-15-20 TOWN THE TOW
		27.7	MAA.	20.8	20.9	20.8	17.1	17.3	17.1	16.9	\langle										STANDARD DEPARTMENT OF TRANSPORTATION PIPE HEIGHT OF COVER LIMITS JANUARY 1998 STANDARD DAWING NO.E 715—PHCL—06 STANDARD DAWING NO.E 715—PHC
SEAM)		0.135	MIIN.	1.1	171	1.1	1.2	1.2	1.2	27	\langle				+						STAN
OR LOCK	(in.)	2	MAA.	20.8	50.9	20.8	17.1	17.3	\bigvee	V.	\langle										
3" x 1" CORRUGATED ALUMINUM ALLOY PIPE-ARCH (RIVETED OR LOCK SEAM) HEIGHT OF COVER LIMITS (ft.)	THICKNESS	0.105	MIIN.	=	1.1	1.1	1.2	1.2		X.										-	
LUMINUM ALLOY PIPE-ARCH (F HEIGHT OF COVER LIMITS (ft.)		27.	MAA.	20.8	50.9	20.8	V	M	\ \ \	X X	$\langle $										
M ALLOY	alaco o	0.075	MIN.	11	1:1	1.1	V	\\	<u> </u>	$\sqrt{}$	$\langle $										
D ALUMINU HEIGH		277	MAA.	$\sqrt{}$		M	V	\ \ \	\ \ \	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	<u>}</u>										om y yr than sall be
JGATE	900	0.060	1	\ \ \	/ <u> </u>	<u> </u>	4	/ }	/ <u>\</u>	\ \	+	+	1	+	+	+	+	\perp		+	e botte pipe. 183 196. 196. ii othe sign sh
I" CORRI		NO.	WIIN.	$\langle $	\bigvee	\setminus	\bigwedge	X,	\bigvee	$\sqrt{}$											easured frem the bottom to the top of the pipe. Jumn, such as 8/18\$ I by AASHTO M 196. ble. be-arches with typically with corner radii other than with corner radii other than ed, a specific design shall be iy.
3, x	AREA	(sft)		15.6	19.3	23.2	27.4	32.1	37.0	42.4	48.0										be measurus' column, us' column, us' column, available. cct pipe-arch with be used, a lequacy.
	RISE	(in.)	ç	46	51	55	59	63	29	71	75										depths shall norete paves for a pare Radi ng. Corner Radius a ner radius a stypically beights reflerible is to tructural activations of tructural activations.
	SPAN	(in.)	e e	09	99	73	81	87	92	103	112										NOTE: 1. The tabulated cover depths shall be measured from the bottom of the asphalt or concrete parement to the top of the pipe. 2. Dual entries in the "Corner Radius" column, such as 8/18\frac{3}{4} represent the following: 8 - minimum corner radius allowed by AASHTO M 196. 18\frac{3}{4} - corner radius typically available. 3. The tabulated cover heights reflect pipe-arches with typically available corner radii. If a pipe-arch with corner radii other than what is typically available is to be used, a specific design shall be performed to verify structural adequacy.
	CORNER	(in.)	800/00	8/184	9/203	12/22 8	14/20g	14/22}	16/24 8	16/268	18/274										NOTE: 1. The tabulated cover depths shall be measured from the botton of the asphalt or concrete parement to the top of the pipe. 2. Dual entries in the "Corner Radius" column, such as 8/18\frac{3}{4} represent the following: 8 - minimum corner radius allowed by AASHTO M 196. 18\frac{3}{4} - corner radius typically available. 3. The tabulated cover heights reflect pipe-arches with typically available corner radii. If a pipe-arch with corner radii other what is typically available is to be used, a specific design shaperformed to verify structural adequacy.

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-07 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-08 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)

		0.164	MIN.	1.0	1.0	38.6 1.0 46.3	0.1	30.6 1.0 37.1	1.0	1	1.0	23.4 1.1 28.4	+	1.2 25.4									INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEIGHT OF		JANUARY 1998	E E	DETALS PLACED IN THIS FORMY 11-15-99	No. 2 Anthony L. themowich 11-15-99	VEER	1.9/ONL CALL CHEE HIGHER ENTREE DATE
ETED)		0.135	MIN.	1.0	0.1	100	1.0	1.0	1.0	1.0	1.0	= /	$\sqrt{}$	\langle			+	+													
x 1" CORRUGATED ALUMINUM ALLOY PIPE (RIVETED) HEIGHT OF COVER LIMITS (ft.)	THICKNESS (in.)	0.105	MAX.	38.7	34.4	31.0	25.8	23.8	22.1	20.6	\bigvee	$\sqrt{}$	$\sqrt{}$	\langle																	
INUM ALLO	THICKNI	0.1	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1:1	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	\langle																	
RUGATED ALUMINUM ALLOY PII HEIGHT OF COVER LIMITS (ft.)		0.075	MAX.	26.3	23.4	191	17.5	16.2	M	\bigvee	$\sqrt{}$	\bigvee_{i}	$\sqrt{}$	\langle																	
" CORRUGA		0.0	MIN.	1.0	01;	3 2	1 2	13	M	\bigvee	$\sqrt{}$	\bigvee	\bigvee	\langle									١	ottom	P						
6', x		0900	MAX.	22.2	19.7	16.1	TOT V	\bigvee	M	\bigvee	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$										measured from the bottom	to the top of the pipe						
		0.0	MIN.	1.0	= 5	2 5	P.	\bigvee	\bigvee	\bigvee	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	\langle																	
		DIAMETER (in.)	(II)	48	54	00	3 2	2.82	84	06	96	102	901	114										depths shall	oncrete paver						
		AREA (sft)	()	12.6	15.9	19.0	28.3	33.2	38.5	44.2	50.3	56.7	63.0	70.9										 The tabulated cover depths shall be 	of the asphalt or concrete pavement						
																							NOTE:	1. The ta	et the						

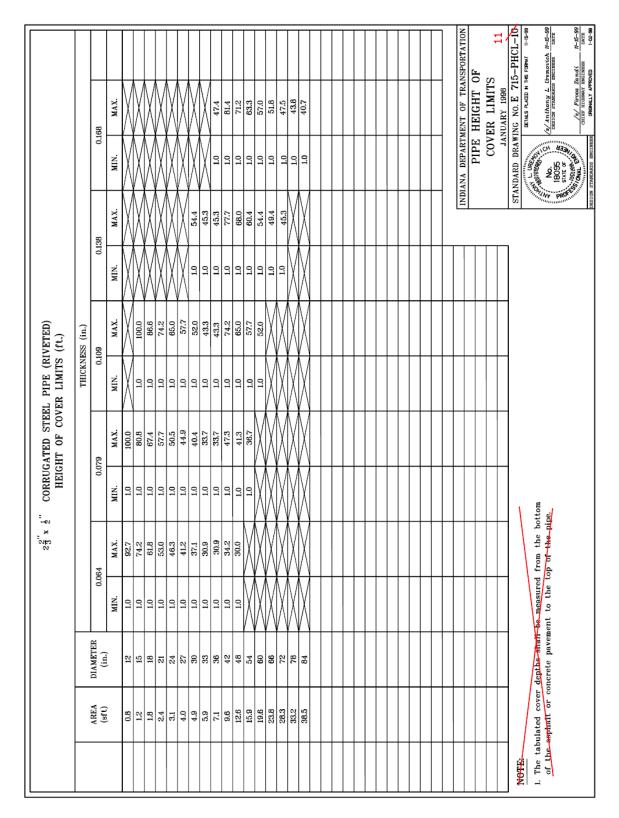
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-09 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)

x ½" CORRUGATED STEEL PIPE (LOCK SEAM) HEIGHT OF COVER LIMITS (ft.) THICKNESS (in.)	0.079 0.109 0.138 0.168	K. MIN. MAX. MIN. MAX. MIN. MAX. MIN. MAX.	00 1.0 100.0	1.0 100.0 1.0	1.0 100.0	1.0 100.0 1.0	1.0 100.0 1.0	1.0 100.0 1.0	1.0 100.0 1.0 100.0 1.0	1.0 88.7 1.0 100.0 1.0 100.0	1.0 88.7 1.0 100.0 1.0 100.0	1.0 (70.0 L.O 100.0 L.O 10	01 0001 01 828 01 10 100 01	01 020 01 020 01	10 879	79.9	07								NOTATION TRANSPORTATION	AC UNIVERSITY AND A STATE OF THE STATE OF TH	MI GENOS	COVER LIMITS	JANUARY 1998	STANDARD DRAWING NO. E. 715—PHCL—OM	ON THE STATE OF TH	9091 PE 2010 P
		MIN.	\setminus	\setminus	X	V	$\backslash\!$	\bigwedge	1.0	1.0	0.1	1.0	0.1	10	C: -	V -	X	\\			_							_				
S (ft.)	0.109	MAX.	\setminus	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	82.8	87.8		\bigvee_{k}	$\bigvee_{\mathbf{A}}$	\bigvee_{k}										_				
VER LIMIT		MIN.	$\backslash\!$	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.1	10	1.0	10		\bigvee	\bigvee	\bigvee														
TED STEE	621	MAX.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	88.7	88.7	70.0	50.1		$\sqrt{}$	$\sqrt[]{}$	\bigvee	\bigvee														
	0.0	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.1	1.0	01		\bigvee	\bigvee	\bigvee	\bigvee	(1	ttom	
	54	MAX.	100.0	100.0	100.0	100.0	100.0	94.7	85.2	71.0	71.0	69.0	3,00	$\sqrt{}$	\bigvee	\bigvee	\bigvee	\bigvee	/												measured from the bottom to the top of the pipe.	
	0.064	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		\bigvee	\bigvee	\bigvee_{V}	\bigvee	\bigvee	\													
	DIAMETER (in)	(111)	12	15	18	23	24	27	30	33	36	45		T	T			84													 The tabulated cover depths shall be of the asphalt or concrete pavement 	
	AREA (sft)	(316)	0.8	1.2	1.8	2.4	3.1	4.0	4.9	5.9	7.1	9.0	15.0	19.6	23.8	28.3	33.2	38.5													ated cover	

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-10 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)



REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-11 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)

			्र ल्लाक *	× ½" CORRU	CORRUGATED STE	EL PIPE-Al GHT OF CO	STEEL PIPE-ARCH (RIVETED OR LOCK SEAM) HEIGHT OF COVER LIMITS (ft.)	ED OR LOC (ft.)	K SEAM)				
								THICKN	THICKNESS (in.)				
(j. Re	SPAN (in.)	RISE (in.)	AREA (eft)	0.064	64	0.0	0.079	0.1	0.109	0.i	0.138	0.168	68
(::::)	(:;;)	(::::)	(318)	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
3/3}	17	13	1.1	1.5	13.7	1.5	13.7	1.5	13.7	\bigvee	\bigvee	\bigvee	\bigvee
3/4월	21	15	1.6	1.6	13.0	1.6	13.0	1.6	13.0	\bigvee	\bigvee	\bigvee	\bigvee
3/48	24	18	2.2	1.5	13.5	1.5	13.5	1.5	13.5	\bigvee	\bigvee	\bigvee	\bigvee
3/52	28	20	2.9	1.6	13.0	1.6	13.0	1.6	13.0			$\sqrt{}$	\bigvee
3/68	8 8	24	4.5	1.6	13.0	1.6	13.0	1.6	13.0	1.6	13.0	٤	055
4/99	49	3 8	8.9		No.	1.6	13.0	1.6	13.0	1.6	13.0	1.6	13.0
5/11	25	38	11.6	\bigvee	\bigvee	\bigvee	\bigvee	1.6	12.8	1.6	12.8	1.6	12.8
6/128	64	43	14.7	\bigvee	\bigvee	\bigvee	\bigvee	1.6	12.8	1.6	12.8	1.6	12.8
7/133	7.1	47	18.1	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	1.6	12.9	1.6	12.9
8/158	7.7	25	21.9	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	1.6	13.0
9/16	83	57	26.0	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\setminus	1.5	13.2
													Ī
NOTE:													
1. The t of th	abulat ed sow sasphalt or	er depths sh concrete pay	all be measu verment to th	1. The tabulated eaver depths shall be measured from the bottom of the asphalt or concrete pavement to the top of the pipe.	bottom pipe.								
2. Dual	2. Dual entries in the "Corner Radius"	e "Corner Ra		column, such as 3/3½,	.; 3-,					Ľ	DIANA DEPAR	FMENT OF TRA	INDIANA DEPARTMENT OF TRANSPORTATION
repres	represent the following:	wing:	allowed by	present the following:						1	PIPE	PIPE HEIGHT OF	OF
3,1	$3\frac{1}{2}$ corner radius typically available.	us typically	ariowed by available.	AASHIO M SO							00	COVER LIMITS	
1											ľ	JANUARY 1998	12
3. The t	3. The tabulated cover heights reflect	er heights re	ellect pipe-a	The tabulated cover heights reflect pipe-arches with typically	pically					Š	TANDARD DRA	WING NO.E 7	STANDARD DRAWING NO. E 715-PHCL-IN
than	avanable corner radir. II a pipe-al than what is typically available is	cally availab	lpe-arch with	to be used, a specific design	ic design						MAN L UREN	DETALS PLACED IN	DETALS PLACED IN THIS FORMAT 11-15-99
shall	shall be performed to verify structural adequacy.	to verify s	tructural ad	equacy.						ainm	No.	/s/ Anthony L.	(s/Anthony L. Uremovich 11-15-99
										inimin.	SIATE OF STATE OF		
											S/ONAL EN	/s/ Firoz Zandi	-
										DEST	DESIGN STANDARDS ENGINEES		PROVED 1-02-98

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-12 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)

		0.168	MAX.	V	V		100.0	100.0	100.0	100.0	96.5	90.1	84.4	79.5	75.1	71.1	67.5	64.3	61.4	58.7	56.3						INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEIGHT OF	COVER LIMITS	JANUARY 1998	15-PHC	DETALS PLACED IN THIS FORMAT 11-15-99	2 /e/ Anthony L. Uremovich 11-15-99 DESIGN STANDARDS ENGINEER DATE	1	CHIEF HIGHWAY ENCINEER
			MIN.	\backslash	X	\setminus	1.0	1.0	1.0	0.1	9	1.0	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.4	1.5						IANA DEPA	PIP	ŏ		ANDARD DR	ON THE	oN o	STATE OF STA	AND AND THE PERSON
		38	MAX.	\mathbb{N}	100.0	100.0	100.0	100.0	100.0	92.0	78.8	73.6	0.69	64.9	61.3	58.1	55.2	52.5	50.2	48.0	\bigvee						INI				SI	744	Ay (Romin	
Q		0.138	MIN.	\bigvee	1.0	1.0	1.0	1.0	1.0	0,1	1.0	1.0	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.4	\setminus														
(LOCK SEAM) (ft.)	SS (in.)	6(MAX.	M	100.0	100.0	95.3	85.8	78.0	71.5	61.2	57.2	53.6	50.4	47.6	45.1	42.9	\bigvee	\bigvee	\bigvee	\bigvee														
	THICKNESS (in.)	0.109	MIN.	M	1.0	1.0	1.0	1.0	1.0	0,1	0.1	1.0	1.0	1:1	1:1	1.2	1.3	V	\bigvee	\bigvee					†			1							
CORRUGATED STEEL PIPE (LOC HEIGHT OF COVER LIMITS (ft.)		6.	MAX.	M	87.4	76.5	68.0	61.2	55.6	51.0	43.7	40.8	38.2	36.0	M	\setminus	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee														
x 1" CORR HEIGI		0.079	MIN.	M	1.0	1.0	1.0	1.0	1.0	0.1	0.1	1.0	1.0	1.1	M		\bigvee	V		\bigvee	\bigvee							1				mo t			
3,		4	MAX.	81.5	68.9	61.1	54.3	48.9	44.5	40.7	34.9	32.6	M	M	M		\bigvee	\bigvee	\bigvee	\bigvee	\bigvee											from the het	to the top of the pipe.		
		0.064	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	0 2	01	1.0	M	M	M		N	M	\bigvee		\bigvee				\dagger			\dagger				1 The tehnleted owner deaths that messured from the hottom	nt to the to		
		DIAMETER (in.)		36	42	48	54	09	99	27 8%	84	06						126			Ī				†		1	†				lont ho share	of the asphalt or concrete pavement		
		AREA (sft)		7.1	9.6	12.6	15.9	19.6	23.8	28.3	38.5	44.2	50.3	56.7	63.6	70.9	78.5	9.98	95.0	103.9	113.1				\dagger			+				b revoc bete	phalt or con		
																															NOTE	The tabil	of the as		

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-13 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)

NOTE:	AREA (sft) (7.1 2.6 15.9 18.5 28.3 33.2 38.5 56.7 56.3 66.6 68.6 68.6 68.6 68.6 113.1 113.1 113.1 113.1	AREA DIAMETER 0.0064 (st) (in) MIN. MAX. M	0.064 MIN. 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	MIN. MAX. 1.0 45.5 1.0 45.5 1.0 39.8 1.0 38.4 1.0 28.3 1.0 28.5 1.0 28.5 1.0 28.5 1.0 28.5 1.0 28.7 1.1 21.2 1.0 28.5 1.0 22.7 1.1 21.2 1.0 28.5 1.0 22.7 1.1 21.2 1.0 28.5 1.0 22.7 1.1 21.2 1.0 22.7 1.1 21.2 1.0 22.7 1.1 21.2 1.0 22.7 1.1 21.2 1.0 22.7 1.1 21.2 1.0 22.7 1.1 21.2 1.0 22.7 1.1 21.2 1.0 22.7 1.1 21.2 1.0 22.7 1.1 21.2 1.0 2.2 2.7 1.1 21.2 1.0 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2		1" CORRUGATED STEEL PIPE (RIVETED) HEIGHT OF COVER LIMITS (ft.) THICKNESS (in.) 0.079 0.079 0.079 0.079 0.079 1.0 56.6 1.0 84.1 1.0 38.6 1.0 73.6 1.0 38.0 1.0 73.6 1.0 38.0 1.0 45.2 1.0 38.0 1.0 48.0 1.0 24.7 1.0 36.8 1.1 32.3 1.1 34.6 1.1 23.3 1.1 32.7 1.2 38.9 1.1 32.7 1.3 29.4 1.4 23.3 1.1 32.7 1.5 28.4 1.0 36.8 1.1 23.3 1.1 32.7 1.2 38.9 1.3 29.4	THICKNESS (in.) THICKNESS (in.) THICKNESS (in.) AIN. MIN. MAA MIN. MAA 1.0 65. 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1	SS (in.) SS (in.) SS (in.) MAX. MAX. 84.1 73.6 65.4 58.8 53.5 49.0 45.2 42.0 39.2 30.9 29.4 29.4	0.138 WIN. 1.0 1.0 1.0 1.0 1.0 1.1 1.1 1.1 1.3 1.3 1.3 1.3 1.3 1.3 1.3	MAX. MAX. 100.0 10	NIN. 10 10 10 10 10 10 10 1	NAN. MAX. MAX.	PONTATION F 14 PHCL—18 FORM 11-15-39 FORM 11-15-39 FORM 11-15-39 FORM 11-15-39
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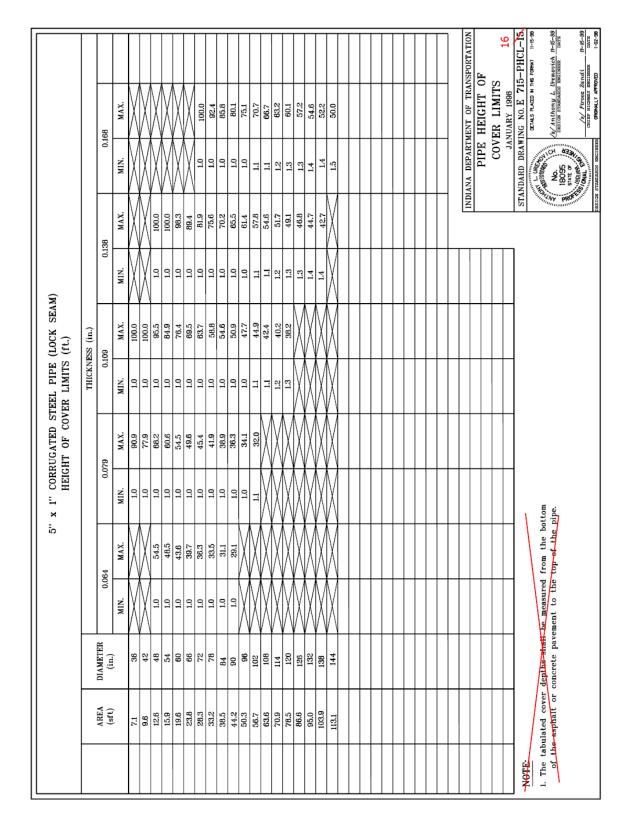
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-14 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)

		0.168	MAX.	20.8	50.9	20.8	17.1	17.3	17.1	16.9	16.0	16.9	16.0	16.3						INDIANA DEPARTMENT OF TRANSPORTATION PIPE HEIGHT OF COVER LIMITS JANUARY 1998 STANDARD DRAWING NO.E 715-PHCL-NA DRAWING NO.E 715-99 DRAWING N
			MIN.	1.1	1.1	11	1.2	1.2	175	7.2	3 6	13	13	1.3						PIPE HEIGHT OF TRANSF PIPE HEIGHT OF COVER LIMITS JANUARY 1998 DRAWING NO. E 715— ETAS PLANT NO. INC. INC. INC. INC. INC. INC. INC. INC
		38	MAX.	80.8	20.9	20.8	17.1	17.3	17.1	16.9	16.9	16.2	16.0							INDIANA DEPAI PIP CC CC STANDARD DR. No. SIROS BIROS B
0		0.138	MIN.	1.1	1.1	1.1	1.2	1.2	1.2	27.	3 6	13	1.3							
LOCK SEAM	S (in.)		MAX.	20.8	50.9	20.8	17.1	17.3	17.1	16.9	16.9		$\sqrt{}$	\bigvee						
/ETED OR (ft.)	THICKNESS (in.)	0.109	MIN.	1.1	11	1.1	1.2	1.2	1.2	27 5	1.0		$\sqrt{}$							
3" x 1" CORRUGATED STEEL PIPE-ARCH (RIVETED OR LOCK SEAM) HEIGHT OF COVER LIMITS (ft.)		6	MAX.	20.8	50.9	20.8	17.1	17.3	17.1	$\langle \rangle$	$\langle \rangle$	$\sqrt{}$	$\sqrt{}$							
STEEL PIPE HT OF COV		0.079	MIN.	1.1	11	1.1	1.2	1.2	1.2	$\langle \rangle$	$\langle \rangle$	$\sqrt{}$	$\sqrt{}$							
RUGATED S		_	MAX.	M	M	\bigvee	M	M		$\langle \rangle$	$\langle \rangle$	$\sqrt{}$								bottom pipe. 3/183. i other c design
" x 1" COR		0.064	MIN.	\bigvee	M	\bigvee	\bigvee			$\langle \rangle$	$\langle \rangle$	$\sqrt{}$								NOTE: 1. The tabulated cover depths shall be measured from the bottom of the asphalt or concrete pavement to the top of the pipe. 2. 2. Dual entries in the Corner Radius, column, such as 8/18\frac{3}{4}. represent the following: 8 - minimum corner radius allowed by AASHTO M 36. 18\frac{3}{4} - corner radius typically available. 3. The tabulated cover heights reflect pipe-arches with typically available corner radii. If a pipe-arch with corner radii other than what is typically available is to be used, a specific design shall be performed to verify structural adequacy.
ဂ		AREA (sft)	<u> </u>	15.6	19.3	23.2	27.4	32.1	37.0	42.4	48.0	80 F	67.4	74.5						TFE. The tabulated cover depths shall be measured from the of the asphalt or concrete pavement to the top of the 2. Dual entries in the Corner Radius, column, such as represent the following: 8 - minimum corner radius allowed by AASHTO M 36, 184 - corner radius typically available. The tabulated cover heights reflect pipe-arches with ty available corner radii. If a pipe-arch with corner radii than what is typically available is to be used, a specifi shall be performed to verify structural adequacy.
		RISE (in.)	Ì	46	51	55	28	63	67	71	202	8	87	16						NOTE: 1. The tabulated cover depths shall be of the asphalt or concrete pavement of the asphalt or concrete pavement represent the following: 8 - minimum corner radius allowing: 8 - corner radius typically available corner radius typically available corner radii. If a pipe-anthan what is typically available is shall be performed to verify struct
		SPAN (in.))	09	99	73	81	87	95	103	117	128	137	142						TRE. The tabulated cover depoint to concer of the asphalt or concer represent the following: 8 - minimum corner 184 - corner radius to the tabulated cover hei available corner radii. The tabulated to ver radii.
		Re (in.)	<u> </u>	8/183	9/203	12/22 8	14/208	14/22}	16/24	16/268	18/201	18/314	18/33	18/343						NOTE: 1. The te 2. 2. Dua repress 8 - 8 - 184 3. The ta availat than y

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-15 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)



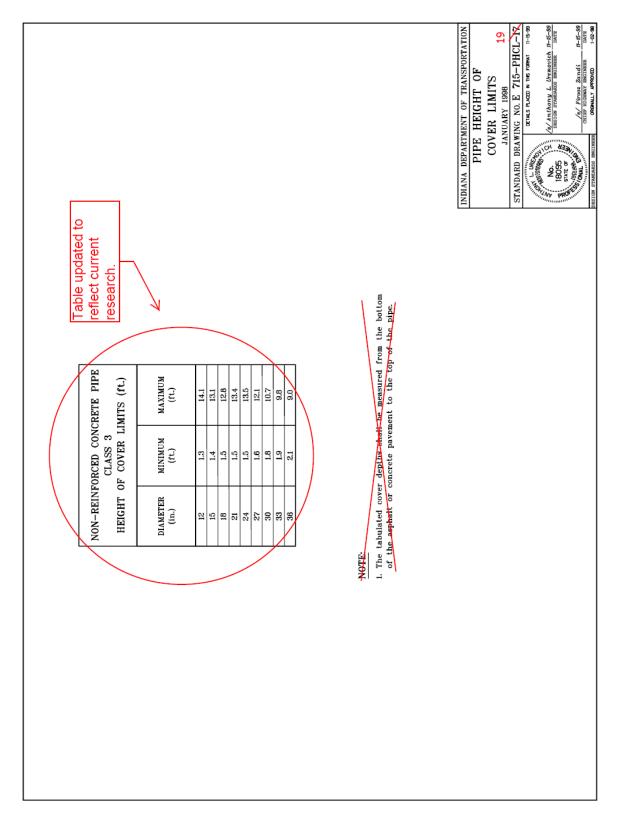
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-16 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)

		0.168	. MIN. MAX.	V V			1.2 17.1	1.2	1.2	1.2	1.3	1.2	1.3	1.3	16.3						INDIANA DEPARTMENT OF TRANSPORTATION PIPE HEIGHT OF COVER LIMITS JANUARY 1998 STANDARD DRAWING NO. E 715-PHCL-18. A Anthony L themoster in-6-99 TO Anthony
		0.138	MIN. MAX.	1.1 20.8			1.2 17.1				+	+	1	1.3	1			<u> </u>			STANDARD DRAG INDIA STANDA
			M	1	_	1	1	-	_	_	_			1	V				╧		
SEAM)	THICKNESS (in.)	0.109	MAX.	20.8	50.9	20.8	17.1	17.3	17.1	16.9	16.5	16.8	$\sqrt{}$	$\sqrt{}$	\langle						
SCH (LOCK (ft.)	THICKN	0.1	MIN.	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.2	$\sqrt{}$	$\sqrt{}$	\langle						
1" CORRUGATED STEEL PIPE-ARCH (LOCK SEAM) HEIGHT OF COVER LIMITS (ft.)		0.079	MAX.	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	\langle						
SATED STE		0.0	MIN.	\setminus	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	\langle						
1" CORRUI HEIC		34	MAX.	M	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	\langle						ottom ipe. 3. 3. 3. 4. 5. 5. 6. 6. 6. 6. 6. 7. 6. 7. 6. 7. 6. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7.
2, x		0.064	MIN.	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	\langle						NOTES: 1. The tabulated cover depths shall be measured from the bottom of the asphalt or concrete percental to the top of the pipe. 2. Dual entries in the "Corner Radius" column, such as 8/18\frac{2}{3}, represent the following: 8 - minimum corner radius allowed by AASHTO M 36. 18\frac{2}{3} - corner radius typically available. 3. The tabulated cover heights reflect pipe-arches with typically available corner radii. If a pipe-arch with corner radii other than what is typically available is to be used, a specific design shall be performed to verify structural adequacy.
		AREA (sft)	(2.5)	15.6	19.3	23.2	27.4	32.1	37.0	42.4	48.0	54.2	60.5	67.4	74.5						TTES: The tabulated cover depths shall be measured from the of the asphalt or concrete percuest to the top of the bual entries in the "Corner Radius" column, such as 8/represent the following: 8 - minimum corner raduis allowed by AASHTO M 36. 18\$\frac{1}{2}-\text{ corner radius typically available.} The tabulated cover heights reflect pipe-arches with ty available corner radii. If a pipe-arch with corner radii than what is typically available is to be used, a specificaball be performed to verify structural adequacy.
		RISE (in.)		46	51	55	59	63	67	7.1	75	29	83	87	91						TES: The tabulated cover depths shall be moof the asphalt or concrete pavement to bual entries in the "Corner Radius" corpresent the following: 8 - minimum corner raduis allowed 183- corner radius typically available The tabulated cover heights reflect pip available corner radii. If a pipe-arch than what is typically available is to shall be performed to verify structural
		SPAN (in.)	<u></u>	90	99	73	81	87	35	103	112	117	128	137	142						TTES: The tabulated cover dep of the asphalt or concrete the asphalt or concrete the following: 8 - minimum corner: 184- corner radius ty The tabulated cover heig available corner radii. than what is typically shall be performed to version of the corner radii.
		Re (in.)		8/183	9/203	12/22}	$14/20\frac{7}{8}$	$14/22\frac{5}{8}$	16/24 8	16/268	18/274	18/292	18/314	18/33	18/344						NOTES: 1. The tabu of the as constant represent 8 - mi 183 - c 3. The tabu available than who shall be

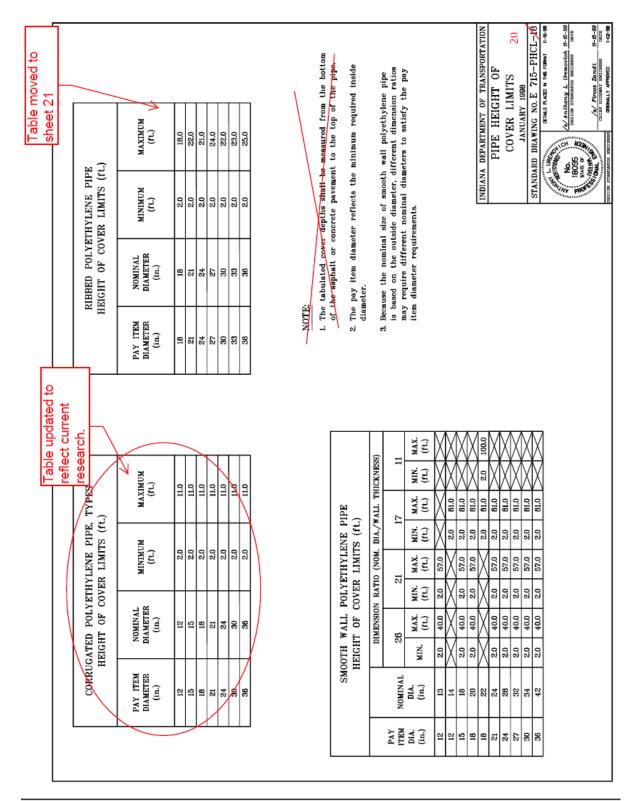
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-17 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)



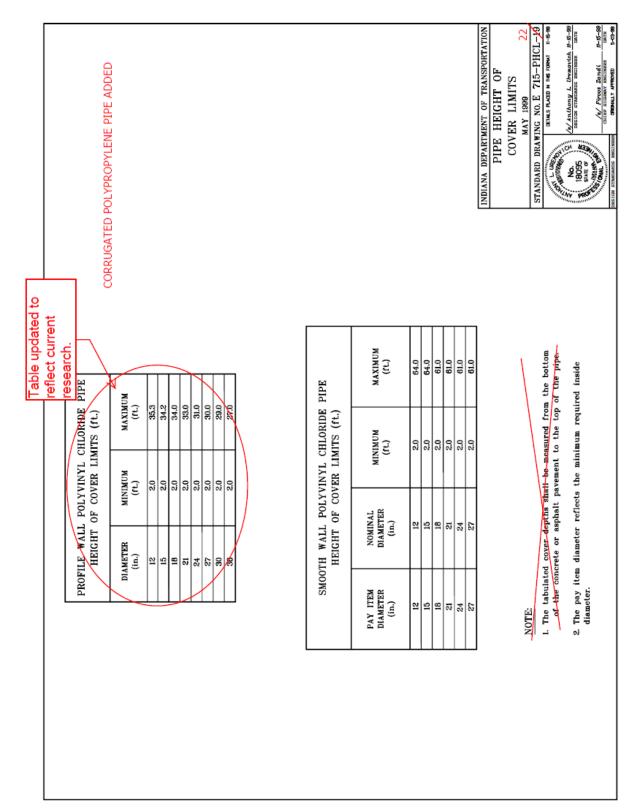
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-18 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)



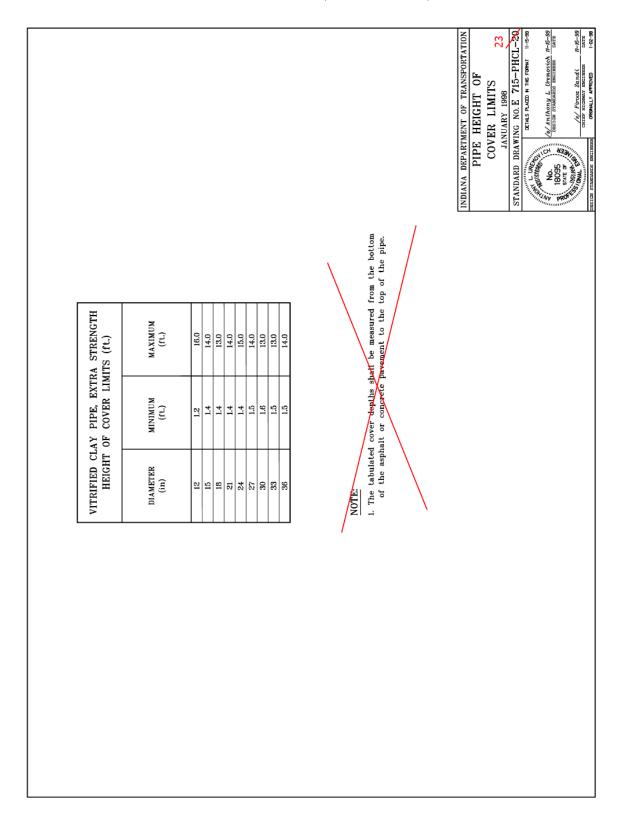
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-19 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)



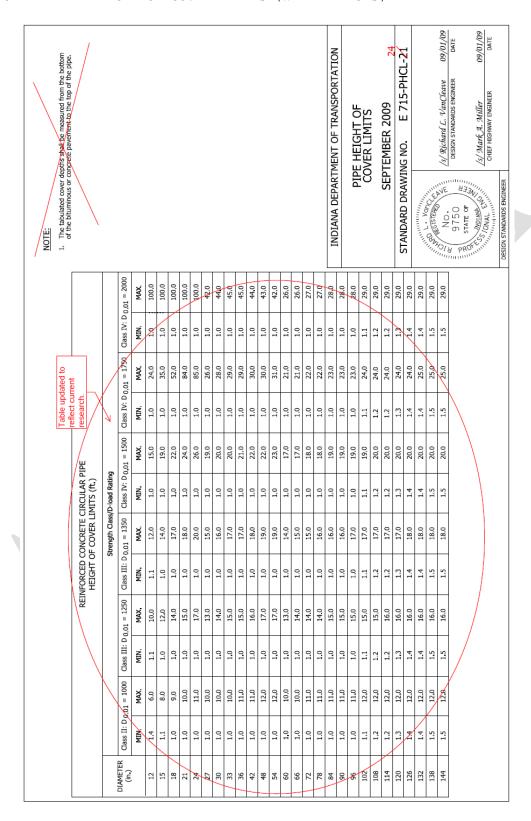
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-20 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)



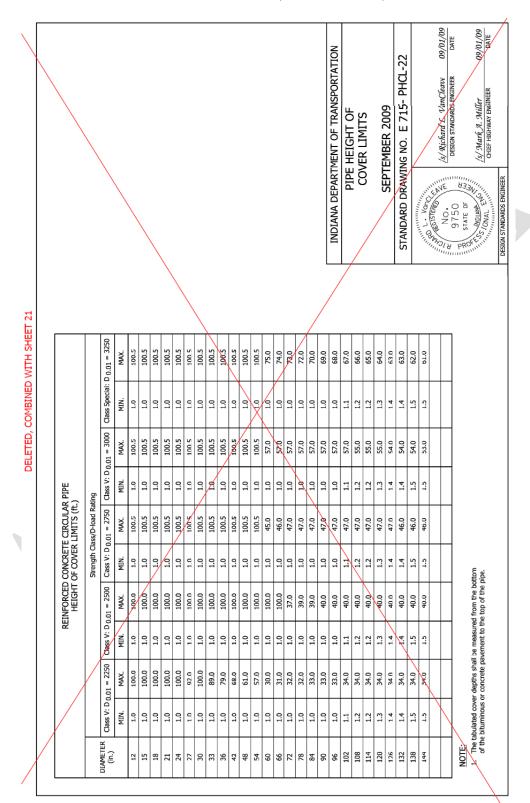
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-21 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)



REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-22 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)



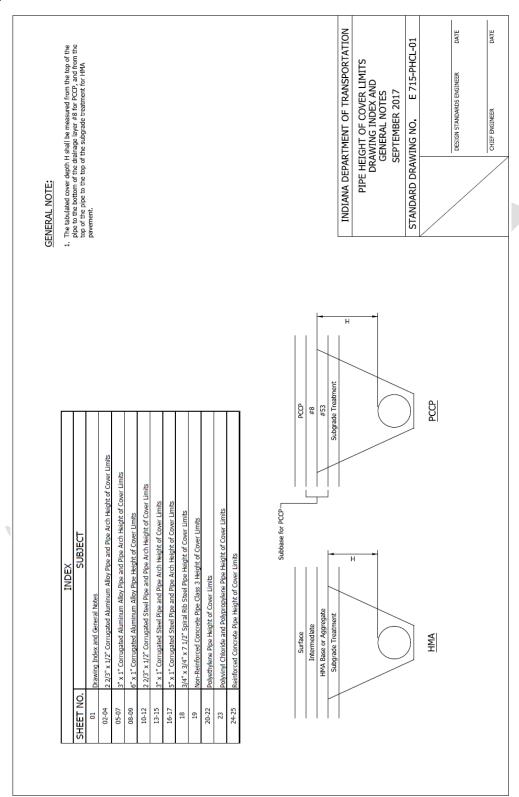
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-23 PIPE HEIGHT OF COVER LIMITS (WITH MARKUPS)

		_		_			_	_			_					_	_	_	_	_	_	_				 _	_	STATION		75	3	ICL-K3	ch 11-15-9	R DATE	#-15-99
		D 0.01 = 2000	MAX.	100.0	47.0	48.0	49.0	20.0	45.0	45.0	26.0	27.0	28.0	29.0	29.0	29.0	30.0	30.0	30.0	30.0	31.0	310	31.0	31.0				OF TRANSPOI	HT OF	SLIMI	1998	IG NO.E 715-PHO	/s/ Anthony L. Cremovich 11-15-99	STANDARDS ENGINEE	/8/ Firooz Zandi Chirp highway engineer
		Class HE-IV:]	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.3	4.1	C1 :	1.0	1.8	1.9				INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEIGHT OF	COVER LIMITS	JANUARY 1998	KAWIN -	arriver CH	EER	V.
			MAX.	20.0	16.0	17.0	18.0	19.0	19.0	19.0	15.0	15.0	16.0	16.0	17.0	17.0	17.0	18.0	18.0	18.0	18.0	19.0	19.0	19.0				INDIANA D				STANDARD	O September 1	18095 STATE OF	SONAL
		Class HE-III: $D_{0.01} = 1350$	MIN.	1.0	1.0	1.0	1.0	1.0	0.1	0.1	2 2	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.3	4:1;	0 1	6.1	1.8	1.9											
ELLIPICAL PIPE (ft.)	D-load Rating	ı	MAX.	11.0	10.0	11.0	11.0	12.0	12.0	12.0	10.0	10.0	11.0	11.0	12.0	12.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0	13.0											
	Strength Class/D-load Rating	Class HE-II: D 0.01 = 1000	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	0.1	100	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.3	4:1	C .	6.1	1.8	1.9											
D CONCRETE HORIZONTAL ELLI HEIGHT OF COVER LIMITS (ft.)	Str	D _{0.01} = 800	MAX.	8.0	2.0	8.0	8.0	9.0	9.0	0.6	8.0	8.0	8.0	0.6	9.0	0.6	0.6	0.6	0.6	10.0	10.0	10.0	10.0	10.0											
REINFORCED CONCRETE HORIZONTAL HEIGHT OF COVER LIMITS		Class HE-I: I	MIN.	1.0	1.0	1.0	1.0	1.0	0.0	0.1	0.1	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.3	4.1	6.1	G 4	1.8	1.9											
REINFORCE		009 = 1000	MAX.	4.0	5.0	5.0	5.0	6.0	6.0	0.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0	2.0	7.0	2.0	0.7	0.7	2.0	7.0					he bottom	tne pipe.					
		Class HE-A: Do.01	MIN.	1.3	1.1	1.0	1.0	1.0	1.0	0.1	0.1	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.3	4.1	C1 :	C. 1	1.7	1.8					he tabulated cover depths shall be measured from the bottom	o don aun o					
		AREA	(316)	1.8	3.3	4.1	5.1	6.3	7.4	8.8	12.9	16.6	20.5	24.8	29.5	34.6	40.1	46.1	52.4	59.2	4.00	0.47	99.2	118.6					shall be mea	pavement t					
		RISE (in)	()	14	19	22	24	22	29	32	88	43	48	53	58	63	68	22	22	823	96	2/6	106	116					1. The tabulated cover depths shall be	or concrete					
		SPAN (in.))	23	30	34	38	42	45	49	60	68	76	83	91	98	106	113	121	128	130	143	166	180				NOTE	tabulated c	tne aspnan					

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-01 PIPE HEIGHT OF COVER LIMITS DRAWING INDEX AND GENERAL NOTES (DRAFT)



REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-02 PIPE HEIGHT OF COVER LIMITS (DRAFT)

																			INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEIGHT OF COVER LIMITS	SEPTEMBER 2017	STANDARD DRAWING NO. E 715-PHCL-02		DESIGN STANDARDS ENGINEER DATE	
		64	MAX.	X	X	X	X	X	X	X	X	X	X	100.0	87.6	71.6	27.7	45.5							
		0.164	MIN.	X	M	X	\bigvee	X	X	X	X	X	X	1.0	1.0	1.0	1.0	1.0							
AM)		35	MAX.	X	M	X	X	100.0	100.0	100.0	100.0	100.0	2.66	9.98	70.8	97.6	X	X							
2 2/3" x 1/2" CORRUGATED ALUMINUM ALLOY PIPE (LOCK SEAM) HEIGHT OF COVER LIMITS (ft)		0.135	MIN.	X	X	X	X	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X							
OY PIPE (SS (in.)	05	MAX.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	90.4	90.4	77.4	2'99	54.4	\setminus	X	X							
NUM ALL	THICKNESS (in.)	0.105	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X	X							
RUGATED ALUMINUM ALLOY P. HEIGHT OF COVER LIMITS (ft)		75	MAX.	100.0	100.0	100.0	100.0	96.8	86.0	77.4	64.5	64.5	\setminus	\setminus	\setminus	\setminus	\setminus	X							
RUGATE HEIGHT		0.075	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	\setminus	\setminus	\bigvee	\setminus	\setminus	\mathbb{X}							
1/2" CO		0.060	MAX.	100.0	100.0	100.0	88.5	77.5	8.89	62.0	X	> <	\setminus	$>\!\!<$	\setminus	\setminus	$>\!\!<$	\setminus							
2 2/3" x			·NIM	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee	\bigvee							
		DIAMETER (in.)		12	15	18	21	24	27	30	33	36	42	48	72	09	99	72							
		AREA (sft)		8.0	1.2	1.8	2.4	3.1	4.0	4.9	5.9	7.1	9.6	12.6	15.9	19.6	23.8	28.3							

Item No.03 07/21/16 (2016 SS) (contd.)

Ms. Phillips
Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-03 PIPE HEIGHT OF COVER LIMITS (DRAFT)

RATION	S		1CL-03	DATE	DATE
JF TRANSPOF	PIPE HEIGHT OF COVER LIMITS	R 2017	E 715-PHCL-03	DESIGN STANDARDS ENGINEER	EER
TMENT (GHT OF (SEPTEMBER 2017	/ING NO.	DESIGN STA	CHIEF ENGINEER
INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEI	IS	STANDARD DRAWING NO.		

					_	_				_	_	_	_		_			
		0.164	MAX.	X	X	X	X	X	X	X	X	X	X	47.2	41.9	37.7	34.3	31.4
		0.1	MIN.	\setminus	X	X	\setminus	X	\setminus	X	X	X	X	1.0	1.0	1.0	1.0	1.0
Ω		35	MAX.	X	X	X	X	45.0	40.0	36.0	30.0	30.0	52.3	45.8	40.7	36.6	\setminus	X
(RIVETE		0.135	MIN.	X	X	X	X	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X
2 2/3" x 1/2" CORRUGATED ALUMINUM ALLOY PIPE (RIVETED) HEIGHT OF COVER LIMITS (ft)	SS (in.)	05	MAX.	9.98	69.3	27.7	49.5	43.3	38.5	34.6	28.8	28.8	20.0	43.7	38.8	X	X	X
INUM AL R LIMITS	THICKNESS (in.)	0.105	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X	X
RRUGATED ALUMINUM ALLOY HEIGHT OF COVER LIMITS (ft)		75	MAX.	20.0	40.0	33.3	28.5	25.0	22.2	20.0	16.6	16.6	X	X	X	X	X	X
RRUGAT HEIGHT		0.075	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.2	X	X	X	X	X	X
x 1/2" CO		90	MAX.	20.0	40.0	33.3	28.5	25.0	22.2	20.0	X	X	X	X	X	X	X	X
2 2/3"		090.0	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.1	X	X	X	X	X	X	X	X
		DIAMETER (in.)		12	15	18	17	24	22	30	33	98	42	48	22	09	99	72
		AREA (sft)		8.0	1.2	1.8	2.4	3.1	4.0	4.9	5.9	7.1	9.6	12.6	15.9	19.6	23.8	28.3

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-04 PIPE HEIGHT OF COVER LIMITS (DRAFT)

NOTES:	1. Dual entries in the "Corner Radius" column such as 3" (Min.), 3 1/2" (Typ.), represent the following: ("Yip.), propresent the following: 3 1/2" (Tim.) = Corner radius allowed by AASHTO M 36 3 1/2" (Tim.) = Corner radius handralla available	2. The tabulated cover helghts reflect pipe-arches with typically available	corner radil. If a pipe-arch with corner radil other than what is typically available is to be used, a specific design shall be performed to verify structural adequacy.												INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEIGHT OF COVER LIMITS	SEPTEMBER 2017	STANDARD DRAWING NO. E 715-PHCL-04	DESIGN STANDARDS ENGINEER DATE	 CHIEF ENGINEER DATE	
			0.164	MAX.	\setminus	X	\times	X	\times	\times	\times	12.8	12.8	12.9							
			0.1	MIN.	\setminus	X	\times	X	X	X	X	1.6	1.6	1.6							
	AM)		0.135	MAX.	\setminus	X	\times	13.0	13.0	13.0	13.0	12.8	12.8	\bigvee							
	ATED ALUMINUM ALLOY PIPE-ARCH (RIVETED OR LOCK SEAM) HEIGHT OF COVER LIMITS (ft)		0.1	MIN.	\setminus	X	X	1.6	1.6	1.6	1.6	1.6	1.6	\bigvee							
	TED OR	THICKNESS (in.)	0.105	MAX.	13.7	13.0	13.5	13.0	13.0	13.0	13.0	12.8	X	\setminus							
	CH (RIVE	THICKN	0.1	MIN.	1.5	1.6	1.5	1.6	1.6	1.6	1.6	1.6	X	X							
	PIPE-AR		0.075	MAX.	13.7	13.0	13.5	13.0	13.0	13.0	13.0	X	X	X							
	IM ALLOY		0.0	MIN.	1.5	1.6	1.5	1.6	1.6	1.6	1.6	X	X	\setminus							
	ALUMINUM ALLOY PIPE-ARCH HEIGHT OF COVER LIMITS (ft)		09	MAX.	13.7	13.0	13.5	13.0	X	\times	X	X	X	\setminus							
	JGATED ,		090'0	MIN.	1.5	1.6	1.5	1.6	X	X	X	X	X	X							
	/2" CORRI		AREA (sft)		1.1	1.6	2.2	2.9	4.5	6.5	8.9	11.6	14.7	18.1							
	2 2/3" × 1/2" CORRUG		RISE (in.)		13	15	18	20	24	29	33	38	43	47							
			SPAN (in.)		17	21	24	28	35	42	49	57	64	71							
			CORNER RADIUS	(III.)	3 (Min.) 3 1/2 (Typ.)	3 (Min.) 4 1/8 (Typ.)	3 (Min.) 4 7/8 (Typ.)	3 (Min.) 5 1/2 (Typ.)	3 (Min.) 6 7/8 (Typ.)	3 1/2 (Min.) 8 1/4 (Typ.)	4 (Min.) 9 5/8 (Typ.)	5 (Min.) 11 (Typ.)	6 (Min.) 12 3/8 (Typ.)	7 (Min.) 13 3/4 (Typ.)							

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-05 PIPE HEIGHT OF COVER LIMITS (DRAFT)

																			INDIANA DEPARTMENT OF TRANSPORTATION		PIPE HEIGHT OF COVER LIMITS	SEPTEMBER 2017	3 NO. E 715-PHCL-05		DESIGN STANDARDS ENGINEER DATE	
																			INDIANA DEPARTMI		PIPE HEIGHT	SEPTI	STANDARD DRAWING NO.		DESI	/
		4	MAX.	X	X	X	X	100.0	2.06	81.6	74.2	0.89	62.8	58.3	54.4	51.0	48.0	45.3	42.9	40.1						
		0.164	MIN.	X		X	X	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.3						
<u> </u>		35	MAX.	100.0	100.0	100.0	100.0	100.0	95.8	83.5	75.9	9.69	64.2	9.69	55.6	51.3	46.3	41.8	X	X						
3" \times 1" CORRUGATED ALUMINUM ALLOY PIPE (LOCK SEAM) HEIGHT OF COVER LIMITS (ft)		0.135	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	X	X						
PIPE (LC S (ft)	THICKNESS (in.)	0.105	MAX.	100.0	100.0	100.0	89.1	78.0	69.3	62.4	299	52.0	48.0	44.5	41.6	38.1	\bigvee	\bigvee	\bigvee	\bigvee						
JGATED ALUMINUM ALLOY PIPE HEIGHT OF COVER LIMITS (ft)	THICKN	0.1	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	\bigvee	X	X						
ALUMINU F OF COV		0.075	MAX.	89.4	74.5	74.5	63.8	55.9	49.6	44.7	40.6	37.2	34.4	X	X	X	X	\bigvee	M	X						
UGATED		0.	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X	X	X	X	X	X						
1" CORR		090.0	MAX.	71.2	59.3	59.3	50.8	44.5	39.5	32.6	32.3	X	X	X	X	X	X	X	X	X						
3. ×			MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X	X	X	X	X	X	\bigvee	X						
		DIAMETER (in.)	,	30	33	36	42	48	54	09	99	72	78	22	06	96	102	108	114	120						
				1	ı		l	12.6	15.9	19.6	23.8	28.3	33.2	38.5	44.2	50.3	29.7	63.6	6.07	78.5						

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-06 PIPE HEIGHT OF COVER LIMITS (DRAFT)

INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEIGHT OF COVER LIMITS	SEPTEMBER 2017	G NO. E 715-PHCL-06	DESIGN STANDARDS ENGINEER DATE	CHIEF ENGINEER DATE
INDIANA DEPARTI	PIPE HEIGH	SEP.	STANDARD DRAWING NO.	18	6

											_	_								
		0.164	MAX.	\setminus	X	X	\setminus	9'5'	2.79	5'09	55.0	50.4	46.5	43.2	40.3	37.8	35.6	33.6	31.8	30.2
		0.1	MIN.	\setminus	X	X	\setminus	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.3
		35	MAX.	93.3	7.77	7.77	9.99	58.3	51.8	46.6	42.4	38.8	35.8	33.3	31.1	29.1	27.4	25.9	X	X
IVETED)		0.135	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	\setminus	X
3" x 1" CORRUGATED ALUMINUM ALLOY PIPE (RIVETED) HEIGHT OF COVER LIMITS (ft)	SS (in.)	05	MAX.	62.2	51.8	51.8	44.4	38.8	34.5	31.1	28.2	25.9	23.9	22.2	20.7	19.4	X	\bigvee	X	X
JM ALLOY R LIMITS	THICKNESS (in.)	0.105	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	X	X	X	X
UGATED ALUMINUM ALLOY PIF HEIGHT OF COVER LIMITS (ft)		75	MAX.	45.5	37.9	37.9	32.5	28.4	25.3	22.7	20.7	18.9	17.5	X	X	X	X	V	X	X
UGATED		0.075	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2	\bigvee	X	X	X	X	X	X
1" CORR		90	MAX.	36.6	30.5	30.5	26.1	22.9	20.3	18.3	16.6	X	X	X	X	X	X	V	X	X
3" x		090'0	MIN.	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2	X	X	X	X	X	X	X	X	X
		DIAMETER (in.)		30	33	36	45	48	54	09	99	Z	8/	18	06	96	102	108	114	120
		AREA (sft)		4.9	5.9	7.1	9.6	12.6	15.9	19.6	23.8	28.3	33.2	38.5	44.2	50.3	29.7	63.6	6.07	78.5

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-07 PIPE HEIGHT OF COVER LIMITS (DRAFT)

NOTES	 Dual entries in the "Corner Radius" column such as 3" (Min.), 3 1/2" (Typ.), represent the following: 3" (Min.) = Minimum corner radius allowed by AASHTO M 36 3 1/2" (Typ.) = Corner radius typicially available 	2. The tabulated cover heights reflect pipe-arches with typically available	corner radii, il a pipe-arch with corner radii other than what is typically available is to be used, a specific design shall be performed to verify structural adequacy.										INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEIGHT OF COVER LIMITS	SEPTEMBER 2017	STANDARD DRAWING NO. E 715-PHCL-07	DESIGN STANDARDS ENGINEER DATE	CHIEF ENGINEER DATE
			0.164	MAX.	20.8	20.9	20.8	17.1	17.3	17.1	16.9	16.5						
			0.	MIN.	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3						
	1)		0.135	MAX.	20.8	20.9	20.8	17.1	17.3	17.1	16.9	X						
	OCK SEAM		0	MIN.	1.1	1.1	1.1	1.2	1.2	1.2	1.2	X						
	ED OR LC	THICKNESS (in.)	0.105	MAX.	20.8	20.9	20.8	17.1	17.3	X	X	X						
	(RIVETE (ft)	THICKN	0	MIN.	1.1	1.1	1.1	1.2	1.2	X	X	X						
	.UMINUM ALLOY PIPE-ARCH (RI HEIGHT OF COVER LIMITS (ft)		0.075	MAX.	20.8	20.9	20.8	X	X	X	X	X						
	ALLOY P.		0	MIN.	1.1	1.1	1.1	X	X	X	X	X						
	UMINUM HEIGHT (090.0	MAX.	X	X	X	X	X	X	X	X						
	ATED AL		0.	MIN.	X	X	X	X	X	X	X	X						
	3" x 1" CORRUGATED ALUMINUM ALLOY PIPE-ARCH (RIVETED OR LOCK SEAM) HEIGHT OF COVER LIMITS (ft)		AREA (sft)		15.6	19.3	23.2	27.4	32.1	37.0	42.4	48.0						
	3" × 1"		RISE (in.)		46	51	55	59	63	<i>L</i> 9	71	75						
			SPAN (in.)		09	99	73	81	87	95	103	112						
		COBNED	RADIUS	(iii:)	8 (Min.) 18 3/4 (Typ.)	9 (Min.) 20 3/4 (Typ.)	12 (Min.) 22 7/8 (Typ.)	14 (Min.) 20 7/8 (Typ.)	14 (Min.) 22 5/8 (Typ.)	16 (Min.) 24 3/8 (Typ.)	16 (Min.) 26 1/8 (Typ.)	18 (Min.) 27 3/4 (Typ.)						

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-08 PIPE HEIGHT OF COVER LIMITS (DRAFT)

INDIANA DEPARTMENT OF TRANSPORTATION	TMENT OF	TRANSPORTA	TION
PIPE HEI	PIPE HEIGHT OF COVER LIMITS	VER LIMITS	
Ŋ	SEPTEMBER 2017	2017	
STANDARD DRAWING NO.	/ING NO	E 715-PHCL-08	.08
	DESIGN STANDARDS ENGINEER	DS ENGINEER	DATE
	CHIEF ENGINEER		DATE

									_	_					
		0.164	MAX.	100.0	8'46	85.3	5'22	71.1	9:29	6.09	26.8	23.3	49.0	44.5	40.3
		0.1	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2
		35	MAX.	87.2	77.5	69.7	63.4	58.1	53.6	49.8	46.5	43.6	40.0	X	X
CK SEAM		0.135	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	X	X
PIPE (LO	SS (in.)	35	MAX.	67.8	60.2	54.2	49.3	45.2	41.7	38.7	36.1	X	X	X	X
M ALLOY R LIMITS	THICKNESS (in.)	0.105	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X	X	X
$6" \times 1"$ CORRUGATED ALUMINUM ALLOY PIPE (LOCK SEAM) HEIGHT OF COVER LIMITS (ft)		75	MAX.	48.4	43.0	38.7	35.2	32.2	29.7	X	X	X	X	X	X
JGATED /		0.075	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	X	X	X	X	X	X
" CORRU		90	MAX.	38.7	34.4	31.0	28.1	X	X	X	X	X	X	X	X
6" × 1		0.060	MIN.	1.0	1.0	1.0	1.0	X	X	X	X	X	X	X	X
		DIAMETER (in.)		48	15	09	99	72	8/	22	06	96	102	801	114
		AREA (sft)		12.6	15.9	19.6	23.8	28.3	33.2	38.5	44.2	50.3	26.7	63.6	70.9

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-09 PIPE HEIGHT OF COVER LIMITS (DRAFT)

INDIANA DEPARTMENT OF TRANSPORTATION	STMENT OF	TRANSPORTA	ION
PIPE HEI	PIPE HEIGHT OF COVER LIMITS	VER LIMITS	
S	SEPTEMBER 2017	2017	
STANDARD DRAWING NO.	VING NO.	E 715-PHCL-09	60
/	DESIGN STANDARDS ENGINEER	DS ENGINEER	DATE
/			
/	CHIEF ENGINEER		DATE

				_											
		0.164	MAX.	60.4	23.7	48.3	43.9	40.2	37.1	34.5	32.2	30.2	28.4	26.8	25.4
		0.1	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2
		35	MAX.	49.8	44.3	39.8	36.2	33.2	30.6	28.4	26.5	24.9	23.4	X	\setminus
IVETED)		0.135	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	X	X
PIPE (R (ft)	SS (in.)	15	MAX.	38.7	34.4	31.0	28.1	25.8	23.8	22.1	20.6	X	X	X	\bigvee
JM ALLOY R LIMITS	THICKNESS (in.)	0.105	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	X	\bigvee	X	\forall
$6" \times 1"$ CORRUGATED ALUMINUM ALLOY PIPE (RIVETED) HEIGHT OF COVER LIMITS (ft)		75	MAX.	26.3	23.4	21.1	19.1	17.5	16.2	X	X	X	X	X	X
UGATED HEIGHT		0.075	MIN.	1.0	1.0	1.1	1.1	1.2	1.3	X	X	X	X	X	X
1" CORR		90	MAX.	22.2	19.7	17.7	16.1	X	X	X	X	X	X	X	X
e" x		090.0	MIN.	1.0	1.1	1.2	1.3	X	X	X	X	X	X	X	X
		DIAMETER (in.)		48	54	09	99	72	8/	28	06	96	102	108	114
		AREA (sft)		12.6	15.9	19.6	23.8	28.3	33.2	38.5	44.2	50.3	26.7	63.6	70.9

Item No.03 07/21/16 (2016 SS) (contd.)

Ms. Phillips
Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-10 PIPE HEIGHT OF COVER LIMITS (DRAFT)

TATION			CL-10	DATE	DATE
TRANSPOR	VER LIMITS	2017	E 715-PHCL-10	DS ENGINEER	
TMENT OF	PIPE HEIGHT OF COVER LIMITS	SEPTEMBER 2017	ING NO.	DESIGN STANDARDS ENGINEER	CHIEF ENGINEER
INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEI	is	STANDARD DRAWING NO.		

	ı -			N /	. /	\ /	. /	۱ /	1 /	\ /	١ /									
		0.168	MAX.	X	\setminus	\setminus	\setminus	X	\setminus	\setminus	X	100.0	100.0	100.0	100.0	100.0	100.0	0'26	2'98	75.1
		0.1	MIN.	X	\setminus	X	\setminus	X	X	\setminus	\setminus	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		0.138	MAX.	\setminus	\setminus	\bigvee	\setminus	X	\setminus	100.0	100.0	100.0	100.0	100.0	100.0	626	87.2	79.9	\setminus	X
SEAM)		0.1	MIN.	X	X	X	X	X	X	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X
PE (LOCK S (ft)	SS (in.)	0.109	MAX.	\bigvee	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	93.2	82.8	87.8	X	X	X	X
2 2/3" × 1/2" CORRUGATED STEEL PIPE (LOCK SEAM) HEIGHT OF COVER LIMITS (ft)	THICKNESS (in.)	0.1	MIN.	X	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X	X	X
JGATED S		0.079	MAX.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	88.7	88.7	76.0	66.5	59.1	X	X	X	X	X
2" CORRI HEIGHT		0.0	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X	X	X	X
2/3" × 1/2		0.064	MAX.	100.0	100.0	100.0	100.0	100.0	94.7	85.2	71.0	71.0	8.09	53.2	X	X	X	X	X	X
2		0.0	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X	X	X	X	X
		DIAMETER (in.)		12	15	18	21	24	27	30	33	36	42	48	25	09	99	72	78	22
		AREA (sft)		8.0	1.2	1.8	2.4	3.1	4.0	4.9	5.9	7.1	9.6	12.6	15.9	19.6	23.8	28.3	33.2	38.5

Item No.03 07/21/16 (2016 SS) (contd.)

Ms. Phillips
Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-11 PIPE HEIGHT OF COVER LIMITS (DRAFT)

INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEIGHT OF COVER LIMITS	SEPTEMBER 2017	ING NO. E 715-PHCL-11	DESIGN STANDARDS ENGINEER DATE		CHIEF ENGINEER DATE
INDIANA DEPAR	PIPE HEI	ij	STANDARD DRAWING NO.		/	/

				Λ.			. ,									_				
		0.168	MAX.	X	X	X	\setminus	\setminus	\setminus	\setminus	\setminus	47.4	81.4	71.2	63.3	0'25	21.8	47.5	43.8	40.7
		0.1	MIN.	X	X	X	X	\bigvee	X	\bigvee	\setminus	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		38	MAX.	X	X	X	X	X	X	54.4	45.3	45.3	7.77	0.89	60.4	54.4	49.4	45.3	X	X
:ТЕD)		0.138	MIN.	X	X	X	X	X	X	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X
IPE (RIVE 5 (ft)	:SS (in.)	60	MAX.	X	100.0	9.98	74.2	65.0	27.7	52.0	43.3	43.3	74.2	65.0	27.7	52.0	\setminus	\setminus	X	X
STEEL P	THICKNESS (in.)	0.109	MIN.	X	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X	X	X
2" CORRUGATED STEEL PIPE (HEIGHT OF COVER LIMITS (ft)		62	MAX.	100.0	80.8	67.4	27.7	50.5	44.9	40.4	33.7	33.7	47.3	41.3	36.7	X	X	X	X	X
2 2/3" × 1/2" CORRUGATED STEEL PIPE (RIVETED) HEIGHT OF COVER LIMITS (ft)		0.079	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X	X	X	X
2/3" × 1,		54	MAX.	92.7	74.2	61.8	53.0	46.3	41.2	37.1	30.9	30.9	34.2	30.0	X	X	X	X	X	X
2		0.064	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X	X	X	X	X
		DIAMETER (in.)		12	15	18	21	24	27	30	33	36	42	48	54	09	99	72	78	84
		AREA (sft)		8.0	1.2	1.8	2.4	3.1	4.0	4.9	5.9	7.1	9.6	12.6	15.9	19.6	23.8	28.3	33.2	38.5

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-12 PIPE HEIGHT OF COVER LIMITS (DRAFT)

NOTES: 1. Dual entries in the "Corner Radius" column such as 3" (Min.), 3 1/2" (Typ.), represent the following: 3. (Win.), a former radius allowed by AASHTO M 36 3 1/2" (Tru.). = Corner radius the following and a small she will she wil	The tabulated cover helpfus reflect pipe-arches with typically available	corner radil. If a pipe-arch with corner radil other than what is typically available is to be used, a spedific design shall be performed to verify structural adequacy.												INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEIGHT OF COVER LIMITS	SEPTEMBER 2017	STANDARD DRAWING NO. E 715-PHCL-12	DESIGN STANDARDS ENGINEER DATE	CHIEF ENGINEER DATE
		0.168	MAX.	\setminus	X	X	X	X	13.0	13.0	12.8	12.8	12.9	13.0	13.2				
		0.1	NIM.	\setminus	\setminus	X	X	X	9'T	1.6	1.6	1.6	1.6	9'1	1.5				
		0.138	MAX.	\setminus	\times	X	X	13.0	13.0	13.0	12.8	12.8	12.9	\times	X				
SEAM)		0.1	MIN.	\setminus	\times	X	\times	1.6	1.6	1.6	1.6	1.6	1.6	\times	\bigvee				
OR LOCK	THICKNESS (in.)	0.109	MAX.	13.7	13.0	13.5	13.0	13.0	13.0	13.0	12.8	12.8	X	\times	\setminus				
IVETED (THICKN	0.1	MIN.	1.5	1.6	1.5	1.6	1.6	1.6	1.6	1.6	1.6	X	\times	\bigvee				
SATED STEEL PIPE-ARCH (RIVE HEIGHT OF COVER LIMITS (ft)		0.079	MAX.	13.7	13.0	13.5	13.0	13.0	13.0	13.0	X	X	X	\times	X				
EEL PIPE		0.0	MIN.	1.5	1.6	1.5	1.6	1.6	1.6	1.6	X	X	X	\times	X				
ATED STI		0.064	MAX.	13.7	13.0	13.5	13.0	13.0	13.0	X	X	X	X	\times	\bigvee				
CORRUG		0.0	·NIM	1.5	9.1	1.5	9.1	1.6	1.6	\times	X	X	X	\times	\bigvee				
2 2/3" x 1/2" CORRUGATED STEEL PIPE-ARCH (RIVETED OR LOCK SEAM) HEIGHT OF COVER LIMITS (ft)		AREA (sft)		1.1	1.6	2.2	2.9	4.5	6.5	8.9	11.6	14.7	18.1	21.9	26.0				
2 2/		RISE (in.)		13	15	18	20	24	59	33	38	43	47	52	22				
		SPAN (in.)		17	21	24	28	35	42	49	25	49	17	77	83				
	a divided	RADIUS (in)	<u></u>	3 (Min.) 3 1/2 (Typ.)	3 (Min.) 4 1/8 (Typ.)	3 (Min.) 4 7/8 (Typ.)	3 (Min.) 5 1/2 (Typ.)	3 (Min.) 6 7/8 (Typ.)	3 1/2 (Min.) 8 1/4 (Typ.)	4 (Min.) 9 5/8 (Typ.)	5 (Min.) 11 (Typ.)	6 (Min.) 12 3/8 (Typ.)	7 (Min.) 13 3/4 (Typ.)	8 (Min.) 15 1/8 (Typ.)	9 (Min.) 16 1/2 (Typ.)				

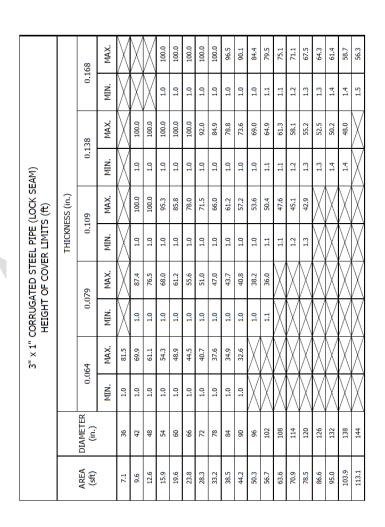
Item No.03 07/21/16 (2016 SS) (contd.)

Ms. Phillips
Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-13 PIPE HEIGHT OF COVER LIMITS (DRAFT)

INDIANA DEPARTMENT OF TRANSPORTATION	RENT OF	TRANSPORTAT	NOI
PIPE HEI	IGHT OF CO	PIPE HEIGHT OF COVER LIMITS	
S	SEPTEMBER 2017	2017	
STANDARD DRAWING NO.	VING NO.	E 715-PHCL-13	13
	DESIGN STANDARDS ENGINEER	XDS ENGINEER	DATE
	CHIEF ENGINEER		DATE



REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-14 PIPE HEIGHT OF COVER LIMITS (DRAFT)

ORTATION	ITS		E 715-PHCL-14	R DATE	DATE
INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEIGHT OF COVER LIMITS	SEPTEMBER 2017		DESIGN STANDARDS ENGINEER	CHIEF ENGINEER
INDIANA DEPAR	PIPE HEI	is	STANDARD DRAWING NO.		

				_	_																	
		0.168	MAX.	X	\setminus	X	87.2	78.5	71.4	65.4	60.4	1.95	52.3	49.0	46.2	43.6	41.3	39.2	37.4	35.7	34.1	32.7
		0.1	MIN.	X	X	X	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.4	1.5
		38	MAX.	X	100.0	88.4	78.6	70.7	64.3	58.9	54.4	50.5	47.1	44.2	41.6	39.3	37.2	35.3	33.7	32.1	30.7	\bigvee
(i)		0.138	MIN.	X	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.4	X
3" x 1" CORRUGATED STEEL PIPE (RIVETED) HEIGHT OF COVER LIMITS (ft)	SS (in.)	60	MAX.	X	84.1	73.6	65.4	58.8	53.5	49.0	45.2	42.0	39.2	36.8	34.6	32.7	30.9	29.4	X	X	\bigvee	X
EEL PIPE R LIMITS	THICKNESS (in.)	0.109	MIN.	X	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.3	X	X	X	X
CORRUGATED STEEL PIPE (RI) HEIGHT OF COVER LIMITS (ft)		62	MAX.	X	9.95	49.5	44.0	39.6	36.0	33.0	30.5	28.3	26.4	24.7	23.3	X	X	X	X	X	X	X
CORRUG		0.079	MIN.	X	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	X	X	X	X	X	X	X
3" × 1"		64	MAX.	53.1	45.5	39.8	35.4	31.8	28.9	26.5	24.5	22.7	21.2	X	X	X	X	X	X	X	X	X
		0.064	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	X	X	X	X	X	X	X	X	X
		DIAMETER (in.)		36	42	48	54	09	99	72	78	84	06	96	102	108	114	120	126	132	138	144
		AREA (sft)		7.1	9.6	12.6	15.9	19.6	23.8	28.3	33.2	38.5	44.2	50.3	26.7	63.6	70.9	78.5	9.98	95.0	103.9	113.1

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-15 PIPE HEIGHT OF COVER LIMITS (DRAFT)

1. Dual entries in the "Corner Radius" column such as 3" (Min.), 3 1/2" (Typ.), represent the following: 3 (Vin.) – Infinitum corner radius allowed by AASHTO M 36 3 1/2" (Typ.) – Corner radius hotelity available	2. The tabulated cover helghts reflect plpe-arches with typically available	corner radii, It a pipe-arch with corner radii other than what is typically available is to be used, a specific design shall be performed to verify structural adequacy.												INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEIGHT OF COVER LIMITS	SEPTEMBER 2017	STANDARD DRAWING NO. E 715-PHCL-15	DESIGN STANDARDS ENGINEER DATE	CHIEF ENGINEER DATE
		0.168	MAX.	20.8	20.9	20.8	17.1	17.3	17.1	16.9	16.5	16.8	16.2	16.0	16.3				
		0.1	·NIM	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.2	1.3	1.3	1.3				
		0.138	MAX.	20.8	20.9	20.8	17.1	17.3	17.1	16.9	16.5	16.8	16.2	16.0					
AM)		0.1	MIN.	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.2	1.3	1.3					
LOCK SE	THICKNESS (in.)	0.109	MAX.	20.8	20.9	20.8	17.1	17.3	17.1	16.9	16.5	16.8	X	X	X				
TED OR (ft)	THICKN	0.1	MIN.	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.2	X	X	X				
ED STEEL PIPE-ARCH (RIVETE HEIGHT OF COVER LIMITS (ft)		0.079	MAX.	20.8	20.9	20.8	17.1	17.3	17.1	\times	X	X	X	X	X				
. PIPE-AR JF COVER		0.0	MIN.	1.1	1.1	1.1	1.2	1.2	1.2	X	X	X	\times	\times	X				
ED STEEL HEIGHT C		0.064	MAX.	\setminus	X	X	\times	\times	\times	\times	\times	\times	\setminus	\times					
RRUGATI H		0.0	MIN.	\setminus	X	X	\setminus	X	X	X	X	X	X	X					
3" x 1" CORRUGATED STEEL PIPE-ARCH (RIVETED OR LOCK SEAM) HEIGHT OF COVER LIMITS (ft)		AREA (sft)		15.6	19.3	23.2	27.4	32.1	37.0	42.4	48.0	59.2	60.5	67.4	74.5				
.,		RISE (in.)		46	51	55	59	63	29	71	75	79	83	87	91				
		SPAN (in.)		09	99	73	81	87	95	103	112	117	128	137	142				
	-	RADIUS		8 (Min.) 18 3/4 (Typ.)	9 (Min.) 20 3/4 (Typ.)	12 (Min.) 22 7/8 (Typ.)	14 (Min.) 20 7/8 (Typ.)	14 (Min.) 22 5/8 (Typ.)	16 (Min.) 24 3/8 (Typ.)	16 (Min.) 26 1/8 (Typ.)	18 (Min.) 27 3/4 (Typ.)	18 (Min.) 29 1/2 (Typ.)	18 (Min.) 31 1/4 (Typ.)	18 (Min.) 33 (Typ.)	18 (Min.) 34 3/4 (Typ.)				

Item No.03 07/21/16 (2016 SS) (contd.)

Ms. Phillips
Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-16 PIPE HEIGHT OF COVER LIMITS (DRAFT)

INDIANA DEPARTMENT OF TRANSPORTATION	TMENT OF	TATANGPORTAT	NOT
PIPE HEI	GHT OF CO	PIPE HEIGHT OF COVER LIMITS	
S	SEPTEMBER 2017	2017	
STANDARD DRAWING NO.	VING NO.	E 715-PHCL-16	91
	DESIGN STANDARDS ENGINEER	XDS ENGINEER	DATE
	CHIEF ENGINEER		DATE

				\ /	\ /	\ /	\ /	\ /	\ /													
		0.168	MAX.	X	A	X	X	X	X	100.0	92.4	85.8	80.1	75.1	70.7	66.7	63.2	60.1	57.2	54.6	52.2	20.0
		0	MIN.	X	X	X	\setminus	X	X	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.4	1.5
		0.138	MAX.	\setminus	\setminus	100.0	100.0	98.3	89.4	6'18	75.6	70.2	65.5	61.4	57.8	54.6	21.7	49.1	46.8	44.7	42.7	X
EAM)		0.1	MIN.	X	\setminus	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.4	X
(LOCK SE	ESS (in.)	0.109	MAX.	100.0	100.0	95.5	84.9	76.4	69.5	63.7	58.8	54.6	50.9	47.7	44.9	42.4	40.2	38.2	\setminus	\setminus	\setminus	X
EL PIPE R LIMITS	THICKNESS (in.)	0.1	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.3	X	X	X	M
$S^n \times 1^n$ CORRUGATED STEEL PIPE (LOCK SEAM) HEIGHT OF COVER LIMITS (ft)		0.079	MAX.	6'06	6.77	68.2	9.09	54.5	49.6	45.4	41.9	38.9	36.3	34.1	32.0	\bigvee	\bigvee	\bigvee	X	X	X	M
CORRUGA HEIGHT		0.0	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	X	X	X	X	X	X	M
5" × 1" (0.064	MAX.	\setminus	X	54.5	48.5	43.6	39.7	36.3	33.5	31.1	29.1	X	\setminus	\setminus	\setminus	X	\setminus	X	X	M
		0.0	MIN.	\setminus	X	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	X	X	X	X	X	X	X	X	M
		DIAMETER (in.)		36	42	48	52	09	99	72	78	84	06	96	102	108	114	120	126	132	138	144
		AREA (sft)		7.1	9.6	12.6	15.9	19.6	23.8	28.3	33.2	38.5	44.2	50.3	56.7	63.6	70.9	78.5	86.6	95.0	103.9	113.1

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-17 PIPE HEIGHT OF COVER LIMITS (DRAFT)

NOTES:	 Dual entries in the "Corner Radius" column such as 3"/ 3 1/2", represent the following: 3" = Minimum corner radius allowed by AASHTO M 36 3 1/2" = Corner radius Projecily available 	2. The tabulated cover helghts reflect pipe-arches with typically available	corner radil, if a pipe-arch with corner radil other than what is typically available is to be used, a specific design shall be performed to verify structural adequacy.												INDIANA DEPARTMENT OF TRANSPORTATION	One 44 Cal (CO) at (Cal) Desire	PIPE REIGHT OF COVER LIMITS	SEPTEMBER 2017	STANDARD DRAWING NO. E 715-PHCL-17	DESIGN STANDARDS ENGINEER DATE	CHIEF ENGINEER DATE
			0.168	MAX.	X	\times	\times	17.1	17.3	17.1	16.9	16.5	16.8	16.2	16.0	16.3					
			0.	MIN.	X	X	X	1.2	1.2	1.2	1.2	1.3	1.2	1.3	1.3	1.3					
			0.138	MAX.	20.8	20.9	20.8	17.1	17.3	17.1	16.9	16.5	16.8	16.2	16.0	X					
	EAM)		0.	MIN.	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.2	1.3	1.3	X					
	C LOCK SI	THICKNESS (in.)	0.109	MAX.	20.8	20.9	20.8	17.1	17.3	17.1	16.9	16.5	16.8	X	X	X					
	ETED OR (ft)	THICK	0.	MIN.	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.2	X	X	X					
	R LIMITS		0.079	MAX.	X	X	X	X	X	X	X	X	X	X	X	X					
	L PIPE-AF OF COVE		0.	MIN.	X	X	X	X	X	X	X	X	X	X	X	X					
	ED STEEL PIPE-ARCH (RIVETE) HEIGHT OF COVER LIMITS (ft)		0.064	MAX.	X	X	X	X	X	X	X	X	X	X	X	X					
	ORRUGAT		0.	MIN.	X	X	X	X	X	X	X	X	X	X	X	X					
	5" x 1" CORRUGATED STEEL PIPE-ARCH (RIVETED OR LOCK SEAM) HEIGHT OF COVER LIMITS (ft)		AREA (sft)		15.6	19.3	23.2	27.4	32.1	37.0	42.4	48.0	54.2	60.5	67.4	74.5					
			RISE (in.)		46	51	55	29	63	29	7.1	75	6/	83	87	91					
			SPAN (in.)		09	99	73	81	87	95	103	112	117	128	137	142					
		GINGO	RADIUS		8 (Min.) 18 3/4 (Typ.)	9 (Min.) 20 3/4 (Typ.)	12 (Min.) 22 7/8 (Typ.)	14 (Min.) 20 7/8 (Typ.)	14 (Min.) 22 5/8 (Typ.)	16 (Min.) 24 3/8 (Typ.)	16 (Min.) 26 1/8 (Typ.)	18 (Min.) 27 3/4 (Typ.)	18 (Min.) 29 1/2 (Typ.)	18 (Min.) 31 1/4 (Typ.)	18 (Min.) 33 (Typ.)	18 (Min.) 34 3/4 (Typ.)					

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-18 PIPE HEIGHT OF COVER LIMITS (DRAFT)

																	INDIANA DEPAKIMENI OF IKANSPOKIATION		PIPE HEIGHT OF COVER LIMITS		X 2	STANDARD DRAWING NO. E 715-PHCL-18	DECICAL CTANDADIC ENCINEED DATE		CHIEF ENGINEER DATE	
																	INDIANA		[d			STANDARE	_	_		
		6	MAX.	100.0	100.0	100.0	100.0	100.0	0.79	81.0	0.69	61.0	54.0	49.0	44.0	40.0	37.0	35.0	32.0	30.0	29.0	27.0				
EL PIPE		0.109	MIN.	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	2.75	2.75	2.75	2.75				
×3/4" ×7 1/2" SPRAL RIB STEEL PIPE HEIGHT OF COVER LIMITS (ft)	SS (in.)	62	MAX.	100.0	100.0	72.0	62.0	0.09	58.0	48.0	41.0	36.0	32.0	29.0	26.0	24.0	X	X	X	X	X	X				
" SPIRAL COVER L	THICKNESS (in.)	0.079	MIN.	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	\bigvee	X	\bigvee	\bigvee	\bigvee	\bigvee				
4" × 7 1/2 :IGHT OF		0.064	MAX.	100.0	100.0	68.0	58.0	51.0	41.0	34.0	29.0	26.0	23.0	M	X	\bigvee	\bigvee	\bigvee	\bigvee			$\sqrt{\ }$				
3/4" × 3/4			MIN.	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	X	X	\bigvee	X	X	\bigvee	X	X	\bigvee				
		DIAMETER (in.)		12	15	18	21	24	30	36	42	48	54	09	99	72	78	84	06	96	102	108				

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-19 PIPE HEIGHT OF COVER LIMITS (DRAFT)

												INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEIGHT OF COVER LIMITS	SEPTEMBER 2017	STANDARD DRAWING NO. E 715-PHCL-19	DESIGN STANDARDS ENGINER DATE	CHIEF ENGINEER DATE	
	Q	MAXIMUM (ft)	25.0	22.0	20.0	20.0	19.0	18.0	16.0	14.0	13.0							
	NON-REINFORCED CONCRETE PIPE CLASS 3	MINIMUM (ft)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0							
	ON	DIAMETER (in.)	12	15	18	21	24	27	30	33	36							

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-20 PIPE HEIGHT OF COVER LIMITS (DRAFT)

NOTES:	1. The pay Item diameter reflects the minimum required inside diameter,	Because the nominal size of smooth wall polyethylene pipe is based on the outside dlameter, different dimension ratios may require different nominal diameters to satisfy the pay Item diameter requirements.									
0		MAXIMUM (ft)	22.0	22.0	20.0	19.0	19.0	17.0	17.0	17.0	15.0
MITS (ft)		MINIMUM (ft)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
OVER LI				2	2			.,	.,		
JOANED POLYETHYLENE PIPE HEIGHT OF COVER LIMITS (ft)		NOMINAL DIAMETER (in.)	12	15	18	21	24	30	36	42	48
CORRUGALED POLYETHYLENE PIPE IYPE S HEIGHT OF COVER LIMITS (#)		PAY ITEM DIAMETER (in.)	12	15	18	21	24	30	36	42	48
		Pt DI.									

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-21 PIPE HEIGHT OF COVER LIMITS (DRAFT)

NOTES: 1. The pay Item diameter reflects the minimum required inside diameter.											INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEIGHT OF COVER LIMITS	SEPTEMBER 2017	STANDARD DRAWING NO. E 715-PHCL-21	 DESIGN STANDARDS ENGINEER DATE	CHIEF ENGINEER DATE	
HATA		MAXIMUM (ft)	47.0	38.0	42.0	40.0	38.0	45.0	30.0	29.0	30.0						
I NHLLAN IOG	ER LIMITS (F	MINIMUM (ft)	2.0	2.0	2.0	2.0	2.2	2.4	2.6	3.0	3.5						
PROFILE WALL (CLOSED) POLYETHYLENE PIPE	HEIGHT OF COVER LIMITS (#)	NOMINAL DIAMETER (in.)	18	21	24	27	23	33	36	42	48						
E Ca	I I	PAY ITEM DIAMETER (in.)	18	21	24	27	30	33	36	42	48						
	ENE PIPE	MAXIMUM (ft)		18.0	22.0	21.0	24.0	22.0	23.0	25.0							
) POLYETHYLI ER LIMITS (fl	MINIMUM (ft)		2.0	2.0	2.0	2.0	2.0	2.0	2.0							
	PROFILE WALL (RIBBED) POLYETHYLENE PIPE HEIGHT OF COVER LIMITS (ft)	NOMINAL DIAMETER (in.)		18	21	24	27	30	33	36							
	PROFILE V HE	PAY ITEM DIAMETER (in.)		18	21	24	27	30	33	36							

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-22 PIPE HEIGHT OF COVER LIMITS (DRAFT)

NOTE: 1. The pay item diameter reflects the minimum required inside diameter.													INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEIGHT OF COVER LIMITS	SEPTEMBER 2017	STANDARD DRAWING NO. F 715-PHCI-22				DESIGN STANDARDS ENGINEER DATE	OHEF ENGINEER DATE
YLENE PIPE MITS (ft)	MAXIMUM (ft)	28.0	28.0	25.0	23.0	23.0	19.0	23.0	22.0	21.0											
CORRUGATED POLYPROPYLENE PIPE HEIGHT OF COVER LIMITS (ft)	MINIMUM (ft)	6.0	1.1	1.3	1.8	1.8	2.2	2.6	3.1	3.5			T			Ī		1			
CORRUGATE HEIGHT (DIAMETER (in.)	12	15	18	21	24	30	36	42	48		RIDE PIPE (ft)		MAXIMUM (ft)	64.0	64.0	61.0	61.0	61.0	61.0	
	<u> </u>	<u> </u>	<u> </u>									SMOOTH WALL POLYVINYL CHLORIDE PIPE HEIGHT OF COVER LIMITS (ft)		MINIMUM (ft)	2.0	2.0	2.0	2.0	2.0	2.0	
									1			WALL POLYNIGHT OF CO		NOMINAL DIAMETER (in.)	12	15	18	21	24	27	
PROFILE WALL POLYVINYL CHLORIDE PIPE HEIGHT OF COVER LIMITS (ft)	MAXIMUM (ft)	20.0	20.0	20.0	20.0	20.0	18.0	18.0				SMOOTH HE		PAY 11 EM DIAMETER (in.)	12	15	18	21	24	27	
LE WALL POLYVINYL CHLORIDE HEIGHT OF COVER LIMITS (Ħ)	MINIMUM (ft)	2.0	2.0	2.0	2.0	2.0	2.0	2.0					1					<u> </u>			
	<u> </u>	+	\vdash																		

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-23 PIPE HEIGHT OF COVER LIMITS (DRAFT)

										INDIANA DEPARTMENT OF TRANSPORTATION		PIPE HEIGHT OF COVER LIMITS	SEPTEMBER 2017	STANDARD DRAWING NO. E 715-PHCL-23	DESIGN STANDARDS BYGINER DATE	OHEF ENGINEER DATE	
	A STRENGTH ITS (ft)	MAXIMUM (ft)	16.0	14.0	13.0	14.0	15.0	14.0	13.0	13.0	14.0						
	VITRIFIED CLAY PIPE, EXTRA STRENGTH HEIGHT OF COVER LIMITS (ft)	MINIMUM (ft)	1.2	1.4	1.4	1.4	1.4	1.5	1.6	1.5	1.5						
	VITRIFIED CL/ HEIGHT	DIAMETER (in.)	12	15	18	21	24	27	30	33	36						

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Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-24 PIPE HEIGHT OF COVER LIMITS (DRAFT)

TATION	10		CL-24	DATE	DATE
F TRANSPOR	PIPE HEIGHT OF COVER LIMITS	2017	E 715-PHCL-24	DESIGN STANDARDS ENGINEER	R
TMENT OI	GHT OF C	SEPTEMBER 2017	ING NO.	DESIGN STAND	CHIEF ENGINEER
INDIANA DEPARTMENT OF TRANSPORTATION	PIPE HEI	S	STANDARD DRAWING NO.		

YPE	TING	$_{01} = 2000$ CLASS V: $D_{0.01} = 3000$	MAX. MIN. MAX.	38.0 1.0 54.0	38.0 1.0 54.0	38.0 1.0 54.0	38.0 1.0 54.0	38.0 1.0 54.0	38.0 1.0 54.0	38.0 1.0 54.0	38.0 1.0 54.0	36.0 1.0 54.0	36.0 1.0 54.0	36.0 1.0 54.0	36.0 1.0 54.0	36.0 1.0 54.0	34.0 1.0 54.0	34.0 1.0 54.0	34.0 1.0 52.0	34.0 1.0 52.0	34.0 1.0 52.0	34.0 1.0 52.0	31.0 1.0 52.0	31.0 1.0 52.0	31.0 1.0 49.0	31.0 1.0 49.0	31.0 1.0 49.0	31.0 1.0 49.0	31.0 1.0 49.0	31.0 1.0 49.0
IRCULAR I	D-LOAD RA	CLASS IV: D _{0.01} = 2000	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CONCRETE CIRCULAR PIPE OF COVER LIMITS (ft)	STRENGTH CLASS / D-LOAD RATING	0.01 = 1350	MAX.	26.0	26.0	26.0	26.0	26.0	26.0	24.0	24.0	24.0	24.0	24.0	24.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
REINFORCED CC HEIGHT OF	STRENG	CLASS III: D _{0.01} =	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.3	1.4	1.4	1.5	1.5
REINE		0.01 = 1000	MAX.	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	11.0	11.0
		CLASS II: D _{0.01} =	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		DIAMETER (in.)		12	15	18	21	24	27	30	33	36	42	48	54	09	99	7.2	78	84	06	96	102	108	114	120	126	132	138	144

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Date: 07/21/16

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PHCL-25 PIPE HEIGHT OF COVER LIMITS (DRAFT)

																			INDIANA DEPARTMENT OF TRANSPORTATION		PIPE HEIGHT OF COVER LIMITS		SEPTEMBER 2017	STANDARD DRAWING NO. E 715-PHCL-25			DESIGN STANDARDS ENGINEER DATE	CHIEF ENGINEER DATE	7
		CLASS HE-IV: D _{0.01} = 2000	MAX.	100.0	47.0	48.0	49.0	20.0	45.0	45.0	44.0	26.0	27.0	28.0	29.0	29.0	29.0	30.0	30.0	30.0	30.0	31.0	31.0	31.0	31.0	31.0			
		CLASS HE-IV	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.5	1.6	1.8	1.9			
		CLASS HE-II: $D_{0.01} = 1000$ CLASS HE-III: $D_{0.01} = 1350$	MAX.	20.0	16.0	17.0	18.0	19.0	19.0	19.0	20.0	15.0	15.0	16.0	16.0	17.0	17.0	17.0	18.0	18.0	18.0	18.0	18.0	19.0	19.0	19.0			
PIPE	ATING	CLASS HE-III:	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.5	1.6	1.8	1.9			
ELLIPTICAL (ft)	/ D-LOAD RA	D _{0.01} = 1000	MAX.	11.0	10.0	11.0	11.0	12.0	12.0	12.0	12.0	10.0	10.0	11.0	11.0	12.0	12.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0	13.0	13.0			
REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE HEIGHT OF COVER LIMITS (ft)	STRENGTH CLASS / D-LOAD RATING	CLASS HE-II:	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.5	1.6	1.8	1.9			
CRETE HOR	STREN	CLASS HE-I: D _{0.01} = 800	MAX.	8.0	7.0	8.0	8.0	0.6	9.0	0.6	9.0	8.0	8.0	8.0	9:0	9.0	0.6	9.0	9.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0			
CED CONC		CLASS HE-I:	MIN.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.5	1.6	1.8	1.9			
REINFO		CLASS HE-A: D _{0.01} = 600	MAX.	4.0	5.0	5.0	5.0	0.9	0.9	6.0	0.9	5.0	0.9	0.9	6.0	0.9	0.9	0.9	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0			
		CLASS HE-A:	MIN.	1.3	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.5	1.6	1.7	1.8			
		AREA (sft)		1.8	3.3	4.1	5.1	6.3	7.4	8.8	10.2	12.9	16.6	20.5	24.8	29.5	34.6	40.1	46.1	52.4	59.2	66.4	74.0	82.0	99.2	118.6			
		RISE (in.)		14	19	22	24	22	59	32	34	38	43	48	23	28	63	89	72	77	82	87	92	26	106	116			
		SPAN (in.)		23	30	34	38	42	45	46	23	09	89	9/	83	91	86	106	113	121	128	136	143	151	166	180			

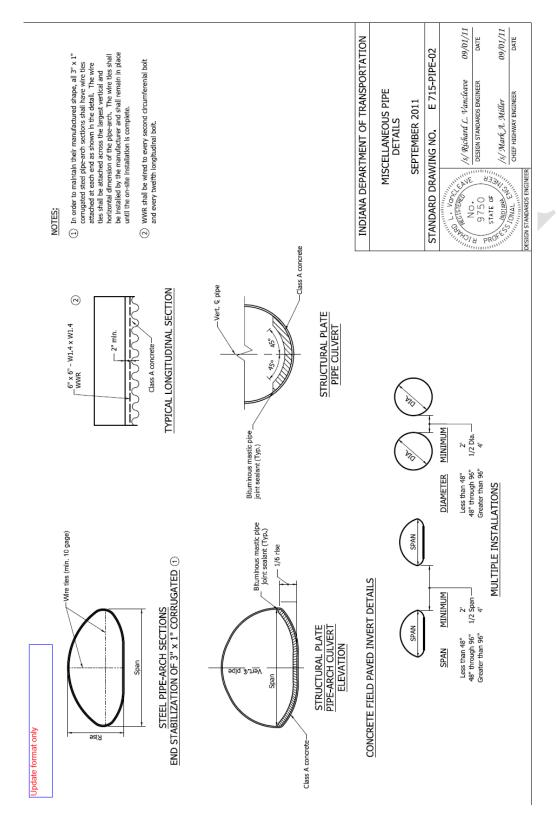
REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PIPE-01 PIPE CLASSIFICATION TABLES (WITH MARKUPS)

TYPE	5 4 5					×	×	×	×	×	×	×	×	×	×	×	×		INDIANA DEPARTMENT OF TRANSPORTATION	PIPE CLASSIFICATION TABLES	SEPTEMBER 2010	STANDARD DRAWING NO. E 715-PIPE-01	13 P. Van Cleave 09/01/10 15/ Richard L. Van Cleave 09/01/10 9750	STATE OF THE STATE OF THE STATE OF THE OF TH
PIPE TYPE	2 3	×	×	×	×				×	×	×			×	×							S	R I Chillin	PROF
_	~	×	×	×	×				×	×	×			×	×						ě.			
MATERIAL	ואאובאאר	Structural Plate Steel Pipe-Arch (C)	Structural Plate Aluminum Alloy Pipe (C)	Structural Plate Aluminum Alloy Pipe-Arch (C)	Clay Pipe, Extra Strength (S)	Clay Pipe	Perforated Clay Plpe	Corrugated Polyethylene Plpe, Type SP	Corrugated Polyethylene Pipe, Type (S)	Ribbed Polyethylene Plpe (S)	Smooth Wall Polyethylene Pipe (S)	Corrugated Polyethylene Drainage Tubing	Perforated PVC Semidrcular Pipe	Profile Wall PVC Plpe (S)	Smooth Wall PVC Pipe (S)	Concrete Drain Tile	Clay Drain Tile			LEGENID (G)- Corrugated Interior Culvert Pipe.	0	(SS) - Semi-Smooth		
										Profile Wall	(Midded)									3. Refer to Standard Drawings E 715-PSLC-01 through F 715-DS1 C-03 for reconjugation accordes the oribotic	Any pipe material which is in accordance with the	designated pipe type, acceptable for cover conditions, and conforms to service life criteria may be installed.		
ЭE	4 5	×				×	×	×	×	×	×	×	×	×		×				ngs E	Sha	cceptat life cri		
PIPE TYPE	3		×	×	×	×	×	×	×		×		×	×	×	×				d Draw	which	type, ar service		
PIP	1 2		×	×	×	×	×	×	×	×	×	×	×	×	×	×				tandarı C.03 f	naterla	ms to		
MATERIA	MAIENAL	Non-ReInforced Concrete Pipe	Non-ReInforced Concrete Pipe, Class 3 (S)	Reinforced Concrete Pipe (S)	Reinforced Concrete Horizontal Elliptical Pipe (S)	Corrugated Steel Plpe (C)	Corrugated Steel Plpe-Arch (C)	Polymer Precoated Galvanized Corrugated Steel Pipe (C)	Polymer Precoated Galvanized Corrugated Steel Pipe Type 1A (S)	Fully Bituminous Coated and Lined Corrugated Steel Pipe (S)	Polymer Precoated Galvanized Corr. Steel Pipe Arch Type IIA (S)	Fully Bituminous Coated and Lined Corrugated Steel Pipe-Arch (S)	Corrugated Aluminum Alloy Pipe (C)	Corrugated Aluminum Alloy Pipe-Arch (C)	Structural Plate Steel Pipe (C)	Polymer Precoated Galvanized Corrugated Steel Pipe-Arch (C)		Added Polypropylene (Types 1, 2, 3, 5) Added Spiral Steel Rib (Types 1, 3, 5) Added Profile Wall (Closed) Polyethylene (Types 1, 2, 3, 5)		GENERAL NOTES The prescribed uses for the pipe types are as follows: 3. Refer to S. Trice 1 Pipe - Culveris under mainline pavement F. 714-DE1	4		outploop from the control and the control and the control and cont	

REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PIPE-02 MISCELLANEOUS PIPE DETAILS (WITH MARKUPS)



REVISION TO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

715-PIPE-01 PIPE CLASSIFICATION TABLES (DRAFT)

NOTES:	The prescribed uses for the pipe types are as follows, a. Type 1 Pipe - Culverts under mainline pavement and public road approaches. b. Type 2 Pipe - Storm sewer pipe, c. Type 3 Pipe - Culverts under driveways and field entrances, d. Type 4 Pipe - Drain tile and longitudinal underdrains. e. Type 5 Pipe - Broken back and other installations requiring coupled pipe.	 Refer to Standard Drawings E 715-PHCL-01 through E 715-PHCL-25 and E 717-PHCL-01 through E 717-PHCL-10 for allowable heights of cover for various pipe materials except Type 4 pipes. 	Refer to Standard Drawings E 715-PSLC-01 through E 715-PSLC-03 for required pipe service life criteria.	 Any pipe material which is in accordance with the designated pipe type, acceptable for cover conditions, and conforms to service life criteria may be installed. 	LEGEND:	(C)- Corrugated Interior Culvert Pipe,	(S)- Smooth Interior Culvert or Storm Sewer Pipe.	(SS)- Semi-Smooth Interior Culvert Pipe.	INDIANA DEPARTMENT OF TRANSPORTATION	PIPE CLASSIFICATION TABLES	SEPTEMBER 2017	STANDARD DRAWING NO. E 715-PIPE-01	DESIGN STANDARDS ENGINEER DATE	This document was sent to the print CHEF BIGINER DATE Document PTS-PRAST CSO AT December PROTATION CSC 1-186 15 50 nm	IOTPRNP21VW.shared.st
														This Docur	IOTP

Management		Ρi	Pipe Type	/be	
Material	1	2	3	4	5
Non-Reinforced Concrete Pipe				X	Г
Non-Reinforced Concrete Pipe, Class 3 (S)	X	X	Х		
Reinforced Concrete Pipe (S)	×	×	×		
Reinforced Concrete Horizontal Elliptical Pipe (S)	X	×	X		
Corrugated Steel Pipe (C)	×		X	Г	×
Corrugated Steel Pipe-Arch (C)	X		Х		×
Spiral Rib Steel Pipe (SS)	×		×		×
Polymer Precoated Galvanized Corrugated Steel Pipe (C)	X		X		×
Polymer Precoated Galvanized Corrugated Steel Pipe Type 1A (S)	X	Х	X		×
Fully Bituminous Coated and Lined Corrugated Steel Pipe (S)		×			×
Polymer Precoated Galvanized Corr. Steel Pipe Arch Type IIA (S)	×	×	×		×
Fully Bituminous Coated and Lined Corrugated Steel Pipe-Arch (S)		×			×
Corrugated Aluminum Alloy Pipe (C)	X		Х		×
Corrugated Aluminum Alloy Pipe-Arch (C)	×		×		×
Structural Plate Steel Pipe (C)	X		×		
Polymer Precoated Galvanized Corrugated Steel Pipe-Arch (C)	X		Х		×

		Pip	Pipe Type	/pe	
Material	1	2	3	4	5
Structural Plate Steel Pipe-Arch	×		Х		
Structural Plate Aluminum Alloy Pipe (C)	×		Х		
Structural Plate Aluminum Alloy Pipe-Arch (C)	×		X		
Clay Pipe, Extra Strength (S)	×	×	×		
Clay Pipe				X	
Perforated Clay Pipe				X	
Corrugated Polyethylene Pipe, Type SP				×	
Corrugated Polyethylene Pipe, Type (S)	×	X	Х	X	×
Profile Wall (Ribbed) Polyethylene Pipe (S)	×	X	Х		×
Profile Wall (Closed) Polyethylene Pipe (S)	×	X	X		×
Smooth Wall Polyethylene Pipe (S)	×	×	X		×
Corrugated Polyethylene Drainage Tubing				X	
Corrugated Polypropylene Pipe (C)	×	Х	Х		×
Perforated PVC Semicircular Pipe				×	
Profile Wall PVC Pipe (S)	×	×	X	×	×
Smooth Wall PVC Pipe (S)	×	X	Х		×
Concrete Drain Tile				X	
Clay Drain Tile				×	

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Ms. Phillips
Date: 07/21/16

COMMENTS AND ACTION

- 715.02 MATERIALS
- 715.05 LAYING PIPE
- 715.07 TEE AND STUB-TEE CONNECTIONS
- 715.09 BACKFILLING
- 715.13 METHOD OF MEASUREMENT
- 715.14 BASIS OF PAYMENT
- 907.16 THERMOPLASTIC PIPE REQUIREMENTS
- 907.20 RIBBED POLYETHYLENE PIPE
- 908.02 CORRUGATED STEEL PIPE AND PIPE-ARCHES
- 908.08 POLYMER PRECOATED GALVANIZED CORRUGATED STEEL CULVERT PIPE AND PIPE-ARCHES
- 715-PSLC-01 THRU -03 PIPE SERVICE LIFE CRITERIA
- 715-PHCL-01 THRU -23 PIPE HEIGHT OF COVER LIMITS
- 715-PIPE-01 AND -02 PIPE CLASSIFICATION TABLES

DISCUSSION:

Motion: Second: Ayes: Nays: FHWA Approval:	Action: Passed as Submitted Passed as Revised Withdrawn
Standard Specifications Sections referenced and/or affected: 715 pg 631 thru 644; 907 pg 898 and 899; 908 pg 902 and 905.	2018 Standard Specifications Revise Pay Items List
Recurring Special Provision affected: NONE	Create RSP (No) Effective Letting RSP Sunset Date:
Standard Drawing affected: 715-PSLC-01 THRU -03 PIPE SERVICE LIFE CRITERIA	Revise RSP (No) Effective Letting RSP Sunset Date:
715-PHCL-01 THRU -23 PIPE HEIGHT OF COVER LIMITS 715-PIPE-01 AND -02 PIPE CLASSIFICATION TABLES	Standard Drawing Effective
Design Manual Sections affected:	Create RPD (No) Effective Letting
203-2.02	GIFE Update
GIFE Sections cross-references: NONE	SiteManager Update