

# ALABAMA

Name(s)	
Title(s)	Assistant State Maintenance Engineer - Bridge
Agency	Alabama Department of Transportation
State/Province	AL
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">50</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source:

# ALABAMA

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	
	PT decks	PT decks
	PT slab bridges	
	Box girders	Box girders
	Pier caps	
	Spliced girder	
	Other	consists of precast channel units built in the 1970's
	<b>Are your PT structures designed for a specific service life?</b>	NO
YES, What is the design service life (number of years)?		
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	NO
	YES	

# ALABAMA

<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
	Other
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO
	YES, Please describe issue and performed repair:

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<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons
	During construction
	At a later stage when structure in-service
	NDT-aided inspection of PT system
	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)
	FRP wrapping
	Injection of corrosion inhibitor
	Crack injection
	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement
	External/unbonded tendon replacement
	Other. Please specify:
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link or location where procedure can be accessed:

# ALABAMA

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Visual methods</td> <td style="width: 50%; border: none;">Visual methods</td> </tr> </table>	Visual methods	Visual methods
	Visual methods	Visual methods	
	Magnetic methods (i.e., magnetic flux leakage)		
	vibration methods (i.e., acoustic emission, impact echo, ultrasonic)		
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)		
	Direct measurement of tendon force (i.e. gages on strands)		
	Radiation methods (i.e., x-ray diffraction, radiography)		
	Electrochemical techniques (i.e., half-cell potential)		
Other, or not sure how to classify. Please describe:			
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification		
	PTI Level 1 installer		
	PTI Level 2 installer		
	Other, please describe:		

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<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	<p>Open-Ended Response</p>
<p><b>Does your agency have grout storage requirements?</b></p>	<p>NO</p> <p>YES, Please specify guiding document, provide link, or describe:</p>
<p><b>Who conducts QA? Please check all that apply.</b></p>	<p>Contractor</p> <p>In-house</p> <p>Consultant inspection (CEI)</p> <p>Other, please specify:</p>
<p><b>Who conducts QC? Please check all that apply.</b></p>	<p>Contractor</p> <p>In-house</p> <p>Consultant inspection (CEI)</p> <p>Other, please specify:</p>
<p><b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b></p>	<p>Open-Ended Response</p>

# ALABAMA

**Have you encountered problematic PT construction details?**

YES

NO

**Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.**

Anchorage pour-back details

Mid-tendon vents

Inspection ports

Duct placement

Duct splicing

Heat-shrink sleeves

Confinement reinforcement

Segment mating during erection

Match-cast joints

Precast quality

Deck drainage details

Other. Please describe:

**Have you encountered problematic construction techniques/methods?**

YES

NO

# ALABAMA

<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.
<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES
	NO
<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	Open-Ended Response
<p><b>How have you rectified these issues?</b></p>	Open-Ended Response

# ALABAMA

<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO NO
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	YES, Please describe how it was performed:  Open-Ended Response

# ALASKA

Name(s)	
Title(s)	Technical Engineer II
Agency	Alaska DOT&PF
State/Province	AK
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">10</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">3/1/2017</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	ASBI, PTI, AASHTO, and other state DOT specifications (CA and FL) Open-Ended Response
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications    In-house/DOT created specifications
	Other, please provide a link:

# ALASKA

<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source: CA and FL
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders Box girders
	Pier caps
	Spliced girder
	Other hybrid pre-tensioned, post-tensioned girders
<b>Are your PT structures designed for a specific service life?</b>	NO NO
	YES, What is the design service life (number of years)?
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO NO
	YES
	YES, What is the level specified?
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response Include as special provision: "Use pre-packaged thixotropic grout formulated specifically for bonded post-tensioned concrete structures in aggressive exposures."
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO NO
	YES

# ALASKA

<p><b>On what types of PT structures have you performed repairs? Please check all that apply.</b></p>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
	Other
<p><b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b></p>	NO <span style="margin-left: 200px;">NO</span>
	YES, Please provide a link:
<p><b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b></p>	NO <span style="margin-left: 200px;">NO</span>
	YES, Please provide a link:
<p><b>Who performs repairs? Please check all that apply.</b></p>	In-house staff
	Contractor
	Other. Please describe:
<p><b>Has your agency encountered issues requiring repair during construction?</b></p>	NO <span style="margin-left: 200px;">NO</span>
	YES, Please describe issue and performed repair:
<p><b>Has your agency encountered issues requiring repair related to corrosion?</b></p>	NO <span style="margin-left: 200px;">NO</span>
	YES, Please describe issue and performed repair:

# ALASKA

<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO <span style="margin-left: 200px;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO <span style="margin-left: 200px;">NO</span>
	YES, Please describe issue and performed repair:
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons
	During construction
	At a later stage when structure in-service
	NDT-aided inspection of PT system <span style="margin-left: 100px;">NDT-aided inspection of PT system</span>
	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)
	FRP wrapping
	Injection of corrosion inhibitor
	Crack injection
	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement
	External/unbonded tendon replacement
	Other. Please specify:
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO <span style="margin-left: 200px;">NO</span>
	YES, Please provide a link or location where procedure can be accessed:

# ALASKA

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	
	PTI Level 2 installer	
	Other, please describe:	minimum of 5 years experience
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response	<p>Refer to Section 502 of the Alaska Department of Transportation and Public Facilities Standard Specifications for Highway Construction.  <a href="http://www.dot.state.ak.us/stwddes/dcsspecs/index.shtml">http://www.dot.state.ak.us/stwddes/dcsspecs/index.shtml</a></p>
<p><b>Does your agency have grout storage requirements?</b></p>	NO	
	<p>YES, Please specify guiding document, provide link, or describe:</p>	<p>502-3.05.4. Grout Storage. Store all grout materials in a dry enclosure or building that is convenient to the work site. Limit on site storage of grout to a maximum period of one month.</p>

# ALASKA

<b>Who conducts QA? Please check all that apply.</b>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	
	Contractor	
	In-house	
	Consultant inspection (CEI)	
Other, please specify:		
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	
<b>Have you encountered problematic PT construction details?</b>	YES	
	NO	NO

# ALASKA

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
	Other. Please describe:
<p><b>Have you encountered problematic construction techniques/methods?</b></p>	YES
	NO <span style="float: right;">NO</span>
<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.

# ALASKA

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO NO
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response We have very few CIP PT bridges in our inventory
<b>How have you rectified these issues?</b>	Open-Ended Response NA
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO NO
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response NA

# ARIZONA

Name(s)	
Title(s)	Bridge Design Manager
Agency	Arizona DOT
State/Province	AZ
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">500</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">01/01/2008</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">Minor updates no reference</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source: <span style="float: right;">Caltrans</span>

# ARIZONA

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	<input type="checkbox"/> Cast-in-place segmental <input type="checkbox"/> Cast-in-place segmental
	<input type="checkbox"/> Precast segmental
	<input type="checkbox"/> Cast-in-place, non-segmental
	<input type="checkbox"/> PT decks
	<input type="checkbox"/> PT slab bridges
	<input type="checkbox"/> Box girders <input type="checkbox"/> Box girders
	<input type="checkbox"/> Pier caps <input type="checkbox"/> Pier caps
	<input type="checkbox"/> Spliced girder <input type="checkbox"/> Spliced girder
	<input type="checkbox"/> Other
	<b>Are your PT structures designed for a specific service life?</b>
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	<input type="checkbox"/> NO <input type="checkbox"/> NO
	<input type="checkbox"/> YES
	<input type="checkbox"/> YES, What is the level specified?
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	<input type="checkbox"/> Open-Ended Response <input type="checkbox"/> cement/water
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	<input type="checkbox"/> NO
	<input type="checkbox"/> YES <input type="checkbox"/> YES

# ARIZONA

<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders <span style="float: right;">Box girders</span>
	Pier caps
	Spliced girder
	Other
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor <span style="float: right;">Contractor</span>
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO
	YES, Please describe issue and performed repair: <span style="float: right;">of CIP concrete in webs around ducts. Failure of concrete at PT</span>
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:

# ARIZONA

<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	
	YES, Please describe issue and performed repair:	Repairs limited to deck patching and overlay of decks on PT bridges.
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	
	During construction	During construction
	At a later stage when structure in-service	
	NDT-aided inspection of PT system	
	Invasive inspection of PT system	
	Repair of pour-back (anchor block-out)	
	FRP wrapping	
	Injection of corrosion inhibitor	
	Crack injection	
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	
	Other. Please specify:	
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO	NO
	YES, Please provide a link or location where procedure can be accessed:	

# ARIZONA

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	
	PTI Level 1 installer	
	PTI Level 2 installer	
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	<p>Construction Manual has procedures. Chapter 6 - Structures Link is <a href="https://azdot.gov/node/10355">https://azdot.gov/node/10355</a></p>	
	Open-Ended Response	
<p><b>Does your agency have grout storage requirements?</b></p>	NO	NO
	YES, Please specify guiding document, provide link, or describe:	

# ARIZONA

<b>Who conducts QA? Please check all that apply.</b>	Contractor
	In-house <span style="float: right;">In-house</span>
	Consultant inspection (CEI)
	Other, please specify:
<b>Who conducts QC? Please check all that apply.</b>	Contractor <span style="float: right;">Contractor</span>
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response
<b>Have you encountered problematic PT construction details?</b>	YES <span style="float: right;">YES</span>
	NO

# ARIZONA

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details <span style="float: right;">Deck drainage details</span>
	Other. Please describe:
<p><b>Have you encountered problematic construction techniques/methods?</b></p>	YES
	NO <span style="float: right;">NO</span>
<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.

# ARIZONA

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response <span style="float: right;">None</span>
<b>How have you rectified these issues?</b>	Open-Ended Response
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response <span style="float: right;">NA</span>

# CALIFORNIA

Name(s)	
Title(s)	Senior Bridge Engineer
Agency	Caltrans, Transportation
State/Province	CA
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">2900</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">08/19/2019</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications
	AASHTO LRFD Bridge Design Specifications, Eighth Edition with California Amendments (AASHTO-CA BDS-8)
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source:

# CALIFORNIA

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	PT decks
	PT slab bridges	PT slab bridges
	Box girders	Box girders
	Pier caps	Pier caps
	Spliced girder	
	Other	
<b>Are your PT structures designed for a specific service life?</b>	NO	
	YES, What is the design service life (number of years)?	75
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	NO
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	cement/water or packaged complying with ASTM C1107
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	
	YES	YES

# CALIFORNIA

<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental                      Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders    Box girders
	Pier caps
	Spliced girder
	Other
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO    NO
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO    NO
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor    Contractor
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO
	YES, Please describe issue and performed repair:                      PT duct popping of girder stem
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO
	YES, Please describe issue and performed repair:                      Placed corrosion inhibitors in duct

# CALIFORNIA

<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">NO</td> <td style="width: 50%; border: none;">NO</td> </tr> <tr> <td colspan="2" style="border: none;">YES, Please describe issue and performed repair:</td> </tr> </table>	NO	NO	YES, Please describe issue and performed repair:												
NO	NO															
YES, Please describe issue and performed repair:																
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">NO</td> <td style="width: 50%; border: none;">NO</td> </tr> <tr> <td colspan="2" style="border: none;">YES, Please describe issue and performed repair:</td> </tr> </table>	NO	NO	YES, Please describe issue and performed repair:												
NO	NO															
YES, Please describe issue and performed repair:																
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	<table style="width: 100%; border: none;"> <tr><td style="border: none;">Member strengthening to address corrosion/impact damage</td></tr> <tr><td style="border: none;">Re-grouting of tendons</td></tr> <tr><td style="border: none;">During construction</td></tr> <tr><td style="border: none;">At a later stage when structure in-service</td></tr> <tr><td style="border: none;">NDT-aided inspection of PT system</td></tr> <tr><td style="border: none;">Invasive inspection of PT system</td></tr> <tr><td style="border: none;">Repair of pour-back (anchor block-out)</td></tr> <tr><td style="border: none;">FRP wrapping</td></tr> <tr> <td style="border: none;">Injection of corrosion inhibitor</td> <td style="border: none; text-align: right;">Injection of corrosion inhibitor</td> </tr> <tr><td style="border: none;">Crack injection</td></tr> <tr><td style="border: none;">Repair or replacement of deck on a PT superstructure</td></tr> <tr><td style="border: none;">Internal/bonded tendon replacement</td></tr> <tr><td style="border: none;">External/unbonded tendon replacement</td></tr> <tr><td style="border: none;">Other. Please specify:</td></tr> </table>	Member strengthening to address corrosion/impact damage	Re-grouting of tendons	During construction	At a later stage when structure in-service	NDT-aided inspection of PT system	Invasive inspection of PT system	Repair of pour-back (anchor block-out)	FRP wrapping	Injection of corrosion inhibitor	Injection of corrosion inhibitor	Crack injection	Repair or replacement of deck on a PT superstructure	Internal/bonded tendon replacement	External/unbonded tendon replacement	Other. Please specify:
Member strengthening to address corrosion/impact damage																
Re-grouting of tendons																
During construction																
At a later stage when structure in-service																
NDT-aided inspection of PT system																
Invasive inspection of PT system																
Repair of pour-back (anchor block-out)																
FRP wrapping																
Injection of corrosion inhibitor	Injection of corrosion inhibitor															
Crack injection																
Repair or replacement of deck on a PT superstructure																
Internal/bonded tendon replacement																
External/unbonded tendon replacement																
Other. Please specify:																
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">NO</td> <td style="width: 50%; border: none;">NO</td> </tr> <tr> <td colspan="2" style="border: none;">YES, Please provide a link or location where procedure can be accessed:</td> </tr> </table>	NO	NO	YES, Please provide a link or location where procedure can be accessed:												
NO	NO															
YES, Please provide a link or location where procedure can be accessed:																

# CALIFORNIA

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)
	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification
	PTI Level 1 installer
	PTI Level 2 installer <span style="float: right;">PTI Level 2 installer</span>
	Other, please describe:
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Yes QC/QA Section 50 Standard Specificaitons
	Open-Ended Response
<p><b>Does your agency have grout storage requirements?</b></p>	NO
	YES, Please specify guiding document, provide link, or describe: <span style="float: right;">store grout in a dry environment</span>

# CALIFORNIA

<b>Who conducts QA? Please check all that apply.</b>	Contractor
	In-house <span style="float: right;">In-house</span>
	Consultant inspection (CEI)
	Other, please specify:
<b>Who conducts QC? Please check all that apply.</b>	Contractor <span style="float: right;">Contractor</span>
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response
<b>Have you encountered problematic PT construction details?</b>	YES
	NO <span style="float: right;">NO</span>

# CALIFORNIA

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
	Other. Please describe:
<p><b>Have you encountered problematic construction techniques/methods?</b></p>	YES
	NO <span style="float: right;">NO</span>
<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.

# CALIFORNIA

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response <span style="float: right;">Excessive prestress shrinkage causing joint and elastomeric bearing failure</span>
<b>How have you rectified these issues?</b>	Open-Ended Response <span style="float: right;">Reconstruct joints openings and replace bearings</span>
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response

# COLORADO

Name(s)	
Title(s)	Professional Engineer II
Agency	Colorado Department of Transportation
State/Province	CO
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: 173
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date 12/13/2018
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response PTI M50, PTI M, PTI Bonded Training course materials, ASBI training course materials.
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50 ASBI/PTI M50
	PTI M55 PTI M55
	In-house/DOT created specifications In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source:

# COLORADO

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental <span style="float: right;">Precast segmental</span>
	Cast-in-place, non-segmental <span style="float: right;">Cast-in-place, non-segmental</span>
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges
	Box girders <span style="float: right;">Box girders</span>
	Pier caps <span style="float: right;">Pier caps</span>
	Spliced girder <span style="float: right;">Spliced girder</span>
	Other
<b>Are your PT structures designed for a specific service life?</b>	NO <span style="float: right;">NO</span>
	YES, What is the design service life (number of years)?
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO
	YES
	YES, What is the level specified? <span style="float: right;">called out as PL-1B, but the specifications require all the</span>
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response <span style="float: right;">We require PTI M55 Classification: Class C Pre-packaged</span>
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO
	YES <span style="float: right;">YES</span>

# COLORADO

<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges
	Box girders <span style="float: right;">Box girders</span>
	Pier caps
	Spliced girder
Other	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor <span style="float: right;">Contractor</span>
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO
	YES, Please describe issue and performed repair: <span style="float: right;">Not sealed conduit, i.e. leaking.</span>
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO
	YES, Please describe issue and performed repair: <span style="float: right;">Corroded strands discovered in external PT added after construction to control cracking. No repair performed, as no strength loss has occurred. PT strands are for serviceability on the structure</span>

# COLORADO

<p><b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b></p>	<p style="text-align: center;">NO</p> <p style="text-align: right; padding-right: 20px;">We have not done many repairs on P/T bridges except for the P/T slabs in Glenwood canyon during rockfall with FRP rebar strips. The asphalt was cracked and thought that the deck was also. After uncovering the overlay out the slab is fine. There was another instance in 2016 for repairing the same type of P/T slabs.</p> <p>YES, Please describe issue and performed repair:</p>
<p><b>Has your agency performed repair/replacement of decks on PT bridges?</b></p>	<p style="text-align: center;">NO <span style="float: right;">NO</span></p> <p>YES, Please describe issue and performed repair:</p>
<p><b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b></p>	<p>Member strengthening to address corrosion/impact damage</p> <p>Re-grouting of tendons</p> <p>During construction</p> <p>At a later stage when structure in-service</p> <p>NDT-aided inspection of PT system</p> <p>Invasive inspection of PT system</p> <p>Repair of pour-back (anchor block-out)</p> <p>FRP wrapping</p> <p>Injection of corrosion inhibitor</p> <p>Crack injection</p> <p>Repair or replacement of deck on a PT superstructure</p> <p>Internal/bonded tendon replacement</p> <p>External/unbonded tendon replacement</p> <p>Other. Please specify:</p>
<p><b>Does your agency have established inspection procedures specific to PT bridges?</b></p>	<p style="text-align: center;">NO <span style="float: right;">NO</span></p> <p>YES, Please provide a link or location where procedure can be accessed:</p>

# COLORADO

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	
	PTI Level 2 installer	PTI Level 2 installer
	Other, please describe:	See CDOT Standard Specification section 618.
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	<p>Open-Ended Response</p>	
<p><b>Does your agency have grout storage requirements?</b></p>	NO	NO
	<p>YES, Please specify guiding document, provide link, or describe:</p>	

## COLORADO

<b>Who conducts QA? Please check all that apply.</b>	Contractor	Contractor
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	Contractor
	In-house	
	Consultant inspection (CEI)	
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	N/A
<b>Have you encountered problematic PT construction details?</b>	YES	YES
	NO	

# COLORADO

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details	Anchorage pour-back details	
	Mid-tendon vents		
	Inspection ports	Inspection ports	
	Duct placement	Duct placement	
	Duct splicing	Duct splicing	
	Heat-shrink sleeves		
	Confinement reinforcement	Confinement reinforcement	
	Segment mating during erection	Segment mating during erection	
	Match-cast joints	Match-cast joints	
	Precast quality		
	Deck drainage details	Deck drainage details	
	Other. Please describe:		
	<p><b>Have you encountered problematic construction techniques/methods?</b></p>	YES	YES
NO			
<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test	Air (pressure) test	
	Vacuum test		
	Deck-level vent removal/permanent vent cap placement		
	Permanent grout cap placement		
	Grouting/filler procedures		
	Vacuum grouting		
	Preparing anchorage area for block-out pour	Preparing anchorage area for block-out pour	
	Other. Please specify.		
	<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES	YES
		NO	

# COLORADO

<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)	
	Prestressing steel	
	Elastomeric coatings	
	Epoxy grouts	
	Pour-back materials	Pour-back materials
	Other, please specify:	
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	Open-Ended Response	N/A
<p><b>How have you rectified these issues?</b></p>	Open-Ended Response	N/A
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	NO	NO
	YES, Please describe how it was performed:	
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	Open-Ended Response	N/A

# CONNECTICUT

Name(s)	
Title(s)	Trans. Principal Engineer
Agency	CTDOT
State/Province	CT
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">120</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications    In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO <span style="float: right;">NO</span>
	YES, Please specify source:

# CONNECTICUT

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	PT decks
	PT slab bridges	
	Box girders	
	Pier caps	Pier caps
	Spliced girder	
	Other	
	<b>Are your PT structures designed for a specific service life?</b>	NO
YES, What is the design service life (number of years)?		
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	NO
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	pre-bagged
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	NO
	YES	

# CONNECTICUT

<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
	Other
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="margin-left: 200px;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="margin-left: 200px;">NO</span>
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor
	Other. Please describe: <span style="float: right;">No repairs yet completed</span>
<b>Has your agency encountered issues requiring repair during construction?</b>	NO <span style="margin-left: 200px;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO <span style="margin-left: 200px;">NO</span>
	YES, Please describe issue and performed repair:

# CONNECTICUT

<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons
	During construction
	At a later stage when structure in-service
	NDT-aided inspection of PT system
	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)
	FRP wrapping <span style="float: right;">FRP wrapping</span>
	Injection of corrosion inhibitor
	Crack injection <span style="float: right;">Crack injection</span>
	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement
	External/unbonded tendon replacement
	Other. Please specify:
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO
	YES, Please provide a link or location where procedure can be accessed: <span style="float: right;">YES</span>

# CONNECTICUT

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Visual methods</td> <td style="width: 50%; border: none;">Visual methods</td> </tr> </table>	Visual methods	Visual methods
	Visual methods	Visual methods	
	Magnetic methods (i.e., magnetic flux leakage)		
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)		
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)		
	Direct measurement of tendon force (i.e. gages on strands)		
	Radiation methods (i.e., x-ray diffraction, radiography)		
	Electrochemical techniques (i.e., half-cell potential)		
Other, or not sure how to classify. Please describe:			
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification		
	PTI Level 1 installer		
	PTI Level 2 installer		
	Other, please describe:		
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	<div style="border: 1px solid black; min-height: 100%;"></div>		
	Open-Ended Response		
<p><b>Does your agency have grout storage requirements?</b></p>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">NO</td> <td style="width: 50%; border: none;">NO</td> </tr> </table>	NO	NO
	NO	NO	
YES, Please specify guiding document, provide link, or describe:			

# CONNECTICUT

<b>Who conducts QA? Please check all that apply.</b>	Contractor
	In-house <span style="float: right;">In-house</span>
	Consultant inspection (CEI) <span style="float: right;">Consultant inspection (CEI)</span>
	Other, please specify:
<b>Who conducts QC? Please check all that apply.</b>	Contractor <span style="float: right;">Contractor</span>
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response
<b>Have you encountered problematic PT construction details?</b>	YES
	NO

# CONNECTICUT

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
	Other. Please describe:
<p><b>Have you encountered problematic construction techniques/methods?</b></p>	YES
	NO <span style="margin-left: 150px;">NO</span>
<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.

# CONNECTICUT

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response
<b>How have you rectified these issues?</b>	Open-Ended Response
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response

# DELAWARE

Name(s)	
Title(s)	Chief of Bridges & Structures
Agency	Delaware DOT
State/Province	DE
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">3</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">12/31/2017</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">PTI</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications <span style="margin-left: 20px;">In-house/DOT created specifications</span>
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source:

## DELAWARE

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	
	Box girders	
	Pier caps	Pier caps
	Spliced girder	Spliced girder
	Other	
	<b>Are your PT structures designed for a specific service life?</b>	NO
YES, What is the design service life (number of years)?		75
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	cement/water
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	
	YES	

## DELAWARE

<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
	Other
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">no</span>
	YES, Please provide a link: <span style="float: right;">Our cable stay bridge has an owner's manual</span>
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor <span style="float: right;">Contractor</span>
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:

## DELAWARE

<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">NO</td> <td style="width: 50%; border: none;">NO</td> </tr> <tr> <td colspan="2" style="border: none;">YES, Please describe issue and performed repair:</td> </tr> </table>	NO	NO	YES, Please describe issue and performed repair:																									
NO	NO																												
YES, Please describe issue and performed repair:																													
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">NO</td> <td style="width: 50%; border: none;">NO</td> </tr> <tr> <td colspan="2" style="border: none;">YES, Please describe issue and performed repair:</td> </tr> </table>	NO	NO	YES, Please describe issue and performed repair:																									
NO	NO																												
YES, Please describe issue and performed repair:																													
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Member strengthening to address corrosion/impact damage</td> <td style="width: 50%; border: none;"></td> </tr> <tr> <td style="border: none;">Re-grouting of tendons</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">During construction</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">At a later stage when structure in-service</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">NDT-aided inspection of PT system</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">Invasive inspection of PT system</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">Repair of pour-back (anchor block-out)</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">FRP wrapping</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">Injection of corrosion inhibitor</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">Crack injection</td> <td style="border: none;">Crack injection</td> </tr> <tr> <td style="border: none;">Repair or replacement of deck on a PT superstructure</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">Internal/bonded tendon replacement</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">External/unbonded tendon replacement</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;">Other. Please specify:</td> <td style="border: none;"></td> </tr> </table>	Member strengthening to address corrosion/impact damage		Re-grouting of tendons		During construction		At a later stage when structure in-service		NDT-aided inspection of PT system		Invasive inspection of PT system		Repair of pour-back (anchor block-out)		FRP wrapping		Injection of corrosion inhibitor		Crack injection	Crack injection	Repair or replacement of deck on a PT superstructure		Internal/bonded tendon replacement		External/unbonded tendon replacement		Other. Please specify:	
Member strengthening to address corrosion/impact damage																													
Re-grouting of tendons																													
During construction																													
At a later stage when structure in-service																													
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External/unbonded tendon replacement																													
Other. Please specify:																													
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">NO</td> <td style="width: 50%; border: none;">NO</td> </tr> <tr> <td colspan="2" style="border: none;">YES, Please provide a link or location where procedure can be accessed:</td> </tr> </table>	NO	NO	YES, Please provide a link or location where procedure can be accessed:																									
NO	NO																												
YES, Please provide a link or location where procedure can be accessed:																													

## DELAWARE

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)
	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	<input type="checkbox"/> ASBI grouting certification <input type="checkbox"/> ASBI grouting certification
	<input type="checkbox"/> PTI Level 1 installer
	<input type="checkbox"/> PTI Level 2 installer
	Other, please describe:
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	<input type="checkbox"/> Open-Ended Response <input type="checkbox"/> PTI Recommendations
	<input type="checkbox"/> NO
<p><b>Does your agency have grout storage requirements?</b></p>	<input type="checkbox"/> YES, Please specify guiding document, provide link, or describe: <input type="checkbox"/> Special provision in contract docs
	<input type="checkbox"/> NO

## DELAWARE

<b>Who conducts QA? Please check all that apply.</b>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	
	Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	
	In-house	
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>		
	Open-Ended Response	none
<b>Have you encountered problematic PT construction details?</b>	YES	
	NO	NO

## DELAWARE

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
	Other. Please describe:
<p><b>Have you encountered problematic construction techniques/methods?</b></p>	YES
	NO <span style="float: right;">NO</span>

## DELAWARE

<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.
<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES
	NO <span style="margin-left: 150px;">NO</span>
<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:

## DELAWARE

<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	<p>Open-Ended Response                      None</p>
<p><b>How have you rectified these issues?</b></p>	<p>Open-Ended Response                      N/A</p>
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	<p>NO    NO</p>
	<p>YES, Please describe how it was performed:</p>
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	<p>Open-Ended Response                      None</p>

# FLORIDA

Name(s)	
Title(s)	Major Bridge Design Engineer
Agency	FDOT
State/Province	FL
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">500</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">01/01/2020</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">FDOT Structure Design Guidelines, Spec. 462</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO <span style="float: right;">NO</span>
	YES, Please specify source:

# FLORIDA

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	PT decks
	PT slab bridges	PT slab bridges
	Box girders	Box girders
	Pier caps	Pier caps
	Spliced girder	Spliced girder
	Other	PT column, PT U beam, PT straddle beam, PT C pier, footing
	<b>Are your PT structures designed for a specific service life?</b>	NO
YES, What is the design service life (number of years)?		75
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	
	YES	
	YES, What is the level specified?	FDOT protection level is equal to or better than PL-2
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	Prepackaged and pre-approved grouts
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	
	YES	YES

# FLORIDA

<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	PT decks
	PT slab bridges	PT slab bridges
	Box girders	Box girders
	Pier caps	Pier caps
	Spliced girder	Spliced girder
Other	Pier column	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO	NO
	YES, Please provide a link:	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO	NO
	YES, Please provide a link:	
<b>Who performs repairs? Please check all that apply.</b>	In-house staff	
	Contractor	Contractor
	Other. Please describe:	
<b>Has your agency encountered issues requiring repair during construction?</b>	NO	
	YES, Please describe issue and performed repair:	1.Repair of cracked PT anchor blocks, blisters 2.Repair of cracked box girder webs 3.Repair of cracked shear keys 4. Re-grouting voids in PT ducts
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	
	YES, Please describe issue and performed repair:	Since 1999, we have many projects repair related to tendon failure / corrosion. Sunshine Skyway Bridge: tendon corrosion due to lack of protection (bleed water); cracked PE duct Ringling Bridge: tendon failure and corrosion due to soft grout, replaced external tendons Wonderwood Bridge: tendon corrosion due to soft grout and voids, drying and impregnation of tendons, added external tendons. Nile channel Bridge: replaced external tendons Mid-Bay Bridge: replaced external tendons

# FLORIDA

<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons	Re-grouting of tendons
	During construction	During construction
	At a later stage when structure in-service	At a later stage when structure in-service
	NDT-aided inspection of PT system	NDT-aided inspection of PT system
	Invasive inspection of PT system	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)	Repair of pour-back (anchor block-out)
	FRP wrapping	FRP wrapping
	Injection of corrosion inhibitor	Injection of corrosion inhibitor
	Crack injection	Crack injection
	Repair or replacement of deck on a PT superstructure	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	External/unbonded tendon replacement
	Other. Please specify:	Repair tendons due to the presence of soft grout. (Drying of tendons).

# FLORIDA

<p><b>Does your agency have established inspection procedures specific to PT bridges?</b></p>	NO	NO
	<p>YES, Please provide a link or location where procedure can be accessed:</p>	
<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	
	PTI Level 1 installer	
	PTI Level 2 installer	
	Other, please describe:	FDOT required CTQP Level 1 and 2
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response	CPAM

# FLORIDA

<b>Does your agency have grout storage requirements?</b>	NO
	YES, Please specify guiding document, provide link, or describe: See FDOT Spec. 462
<b>Who conducts QA? Please check all that apply.</b>	Contractor
	In-house
	Consultant inspection (CEI)                      Consultant inspection (CEI)
	Other, please specify:
<b>Who conducts QC? Please check all that apply.</b>	Contractor    Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response    See FDOT Standard Detailing Manual
<b>Have you encountered problematic PT construction details?</b>	YES    YES
	NO

# FLORIDA

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details	Anchorage pour-back details	
	Mid-tendon vents	X	
	Inspection ports		
	Duct placement		
	Duct splicing	Duct splicing	
	Heat-shrink sleeves	Heat-shrink sleeves	
	Confinement reinforcement		
	Segment mating during erection		
	Match-cast joints	Match-cast joints	
	Precast quality	Precast quality	
	Deck drainage details		
	Other. Please describe:	blisters / deviators. 2.GROUT vent tubes sticking up on the deck, mostly	
	<p><b>Have you encountered problematic construction techniques/methods?</b></p>	YES	YES
		NO	

# FLORIDA

<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test	Air (pressure) test
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement	
	Grouting/filler procedures	Grouting/filler procedures
	Vacuum grouting	
	Preparing anchorage area for block-out pour	
	Other. Please specify.	CIP joints, e.g. for PT spliced girder bridge.
	<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES
NO		
<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)	
	Prestressing steel	
	Elastomeric coatings	
	Epoxy grouts	
	Pour-back materials	Pour-back materials
	Other, please specify:	

# FLORIDA

<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	<p>Open-Ended Response</p> <p style="text-align: right;">Grout voids in draped tendons.</p>
<p><b>How have you rectified these issues?</b></p>	<p>Open-Ended Response</p> <p style="text-align: right;">Re-grouting the tendons with vacuum grouting method.</p>
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	<p>NO</p> <p style="text-align: right;">NO</p>
	<p>YES, Please describe how it was performed:</p>
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	<p>Open-Ended Response</p> <p style="text-align: right;">Wonderwood Bridge Repair Issue: Repair of soft grout</p>

# GEORGIA

Name(s)	
Title(s)	State Bridge Engineer
Agency	Georgia DOT
State/Province	GA
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">150</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">11/06/2006</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">PTI Grout Specifications</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO <span style="float: right;">NO</span>
	YES, Please specify source:

# GEORGIA

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	<input type="checkbox"/> Cast-in-place segmental <input type="checkbox"/> Cast-in-place segmental
	<input type="checkbox"/> Precast segmental
	<input type="checkbox"/> Cast-in-place, non-segmental
	<input type="checkbox"/> PT decks
	<input type="checkbox"/> PT slab bridges
	<input type="checkbox"/> Box girders <input type="checkbox"/> Box girders
	<input type="checkbox"/> Pier caps <input type="checkbox"/> Pier caps
	<input type="checkbox"/> Spliced girder <input type="checkbox"/> Spliced girder
	<input type="checkbox"/> Other
	<b>Are your PT structures designed for a specific service life?</b>
<input type="checkbox"/> YES, What is the design service life (number of years)?	
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	<input type="checkbox"/> NO <input type="checkbox"/> NO
	<input type="checkbox"/> YES
	<input type="checkbox"/> YES, What is the level specified?
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	<input type="checkbox"/> Open-Ended Response <input type="checkbox"/> pre-bagged
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	<input type="checkbox"/> NO <input type="checkbox"/> NO
	<input type="checkbox"/> YES

# GEORGIA

<p><b>On what types of PT structures have you performed repairs? Please check all that apply.</b></p>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders <span style="float: right;">Box girders</span>
	Pier caps
	Spliced girder
	Other
<p><b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b></p>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<p><b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b></p>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<p><b>Who performs repairs? Please check all that apply.</b></p>	In-house staff
	Contractor <span style="float: right;">Contractor</span>
	Other. Please describe:
<p><b>Has your agency encountered issues requiring repair during construction?</b></p>	NO
	YES, Please describe issue and performed repair: <span style="float: right;">segregation/honeycomb in some box girder walls. Repairs were made</span>
<p><b>Has your agency encountered issues requiring repair related to corrosion?</b></p>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:

# GEORGIA

<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">NO</td> <td style="width: 50%; text-align: center;">NO</td> </tr> <tr> <td colspan="2">YES, Please describe issue and performed repair:</td> </tr> </table>	NO	NO	YES, Please describe issue and performed repair:																									
NO	NO																												
YES, Please describe issue and performed repair:																													
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">NO</td> <td style="width: 50%; text-align: center;">NO</td> </tr> <tr> <td colspan="2">YES, Please describe issue and performed repair:</td> </tr> </table>	NO	NO	YES, Please describe issue and performed repair:																									
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<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">Member strengthening to address corrosion/impact damage</td> </tr> <tr> <td colspan="2">Re-grouting of tendons</td> </tr> <tr> <td style="width: 50%; text-align: center;">During construction</td> <td style="width: 50%; text-align: center;">During construction</td> </tr> <tr> <td colspan="2">At a later stage when structure in-service</td> </tr> <tr> <td colspan="2">NDT-aided inspection of PT system</td> </tr> <tr> <td colspan="2">Invasive inspection of PT system</td> </tr> <tr> <td style="width: 50%; text-align: center;">Repair of pour-back (anchor block-out)</td> <td style="width: 50%; text-align: center;">Repair of pour-back (anchor block-out)</td> </tr> <tr> <td colspan="2">FRP wrapping</td> </tr> <tr> <td colspan="2">Injection of corrosion inhibitor</td> </tr> <tr> <td style="width: 50%; text-align: center;">Crack injection</td> <td style="width: 50%; text-align: center;">Crack injection</td> </tr> <tr> <td colspan="2">Repair or replacement of deck on a PT superstructure</td> </tr> <tr> <td colspan="2">Internal/bonded tendon replacement</td> </tr> <tr> <td colspan="2">External/unbonded tendon replacement</td> </tr> <tr> <td colspan="2">Other. Please specify:</td> </tr> </table>	Member strengthening to address corrosion/impact damage		Re-grouting of tendons		During construction	During construction	At a later stage when structure in-service		NDT-aided inspection of PT system		Invasive inspection of PT system		Repair of pour-back (anchor block-out)	Repair of pour-back (anchor block-out)	FRP wrapping		Injection of corrosion inhibitor		Crack injection	Crack injection	Repair or replacement of deck on a PT superstructure		Internal/bonded tendon replacement		External/unbonded tendon replacement		Other. Please specify:	
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<b>Does your agency have established inspection procedures specific to PT bridges?</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">NO</td> <td style="width: 50%;"></td> </tr> <tr> <td colspan="2">YES, Please provide a link or location where procedure can be accessed:</td> </tr> </table>	NO		YES, Please provide a link or location where procedure can be accessed:																									
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# GEORGIA

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	PTI Level 1 installer
	PTI Level 2 installer	PTI Level 2 installer
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response	All of the above are required by contract special provisions.
<p><b>Does your agency have grout storage requirements?</b></p>	NO	
	YES, Please specify guiding document, provide link, or describe:	Project specifications require proper storage and shelf life

# GEORGIA

<b>Who conducts QA? Please check all that apply.</b>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	
	In-house	
	Consultant inspection (CEI)	
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	N/A
<b>Have you encountered problematic PT construction details?</b>	YES	YES
	NO	

# GEORGIA

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement <span style="float: right;">Duct placement</span>
	Duct splicing
	Heat-shrink sleeves <span style="float: right;">Heat-shrink sleeves</span>
	Confinement reinforcement <span style="float: right;">Confinement reinforcement</span>
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
	Other. Please describe:
	<p><b>Have you encountered problematic construction techniques/methods?</b></p>

# GEORGIA

<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test		
	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Vacuum test</td> <td style="width: 50%; border: none; text-align: right;">Vacuum test</td> </tr> </table>	Vacuum test	Vacuum test
	Vacuum test	Vacuum test	
	Deck-level vent removal/permanent vent cap placement		
	Permanent grout cap placement		
	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Grouting/filler procedures</td> <td style="width: 50%; border: none; text-align: right;">X</td> </tr> </table>	Grouting/filler procedures	X
	Grouting/filler procedures	X	
	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Vacuum grouting</td> <td style="width: 50%; border: none; text-align: right;">Vacuum grouting</td> </tr> </table>	Vacuum grouting	Vacuum grouting
Vacuum grouting	Vacuum grouting		
Preparing anchorage area for block-out pour			
Other. Please specify.			
<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">YES</td> <td style="width: 50%; border: none; text-align: right;">YES</td> </tr> </table>	YES	YES
	YES	YES	
NO			
<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material		
	Flexible filler material (non-cementitious, wax, grease, etc.)		
	Prestressing steel		
	Elastomeric coatings		
	Epoxy grouts		
	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Pour-back materials</td> <td style="width: 50%; border: none; text-align: right;">Pour-back materials</td> </tr> </table>	Pour-back materials	Pour-back materials
	Pour-back materials	Pour-back materials	
Other, please specify:			

# GEORGIA

<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	<p>Open-Ended Response</p> <p style="text-align: right;">Cracking in decks and leaking between segments</p>
<p><b>How have you rectified these issues?</b></p>	<p>Open-Ended Response</p> <p style="text-align: right;">epoxy injection</p>
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	<p>NO</p> <p style="text-align: right;">NO</p>
	<p>YES, Please describe how it was performed:</p>
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	<p>Open-Ended Response</p> <p style="text-align: right;">N/A</p>

# HAWAII

Name(s)	
Title(s)	CE/SE
Agency	HDOT
State/Province	HI
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: 20
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date 12/31/2018
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response BrM & SI&A
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55 PTI M55
	In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source: CALTRANS

# HAWAII

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	
	PT slab bridges	
	Box girders	Box girders
	Pier caps	Pier caps
	Spliced girder	Spliced girder
	Other	
	<b>Are your PT structures designed for a specific service life?</b>	NO
YES, What is the design service life (number of years)?		50
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	NO
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	"pre-bagged, proprietary", "cement/water"
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	
	YES	YES

# HAWAII

<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	
	PT slab bridges	
	Box girders	Box girders
	Pier caps	Pier caps
	Spliced girder	Spliced girder
	Other	
	<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO
YES, Please provide a link:		
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO	NO
	YES, Please provide a link:	
<b>Who performs repairs? Please check all that apply.</b>	In-house staff	
	Contractor	Contractor
	Other. Please describe:	
<b>Has your agency encountered issues requiring repair during construction?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	NO
	YES, Please describe issue and performed repair:	

# HAWAII

<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	
	YES, Please describe issue and performed repair:	Oversize vehicle impact strikes: Contractedout repairs per approved repair drawings:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	
	YES, Please describe issue and performed repair:	
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	Re-grouting of tendons
	During construction	
	At a later stage when structure in-service	At a later stage when structure in-service
	NDT-aided inspection of PT system	NDT-aided inspection of PT system
	Invasive inspection of PT system	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)	
	FRP wrapping	FRP wrapping
	Injection of corrosion inhibitor	
	Crack injection	Crack injection
	Repair or replacement of deck on a PT superstructure	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	
	Other. Please specify:	
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO	
	YES, Please provide a link or location where procedure can be accessed:	

# HAWAII

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	PTI Level 1 installer
	PTI Level 2 installer	PTI Level 2 installer
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response	QA/QC provided by contractors, Reviewed by in house Engineers.
	NO	NO
<p><b>Does your agency have grout storage requirements?</b></p>	YES, Please specify guiding document, provide link, or describe:	

# HAWAII

<b>Who conducts QA? Please check all that apply.</b>	Contractor	Contractor
	In-house	
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	Contractor
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	QA/QC Highly certified contractors, Engineering contractors
<b>Have you encountered problematic PT construction details?</b>	YES	
	NO	NO

# HAWAII

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
	Other. Please describe:
<p><b>Have you encountered problematic construction techniques/methods?</b></p>	YES
	NO <span style="float: right;">NO</span>

# HAWAII

<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test	
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	
	Permanent grout cap placement	
	Grouting/filler procedures	
	Vacuum grouting	
	Preparing anchorage area for block-out pour	
	Other. Please specify.	
<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES	YES
	NO	
<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)	
	Prestressing steel	Prestressing steel
	Elastomeric coatings	Elastomeric coatings
	Epoxy grouts	Epoxy grouts
	Pour-back materials	Pour-back materials
	Other, please specify:	

# HAWAII

<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response                      Corrosion
<b>How have you rectified these issues?</b>	Open-Ended Response                      Contracted with QA/QC
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO    NO
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response                      N/A

# IDAHO

Name(s)	
Title(s)	State Bridge Engineer
Agency	Idaho Transportation Dept
State/Province	ID
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">40</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">01/01/2018</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">PTI Grouting Specification</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source: <span style="float: right;">Washington DOT</span>

# IDAHO

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	PT decks
	PT slab bridges	
	Box girders	
	Pier caps	Pier caps
	Spliced girder	
	Other	
	<b>Are your PT structures designed for a specific service life?</b>	NO
YES, What is the design service life (number of years)?		
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	NO
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	commercial pre-packaged thixotropic tendon grout
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	
	YES	YES

# IDAHO

<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	
	PT slab bridges	
	Box girders	
	Pier caps	Pier caps
	Spliced girder	
	Other	Straddle Bent Pier Cap
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO	NO
	YES, Please provide a link:	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO	NO
	YES, Please provide a link:	
<b>Who performs repairs? Please check all that apply.</b>	In-house staff	
	Contractor	Contractor
	Other. Please describe:	
<b>Has your agency encountered issues requiring repair during construction?</b>	NO	
	YES, Please describe issue and performed repair:	Voids or honeycombing underneath p-t anchorages or bearing plates
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	NO
	YES, Please describe issue and performed repair:	

# IDAHO

<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">NO</td> <td style="width: 50%; text-align: center;">NO</td> </tr> <tr> <td colspan="2">YES, Please describe issue and performed repair:</td> </tr> </table>	NO	NO	YES, Please describe issue and performed repair:																													
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YES, Please describe issue and performed repair:																																	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">NO</td> <td style="width: 50%;"></td> </tr> <tr> <td colspan="2">YES, Please describe issue and performed repair:</td> </tr> <tr> <td></td> <td style="text-align: right;">We have hydro demolished 1-1/2" inches of concrete removal of the deck of a post tensioned box and applied a silica fume composite overlay.</td> </tr> </table>	NO		YES, Please describe issue and performed repair:			We have hydro demolished 1-1/2" inches of concrete removal of the deck of a post tensioned box and applied a silica fume composite overlay.																										
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Member strengthening to address corrosion/impact damage																																	
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Repair or replacement of deck on a PT superstructure																																	
Internal/bonded tendon replacement																																	
External/unbonded tendon replacement																																	
Other. Please specify:																																	
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">NO</td> <td style="width: 50%; text-align: center;">NO</td> </tr> <tr> <td colspan="2">YES, Please provide a link or location where procedure can be accessed:</td> </tr> </table>	NO	NO	YES, Please provide a link or location where procedure can be accessed:																													
NO	NO																																
YES, Please provide a link or location where procedure can be accessed:																																	

# IDAHO

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	
	PTI Level 2 installer	
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response	On site State Inspectors or CE&I consultant inspectors
<p><b>Does your agency have grout storage requirements?</b></p>	NO	NO
	YES, Please specify guiding document, provide link, or describe:	

# IDAHO

<b>Who conducts QA? Please check all that apply.</b>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	
<b>Have you encountered problematic PT construction details?</b>	YES	
	NO	NO

# IDAHO

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details	
	Mid-tendon vents	
	Inspection ports	
	Duct placement	
	Duct splicing	
	Heat-shrink sleeves	
	Confinement reinforcement	X
	Segment mating during erection	
	Match-cast joints	
	Precast quality	
	Deck drainage details	
	Other. Please describe:	Rebar congestion
<p><b>Have you encountered problematic construction techniques/methods?</b></p>	YES	YES
	NO	
<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test	
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	
	Permanent grout cap placement	
	Grouting/filler procedures	X
	Vacuum grouting	
	Preparing anchorage area for block-out pour	
	Other. Please specify.	

# IDAHO

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
Other, please specify:	
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response <span style="float: right;">Some concern with older style grout segregation and shrinkage. No problems found to date.</span>
<b>How have you rectified these issues?</b>	Open-Ended Response <span style="float: right;">Yes</span>
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response <span style="float: right;">We have not had to replace a deteriorated hinge as yet, but would be interested received such information if found.</span>

# INDIANA

Name(s)	
Title(s)	Standards Engineer
Agency	Indiana Department of Transportation
State/Province	IN
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: 24
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date 11/06/2019
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response PTI, ASBI
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50 ASBI/PTI M50
	PTI M55 PTI M55
	In-house/DOT created specifications In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO NO
	YES, Please specify source:

# INDIANA

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	PT decks
	PT slab bridges	PT slab bridges
	Box girders	Box girders
	Pier caps	Pier caps
	Spliced girder	Spliced girder
	Other	
<b>Are your PT structures designed for a specific service life?</b>	NO	
	YES, What is the design service life (number of years)?	75
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	NO
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	pre-bagged, thixotropic, in accordance with 10.9.3 of LRFD Bridge Construction Specifications
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	
	YES	YES
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	
	PT slab bridges	PT slab bridges
	Box girders	Box girders
	Pier caps	
	Spliced girder	Spliced girder
	Other	

# INDIANA

<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO	NO
	YES, Please provide a link:	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO	NO
	YES, Please provide a link:	
<b>Who performs repairs? Please check all that apply.</b>	In-house staff	
	Contractor	Contractor
	Other. Please describe:	
<b>Has your agency encountered issues requiring repair during construction?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	
	YES, Please describe issue and performed repair:	Voids detected in ducts, some strand corrosion. Required vacuum grouting.
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	NO
	YES, Please describe issue and performed repair:	

# INDIANA

<p><b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b></p>	Member strengthening to address corrosion/impact damage	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons	Re-grouting of tendons
	During construction	
	At a later stage when structure in-service	At a later stage when structure in-service
	NDT-aided inspection of PT system	NDT-aided inspection of PT system
	Invasive inspection of PT system	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)	Repair of pour-back (anchor block-out)
	FRP wrapping	
	Injection of corrosion inhibitor	
	Crack injection	Crack injection
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	
	Other. Please specify:	
<p><b>Does your agency have established inspection procedures specific to PT bridges?</b></p>	NO	
	YES, Please provide a link or location where procedure can be accessed:	YES
<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	

# INDIANA

<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	PTI Level 1 installer
	PTI Level 2 installer	PTI Level 2 installer
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	<p>We currently cover post-tensioning requirements under project specific unique special provisions (USP). Our most current USP required ASBI certification, inspection hold points for duct placement and pressure testing, duct proving prior to strand installation, pre-grouting inspection, and inspection of grout. We also require friction tests and five field tests of the grout (chloride ion, pressure bleed, mud balance, strength, and fluidity).</p> <p>Open-Ended Response</p>	
<p><b>Does your agency have grout storage requirements?</b></p>	NO	
	<p>YES, Please specify guiding document, provide link, or describe: Waterproof location.</p>	
<p><b>Who conducts QA? Please check all that apply.</b></p>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	<p>Other, please specify: We have used both in-house and consultant inspection services, depending on the project and staff availability.</p>	

# INDIANA

<b>Who conducts QC? Please check all that apply.</b>	Contractor	Contractor
	In-house	
	Consultant inspection (CEI)	
	Other, please specify:	sub-contract this work to a specialty Contractor.
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	We have very general guidance in chapter 406 of our Indiana Design Manual. <a href="https://www.in.gov/indot/design_manual/design_manual_2013.htm">https://www.in.gov/indot/design_manual/design_manual_2013.htm</a>
<b>Have you encountered problematic PT construction details?</b>	YES	
	NO	NO
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details	
	Mid-tendon vents	
	Inspection ports	
	Duct placement	
	Duct splicing	
	Heat-shrink sleeves	
	Confinement reinforcement	
	Segment mating during erection	
	Match-cast joints	
	Precast quality	
	Deck drainage details	
Other. Please describe:		
<b>Have you encountered problematic construction techniques/methods?</b>	YES	
	NO	NO

# INDIANA

<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test	
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	
	Permanent grout cap placement	
	Grouting/filler procedures	
	Vacuum grouting	
	Preparing anchorage area for block-out pour	
	Other. Please specify.	
<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES	YES
	NO	
<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)	
	Prestressing steel	
	Elastomeric coatings	
	Epoxy grouts	
	Pour-back materials	
	Other, please specify:	
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	Open-Ended Response	The issues that I'm aware of are related to poor grouting or poor grout materials, or inadequate design. These were discovered on older bridges that didn't use modern grout or modern design software.
<p><b>How have you rectified these issues?</b></p>	Open-Ended Response	Yes. We have vacuum grouted voids and also performed strengthening retrofits.
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	NO	NO
	YES, Please describe how it was performed:	
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	Open-Ended Response	I70 WB Ramp over I70 on the east side of Indianapolis had some crack injection and a shear strengthening retrofit performed within the past three years.

# IOWA

Name(s)	
Title(s)	State Bridge Engineer
Agency	Department of Transportation
State/Province	IA
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO	NO
	YES, please specify approximate quantity:	
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures	
	Concerns related to quality/durability	Concerns related to quality/durability
	Expense	Expense
	Time consuming design/construction	
	Other, Please describe:	Lack of a locally established industry presence to build post-tensioned of bridges.
<b>When were your PT Specifications last updated (approximately)?</b>	Date	
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response	
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50	
	PTI M55	
	In-house/DOT created specifications	
	Other, please provide a link:	
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO	
	YES, Please specify source:	

# IOWA

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
Other	
<b>Are your PT structures designed for a specific service life?</b>	NO
	YES, What is the design service life (number of years)?
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO
	YES
	YES, What is the level specified?
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO
	YES

# IOWA

<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
Other	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO
	YES, Please describe issue and performed repair:

# IOWA

<p><b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b></p>	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons
	During construction
	At a later stage when structure in-service
	NDT-aided inspection of PT system
	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)
	FRP wrapping
	Injection of corrosion inhibitor
	Crack injection
	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement
External/unbonded tendon replacement	
Other. Please specify:	
<p><b>Does your agency have established inspection procedures specific to PT bridges?</b></p>	NO
	YES, Please provide a link or location where procedure can be accessed:
<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)
	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)
Other, or not sure how to classify. Please describe:	

# IOWA

<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification
	PTI Level 1 installer
	PTI Level 2 installer
	Other, please describe:
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response
<p><b>Does your agency have grout storage requirements?</b></p>	NO
	YES, Please specify guiding document, provide link, or describe:
<p><b>Who conducts QA? Please check all that apply.</b></p>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<p><b>Who conducts QC? Please check all that apply.</b></p>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<p><b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b></p>	Open-Ended Response

# IOWA

<b>Have you encountered problematic PT construction details?</b>	YES
	NO
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
	Other. Please describe:
<b>Have you encountered problematic construction techniques/methods?</b>	YES
	NO
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.
<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO

# IOWA

<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	Open-Ended Response
<p><b>How have you rectified these issues?</b></p>	Open-Ended Response
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	NO
	YES, Please describe how it was performed:
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	Open-Ended Response

# KANSAS

Name(s)	
Title(s)	Bridge Design Engineer
Agency	Kansas DOT
State/Province	KS
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: 21
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date 06/12/2018
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50 ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO NO
	YES, Please specify source:

# KANSAS

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	PT slab bridges
	Box girders	Box girders
	Pier caps	
	Spliced girder	
	Other	
<b>Are your PT structures designed for a specific service life?</b>	NO	NO
	YES, What is the design service life (number of years)?	
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	NO
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	prequalified prebagged
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	
	YES	YES
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	PT slab bridges
	Box girders	Box girders
	Pier caps	
	Spliced girder	
	Other	

# KANSAS

<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor <span style="float: right;">Contractor</span>
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO
	YES, Please describe issue and performed repair: required repair of the anchorages of transverse tendons We a had major
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:

# KANSAS

<p><b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b></p>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	Re-grouting of tendons
	During construction	
	At a later stage when structure in-service	At a later stage when structure in-service
	NDT-aided inspection of PT system	NDT-aided inspection of PT system
	Invasive inspection of PT system	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)	Repair of pour-back (anchor block-out)
	FRP wrapping	
	Injection of corrosion inhibitor	
	Crack injection	Crack injection
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	
	Other. Please specify:	
<p><b>Does your agency have established inspection procedures specific to PT bridges?</b></p>	NO <span style="float: right;">NO</span>	
	YES, Please provide a link or location where procedure can be accessed:	

# KANSAS

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	Magnetic methods (i.e., magnetic flux leakage)
	vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	(i.e., infrared thermography, impulse radar, ground penetrating radar)	(i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	
	PTI Level 2 installer	
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response	<a href="http://www.ksdot.org/Assets/wwwksdotorg/bureaus/burConsMain/specprov/2015/PDF/15-07014.pdf">http://www.ksdot.org/Assets/wwwksdotorg/bureaus/burConsMain/specprov/2015/PDF/15-07014.pdf</a>
<p><b>Does your agency have grout storage requirements?</b></p>	NO	NO
	<p>YES, Please specify guiding document, provide link, or describe:</p>	

# KANSAS

<b>Who conducts QA? Please check all that apply.</b>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>		
	Open-Ended Response	
<b>Have you encountered problematic PT construction details?</b>	YES	YES
	NO	
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details	Anchorage pour-back details
	Mid-tendon vents	
	Inspection ports	
	Duct placement	Duct placement
	Duct splicing	
	Heat-shrink sleeves	
	Confinement reinforcement	
	Segment mating during erection	
	Match-cast joints	
	Precast quality	
	Deck drainage details	Deck drainage details
	Other. Please describe:	
<b>Have you encountered problematic construction techniques/methods?</b>	YES	
	NO	NO

# KANSAS

<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.
<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES <span style="float: right;">YES</span>
	NO
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts <span style="float: right;">Epoxy grouts</span>
	Pour-back materials
	Other, please specify:
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response <span style="float: right;">anchorage protection for transverse tendons on PT slab bridges</span>
<b>How have you rectified these issues?</b>	Open-Ended Response <span style="float: right;">Better material, closer inspection</span>
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response <span style="float: right;">US-54 Central Business District Viaduct- Wichita, KS PT Box girder, voids in metal ducts</span>

# KENTUCKY

Name(s)	
Title(s)	Branch Managers
Agency	KY Transportation Cabinet
State/Province	KY
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">6</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date
<b>What were the reference documents used for updating? Please specify/explain:</b>	<p style="text-align: right;">KY does not have any specific PT specifications currently. If it is not covered by AASHTO, we don't specify anything else. Anything else would have to be covered by special</p> Open-Ended Response
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source:

# KENTUCKY

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental <span style="float: right;">Precast segmental</span>
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
	Other <span style="float: right;">post tensioned stay cables with grout.</span>
<b>Are your PT structures designed for a specific service life?</b>	NO
	YES, What is the design service life (number of years)? <span style="float: right;">999</span>
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO <span style="float: right;">NO</span>
	YES
	YES, What is the level specified?
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO
	YES <span style="float: right;">YES</span>
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental <span style="float: right;">Precast segmental</span>
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
	Other <span style="float: right;">Post tensioned stay cables.</span>

# KENTUCKY

<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO	NO
	YES, Please provide a link:	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO	NO
	YES, Please provide a link:	
<b>Who performs repairs? Please check all that apply.</b>	In-house staff	
	Contractor	Contractor
	Other. Please describe:	
<b>Has your agency encountered issues requiring repair during construction?</b>	NO	
	YES, Please describe issue and performed repair:	adjacent duct. He could not get strands placed for next sequence. We
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	NO
	YES, Please describe issue and performed repair:	



# KENTUCKY

<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	<p>ASBI grouting certification</p> <hr/> <p>PTI Level 1 installer</p> <hr/> <p>PTI Level 2 installer</p> <hr/> <p>Other, please describe:</p>								
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	<p>Open-Ended Response</p>								
<p><b>Does your agency have grout storage requirements?</b></p>	<p style="text-align: center;">NO <span style="margin-left: 150px;">NO</span></p> <hr/> <p>YES, Please specify guiding document, provide link, or describe:</p>								
<p><b>Who conducts QA? Please check all that apply.</b></p>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-bottom: 1px solid black;">Contractor</td> <td style="width: 50%; border-bottom: 1px solid black;">Contractor</td> </tr> <tr> <td style="border-bottom: 1px solid black;">In-house</td> <td style="border-bottom: 1px solid black;">In-house</td> </tr> <tr> <td style="border-bottom: 1px solid black;">Consultant inspection (CEI)</td> <td style="border-bottom: 1px solid black;">Consultant inspection (CEI)</td> </tr> <tr> <td colspan="2" style="border-bottom: 1px solid black;">Other, please specify:</td> </tr> </table>	Contractor	Contractor	In-house	In-house	Consultant inspection (CEI)	Consultant inspection (CEI)	Other, please specify:	
Contractor	Contractor								
In-house	In-house								
Consultant inspection (CEI)	Consultant inspection (CEI)								
Other, please specify:									
<p><b>Who conducts QC? Please check all that apply.</b></p>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-bottom: 1px solid black;">Contractor</td> <td style="width: 50%; border-bottom: 1px solid black;">Contractor</td> </tr> <tr> <td style="border-bottom: 1px solid black;">In-house</td> <td style="border-bottom: 1px solid black;">In-house</td> </tr> <tr> <td style="border-bottom: 1px solid black;">Consultant inspection (CEI)</td> <td style="border-bottom: 1px solid black;">Consultant inspection (CEI)</td> </tr> <tr> <td colspan="2" style="border-bottom: 1px solid black;">Other, please specify:</td> </tr> </table>	Contractor	Contractor	In-house	In-house	Consultant inspection (CEI)	Consultant inspection (CEI)	Other, please specify:	
Contractor	Contractor								
In-house	In-house								
Consultant inspection (CEI)	Consultant inspection (CEI)								
Other, please specify:									
<p><b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b></p>	<p>Open-Ended Response</p>								

# KENTUCKY

<b>Have you encountered problematic PT construction details?</b>	YES	YES
	NO	
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details	
	Mid-tendon vents	
	Inspection ports	
	Duct placement	
	Duct splicing	
	Heat-shrink sleeves	
	Confinement reinforcement	
	Segment mating during erection	
	Match-cast joints	
	Precast quality	
	Deck drainage details	
Other. Please describe:		
<b>Have you encountered problematic construction techniques/methods?</b>	YES	YES
	NO	
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test	
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	
	Permanent grout cap placement	
	Grouting/filler procedures	Grouting/filler procedures
	Vacuum grouting	
	Preparing anchorage area for block-out pour	
Other. Please specify.		
<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES	YES
	NO	
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)	
	Prestressing steel	
	Elastomeric coatings	
	Epoxy grouts	Epoxy grouts
	Pour-back materials	
Other, please specify:		

# KENTUCKY

**What specific problems with deterioration of CIP post-tensioned bridges have you encountered?**

Open-Ended Response

**How have you rectified these issues?**

Open-Ended Response

**Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?**

NO

NO

YES, Please describe how it was performed:

**If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):**

Open-Ended Response

# LOUISIANA

Name(s)	
Title(s)	Assistant Bridge Design Administrator
Agency	Louisiana Dept. of Transportation and Development
State/Province	LA
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: 10
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date 01/01/2014
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response LA DOTD does not have standard PT specifications. PT specifications are created on a project by project basis.
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50 ASBI/PTI M50
	PTI M55 PTI M55
	In-house/DOT created specifications In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source: borrowed for the most recent PT project

# LOUISIANA

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	
	Box girders	
	Pier caps	Pier caps
	Spliced girder	Spliced girder
	Other	bridges utilizing transverse PT bars (mostly built in the 70s and 80s) that
	<b>Are your PT structures designed for a specific service life?</b>	NO
YES, What is the design service life (number of years)?		
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	
	YES	
	YES, What is the level specified?	PL-2
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	Pre-bagged grout meeting the requirements of PTI M55 Type C
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	
	YES	YES

# LOUISIANA

<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	
	Box girders	
	Pier caps	
	Spliced girder	
Other		
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO	NO
	YES, Please provide a link:	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO	NO
	YES, Please provide a link:	
<b>Who performs repairs? Please check all that apply.</b>	In-house staff	
	Contractor	Contractor
	Other. Please describe:	
<b>Has your agency encountered issues requiring repair during construction?</b>	NO	
	YES, Please describe issue and performed repair:	concrete voids / honeycombs - Concrete surrounding PT anchor
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	NO
	YES, Please describe issue and performed repair:	

# LOUISIANA

<p><b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b></p>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	Re-grouting of tendons
	During construction	During construction
	At a later stage when structure in-service	
	NDT-aided inspection of PT system	
	Invasive inspection of PT system	
	Repair of pour-back (anchor block-out)	Repair of pour-back (anchor block-out)
	FRP wrapping	
	Injection of corrosion inhibitor	Injection of corrosion inhibitor
	Crack injection	Crack injection
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	External/unbonded tendon replacement
External/unbonded tendon replacement	External/unbonded tendon replacement	
Other. Please specify:		
<p><b>Does your agency have established inspection procedures specific to PT bridges?</b></p>	NO	NO
	YES, Please provide a link or location where procedure can be accessed:	
<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
Other, or not sure how to classify. Please describe:		

# LOUISIANA

<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	PTI Level 1 installer
	PTI Level 2 installer	PTI Level 2 installer
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	<p>Open-Ended Response</p>	<p>All of the above (Project specific requirements based on ASBI / PTI documents)</p>
<p><b>Does your agency have grout storage requirements?</b></p>	NO	
<p><b>Does your agency have grout storage requirements?</b></p>	<p>YES, Please specify guiding document, provide link, or describe:</p>	<p>Project specific requirements based on ASBI / PTI documents</p>
<p><b>Who conducts QA? Please check all that apply.</b></p>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	

# LOUISIANA

<b>Who conducts QC? Please check all that apply.</b>	Contractor	Contractor
	In-house	
	Consultant inspection (CEI)	
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>		
	Open-Ended Response	N/A
<b>Have you encountered problematic PT construction details?</b>	YES	YES
	NO	
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details	
	Mid-tendon vents	
	Inspection ports	
	Duct placement	
	Duct splicing	
	Heat-shrink sleeves	
	Confinement reinforcement	Confinement reinforcement
	Segment mating during erection	
	Match-cast joints	
	Precast quality	Precast quality
	Deck drainage details	
	Other. Please describe:	
<b>Have you encountered problematic construction techniques/methods?</b>	YES	YES
	NO	
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test	Air (pressure) test
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	
	Permanent grout cap placement	Permanent grout cap placement
	Grouting/filler procedures	Grouting/filler procedures
	Vacuum grouting	Vacuum grouting
	Preparing anchorage area for block-out pour	Preparing anchorage area for block-out pour
	Other. Please specify.	

# LOUISIANA

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
Other, please specify:	
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response <span style="float: right;">None to date</span>
<b>How have you rectified these issues?</b>	Open-Ended Response <span style="float: right;">N/A</span>
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response <span style="float: right;">N/A</span>

# MAINE

Name(s)	
Title(s)	Fabrication Engineer
Agency	MaineDOT
State/Province	ME
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">50</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">PCI Design and Standard Details</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link: <span style="float: right;">MNL-116</span>
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO <span style="float: right;">NO</span>
	YES, Please specify source:

# MAINE

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	PT slab bridges
	Box girders	Box girders
	Pier caps	
	Spliced girder	
	Other	
<b>Are your PT structures designed for a specific service life?</b>	NO	
	YES, What is the design service life (number of years)?	75
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	ready mix grout with a compressive strength of 6ksi
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	
	YES	YES
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	
	Box girders	
	Pier caps	
	Spliced girder	
Other		
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO	
	YES, Please provide a link:	

# MAINE

<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO
	YES, Please describe issue and performed repair:

# MAINE

<p><b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b></p>	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons
	During construction
	At a later stage when structure in-service
	NDT-aided inspection of PT system
	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)
	FRP wrapping
	Injection of corrosion inhibitor
	Crack injection
	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement
External/unbonded tendon replacement	
Other. Please specify:	
<p><b>Does your agency have established inspection procedures specific to PT bridges?</b></p>	NO
	YES, Please provide a link or location where procedure can be accessed:
<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)
	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)
Other, or not sure how to classify. Please describe:	

# MAINE

<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification
	PTI Level 1 installer
	PTI Level 2 installer
	Other, please describe:
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response
<p><b>Does your agency have grout storage requirements?</b></p>	NO
	YES, Please specify guiding document, provide link, or describe:
<p><b>Who conducts QA? Please check all that apply.</b></p>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<p><b>Who conducts QC? Please check all that apply.</b></p>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<p><b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b></p>	Open-Ended Response

# MAINE

<b>Have you encountered problematic PT construction details?</b>	YES
	NO
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
Other. Please describe:	
<b>Have you encountered problematic construction techniques/methods?</b>	YES
	NO
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
Other. Please specify.	
<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO

# MAINE

<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	Open-Ended Response
<p><b>How have you rectified these issues?</b></p>	Open-Ended Response
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	<p>NO</p> <p>YES, Please describe how it was performed:</p>
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	Open-Ended Response

# MARYLAND

Name(s)	
Title(s)	Division Chief
Agency	Maryland State Highway Administration
State/Province	MD
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO	NO
	YES, please specify approximate quantity:	
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability	Concerns related to quality/durability
	Expense	
	Time consuming design/construction	
	Other, Please describe:	
<b>When were your PT Specifications last updated (approximately)?</b>	Date	
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response	
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50	
	PTI M55	
	In-house/DOT created specifications	
	Other, please provide a link:	
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO	
	YES, Please specify source:	

# MARYLAND

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
	Other
<b>Are your PT structures designed for a specific service life?</b>	NO
	YES, What is the design service life (number of years)?
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO
	YES
	YES, What is the level specified?
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO
	YES
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
Other	

# MARYLAND

<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO
	YES, Please describe issue and performed repair:

# MARYLAND

<p><b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b></p>	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons
	During construction
	At a later stage when structure in-service
	NDT-aided inspection of PT system
	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)
	FRP wrapping
	Injection of corrosion inhibitor
	Crack injection
	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement
	External/unbonded tendon replacement
	Other. Please specify:
<p><b>Does your agency have established inspection procedures specific to PT bridges?</b></p>	NO
	YES, Please provide a link or location where procedure can be accessed:
<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)
	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:

# MARYLAND

<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification
	PTI Level 1 installer
	PTI Level 2 installer
	Other, please describe:
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response
<p><b>Does your agency have grout storage requirements?</b></p>	NO
	YES, Please specify guiding document, provide link, or describe:
<p><b>Who conducts QA? Please check all that apply.</b></p>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<p><b>Who conducts QC? Please check all that apply.</b></p>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<p><b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b></p>	Open-Ended Response
<p><b>Have you encountered problematic PT construction details?</b></p>	YES
	NO

# MARYLAND

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
Other. Please describe:	
<p><b>Have you encountered problematic construction techniques/methods?</b></p>	YES
	NO
<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
Other. Please specify.	
<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES
	NO
<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
Other, please specify:	

# MARYLAND

**What specific problems with deterioration of CIP post-tensioned bridges have you encountered?**

Open-Ended Response

**How have you rectified these issues?**

Open-Ended Response

**Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?**

NO

YES, Please describe how it was performed:

**If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):**

Open-Ended Response

# MASSACHUSETTS

Name(s)	
Title(s)	State Bridge Engineer
Agency	MassDOT
State/Province	MA
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">62</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">10/10/2004</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">Boston Central Artery Specification</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50 <span style="float: right;">ASBI/PTI M50</span>
	PTI M55
	In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO <span style="float: right;">NO</span>
	YES, Please specify source:

# MASSACHUSETTS

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	
	PT decks	PT decks
	PT slab bridges	PT slab bridges
	Box girders	
	Pier caps	Pier caps
	Spliced girder	Spliced girder
	Other	
<b>Are your PT structures designed for a specific service life?</b>	NO	NO
	YES, What is the design service life (number of years)?	
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	NO
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>		
	Open-Ended Response	pre-bagged
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	NO
	YES	
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	
	Box girders	
	Pier caps	
	Spliced girder	
	Other	

# MASSACHUSETTS

<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor
	Other. Please describe: <span style="float: right;">Not Applicable</span>
<b>Has your agency encountered issues requiring repair during construction?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:



# MASSACHUSETTS

<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	<input type="checkbox"/> ASBI grouting certification <span style="margin-left: 150px;"><input type="checkbox"/> ASBI grouting certification</span>
	<input type="checkbox"/> PTI Level 1 installer <span style="margin-left: 150px;"><input type="checkbox"/> PTI Level 2 installer</span>
	<input type="checkbox"/> Other, please describe: <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>
	Open-Ended Response
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response
<p><b>Does your agency have grout storage requirements?</b></p>	<input type="checkbox"/> NO <span style="margin-left: 150px;"><input type="checkbox"/> NO</span>
<p><b>Who conducts QA? Please check all that apply.</b></p>	<input type="checkbox"/> Contractor <span style="margin-left: 150px;"><input type="checkbox"/> In-house</span>
<p><b>Who conducts QC? Please check all that apply.</b></p>	<input type="checkbox"/> Contractor <span style="margin-left: 150px;"><input type="checkbox"/> Contractor</span>
<p><b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b></p>	<input type="checkbox"/> Open-Ended Response <span style="margin-left: 150px;"><input type="checkbox"/> Not Applicable</span>
<p><b>Have you encountered problematic PT construction details?</b></p>	<input type="checkbox"/> YES <span style="margin-left: 150px;"><input type="checkbox"/> YES</span>
<p><b>Have you encountered problematic PT construction details?</b></p>	<input type="checkbox"/> NO

# MASSACHUSETTS

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing <span style="float: right;">Duct splicing</span>
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
	Other. Please describe:
<p><b>Have you encountered problematic construction techniques/methods?</b></p>	YES
	NO <span style="float: right;">NO</span>
<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.
<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES
	NO <span style="float: right;">NO</span>

# MASSACHUSETTS

<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	<p>Open-Ended Response <span style="float: right;">None</span></p>
<p><b>How have you rectified these issues?</b></p>	<p>Open-Ended Response <span style="float: right;">N/A</span></p>
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	<p>NO <span style="float: right;">NO</span></p>
<p>YES, Please describe how it was performed:</p>	
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	<p>Open-Ended Response <span style="float: right;">N/A</span></p>

# MICHIGAN

Name(s)	
Title(s)	Chief Bridge Engineer
Agency	Michigan Department of Transportation
State/Province	MI
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">6</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">12/01/2013</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">ASBI, PTI, AASHTO, fib</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50 <span style="float: right;">ASBI/PTI M50</span>
	PTI M55 <span style="float: right;">PTI M55</span>
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO <span style="float: right;">NO</span>
	YES, Please specify source:

# MICHIGAN

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	PT slab bridges
	Box girders	
	Pier caps	Pier caps
	Spliced girder	
	Other	
<b>Are your PT structures designed for a specific service life?</b>	NO	
	YES, What is the design service life (number of years)?	50
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	
	YES	
	YES, What is the level specified?	PL-3
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	pre-bagged, thixotropic
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	
	YES	YES
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	
	Box girders	
	Pier caps	
	Spliced girder	
	Other	

# MICHIGAN

<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO	NO
	YES, Please provide a link:	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO	NO
	YES, Please provide a link:	
<b>Who performs repairs? Please check all that apply.</b>	In-house staff	
	Contractor	Contractor
	Other. Please describe:	
<b>Has your agency encountered issues requiring repair during construction?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	NO
	YES, Please describe issue and performed repair:	

# MICHIGAN

<p><b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b></p>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	
	During construction	
	At a later stage when structure in-service	At a later stage when structure in-service
	NDT-aided inspection of PT system	NDT-aided inspection of PT system
	Invasive inspection of PT system	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)	
	FRP wrapping	
	Injection of corrosion inhibitor	
	Crack injection	Crack injection
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	
	Other. Please specify:	additional external tendon installation (reason not given).
	<p><b>Does your agency have established inspection procedures specific to PT bridges?</b></p>	NO
YES, Please provide a link or location where procedure can be accessed:		
<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	

# MICHIGAN

<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	<div style="display: flex; justify-content: space-between;"> <span>ASBI grouting certification</span> <span>ASBI grouting certification</span> </div>
	<div style="display: flex; justify-content: space-between;"> <span>PTI Level 1 installer</span> </div>
	<div style="display: flex; justify-content: space-between;"> <span>PTI Level 2 installer</span> </div>
	<div style="display: flex; justify-content: space-between;"> <span>Other, please describe:</span> </div>
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	<div style="display: flex; justify-content: space-between;"> <span>Open-Ended Response</span> <span>mock-up construction, grout QA/QC</span> </div>
<p><b>Does your agency have grout storage requirements?</b></p>	<div style="display: flex; justify-content: space-between;"> <span>NO</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>YES, Please specify guiding document, provide link, or describe:</span> <span>ASBI, PTI</span> </div>
<p><b>Who conducts QA? Please check all that apply.</b></p>	<div style="display: flex; justify-content: space-between;"> <span>Contractor</span> </div>
	<div style="display: flex; justify-content: space-between;"> <span>In-house</span> </div>
	<div style="display: flex; justify-content: space-between;"> <span>Consultant inspection (CEI)</span> <span>Consultant inspection (CEI)</span> </div>
	<div style="display: flex; justify-content: space-between;"> <span>Other, please specify:</span> </div>
<p><b>Who conducts QC? Please check all that apply.</b></p>	<div style="display: flex; justify-content: space-between;"> <span>Contractor</span> <span>Contractor</span> </div>
	<div style="display: flex; justify-content: space-between;"> <span>In-house</span> </div>
	<div style="display: flex; justify-content: space-between;"> <span>Consultant inspection (CEI)</span> </div>
	<div style="display: flex; justify-content: space-between;"> <span>Other, please specify:</span> </div>
<p><b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b></p>	<div style="display: flex; justify-content: space-between;"> <span>Open-Ended Response</span> </div>

# MICHIGAN

<b>Have you encountered problematic PT construction details?</b>	YES	YES	
	NO		
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details		
	Mid-tendon vents		
	Inspection ports		
	Duct placement		
	Duct splicing		
	Heat-shrink sleeves		
	Confinement reinforcement		
	Segment mating during erection		
	Match-cast joints		
	Precast quality		Precast quality
	Deck drainage details		
	Other. Please describe:		Large shear keys cracking during erection.
<b>Have you encountered problematic construction techniques/methods?</b>	YES	YES	
	NO		
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test		
	Vacuum test		
	Deck-level vent removal/permanent vent cap placement		
	Permanent grout cap placement		
	Grouting/filler procedures		Grouting/filler procedures
	Vacuum grouting		
	Preparing anchorage area for block-out pour		
	Other. Please specify.		
<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES		
	NO	NO	

# MICHIGAN

<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	<p>Open-Ended Response</p> <p style="text-align: right;">principle web tension cracks, requiring injection and/or segment strengthening.</p>
<p><b>How have you rectified these issues?</b></p>	<p>Open-Ended Response</p> <p style="text-align: right;">Capital projects to strengthen.</p>
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	<p>NO</p> <p style="text-align: right;">NO</p>
	<p>YES, Please describe how it was performed:</p>
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	<p>Open-Ended Response</p> <p style="text-align: right;">Zilwaukee bridge, Saginaw, MI - bearing replacement US-131 over Muskegon River - addition of external tendons for strengthening.</p>

# MINNESOTA

Name(s)	
Title(s)	Metro District Structures Engineer
Agency	MnDOT
State/Province	MN
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">40</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">01/01/2015</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">ASBI/PTI M50 and PTI M55</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link: <span style="float: right;">We have updated for each segmental project with input from the consultant designer. We have incorporated much of ASBI/PTI M50 and PTI M55 but have not switched completely to those specifications. We plan to do so in the future.</span>

# MINNESOTA

	NO	
<b>Are your PT specifications very similar to or derived from another state's?</b>	YES, Please specify source:	Similar to FDOT with modifications for ASBI/PTI M50, PTI M55, and best practices suggested from consultant designers.
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	PT decks
	PT slab bridges	PT slab bridges
	Box girders	Box girders
	Pier caps	Pier caps
	Spliced girder	Spliced girder
	Other	
<b>Are your PT structures designed for a specific service life?</b>	NO	
	YES, What is the design service life (number of years)?	100
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	
	YES	
	YES, What is the level specified?	PL-2 except we have not successfully used duct couplers on precast segmental.
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	pre-bagged thixotropic grout
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	
	YES	YES
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	
	PT slab bridges	
	Box girders	
	Pier caps	
	Spliced girder	
Other		

# MINNESOTA

	NO	no
<p><b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b></p>	<p>YES, Please provide a link:</p>	<p>No standard plans but there are project-specific details for tendon replacement on the Plymouth Ave bridge over the Mississippi River in Minneapolis. This structures is owned by the city of Minneapolis. We also replaced external tendons that formed the tension-tie on a steel arch bridge.</p>
<p><b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b></p>	<p>YES, Please provide a link:</p>	<p>NO</p> <p>Yes, we have a standard procedure for remedial grouting. See the following research projects:          Considerations for Development of Inspection and Remedial Grouting Contracts for Post-tensioned Bridges - WJE/VSL:  <a href="http://www.dot.state.mn.us/research/reports/2017/201704.pdf">http://www.dot.state.mn.us/research/reports/2017/201704.pdf</a>          Development of Best Practices for Inspection of PT Bridges in Minnesota – Andrea Schokker, UMD:  <a href="http://www.dot.state.mn.us/research/TS/2012/2012-09.pdf">http://www.dot.state.mn.us/research/TS/2012/2012-09.pdf</a> We have also performed invasive inspection of tendons in response to the Sika grout chloride issue.</p>
<p><b>Who performs repairs? Please check all that apply.</b></p>	<p>In-house staff</p> <p>Contractor</p> <p>Other. Please describe:</p>	<p>Contractor</p>

# MINNESOTA

	NO
<b>Has your agency encountered issues requiring repair during construction?</b>	<p style="text-align: right;">We have performed vacuum grouting repairs of partially grouted tendons during construction. We have many challenges with PT construction due to cold weather in MN. Segmental construction continues through the winter with strand placed in duct but not grouted due to low temperatures. Corrosion inhibitor is used as mitigation in the winter to protect ungrouted tendons. We have had to replace some tendons prior to grouting in the spring due to initial corrosion from water infiltration. We have also had PT anchorage blockouts (precast segments) that were not filled after grouting during the construction season. Water infiltrated the blockouts, froze, and spalled concrete around the anchorage blockout. The damaged areas were inspected with NDT methods (impact echo) and found no damage to concrete in front of the anchorage. Spalled areas were repaired with epoxy pourback material.</p>
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	<p style="text-align: center;">NO</p> <p style="text-align: right;">The city of Minneapolis replaced continuity tendons on the Plymouth Ave bridge over the Mississippi River in Minneapolis. This bridge is a CIP concrete box girder constructed with a mix of segmental and falsework methods. Deck drains routed inside the box girders leaked and saturated the bottom slab with chlorides.</p>
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	<p style="text-align: center;">NO</p> <p style="text-align: center;">NO</p>
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	<p>YES, Please describe issue and performed repair:</p>

# MINNESOTA

<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons	Re-grouting of tendons
	During construction	During construction
	At a later stage when structure in-service	At a later stage when structure in-service
	NDT-aided inspection of PT system	NDT-aided inspection of PT system
	Invasive inspection of PT system	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)	Repair of pour-back (anchor block-out)
	FRP wrapping	
	Injection of corrosion inhibitor	
	Crack injection	Crack injection
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	Internal/bonded tendon replacement
	External/unbonded tendon replacement	External/unbonded tendon replacement
	Other. Please specify:	
	<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO
	YES, Please provide a link or location where procedure can be accessed:	YES

# MINNESOTA

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	PTI Level 1 installer
	PTI Level 2 installer	PTI Level 2 installer
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	<p style="text-align: right;">Stressing ram calibration, stressing elongation check prior to cutting strands, air pressure test prior to grouting, visual grout vent inspection after grouting, drilling of a percentage of vent inspection ports, ASBI and PTI L1 &amp; 2 certifications, grout tests – mud balance, flow cone, Schupack bleed test, and grout cubes.</p> <p>Open-Ended Response</p>	
<p><b>Does your agency have grout storage requirements?</b></p>	NO	
	YES, Please specify guiding document, provide link, or describe: <span style="float: right;">See attached specs.</span>	

## MINNESOTA

<b>Who conducts QA? Please check all that apply.</b>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	
	Other, please specify: consultants hired to supplement the team.	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	
	In-house	
	Consultant inspection (CEI)	
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	tendon grouting mock-up prior to field installation
<b>Have you encountered problematic PT construction details?</b>	YES	YES
	NO	

# MINNESOTA

**Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.**

Anchorage pour-back details	Anchorage pour-back details
Mid-tendon vents	
Inspection ports	Inspection ports
Duct placement	
Duct splicing	
Heat-shrink sleeves	
Confinement reinforcement	Confinement reinforcement
Segment mating during erection	Segment mating during erection
Match-cast joints	
Precast quality	Precast quality
Deck drainage details	Deck drainage details

Deck drainage details in the past have caused deterioration. We try not to route deck drainage pipe to interior of box girder unless absolutely necessary and provide a secondary containment system if inside box. Sealing openings in the top slab for construction access. CIP closure pours on segmental bridges develop cracks. We have tried to mitigate by modifying stressing sequence to get early transverse compression during curing but the top slab still cracks. Maybe not a true construction detail, but need good shop drawings that identify conflicts before construction. Consider 3D shop drawings for complicated/congested areas of with high density of rebar and PT. Also, curved (both longitudinal curvature and curved web forms) cast-in-place box girder on falsework, difficult to layout web tendon ducts to tolerance as it is hard to define reference points. 3D shop drawings and additional field surveys may help with that.

Other. Please describe:

**Have you encountered problematic construction techniques/methods?**

YES	YES
NO	

# MINNESOTA

<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test	Air (pressure) test
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	X
	Permanent grout cap placement	
	Grouting/filler procedures	
	Vacuum grouting	X
	Preparing anchorage area for block-out pour	
	Other. Please specify.	
<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES	YES
	NO	
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)	
	Prestressing steel	
	Elastomeric coatings	
	Epoxy grouts	Epoxy grouts
	Pour-back materials	Pour-back materials
	Other, please specify:	
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response	Deck drainage issue mentioned above on the Plymouth Ave bridge.
<b>How have you rectified these issues?</b>	Open-Ended Response	Try not to route deck drainage through box girders and provide secondary containment if drains inside the box cannot be avoided.
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO	
	YES, Please describe how it was performed:	No, but we have begun using stainless steel rebar in PT decks for that reason.
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response	Plymouth Ave Bridge over Mississippi River in Minneapolis – Bridge No. 27611 – replaced continuity tendons due to leaking drainage system.

# MISSISSIPPI

Name(s)	
Title(s)	Director of Structures
Agency	Mississippi DOT
State/Province	MS
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">7</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">10/24/2019</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55 <span style="float: right;">PTI M55</span>
	In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO <span style="float: right;">NO</span>
	YES, Please specify source:
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental <span style="float: right;">Precast segmental</span>
	Cast-in-place, non-segmental
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges
	Box girders
	Pier caps <span style="float: right;">Pier caps</span>
	Spliced girder <span style="float: right;">Spliced girder</span>
Other	

# MISSISSIPPI

<b>Are your PT structures designed for a specific service life?</b>	NO <span style="float: right;">NO</span>
	YES, What is the design service life (number of years)?
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO
	YES
	YES, What is the level specified? <span style="float: right;">PL-2</span>
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response <span style="float: right;">just that it meet PTI M55.1</span>
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO <span style="float: right;">NO</span>
	YES
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
	Other
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:

# MISSISSIPPI

<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor <span style="float: right;">Contractor</span>
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons
	During construction
	At a later stage when structure in-service
	NDT-aided inspection of PT system
	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)
	FRP wrapping
	Injection of corrosion inhibitor
	Crack injection
	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement
	External/unbonded tendon replacement
	Other. Please specify:
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link or location where procedure can be accessed:

# MISSISSIPPI

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	
	PTI Level 1 installer	
	PTI Level 2 installer	PTI Level 2 installer
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response	ASBI inspectors required, Agency will hire a 3rd party inspector to provide QA
<p><b>Does your agency have grout storage requirements?</b></p>	NO	NO
	YES, Please specify guiding document, provide link, or describe:	

# MISSISSIPPI

<b>Who conducts QA? Please check all that apply.</b>	Contractor
	In-house
	Consultant inspection (CEI) <span style="float: right;">Consultant inspection (CEI)</span>
	Other, please specify:
<b>Who conducts QC? Please check all that apply.</b>	Contractor <span style="float: right;">Contractor</span>
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response
<b>Have you encountered problematic PT construction details?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
Other. Please describe:	
<b>Have you encountered problematic construction techniques/methods?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.

# MISSISSIPPI

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
Other, please specify:	
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response
<b>How have you rectified these issues?</b>	Open-Ended Response
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response

# MISSOURI

Name(s)	
Title(s)	State Bridge Engineer
Agency	Missouri DOT
State/Province	MO
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">5</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">Unknown.</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications
	Other, please provide a link: <span style="float: right;">Unknown</span>
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO <span style="float: right;">NO</span>
	YES, Please specify source:
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental <span style="float: right;">Precast segmental</span>
	Cast-in-place, non-segmental
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder <span style="float: right;">Spliced girder</span>
Other	

# MISSOURI

<b>Are your PT structures designed for a specific service life?</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">NO</td> <td style="width: 50%; text-align: center;">NO</td> </tr> <tr> <td colspan="2">YES, What is the design service life (number of years)?</td> </tr> </table>	NO	NO	YES, What is the design service life (number of years)?							
NO	NO										
YES, What is the design service life (number of years)?											
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">NO</td> <td style="width: 50%; text-align: center;">NO</td> </tr> <tr> <td colspan="2">YES</td> </tr> <tr> <td colspan="2">YES, What is the level specified?</td> </tr> </table>	NO	NO	YES		YES, What is the level specified?					
NO	NO										
YES											
YES, What is the level specified?											
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Open-Ended Response</td> <td style="width: 40%;">Unknown. It's been 20 years since we built one.</td> </tr> </table>	Open-Ended Response	Unknown. It's been 20 years since we built one.								
Open-Ended Response	Unknown. It's been 20 years since we built one.										
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">NO</td> <td style="width: 50%; text-align: center;">NO</td> </tr> <tr> <td colspan="2">YES</td> </tr> </table>	NO	NO	YES							
NO	NO										
YES											
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cast-in-place segmental</td></tr> <tr><td>Precast segmental</td></tr> <tr><td>Cast-in-place, non-segmental</td></tr> <tr><td>PT decks</td></tr> <tr><td style="text-align: right;">PT decks</td></tr> <tr><td>PT slab bridges</td></tr> <tr><td>Box girders</td></tr> <tr><td>Pier caps</td></tr> <tr><td>Spliced girder</td></tr> <tr><td>Other</td></tr> </table>	Cast-in-place segmental	Precast segmental	Cast-in-place, non-segmental	PT decks	PT decks	PT slab bridges	Box girders	Pier caps	Spliced girder	Other
Cast-in-place segmental											
Precast segmental											
Cast-in-place, non-segmental											
PT decks											
PT decks											
PT slab bridges											
Box girders											
Pier caps											
Spliced girder											
Other											
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">NO</td> <td style="width: 50%; text-align: center;">NO</td> </tr> <tr> <td colspan="2">YES, Please provide a link:</td> </tr> </table>	NO	NO	YES, Please provide a link:							
NO	NO										
YES, Please provide a link:											
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">NO</td> <td style="width: 50%; text-align: center;">NO</td> </tr> <tr> <td colspan="2">YES, Please provide a link:</td> </tr> </table>	NO	NO	YES, Please provide a link:							
NO	NO										
YES, Please provide a link:											
<b>Who performs repairs? Please check all that apply.</b>	<table style="width: 100%; border-collapse: collapse;"> <tr><td>In-house staff</td></tr> <tr><td>Contractor</td></tr> <tr><td style="text-align: right;">Contractor</td></tr> <tr><td>Other. Please describe:</td></tr> </table>	In-house staff	Contractor	Contractor	Other. Please describe:						
In-house staff											
Contractor											
Contractor											
Other. Please describe:											

# MISSOURI

<b>Has your agency encountered issues requiring repair during construction?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	
	YES, Please describe issue and performed repair:	We removed a 5" thick post tensioned concrete deck overlay and replaced it with a non-post tensioned concrete overlay.
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	
	During construction	
	At a later stage when structure in-service	
	NDT-aided inspection of PT system	
	Invasive inspection of PT system	
	Repair of pour-back (anchor block-out)	
	FRP wrapping	
	Injection of corrosion inhibitor	
	Crack injection	
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	
External/unbonded tendon replacement		
Other. Please specify:		
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO	NO
	YES, Please provide a link or location where procedure can be accessed:	

# MISSOURI

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	
	PTI Level 1 installer	
	PTI Level 2 installer	
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response	Unknown. It's been over 20 years since we built one.
<p><b>Does your agency have grout storage requirements?</b></p>	NO	NO
	YES, Please specify guiding document, provide link, or describe:	
<p><b>Who conducts QA? Please check all that apply.</b></p>	Contractor	
	In-house	
	Consultant inspection (CEI)	
	Other, please specify:	

# MISSOURI

<b>Who conducts QC? Please check all that apply.</b>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify: <span style="float: right;">Unknown. It's been over 20 years since we've built one.</span>
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response
<b>Have you encountered problematic PT construction details?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
Deck drainage details	
Other. Please describe:	
<b>Have you encountered problematic construction techniques/methods?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.

# MISSOURI

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response
<b>How have you rectified these issues?</b>	Open-Ended Response
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response

# MONTANA

Name(s)	
Title(s)	Bridge Engineer
Agency	Montana Dept of Transportation
State/Province	MT
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">5</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">01/01/2016</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">Do not have standard specifications, only project specific provisions.</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source:
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental <span style="float: right;">Cast-in-place segmental</span>
	Precast segmental
	Cast-in-place, non-segmental
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges
	Box girders
	Pier caps <span style="float: right;">Pier caps</span>
	Spliced girder
Other	

# MONTANA

<p><b>Are your PT structures designed for a specific service life?</b></p>	<p style="text-align: center;">NO <span style="float: right;">NO</span></p> <p>YES, What is the design service life (number of years)?</p>
<p><b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b></p>	<p style="text-align: center;">NO <span style="float: right;">NO</span></p> <p>YES</p> <p>YES, What is the level specified?</p>
<p><b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b></p>	<p>Open-Ended Response <span style="float: right;">pre-bagged</span></p>
<p><b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b></p>	<p style="text-align: center;">NO <span style="float: right;">NO</span></p> <p>YES</p>
<p><b>On what types of PT structures have you performed repairs? Please check all that apply.</b></p>	<p>Cast-in-place segmental</p> <p>Precast segmental</p> <p>Cast-in-place, non-segmental</p> <p>PT decks</p> <p>PT slab bridges</p> <p>Box girders</p> <p>Pier caps</p> <p>Spliced girder</p> <p>Other</p>
<p><b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b></p>	<p style="text-align: center;">NO <span style="float: right;">NO</span></p> <p>YES, Please provide a link:</p>
<p><b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b></p>	<p style="text-align: center;">NO <span style="float: right;">NO</span></p> <p>YES, Please provide a link:</p>

# MONTANA

<b>Who performs repairs? Please check all that apply.</b>	<input type="checkbox"/> In-house staff <input type="checkbox"/> Contractor <span style="float: right;"><input type="checkbox"/> Contractor</span> Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	<input type="checkbox"/> NO <span style="float: right;"><input type="checkbox"/> NO</span> YES, Please describe issue and performed repair:
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	<input type="checkbox"/> NO <span style="float: right;"><input type="checkbox"/> NO</span> YES, Please describe issue and performed repair:
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	<input type="checkbox"/> NO <span style="float: right;"><input type="checkbox"/> NO</span> YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	<input type="checkbox"/> NO <span style="float: right;"><input type="checkbox"/> NO</span> YES, Please describe issue and performed repair:
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	<input type="checkbox"/> Member strengthening to address corrosion/impact damage <input type="checkbox"/> Re-grouting of tendons <input type="checkbox"/> During construction <input type="checkbox"/> At a later stage when structure in-service <input type="checkbox"/> NDT-aided inspection of PT system <input type="checkbox"/> Invasive inspection of PT system <input type="checkbox"/> Repair of pour-back (anchor block-out) <input type="checkbox"/> FRP wrapping <input type="checkbox"/> Injection of corrosion inhibitor <input type="checkbox"/> Crack injection <input type="checkbox"/> Repair or replacement of deck on a PT superstructure <input type="checkbox"/> Internal/bonded tendon replacement <input type="checkbox"/> External/unbonded tendon replacement Other. Please specify:

# MONTANA

<b>Does your agency have established inspection procedures specific to PT bridges?</b>	<div style="display: flex; justify-content: space-between;"> <span>NO</span> <span>NO</span> </div>
	YES, Please provide a link or location where procedure can be accessed:
	<div style="display: flex; justify-content: space-between;"> <span>Visual methods</span> <span>Visual methods</span> </div>
	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
<b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b>	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)
	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:
<b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b>	ASBI grouting certification
	PTI Level 1 installer
	PTI Level 2 installer
	Other, please describe:
<b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b>	Open-Ended Response

# MONTANA

<b>Does your agency have grout storage requirements?</b>	NO
	YES, Please specify guiding document, provide link, or describe:
<b>Who conducts QA? Please check all that apply.</b>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<b>Who conducts QC? Please check all that apply.</b>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response
<b>Have you encountered problematic PT construction details?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
Other. Please describe:	
<b>Have you encountered problematic construction techniques/methods?</b>	YES
	NO <span style="float: right;">NO</span>

# MONTANA

<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.
<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES
	NO <span style="float: right;">NO</span>
<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
Other, please specify:	
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	Open-Ended Response
<p><b>How have you rectified these issues?</b></p>	Open-Ended Response
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	Open-Ended Response

# NEBRASKA

Name(s)	
Title(s)	Assistant State Bridge Engineer
Agency	DOT
State/Province	NE
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">10</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">07/28/2017</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">LRFD SPEC,ASBI,PTI,fib,</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55 <span style="float: right;">PTI M55</span>
	In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO <span style="float: right;">NO</span>
	YES, Please specify source:

# NEBRASKA

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	PT slab bridges
	Box girders	
	Pier caps	
	Spliced girder	Spliced girder
	Other	
<b>Are your PT structures designed for a specific service life?</b>	NO	
	YES, What is the design service life (number of years)?	75
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	
	YES	
	YES, What is the level specified?	PL-1a and 1b
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	pre-bagged
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	NO
	YES	
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	
	Box girders	
	Pier caps	
	Spliced girder	
	Other	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO	NO
	YES, Please provide a link:	

# NEBRASKA

<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO	NO
	YES, Please provide a link:	
<b>Who performs repairs? Please check all that apply.</b>	In-house staff	
	Contractor	Contractor
	Other. Please describe:	
<b>Has your agency encountered issues requiring repair during construction?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	
	During construction	
	At a later stage when structure in-service	
	NDT-aided inspection of PT system	NDT-aided inspection of PT system
	Invasive inspection of PT system	
	Repair of pour-back (anchor block-out)	
	FRP wrapping	
	Injection of corrosion inhibitor	
	Crack injection	Crack injection
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	
	Other. Please specify:	

# NEBRASKA

<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO	NO
	YES, Please provide a link or location where procedure can be accessed:	
<b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	PTI Level 1 installer
	PTI Level 2 installer	
	Other, please describe:	
<b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b>		
	Open-Ended Response	NOT done
<b>Does your agency have grout storage requirements?</b>	NO	
	YES, Please specify guiding document, provide link, or describe:	see Manual BOPP on line
<b>Who conducts QA? Please check all that apply.</b>	Contractor	Contractor
	In-house	
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	

# NEBRASKA

<b>Who conducts QC? Please check all that apply.</b>	Contractor	Contractor
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	not in position to provide best practice.
<b>Have you encountered problematic PT construction details?</b>	YES	
	NO	NO
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details	
	Mid-tendon vents	
	Inspection ports	
	Duct placement	
	Duct splicing	
	Heat-shrink sleeves	
	Confinement reinforcement	
	Segment mating during erection	
	Match-cast joints	
	Precast quality	
	Deck drainage details	
Other. Please describe:		
<b>Have you encountered problematic construction techniques/methods?</b>	YES	
	NO	NO
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test	
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	
	Permanent grout cap placement	
	Grouting/filler procedures	
	Vacuum grouting	
	Preparing anchorage area for block-out pour	
	Other. Please specify.	

# NEBRASKA

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES	YES
	NO	
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)	
	Prestressing steel	
	Elastomeric coatings	
	Epoxy grouts	
	Pour-back materials	
Other, please specify:		
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response	camber
<b>How have you rectified these issues?</b>	Open-Ended Response	overlay
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO	NO
	YES, Please describe how it was performed:	
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response	

# NORTH DAKOTA

Name(s)	
Title(s)	State Bridge Engineer
Agency	Nevada DOT
State/Province	NV
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">430</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications    In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source: <span style="float: right;">Caltrans</span>
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental <span style="float: right;">Precast segmental</span>
	Cast-in-place, non-segmental <span style="float: right;">Cast-in-place, non-segmental</span>
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges <span style="float: right;">PT slab bridges</span>
	Box girders <span style="float: right;">Box girders</span>
	Pier caps <span style="float: right;">Pier caps</span>
	Spliced girder <span style="float: right;">Spliced girder</span>
Other	

# NORTH DAKOTA

<b>Are your PT structures designed for a specific service life?</b>	NO <span style="float: right;">NO</span>
	YES, What is the design service life (number of years)?
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO <span style="float: right;">NO</span>
	YES
	YES, What is the level specified?
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response <span style="float: right;">pre-bagged</span>
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO
	YES <span style="float: right;">YES</span>
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental <span style="float: right;">Cast-in-place, non-segmental</span>
	PT decks
	PT slab bridges <span style="float: right;">PT slab bridges</span>
	Box girders <span style="float: right;">Box girders</span>
	Pier caps
	Spliced girder
	Other
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor <span style="float: right;">Contractor</span>
	Other. Please describe:

# NORTH DAKOTA

<b>Has your agency encountered issues requiring repair during construction?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	Deck spalling. repairs have included isolated repairs and deck overlays.
	YES, Please describe issue and performed repair:	
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	
	During construction	
	At a later stage when structure in-service	
	NDT-aided inspection of PT system	
	Invasive inspection of PT system	
	Repair of pour-back (anchor block-out)	Repair of pour-back (anchor block-out)
	FRP wrapping	
	Injection of corrosion inhibitor	
	Crack injection	Crack injection
	Repair or replacement of deck on a PT superstructure	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	
	Other. Please specify:	
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO	NO
	YES, Please provide a link or location where procedure can be accessed:	

# NORTH DAKOTA

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)
	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification
	PTI Level 1 installer
	PTI Level 2 installer
	Other, please describe:
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	<div style="display: flex; justify-content: space-between;"> <span>Open-Ended Response</span> <span>Inspection of grouting and PT operations</span> </div>
<p><b>Does your agency have grout storage requirements?</b></p>	NO
	YES, Please specify guiding document, provide link, or describe:
<p><b>Who conducts QA? Please check all that apply.</b></p>	Contractor
	In-house <span style="float: right;">In-house</span>
	Consultant inspection (CEI) <span style="float: right;">Consultant inspection (CEI)</span>
	Other, please specify:

# NORTH DAKOTA

<b>Who conducts QC? Please check all that apply.</b>	Contractor <span style="float: right;">Contractor</span>
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response
<b>Have you encountered problematic PT construction details?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	<input type="checkbox"/> Anchorage pour-back details <input type="checkbox"/> Mid-tendon vents <input type="checkbox"/> Inspection ports <input type="checkbox"/> Duct placement <input type="checkbox"/> Duct splicing <input type="checkbox"/> Heat-shrink sleeves <input type="checkbox"/> Confinement reinforcement <input type="checkbox"/> Segment mating during erection <input type="checkbox"/> Match-cast joints <input type="checkbox"/> Precast quality <input type="checkbox"/> Deck drainage details <input type="checkbox"/> Other. Please describe:
<b>Have you encountered problematic construction techniques/methods?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	<input type="checkbox"/> Air (pressure) test <input type="checkbox"/> Vacuum test <input type="checkbox"/> Deck-level vent removal/permanent vent cap placement <input type="checkbox"/> Permanent grout cap placement <input type="checkbox"/> Grouting/filler procedures <input type="checkbox"/> Vacuum grouting <input type="checkbox"/> Preparing anchorage area for block-out pour <input type="checkbox"/> Other. Please specify.

# NORTH DAKOTA

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify materials which have been problematic. Please check all that apply.</b>	<input type="checkbox"/> Grout filler material <input type="checkbox"/> Flexible filler material (non-cementitious, wax, grease, etc.) <input type="checkbox"/> Prestressing steel <input type="checkbox"/> Elastomeric coatings <input type="checkbox"/> Epoxy grouts <input type="checkbox"/> Pour-back materials <input type="checkbox"/> Other, please specify:
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response <span style="float: right;">none</span>
<b>How have you rectified these issues?</b>	Open-Ended Response
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response

# NEW HAMPSHIRE

Name(s)	
Title(s)	Senior Project Engineer
Agency	NHDOT
State/Province	NH
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">6</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">12/04/2014</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">We were using PCINE guidance.</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source: <span style="float: right;">We used MassDOT and FDOT as a starting point</span>
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
Other	

# NEW HAMPSHIRE

<b>Are your PT structures designed for a specific service life?</b>	NO
	YES, What is the design service life (number of years)? <span style="float: right;">75</span>
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO <span style="float: right;">NO</span>
	YES
	YES, What is the level specified?
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response <span style="float: right;">Pre-bagged to meet specific physical properties stated in spec.</span>
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO <span style="float: right;">NO</span>
	YES
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
	Other
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:

# NEW HAMPSHIRE

<b>Who performs repairs? Please check all that apply.</b>	In-house staff	In-house staff
	Contractor	Contractor
	Other. Please describe:	handle the smaller type bridges but if the bridge is too big we would
<b>Has your agency encountered issues requiring repair during construction?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	
	During construction	
	At a later stage when structure in-service	
	NDT-aided inspection of PT system	
	Invasive inspection of PT system	
	Repair of pour-back (anchor block-out)	
	FRP wrapping	
	Injection of corrosion inhibitor	
	Crack injection	
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	
	Other. Please specify:	

# NEW HAMPSHIRE

<b>Does your agency have established inspection procedures specific to PT bridges?</b>	<div style="display: flex; justify-content: space-between;"> <span>NO</span> <span>NO</span> </div>
	YES, Please provide a link or location where procedure can be accessed:
	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
<b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b>	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)
	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:
<b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b>	<input type="checkbox"/> ASBI grouting certification <input type="checkbox"/> PTI Level 1 installer <input type="checkbox"/> PTI Level 2 installer
	<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;">Other, please describe:</div> <div style="width: 35%;">A qualified rep of the post-tensioning manufacturer per specification. On the projects that I designed, I believe they had ASBI certification.</div> </div>
<b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;">Open-Ended Response</div> <div style="width: 35%;">I will send you the special provision that we use that has this information.</div> </div>

# NEW HAMPSHIRE

<b>Does your agency have grout storage requirements?</b>	NO	NO
	YES, Please specify guiding document, provide link, or describe:	
<b>Who conducts QA? Please check all that apply.</b>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	
	Contractor	
	In-house	
	Consultant inspection (CEI)	
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	<a href="https://www.pci.org/PCINE/Technical_Resources/Bridge_Resources/Bridge_Deck_Panels/PCINE/Technical_Resources/Bridge_Resources/Bridge_Deck_Panels.aspx?hkey=70534732-9293-4eea-bf89-503c3cf492df">https://www.pci.org/PCINE/Technical_Resources/Bridge_Resources/Bridge_Deck_Panels/PCINE/Technical_Resources/Bridge_Resources/Bridge_Deck_Panels.aspx?hkey=70534732-9293-4eea-bf89-503c3cf492df</a>
<b>Have you encountered problematic PT construction details?</b>	YES	YES
	NO	
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details	
	Mid-tendon vents	
	Inspection ports	
	Duct placement	Duct placement
	Duct splicing	Duct splicing
	Heat-shrink sleeves	
	Confinement reinforcement	
	Segment mating during erection	
	Match-cast joints	
	Precast quality	
	Deck drainage details	
	Other. Please describe:	
<b>Have you encountered problematic construction techniques/methods?</b>	YES	YES
	NO	

# NEW HAMPSHIRE

<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify. <span style="float: right;">Alignment of panels and decks.</span>
<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES <span style="float: right;">YES</span>
	NO
<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material <span style="float: right;">Grout filler material</span>
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
Other, please specify:	
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	Open-Ended Response <span style="float: right;">N/A</span>
<p><b>How have you rectified these issues?</b></p>	Open-Ended Response <span style="float: right;">N/A</span>
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	Open-Ended Response

# NEW MEXICO

Name(s)	
Title(s)	State Bridge Load Rating Engineer
Agency	New Mexico Department of Transportation
State/Province	NM
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: 13
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date 01/01/1930
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response N/A
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications
	Other, please provide a link: Unknown
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source:

## NEW MEXICO

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	
	PT slab bridges	PT slab bridges
	Box girders	Box girders
	Pier caps	
	Spliced girder	
	Other	
<b>Are your PT structures designed for a specific service life?</b>	NO	
	YES, What is the design service life (number of years)?	75
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	NO
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	520.2.5 Grout The Contractor shall provide pre-packaged grout with minimum 28-day compressive strength of 6000 psi. The Contractor shall use grout specifically manufactured for grouting of post-tensioning ducts, and approved by the Project Manager prior to use.
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	NO
	YES	
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	
	Box girders	
	Pier caps	
	Spliced girder	
	Other	

## NEW MEXICO

<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:

## NEW MEXICO

<p><b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b></p>	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons
	During construction
	At a later stage when structure in-service
	NDT-aided inspection of PT system
	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)
	FRP wrapping
	Injection of corrosion inhibitor
	Crack injection
	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement
	External/unbonded tendon replacement
	Other. Please specify:
<p><b>Does your agency have established inspection procedures specific to PT bridges?</b></p>	<p style="text-align: center;">NO <span style="margin-left: 150px;">NO</span></p>
	<p>YES, Please provide a link or location where procedure can be accessed:</p>
<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)
	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:

# NEW MEXICO

<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification
	PTI Level 1 installer <span style="float: right;">PTI Level 1 installer</span>
	PTI Level 2 installer
	Other, please describe:
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response
<p><b>Does your agency have grout storage requirements?</b></p>	NO <span style="float: right;">NO</span>
	YES, Please specify guiding document, provide link, or describe:
<p><b>Who conducts QA? Please check all that apply.</b></p>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<p><b>Who conducts QC? Please check all that apply.</b></p>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<p><b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b></p>	Open-Ended Response
<p><b>Have you encountered problematic PT construction details?</b></p>	YES <span style="float: right;">YES</span>
	NO

## NEW MEXICO

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
Other. Please describe:	interior upper corners of segmental box girders; possible link to
<p><b>Have you encountered problematic construction techniques/methods?</b></p>	YES
	NO
<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.
<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES
	NO
<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	Open-Ended Response

## NEW MEXICO

**How have you rectified these issues?**

Open-Ended Response

**Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?**

NO

NO

YES, Please describe how it was performed:

**If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):**

Open-Ended Response

# NEW YORK

Name(s)	
Title(s)	
Agency	NYS Department of Transportation
State/Province	NY
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: 1
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date 05/01/2018
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response PTI M50 PTI M55
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50 ASBI/PTI M50
	PTI M55 PTI M55
	In-house/DOT created specifications In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO NO
	YES, Please specify source:
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental Precast segmental
	Cast-in-place, non-segmental
	PT decks PT decks
	PT slab bridges
	Box girders
	Pier caps Pier caps
	Spliced girder Spliced girder
Other	

# NEW YORK

Are your PT structures designed for a specific service life?	NO
	YES, What is the design service life (number of years)? <span style="float: right;">75</span>
Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?	NO
	YES
	YES, What is the level specified? <span style="float: right;">PL-2 PTI M50</span>
What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:	Open-Ended Response <span style="float: right;">Prepackaged cementitious, no metallic expansion aides w/c &lt;= 0.40</span>
Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?	NO
	YES <span style="float: right;">YES</span>
On what types of PT structures have you performed repairs? Please check all that apply.	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
Other <span style="float: right;">Prestressed precast girders</span>	
Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
Who performs repairs? Please check all that apply.	In-house staff
	Contractor <span style="float: right;">Contractor</span>
	Other. Please describe:

# NEW YORK

<b>Has your agency encountered issues requiring repair during construction?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	
	YES, Please describe issue and performed repair:	required repairs to reduce chloride infiltration and required external PT
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	
	YES, Please describe issue and performed repair:	removed 2" replaced with overlay
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons	Re-grouting of tendons
	During construction	
	At a later stage when structure in-service	At a later stage when structure in-service
	NDT-aided inspection of PT system	NDT-aided inspection of PT system
	Invasive inspection of PT system	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)	Repair of pour-back (anchor block-out)
	FRP wrapping	
	Injection of corrosion inhibitor	
	Crack injection	Crack injection
	Repair or replacement of deck on a PT superstructure	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	External/unbonded tendon replacement
	Other. Please specify:	
	<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO
	YES, Please provide a link or location where procedure can be accessed:	YES

# NEW YORK

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	
	PTI Level 1 installer	
	PTI Level 2 installer	PTI Level 2 installer
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response	Engineer in Charge monitors all aspects of construction
<p><b>Does your agency have grout storage requirements?</b></p>	NO	NO
	YES, Please specify guiding document, provide link, or describe:	

# NEW YORK

<b>Who conducts QA? Please check all that apply.</b>	Contractor	Contractor
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	Contractor
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	
<b>Have you encountered problematic PT construction details?</b>	YES	
	NO	NO
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details	
	Mid-tendon vents	
	Inspection ports	
	Duct placement	
	Duct splicing	
	Heat-shrink sleeves	
	Confinement reinforcement	
	Segment mating during erection	
	Match-cast joints	
	Precast quality	
	Deck drainage details	
Other. Please describe:		
<b>Have you encountered problematic construction techniques/methods?</b>	YES	
	NO	NO
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test	
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	
	Permanent grout cap placement	
	Grouting/filler procedures	
	Vacuum grouting	
	Preparing anchorage area for block-out pour	
	Other. Please specify.	

# NEW YORK

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response
<b>How have you rectified these issues?</b>	Open-Ended Response
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response <span style="float: right;">I-81 (NB &amp; SB) over the Oneida River Syracuse, NY structure required external PT</span>

# NORTH CAROLINA

Name(s)	
Title(s)	Bridge Engineer
Agency	NCDOT Structures Management Unit
State/Province	NC
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: 11
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date 01/01/2020
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications
	Other, please provide a link: NCDOT Specifications
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO NO
	YES, Please specify source:

# NORTH CAROLINA

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	
	PT decks	PT decks
	PT slab bridges	
	Box girders	
	Pier caps	Pier caps
	Spliced girder	Spliced girder
	Other	
<b>Are your PT structures designed for a specific service life?</b>	NO	
	YES, What is the design service life (number of years)?	100
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	NO
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	prebagged
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	
	YES	YES
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	
	Box girders	
	Pier caps	
	Spliced girder	Spliced girder
	Other	

# NORTH CAROLINA

<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	<p style="text-align: center;">NO <span style="margin-left: 200px;">NO</span></p> <hr/> YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	<p style="text-align: center;">NO <span style="margin-left: 200px;">NO</span></p> <hr/> YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	<p>In-house staff</p> <hr/> Contractor <span style="margin-left: 150px;">Contractor</span> <hr/> Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	<p>NO</p> <hr/> <div style="text-align: right; padding-right: 50px;"> <p>Improper dunnage for storage of precast segment that damaged bottom slab of box segment: Repaired bottom slab by removal of portion of slab and replaced with cast in place concrete.</p> <ul style="list-style-type: none"> <li>- Damage ducts at segment joints: Repaired by reshaping ducts or partial removal &amp; replacement with splices and/or heat shrink.</li> <li>- Blocked or Miss-Aligned Duct: Repaired by coring, ramming, or partial replacement</li> <li>- Poor quality grout cap &amp; other block out pour backs: Repaired by removal of Poor quality materials and replacement.</li> <li>- Missing grout cap: Repaired by cutting access hole in concrete to install cap in one or more pieces. Broken or Missing shear key on match cast faces: Repaired with grout after segment erection.</li> <li>- Shrinkage cracking in cast in place closure pours: Repaired by crack injections and HMWM coating.</li> <li>- Missing or damaged grout port/vent: Repaired by field drilling ports &amp; access holes.</li> <li>- Honeycombs &amp; voids in precast Members: Repaired by chipping out voided areas and pour back with CIP concrete, grout, epoxy grouts, etc.</li> </ul> </div> <p>YES, Please describe issue and performed repair:</p>

# NORTH CAROLINA

<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO
	YES, Please describe issue and performed repair: <span style="float: right;">anchorage blockouts</span>
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons <span style="float: right;">Re-grouting of tendons</span>
	During construction <span style="float: right;">During construction</span>
	At a later stage when structure in-service
	NDT-aided inspection of PT system <span style="float: right;">NDT-aided inspection of PT system</span>
	Invasive inspection of PT system <span style="float: right;">Invasive inspection of PT system</span>
	Repair of pour-back (anchor block-out) <span style="float: right;">Repair of pour-back (anchor block-out)</span>
	FRP wrapping
	Injection of corrosion inhibitor <span style="float: right;">Injection of corrosion inhibitor</span>
	Crack injection <span style="float: right;">Crack injection</span>
	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement
	External/unbonded tendon replacement
	Other. Please specify:
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO
	YES, Please provide a link or location where procedure can be accessed: <span style="float: right;">Project specific</span>

# NORTH CAROLINA

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	Direct measurement of tendon force (i.e. gages on strands)
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	PTI Level 1 installer
	PTI Level 2 installer	PTI Level 2 installer
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response	There is not a set or standard stand alone procedure(s). Procedures tend to be project specific and are derived from Contract Project Special Provisions, ASBI/FHWA Publications, PTI publications, Contractor & Producers work plans, Engineer & Technician past experiences. etc.
<p><b>Does your agency have grout storage requirements?</b></p>	NO	
	YES, Please specify guiding document, provide link, or describe:	approved pre-packaged grout that exhibits thixotropic properties and is

# NORTH CAROLINA

<b>Who conducts QA? Please check all that apply.</b>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	
<b>Have you encountered problematic PT construction details?</b>	YES	YES
	NO	
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details	Anchorage pour-back details
	Mid-tendon vents	Mid-tendon vents
	Inspection ports	Inspection ports
	Duct placement	Duct placement
	Duct splicing	Duct splicing
	Heat-shrink sleeves	Heat-shrink sleeves
	Confinement reinforcement	Confinement reinforcement
	Segment mating during erection	Segment mating during erection
	Match-cast joints	Match-cast joints
	Precast quality	Precast quality
	Deck drainage details	Deck drainage details
Other. Please describe:		
<b>Have you encountered problematic construction techniques/methods?</b>	YES	YES
	NO	
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test	Air (pressure) test
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement	Permanent grout cap placement
	Grouting/filler procedures	Grouting/filler procedures
	Vacuum grouting	Vacuum grouting
	Preparing anchorage area for block-out pour	Preparing anchorage area for block-out pour
	Other. Please specify.	

# NORTH CAROLINA

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES	YES
	NO	
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)	
	Prestressing steel	Prestressing steel
	Elastomeric coatings	Elastomeric coatings
	Epoxy grouts	Epoxy grouts
	Pour-back materials	Pour-back materials
Other, please specify:		
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response	
<b>How have you rectified these issues?</b>	Open-Ended Response	
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO	NO
	YES, Please describe how it was performed:	
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response	

# NORTH DAKOTA

Name(s)	
Title(s)	Assistant Bridge Engineer
Agency	NDDOT
State/Province	ND
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: 1
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source:
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
Other	

# NORTH DAKOTA

Are your PT structures designed for a specific service life?	NO
	YES, What is the design service life (number of years)?
Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?	NO
	YES
	YES, What is the level specified?
What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:	Open-Ended Response
Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?	NO
	YES
On what types of PT structures have you performed repairs? Please check all that apply.	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
Other	
Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?	NO
	YES, Please provide a link:
Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?	NO
	YES, Please provide a link:
Who performs repairs? Please check all that apply.	In-house staff
	Contractor
	Other. Please describe:

# NORTH DAKOTA

<b>Has your agency encountered issues requiring repair during construction?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO
	YES, Please describe issue and performed repair:
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons
	During construction
	At a later stage when structure in-service
	NDT-aided inspection of PT system
	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)
	FRP wrapping
	Injection of corrosion inhibitor
	Crack injection
	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement
	External/unbonded tendon replacement
	Other. Please specify:
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO
	YES, Please provide a link or location where procedure can be accessed:

# NORTH DAKOTA

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)
	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification
	PTI Level 1 installer
	PTI Level 2 installer
	Other, please describe:
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response
	NO
<p><b>Does your agency have grout storage requirements?</b></p>	YES, Please specify guiding document, provide link, or describe:
<p><b>Who conducts QA? Please check all that apply.</b></p>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:

# NORTH DAKOTA

<b>Who conducts QC? Please check all that apply.</b>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response
<b>Have you encountered problematic PT construction details?</b>	YES
	NO
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
	Other. Please describe:
<b>Have you encountered problematic construction techniques/methods?</b>	YES
	NO
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.

# NORTH DAKOTA

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
Other, please specify:	
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response
<b>How have you rectified these issues?</b>	Open-Ended Response
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response

# OHIO

Name(s)	
Title(s)	OSE Administrator, Bridge Engineer
Agency	Ohio DOT
State/Province	OH
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: 83
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date 04/20/2018
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response FHWA PT tendon instillation and grouting manual. ASBI specification guide and construction practice handbook. PTI M55. FHWA - HRT -13-028
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50 ASBI/PTI M50
	PTI M55 PTI M55
	In-house/DOT created specifications In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source: Florida DOT specifications

# OHIO

<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	Precast segmental
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	PT decks
	PT slab bridges	
	Box girders	
	Pier caps	Pier caps
	Spliced girder	Spliced girder
	Other	Post tensioned hold downs at end pier
<b>Are your PT structures designed for a specific service life?</b>	NO	
	YES, What is the design service life (number of years)?	999
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	Grouts are accepted based upon meeting the property requirements listed in the supplemental specification.
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	
	YES	YES
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	
	PT slab bridges	
	Box girders	
	Pier caps	
	Spliced girder	
	Other	Straddle Bent Pier Cap *not included in survey but from outside knowledge

# OHIO

<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO	NO
	YES, Please provide a link:	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO	NO
	YES, Please provide a link:	
<b>Who performs repairs? Please check all that apply.</b>	In-house staff	
	Contractor	Contractor
	Other. Please describe:	
<b>Has your agency encountered issues requiring repair during construction?</b>	NO	
	YES, Please describe issue and performed repair:	External PT duct failed during grouting
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	
	YES, Please describe issue and performed repair:	Voids in PT ducts to be regouted with vacuum grouting. Using Vector Corrosion Post-Tech to mitigate corrosion. Replacing anchorage pour backs.
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	
	YES, Please describe issue and performed repair:	ODOT answer = No. Note: Decks containing PT in deck receive a new overlay approximately every 10 years.

# OHIO

<p><b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b></p>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	Re-grouting of tendons
	During construction	During construction
	At a later stage when structure in-service	
	NDT-aided inspection of PT system	NDT-aided inspection of PT system
	Invasive inspection of PT system	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)	Repair of pour-back (anchor block-out)
	FRP wrapping	
	Injection of corrosion inhibitor	Injection of corrosion inhibitor
	Crack injection	
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	
	Other. Please specify:	
<p><b>Does your agency have established inspection procedures specific to PT bridges?</b></p>	NO	
	YES, Please provide a link or location where procedure can be accessed:	
<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	

# OHIO

<b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	PTI Level 1 installer
	PTI Level 2 installer	PTI Level 2 installer
	Other, please describe:	
<b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b>	Open-Ended Response	<a href="http://www.dot.state.oh.us/Divisions/ConstructionMgt/Specification%20Files/855_04202018_for_2019.pdf">http://www.dot.state.oh.us/Divisions/ConstructionMgt/Specification%20Files/855_04202018_for_2019.pdf</a>
<b>Does your agency have grout storage requirements?</b>	NO	
	YES, Please specify guiding document, provide link, or describe:	See section 855.08.C.7 Grout storage of 855 supplemental specification. (link in question above)
<b>Who conducts QA? Please check all that apply.</b>	Contractor	Contractor
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	N/A
<b>Have you encountered problematic PT construction details?</b>	YES	YES
	NO	

# OHIO

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details	
	Mid-tendon vents	Mid-tendon vents
	Inspection ports	
	Duct placement	
	Duct splicing	Duct splicing
	Heat-shrink sleeves	Heat-shrink sleeves
	Confinement reinforcement	
	Segment mating during erection	
	Match-cast joints	
	Precast quality	
	Deck drainage details	
	Other. Please describe:	
<p><b>Have you encountered problematic construction techniques/methods?</b></p>	YES	YES
	NO	
<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test	Air (pressure) test
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement	
	Grouting/filler procedures	
	Vacuum grouting	
	Preparing anchorage area for block-out pour	
	Other. Please specify.	
<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES	YES
	NO	
<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material	
	Flexible filler material (non-cementitious, wax, grease, etc.)	
	Prestressing steel	
	Elastomeric coatings	
	Epoxy grouts	
	Pour-back materials	Pour-back materials
Other, please specify:		

# OHIO

<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response
<b>How have you rectified these issues?</b>	Open-Ended Response                      Currently under construction
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO    NO
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response                      N/A

# OKLAHOMA

Name(s)	
Title(s)	Assistant Bridge Engineer - Maintenance
Agency	ODOT
State/Province	OK
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">37</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">12/16/2009</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">Florida DOT Specifications</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source: <span style="float: right;">Florida</span>
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental <span style="float: right;">Cast-in-place segmental</span>
	Precast segmental <span style="float: right;">Precast segmental</span>
	Cast-in-place, non-segmental
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges
	Box girders
	Pier caps <span style="float: right;">Pier caps</span>
	Spliced girder
Other	

# OKLAHOMA

<b>Are your PT structures designed for a specific service life?</b>	NO <span style="float: right;">NO</span>
	YES, What is the design service life (number of years)?
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO <span style="float: right;">NO</span>
	YES
	YES, What is the level specified?
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response <span style="float: right;">pre-bagged,</span>
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO
	YES <span style="float: right;">YES</span>
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental <span style="float: right;">Cast-in-place segmental</span>
	Precast segmental <span style="float: right;">Precast segmental</span>
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps <span style="float: right;">Pier caps</span>
	Spliced girder
	Other
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor <span style="float: right;">Contractor</span>
	Other. Please describe:

# OKLAHOMA

<b>Has your agency encountered issues requiring repair during construction?</b>	NO	
	YES, Please describe issue and performed repair:	repaired and strengthened the anchor - successfully tensioned
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	
	YES, Please describe issue and performed repair:	Isolated incidents of corrosion in tendons.
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	
	YES, Please describe issue and performed repair:	NO
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	
	YES, Please describe issue and performed repair:	NO
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	Re-grouting of tendons
	During construction	
	At a later stage when structure in-service	At a later stage when structure in-service
	NDT-aided inspection of PT system	NDT-aided inspection of PT system
	Invasive inspection of PT system	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)	Repair of pour-back (anchor block-out)
	FRP wrapping	FRP wrapping
	Injection of corrosion inhibitor	Injection of corrosion inhibitor
	Crack injection	
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	
	Other. Please specify:	
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO	
	YES, Please provide a link or location where procedure can be accessed:	NO

# OKLAHOMA

<b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	
	PTI Level 2 installer	
	Other, please describe:	
<b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b>	Open-Ended Response	Test tendons with compressed air to determine if duct connections need repair. Perform fluidity tests for grout.
<b>Does your agency have grout storage requirements?</b>	NO	NO
	YES, Please specify guiding document, provide link, or describe:	
<b>Who conducts QA? Please check all that apply.</b>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	

# OKLAHOMA

<b>Who conducts QC? Please check all that apply.</b>	Contractor	Contractor
	In-house	
	Consultant inspection (CEI)	
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	Location of grout inlets and outlets includes duct high points 3' upstream and downstream
<b>Have you encountered problematic PT construction details?</b>	YES	YES
	NO	
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details	Anchorage pour-back details
	Mid-tendon vents	
	Inspection ports	
	Duct placement	
	Duct splicing	
	Heat-shrink sleeves	
	Confinement reinforcement	
	Segment mating during erection	
	Match-cast joints	
	Precast quality	
	Deck drainage details	
	Other. Please describe:	
<b>Have you encountered problematic construction techniques/methods?</b>	YES	
	NO	NO
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test	
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	
	Permanent grout cap placement	
	Grouting/filler procedures	
	Vacuum grouting	
	Preparing anchorage area for block-out pour	
	Other. Please specify.	
<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES	
	NO	NO

# OKLAHOMA

<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material	
	Flexible filler material (non-cementitious, wax, grease, etc.)	
	Prestressing steel	
	Elastomeric coatings	
	Epoxy grouts	
	Pour-back materials	
	Other, please specify:	
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	Open-Ended Response	Grout voids
<p><b>How have you rectified these issues?</b></p>	Open-Ended Response	Inspection using boroscoping, grout evaluation, and filling grout voids
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	NO	NO
	YES, Please describe how it was performed:	
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	Open-Ended Response	Grout repairs: 224265542 0210WX04OKLAHOMAI- 235 SBNE16TH PL/23RDST/RR/RAMP

# OREGON

Name(s)	
Title(s)	Prestressed Concrete Standards Engineer
Agency	Oregon Department of Transportation
State/Province	OR
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">220</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">01/31/2017</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">ASBI/PTI M50 and PTI M55</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50 <span style="float: right;">ASBI/PTI M50</span>
	PTI M55 <span style="float: right;">PTI M55</span>
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO <span style="float: right;">NO</span>
	YES, Please specify source:
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental <span style="float: right;">Cast-in-place segmental</span>
	Precast segmental
	Cast-in-place, non-segmental <span style="float: right;">Cast-in-place, non-segmental</span>
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges
	Box girders <span style="float: right;">Box girders</span>
	Pier caps <span style="float: right;">Pier caps</span>
	Spliced girder <span style="float: right;">Spliced girder</span>
Other <span style="float: right;">PT arch ribs</span>	

# OREGON

Are your PT structures designed for a specific service life?	NO	
	YES, What is the design service life (number of years)?	75
Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?	NO	NO
	YES	
	YES, What is the level specified?	
What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:	Open-Ended Response	commercial, pre-packaged, thixotropic tendon grout
Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?	NO	
	YES	YES
On what types of PT structures have you performed repairs? Please check all that apply.	Cast-in-place segmental	Cast-in-place segmental
	Precast segmental	
	Cast-in-place, non-segmental	Cast-in-place, non-segmental
	PT decks	PT decks
	PT slab bridges	
	Box girders	Box girders
	Pier caps	Pier caps
	Spliced girder	Spliced girder
Other		
Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?	NO	NO
	YES, Please provide a link:	
Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?	NO	NO
	YES, Please provide a link:	
Who performs repairs? Please check all that apply.	In-house staff	In-house staff
	Contractor	Contractor
	Other. Please describe:	

# OREGON

<p><b>Has your agency encountered issues requiring repair during construction?</b></p>	<p>NO</p> <p>1) After tensioning, cracks occurred in PT box stems due to poor quality of formwork and shifted PT ducts during concrete pour. On the same project, rebar cages were not built per specs. The PT box stems were re-constructed. 2) Grout leak during grouting. The leak spots were sealed. 3) Voids in grout were found using probing. Grouting was stopped and couldn't push it through from the original side later. The subsequent grouting was done from the opposite side. So, the probing was conducted. Small holes were drilled and grout was injected afterward. 4) Rebar cages shift caused side concrete cover issue. 5) Over tensioning was done and caused cracks in PT decks. Some decks were re-cast and some received epoxy injection.</p> <p>YES, Please describe issue and performed repair:</p>
<p><b>Has your agency encountered issues requiring repair related to corrosion?</b></p>	<p>NO</p> <p>NO</p> <p>YES, Please describe issue and performed repair:</p>
<p><b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b></p>	<p>NO</p> <p>NO</p> <p>YES, Please describe issue and performed repair:</p>
<p><b>Has your agency performed repair/replacement of decks on PT bridges?</b></p>	<p>NO</p> <p>NO</p> <p>YES, Please describe issue and performed repair:</p>

# OREGON

<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons	Re-grouting of tendons
	During construction	During construction
	At a later stage when structure in-service	
	NDT-aided inspection of PT system	NDT-aided inspection of PT system
	Invasive inspection of PT system	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)	
	FRP wrapping	FRP wrapping
	Injection of corrosion inhibitor	
	Crack injection	Crack injection
	Repair or replacement of deck on a PT superstructure	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	External/unbonded tendon replacement
	Other. Please specify:	
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO	NO
	YES, Please provide a link or location where procedure can be accessed:	
<b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:	

# OREGON

<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	
	PTI Level 2 installer	PTI Level 2 installer
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	<p>Open-Ended Response</p> <p style="text-align: right;"><a href="https://www.oregon.gov/odot/Business/Documents/2018_STANDARD_SPECIFICATIONS.pdf">https://www.oregon.gov/odot/Business/Documents/2018_STANDARD_SPECIFICATIONS.pdf</a> Please look for Section 00555.</p>	
<p><b>Does your agency have grout storage requirements?</b></p>	<p>NO NO</p> <p>YES, Please specify guiding document, provide link, or describe:</p>	
<p><b>Who conducts QA? Please check all that apply.</b></p>	<p>Contractor</p> <p>In-house In-house</p> <p>Consultant inspection (CEI)</p> <p>Other, please specify:</p>	
<p><b>Who conducts QC? Please check all that apply.</b></p>	<p>Contractor Contractor</p> <p>In-house In-house</p> <p>Consultant inspection (CEI) Consultant inspection (CEI)</p> <p>Other, please specify:</p>	
<p><b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b></p>	<p>Open-Ended Response</p>	
<p><b>Have you encountered problematic PT construction details?</b></p>	<p>YES YES</p> <p>NO</p>	

# OREGON

<p><b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b></p>	Anchorage pour-back details	
	Mid-tendon vents	
	Inspection ports	
	Duct placement	Duct placement
	Duct splicing	Duct splicing
	Heat-shrink sleeves	
	Confinement reinforcement	Confinement reinforcement
	Segment mating during erection	
	Match-cast joints	
	Precast quality	Precast quality
	Deck drainage details	
	Other. Please describe:	interfered with reinforcing bars. Use of non-metal PT ducts.
<p><b>Have you encountered problematic construction techniques/methods?</b></p>	YES	
	NO	NO
<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test	
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	
	Permanent grout cap placement	
	Grouting/filler procedures	
	Vacuum grouting	
	Preparing anchorage area for block-out pour	
	Other. Please specify.	
<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES	YES
	NO	

# OREGON

<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify: <span style="float: right;">Non-metal PT ducts.</span>
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	<p>Open-Ended Response <span style="float: right;">Cracking along PT ducts Cold joint cracking in spliced girder bridges Voids in PT ducts</span></p>
<p><b>How have you rectified these issues?</b></p>	<p>Open-Ended Response <span style="float: right;">are small. When cracks increase to a certain size, causes will be</span></p>
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	<p>NO <span style="float: right;">NO</span></p>
	<p>YES, Please describe how it was performed:</p>
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	<p>Open-Ended Response <span style="float: right;">NA</span></p>

# PENNSYLVANIA

Name(s)	
Title(s)	Chief Bridge Engineer
Agency	PennDOT
State/Province	PA
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">37</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">01/01/2019</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	<p style="text-align: right;">Publication 15 (Design Manual-4 Structures, Section 5.9.5,5.12.5.3.9 &amp;5.12.5; Publication 218-Bridge Design standards, Publication 219-Bridge Construction standards, Publication 408- Highway Construction Specifications Section 1000 - Structures, Section 1100- Manufactured Materials, Section 1108 - Post Tensioning Operations</p> <p>Open-Ended Response</p>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50 <span style="float: right;">ASBI/PTI M50</span>
	PTI M55 <span style="float: right;">PTI M55</span>
	In-house/DOT created specifications
	Other, please provide a link:

# PENNSYLVANIA

<b>Are your PT specifications very similar to or derived from another state's?</b>	NO <span style="float: right;">NO</span>
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	YES, Please specify source: Cast-in-place segmental Precast segmental Cast-in-place, non-segmental PT decks <span style="float: right;">PT decks</span> PT slab bridges Box girders Pier caps <span style="float: right;">Pier caps</span> Spliced girder <span style="float: right;">Spliced girder</span> Other
<b>Are your PT structures designed for a specific service life?</b>	NO YES, What is the design service life (number of years)? <span style="float: right;">100</span>
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO YES YES, What is the level specified? <span style="float: right;">PL-2 or PL-3</span>
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response <span style="float: right;">prebagged, please refer to BC-790M. <a href="http://www.dot.state.pa.us/public/Bureaus/BOPD/Bridge/2019/BC/BC790M.pdf">http://www.dot.state.pa.us/public/Bureaus/BOPD/Bridge/2019/BC/BC790M.pdf</a></span>
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO <span style="float: right;">NO</span> YES
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental Precast segmental Cast-in-place, non-segmental PT decks PT slab bridges Box girders Pier caps Spliced girder Other

# PENNSYLVANIA

	NO
<p><b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b></p>	<p style="text-align: right;">Publication 15 (Design Manual-4 Structures, Section 5.9.5,5.12.5.3.9 &amp;5.12.5; Publication 218-Bridge Design standards, Publication 219-Bridge Construction standards, Publication 408- Highway Construction Specifications Section 1000 - Structures, Section 1100- Manufactured Materials, Section 1108 - Post Tensioning Operations  <a href="http://www.dot.state.pa.us/public/Bureaus/BOPD/Bridge/NewProducts/drawings/NP59.pdf">http://www.dot.state.pa.us/public/Bureaus/BOPD/Bridge/NewProducts/drawings/NP59.pdf</a>  <a href="http://www.dot.state.pa.us/public/Bureaus/BOPD/Bridge/NewProducts/drawings/NP74.pdf">http://www.dot.state.pa.us/public/Bureaus/BOPD/Bridge/NewProducts/drawings/NP74.pdf</a></p> <p>YES, Please provide a link:</p>
<p><b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b></p>	<p style="text-align: center;">NO <span style="margin-left: 200px;">NO</span></p> <p>YES, Please provide a link:</p>
<p><b>Who performs repairs? Please check all that apply.</b></p>	<p>In-house staff</p> <hr/> <p>Contractor</p> <hr/> <p>Other. Please describe: <span style="float: right;">N/a</span></p>
<p><b>Has your agency encountered issues requiring repair during construction?</b></p>	<p style="text-align: center;">NO <span style="margin-left: 200px;">NO</span></p> <p>YES, Please describe issue and performed repair:</p>
<p><b>Has your agency encountered issues requiring repair related to corrosion?</b></p>	<p style="text-align: center;">NO <span style="margin-left: 200px;">NO</span></p> <p>YES, Please describe issue and performed repair:</p>
<p><b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b></p>	<p style="text-align: center;">NO <span style="margin-left: 200px;">NO</span></p> <p>YES, Please describe issue and performed repair:</p>
<p><b>Has your agency performed repair/replacement of decks on PT bridges?</b></p>	<p style="text-align: center;">NO <span style="margin-left: 200px;">NO</span></p> <p>YES, Please describe issue and performed repair:</p>

# PENNSYLVANIA

<p><b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b></p>	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons
	During construction
	At a later stage when structure in-service
	NDT-aided inspection of PT system
	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)
	FRP wrapping
	Injection of corrosion inhibitor
	Crack injection
	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement
	External/unbonded tendon replacement
	Other. Please specify:
<p><b>Does your agency have established inspection procedures specific to PT bridges?</b></p>	NO
	YES, Please provide a link or location where procedure can be accessed: <span style="float: right;">Project specific</span>

# PENNSYLVANIA

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:	report: <a href="http://www.dot7.state.pa.us/BPR_P">http://www.dot7.state.pa.us/BPR_P</a>
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	
	PTI Level 2 installer	PTI Level 2 installer
		Professional Engineer with Post Tensioning Operational Experience or PTI Level 2 with minimum 3 years post tensioning experience or ASBI certification with 3 years experience. Per Publication 408, Section 1108.01.
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response	<p><a href="http://www.dot.state.pa.us/public/PubsForms/Publications/Pub_408/408_2020/408_2020_IE/408_2020_IE.pdf">http://www.dot.state.pa.us/public/PubsForms/Publications/Pub_408/408_2020/408_2020_IE/408_2020_IE.pdf</a>  <a href="http://www.dot.state.pa.us/public/PubsForms/Publications/Pub_408/408_2020/408_2020_IE/408_2020_IE.pdf">http://www.dot.state.pa.us/public/PubsForms/Publications/Pub_408/408_2020/408_2020_IE/408_2020_IE.pdf</a></p>

# PENNSYLVANIA

<b>Does your agency have grout storage requirements?</b>	NO
	<a href="http://www.dot.state.pa.us/public/PubsForms/Publications/Pub_408/408_2020/408_2020_IE/408_2020_IE.pdf">http://www.dot.state.pa.us/public/PubsForms/Publications/Pub_408/408_2020/408_2020_IE/408_2020_IE.pdf</a>
	YES, Please specify guiding document, provide link, or describe:
<b>Who conducts QA? Please check all that apply.</b>	Contractor
	In-house <span style="float: right;">In-house</span>
	Consultant inspection (CEI)
	Other, please specify:
<b>Who conducts QC? Please check all that apply.</b>	Contractor <span style="float: right;">Contractor</span>
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response <span style="float: right;">Please refer to question regarding standard plans.</span>
<b>Have you encountered problematic PT construction details?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
	Other. Please describe:
<b>Have you encountered problematic construction techniques/methods?</b>	YES
	NO <span style="float: right;">NO</span>

# PENNSYLVANIA

<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.
<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES
	NO <span style="float: right;">NO</span>
<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
Other, please specify:	
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	Open-Ended Response <span style="float: right;">N/a</span>
<p><b>How have you rectified these issues?</b></p>	Open-Ended Response <span style="float: right;">N/a</span>
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	Open-Ended Response <span style="float: right;">N/a</span>

# RHODE ISLAND

Name(s)	
Title(s)	Managing Engineer
Agency	Department of Transportation
State/Province	RI
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">2</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">12/31/2007</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">AASHTO LRFD Bridge Construction Specifications</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50 <span style="float: right;">ASBI/PTI M50</span>
	PTI M55 <span style="float: right;">PTI M55</span>
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link: <span style="float: right;">AASHTO LRFD Bridge Construction Specifications</span>
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source: <span style="float: right;">Massachusetts' Highway Department</span>
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental <span style="float: right;">Precast segmental</span>
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders <span style="float: right;">Box girders</span>
	Pier caps
	Spliced girder <span style="float: right;">Spliced girder</span>
Other	

# RHODE ISLAND

<b>Are your PT structures designed for a specific service life?</b>	NO <span style="float: right;">NO</span>
	YES, What is the design service life (number of years)?
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO
	YES
	YES, What is the level specified? <span style="float: right;">PL-2</span>
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response <span style="float: right;">Pre-bagged grouts mixed with water to obtain W/C ratio specified Thixotropic grout property for even distribution within the ducts</span>
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO
	YES <span style="float: right;">YES</span>
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders <span style="float: right;">Box girders</span>
	Pier caps <span style="float: right;">Pier caps</span>
	Spliced girder <span style="float: right;">Spliced girder</span>
	Other
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor <span style="float: right;">Contractor</span>
	Other. Please describe:

# RHODE ISLAND

	NO	
<b>Has your agency encountered issues requiring repair during construction?</b>	YES, Please describe issue and performed repair:	For both segmental girder and box girder construction, voids in ducts were refilled with grout. Ports were used to ensure that the ducts were entirely filled with grout. Exterior post tensioning exterior Bulb-Tee girder to gain more capacity due to manufacturing defect and drilling through tendon ducts cutting some strands.
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	NO
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	YES, Please describe issue and performed repair:	NO
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	YES, Please describe issue and performed repair:	NO
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	Re-grouting of tendons
	During construction	During construction
	At a later stage when structure in-service	
	NDT-aided inspection of PT system	NDT-aided inspection of PT system
	Invasive inspection of PT system	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)	
	FRP wrapping	
	Injection of corrosion inhibitor	
	Crack injection	
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	
	Other. Please specify:	

# RHODE ISLAND

<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO	NO
	YES, Please provide a link or location where procedure can be accessed:	
<b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	(i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b>	ASBI grouting certification	
	PTI Level 1 installer	
	PTI Level 2 installer	PTI Level 2 installer
	Other, please describe:	
<b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b>	Open-Ended Response	
	Use of thixotropic grout property for even distribution within the ducts, Addition of downstream grout vents at high points to allow air to escape. Use of high speed mixer. On site testing with certified inspectors on site.	
<b>Does your agency have grout storage requirements?</b>	NO	NO
	YES, Please specify guiding document, provide link, or describe:	

# RHODE ISLAND

<b>Who conducts QA? Please check all that apply.</b>	<input type="checkbox"/> Contractor	<input type="checkbox"/> Contractor
	<input type="checkbox"/> In-house	
	<input type="checkbox"/> Consultant inspection (CEI)	<input type="checkbox"/> Consultant inspection (CEI)
	<input type="checkbox"/> Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	<input type="checkbox"/> Contractor	<input type="checkbox"/> Contractor
	<input type="checkbox"/> In-house	
	<input type="checkbox"/> Consultant inspection (CEI)	<input type="checkbox"/> Consultant inspection (CEI)
	<input type="checkbox"/> Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	
<b>Have you encountered problematic PT construction details?</b>	<input type="checkbox"/> YES	
	<input type="checkbox"/> NO	<input type="checkbox"/> NO
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	<input type="checkbox"/> Anchorage pour-back details	
	<input type="checkbox"/> Mid-tendon vents	
	<input type="checkbox"/> Inspection ports	
	<input type="checkbox"/> Duct placement	
	<input type="checkbox"/> Duct splicing	
	<input type="checkbox"/> Heat-shrink sleeves	
	<input type="checkbox"/> Confinement reinforcement	
	<input type="checkbox"/> Segment mating during erection	
	<input type="checkbox"/> Match-cast joints	
	<input type="checkbox"/> Precast quality	
	<input type="checkbox"/> Deck drainage details	
	<input type="checkbox"/> Other. Please describe:	
<b>Have you encountered problematic construction techniques/methods?</b>	<input type="checkbox"/> YES	
	<input type="checkbox"/> NO	<input type="checkbox"/> NO
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	<input type="checkbox"/> Air (pressure) test	
	<input type="checkbox"/> Vacuum test	
	<input type="checkbox"/> Deck-level vent removal/permanent vent cap placement	
	<input type="checkbox"/> Permanent grout cap placement	
	<input type="checkbox"/> Grouting/filler procedures	
	<input type="checkbox"/> Vacuum grouting	
	<input type="checkbox"/> Preparing anchorage area for block-out pour	
	<input type="checkbox"/> Other. Please specify.	

# RHODE ISLAND

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO <span style="float: right;">NO</span>
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response <span style="float: right;">N/A</span>
<b>How have you rectified these issues?</b>	Open-Ended Response <span style="float: right;">N/A</span>
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response <span style="float: right;">Non</span>



# SOUTH CAROLINA

<b>Are your PT structures designed for a specific service life?</b>	NO
	YES, What is the design service life (number of years)? <span style="float: right;">100</span>
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO
	YES
	YES, What is the level specified?
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response <span style="float: right;">prebagged</span>
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO
	YES <span style="float: right;">YES</span>
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental <span style="float: right;">Precast segmental</span>
	Cast-in-place, non-segmental
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
Other	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor <span style="float: right;">Contractor</span>
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO
	YES, Please describe issue and performed repair: <span style="float: right;">Epoxy repair of widespread cracking to PT decks.</span>

# SOUTH CAROLINA

<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	
	YES, Please describe issue and performed repair:	Numerous repairs to Wando River Bridge related to water intrusion and subsequent corrosion. Filling open Grout vent tubes, methacrylate application, tendon replacement, supplemental tendons, anti corrosion impregnation. HDPE and anchorage repairs and coating.
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	
	YES, Please describe issue and performed repair:	epoxy filling cracking that occurred during construction
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons	
	During construction	
	At a later stage when structure in-service	At a later stage when structure in-service
	NDT-aided inspection of PT system	NDT-aided inspection of PT system
	Invasive inspection of PT system	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)	Repair of pour-back (anchor block-out)
	FRP wrapping	
	Injection of corrosion inhibitor	Injection of corrosion inhibitor
	Crack injection	Crack injection
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	External/unbonded tendon replacement
	Other. Please specify:	
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO	NO
	YES, Please provide a link or location where procedure can be accessed:	

# SOUTH CAROLINA

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	
	PTI Level 1 installer	
	PTI Level 2 installer	
	Other, please describe:	project specific
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response	project specific but generally follow FLDOT specifications
<p><b>Does your agency have grout storage requirements?</b></p>	NO	
	YES, Please specify guiding document, provide link, or describe:	Generally follow FLDOT

# SOUTH CAROLINA

<b>Who conducts QA? Please check all that apply.</b>	Contractor	
	In-house	
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	
	In-house	
	Consultant inspection (CEI)	
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>		
	Open-Ended Response	
<b>Have you encountered problematic PT construction details?</b>	YES	YES
	NO	
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details	Anchorage pour-back details
	Mid-tendon vents	Mid-tendon vents
	Inspection ports	
	Duct placement	
	Duct splicing	Duct splicing
	Heat-shrink sleeves	
	Confinement reinforcement	
	Segment mating during erection	
	Match-cast joints	
	Precast quality	
	Deck drainage details	
	Other. Please describe:	
<b>Have you encountered problematic construction techniques/methods?</b>	YES	
	NO	NO
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test	
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	
	Permanent grout cap placement	
	Grouting/filler procedures	
	Vacuum grouting	
	Preparing anchorage area for block-out pour	
	Other. Please specify.	

## SOUTH CAROLINA

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES	YES
	NO	
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)	
	Prestressing steel	
	Elastomeric coatings	
	Epoxy grouts	
	Pour-back materials	Pour-back materials
Other, please specify:		
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response	
<b>How have you rectified these issues?</b>	Open-Ended Response	
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO	NO
	YES, Please describe how it was performed:	
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response	Wando River Bridge, I-526 Charleston SC. Corrosion of external tendons.

# SOUTH DAKOTA

Name(s)	
Title(s)	Chief Bridge Engineer
Agency	SDDOT
State/Province	SD
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO <span style="float: right;">NO</span>
	YES, please specify approximate quantity:
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe: <span style="float: right;">Have not had need for Post Tensioning</span>
<b>When were your PT Specifications last updated (approximately)?</b>	Date
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source:
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
Spliced girder	
	Other

## SOUTH DAKOTA

<b>Are your PT structures designed for a specific service life?</b>	NO
	YES, What is the design service life (number of years)?
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO
	YES
	YES, What is the level specified?
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO
	YES
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
	Other
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO
	YES, Please describe issue and performed repair:

## SOUTH DAKOTA

<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO
	YES, Please describe issue and performed repair:
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons
	During construction
	At a later stage when structure in-service
	NDT-aided inspection of PT system
	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)
	FRP wrapping
	Injection of corrosion inhibitor
	Crack injection
	Repair or replacement of deck on a PT superstructure
Internal/bonded tendon replacement	
External/unbonded tendon replacement	
Other. Please specify:	
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO
	YES, Please provide a link or location where procedure can be accessed:

# SOUTH DAKOTA

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)
	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification
	PTI Level 1 installer
	PTI Level 2 installer
	Other, please describe:
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response
<p><b>Does your agency have grout storage requirements?</b></p>	NO
	YES, Please specify guiding document, provide link, or describe:
<p><b>Who conducts QA? Please check all that apply.</b></p>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<p><b>Who conducts QC? Please check all that apply.</b></p>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:

# SOUTH DAKOTA

<p>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</p>	<p>Open-Ended Response</p>
<p>Have you encountered problematic PT construction details?</p>	<p>YES</p>
<p>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</p>	<p>NO</p> <p>Anchorage pour-back details</p> <p>Mid-tendon vents</p> <p>Inspection ports</p> <p>Duct placement</p> <p>Duct splicing</p> <p>Heat-shrink sleeves</p> <p>Confinement reinforcement</p> <p>Segment mating during erection</p> <p>Match-cast joints</p> <p>Precast quality</p> <p>Deck drainage details</p> <p>Other. Please describe:</p>
<p>Have you encountered problematic construction techniques/methods?</p>	<p>YES</p>
<p>Please identify construction methods that are problematic. Please check all that apply.</p>	<p>NO</p> <p>Air (pressure) test</p> <p>Vacuum test</p> <p>Deck-level vent removal/permanent vent cap placement</p> <p>Permanent grout cap placement</p> <p>Grouting/filler procedures</p> <p>Vacuum grouting</p> <p>Preparing anchorage area for block-out pour</p> <p>Other. Please specify.</p>
<p>Have you found encountered issues with any of the materials used in PT construction?</p>	<p>YES</p>
	<p>NO</p>

## SOUTH DAKOTA

<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	Open-Ended Response
<p><b>How have you rectified these issues?</b></p>	Open-Ended Response
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	NO
<p><b>YES, Please describe how it was performed:</b></p>	
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	Open-Ended Response

# TEXAS

Name(s)	
Title(s)	Transportation Engineer
Agency	TxDOT
State/Province	TX
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">20</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">01/01/2014</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">PTI M55 PTI/ASBI M50</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55 <span style="float: right;">PTI M55</span>
	In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source:
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental <span style="float: right;">Cast-in-place segmental</span>
	Precast segmental <span style="float: right;">Precast segmental</span>
	Cast-in-place, non-segmental <span style="float: right;">Cast-in-place, non-segmental</span>
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges <span style="float: right;">PT slab bridges</span>
	Box girders <span style="float: right;">Box girders</span>
	Pier caps <span style="float: right;">Pier caps</span>
	Spliced girder <span style="float: right;">Spliced girder</span>
Other	

# TEXAS

<b>Are your PT structures designed for a specific service life?</b>	NO
	YES, What is the design service life (number of years)? <span style="float: right;">100</span>
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO
	YES
	YES, What is the level specified?
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response <span style="float: right;">Per Departmental Material Specification through Material Producer List</span>
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO
	YES <span style="float: right;">YES</span>
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental <span style="float: right;">Cast-in-place segmental</span>
	Precast segmental
	Cast-in-place, non-segmental
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges <span style="float: right;">PT slab bridges</span>
	Box girders
	Pier caps
	Spliced girder <span style="float: right;">Spliced girder</span>
Other	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor <span style="float: right;">Contractor</span>
	Other. Please describe:

# TEXAS

<b>Has your agency encountered issues requiring repair during construction?</b>	NO	
	YES, Please describe issue and performed repair:	PT strand replacement, Vacuum Grouting, Bad Grout, Spalling due to PT duct clearance
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	Re-grouting of tendons
	During construction	During construction
	At a later stage when structure in-service	
	NDT-aided inspection of PT system	
	Invasive inspection of PT system	
	Repair of pour-back (anchor block-out)	Repair of pour-back (anchor block-out)
	FRP wrapping	
	Injection of corrosion inhibitor	Injection of corrosion inhibitor
	Crack injection	
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	
	Other. Please specify:	
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO	NO
	YES, Please provide a link or location where procedure can be accessed:	

# TEXAS

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	PTI Level 1 installer
	PTI Level 2 installer	PTI Level 2 installer
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response	In accordance with PTI and ASBI
<p><b>Does your agency have grout storage requirements?</b></p>	NO	
	YES, Please specify guiding document, provide link, or describe:	Yes, per manufacturers recommendations. Considering adding a requirement for contractor to submit life cycle tracking of grout.

# TEXAS

<b>Who conducts QA? Please check all that apply.</b>	Contractor	Contractor
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	
	In-house	
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>		
	Open-Ended Response	
<b>Have you encountered problematic PT construction details?</b>	YES	
	NO	NO
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details	
	Mid-tendon vents	
	Inspection ports	
	Duct placement	
	Duct splicing	
	Heat-shrink sleeves	
	Confinement reinforcement	
	Segment mating during erection	
	Match-cast joints	
	Precast quality	
	Deck drainage details	
Other. Please describe:		
<b>Have you encountered problematic construction techniques/methods?</b>	YES	
	NO	NO
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test	
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	
	Permanent grout cap placement	
	Grouting/filler procedures	
	Vacuum grouting	
	Preparing anchorage area for block-out pour	
	Other. Please specify.	

# TEXAS

<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES	YES
	NO	
<b>Please identify materials which have been problematic. Please check all that apply.</b>	Grout filler material	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)	
	Prestressing steel	Prestressing steel
	Elastomeric coatings	
	Epoxy grouts	
	Pour-back materials	Pour-back materials
Other, please specify:		
<b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b>	Open-Ended Response	Secondary/Transverse PT corrosion damaged failure
<b>How have you rectified these issues?</b>	Open-Ended Response	Restrained by means other than PT
<b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b>	NO	NO
	YES, Please describe how it was performed:	
<b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b>	Open-Ended Response	YES, please contact me.

# UTAH

Name(s)	
Title(s)	Structures Design Manager
Agency	Utah Department of Transportation
State/Province	UT
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">100</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">01/01/2017</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	See UDOT Standard Specification 03251 Section 1.3 for a list of reference documents that were used. Open-Ended Response
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50 <span style="float: right;">ASBI/PTI M50</span>
	PTI M55 <span style="float: right;">PTI M55</span>
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source:
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental <span style="float: right;">Cast-in-place segmental</span>
	Precast segmental <span style="float: right;">Precast segmental</span>
	Cast-in-place, non-segmental
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges
	Box girders
	Pier caps <span style="float: right;">Pier caps</span>
	Spliced girder <span style="float: right;">Spliced girder</span>
Other	

# UTAH

<b>Are your PT structures designed for a specific service life?</b>	NO	NO
	YES, What is the design service life (number of years)?	
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	NO
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	commercial, prepackaged, anti-bleed, post tensioning grout conforming to the requirements for Class C grout as defined by PTI M55.1
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	NO
	YES	
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	
	Box girders	
	Pier caps	
	Spliced girder	
Other		
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO	NO
	YES, Please provide a link:	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO	NO
	YES, Please provide a link:	

# UTAH

<b>Who performs repairs? Please check all that apply.</b>	In-house staff	
	Contractor	Contractor
	Other. Please describe:	
<b>Has your agency encountered issues requiring repair during construction?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	NO
	YES, Please describe issue and performed repair:	Not that I am aware of, but we have widened bridges with PT decks.
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	
	During construction	
	At a later stage when structure in-service	
	NDT-aided inspection of PT system	
	Invasive inspection of PT system	
	Repair of pour-back (anchor block-out)	
	FRP wrapping	
	Injection of corrosion inhibitor	
	Crack injection	
	Repair or replacement of deck on a PT superstructure	
Internal/bonded tendon replacement		
External/unbonded tendon replacement		
Other. Please specify:		
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO	NO
	YES, Please provide a link or location where procedure can be accessed:	

# UTAH

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)
	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification
	PTI Level 1 installer
	PTI Level 2 installer <span style="float: right;">PTI Level 2 installer</span>
	Other, please describe:
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	<p style="text-align: right;">See UDOT Specification 03251  <a href="https://www.udot.utah.gov/main/f?p=100:pg:0:::1:T,V:4867">https://www.udot.utah.gov/main/f?p=100:pg:0:::1:T,V:4867,</a></p>
	Open-Ended Response

# UTAH

<b>Does your agency have grout storage requirements?</b>	NO	
	YES, Please specify guiding document, provide link, or describe:	Deliver grout in plastic lined or coated moisture proof containers, stamped with the applicatino type, date of manufacture, lot number. Use within 6 months of manufacture.
<b>Who conducts QA? Please check all that apply.</b>	Contractor	Contractor
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Who conducts QC? Please check all that apply.</b>	Contractor	Contractor
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	NA
<b>Have you encountered problematic PT construction details?</b>	YES	
	NO	NO
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details	
	Mid-tendon vents	
	Inspection ports	
	Duct placement	
	Duct splicing	
	Heat-shrink sleeves	
	Confinement reinforcement	
	Segment mating during erection	
	Match-cast joints	
	Precast quality	
	Deck drainage details	
	Other. Please describe:	
<b>Have you encountered problematic construction techniques/methods?</b>	YES	
	NO	NO

# UTAH

<p><b>Please identify construction methods that are problematic. Please check all that apply.</b></p>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.
<p><b>Have you found encountered issues with any of the materials used in PT construction?</b></p>	YES
	NO <span style="float: right;">NO</span>
<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	Open-Ended Response <span style="float: right;">NA</span>
	Open-Ended Response <span style="float: right;">NA</span>
<p><b>How have you rectified these issues?</b></p>	Open-Ended Response <span style="float: right;">NA</span>
	Open-Ended Response <span style="float: right;">NA</span>
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	NO <span style="float: right;">NO</span>
	YES, Please describe how it was performed:
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	Open-Ended Response <span style="float: right;">NA</span>
	Open-Ended Response <span style="float: right;">NA</span>

# VERMONT

Name(s)	
Title(s)	
Agency	
State/Province	VT
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">150</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">07/01/2010</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">AASHTO LRFD code, and PCI</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source: <span style="float: right;">NYSDOT</span>
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental <span style="float: right;">Cast-in-place segmental</span>
	Precast segmental <span style="float: right;">Precast segmental</span>
	Cast-in-place, non-segmental <span style="float: right;">Cast-in-place, non-segmental</span>
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges <span style="float: right;">PT slab bridges</span>
	Box girders <span style="float: right;">Box girders</span>
	Pier caps
	Spliced girder <span style="float: right;">Spliced girder</span>
Other	

# VERMONT

<b>Are your PT structures designed for a specific service life?</b>	NO	
	YES, What is the design service life (number of years)?	75
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO	NO
	YES	
	YES, What is the level specified?	
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response	Proprietary, submittals must go through the approved products group.
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO	NO
	YES	
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental	
	Precast segmental	
	Cast-in-place, non-segmental	
	PT decks	
	PT slab bridges	
	Box girders	
	Pier caps	
	Spliced girder	
Other		
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO	NO
	YES, Please provide a link:	
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO	NO
	YES, Please provide a link:	
<b>Who performs repairs? Please check all that apply.</b>	In-house staff	
	Contractor	Contractor
	Other. Please describe:	
<b>Has your agency encountered issues requiring repair during construction?</b>	NO	NO
	YES, Please describe issue and performed repair:	

# VERMONT

<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	
	During construction	
	At a later stage when structure in-service	
	NDT-aided inspection of PT system	
	Invasive inspection of PT system	
	Repair of pour-back (anchor block-out)	
	FRP wrapping	
	Injection of corrosion inhibitor	
	Crack injection	
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	
	Other. Please specify:	
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO	NO
	YES, Please provide a link or location where procedure can be accessed:	

# VERMONT

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	
	PTI Level 2 installer	PTI Level 2 installer
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>		
	Open-Ended Response	
<p><b>Does your agency have grout storage requirements?</b></p>	NO	NO
	YES, Please specify guiding document, provide link, or describe:	
<p><b>Who conducts QA? Please check all that apply.</b></p>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	

# VERMONT

<b>Who conducts QC? Please check all that apply.</b>	Contractor	Contractor
	In-house	
	Consultant inspection (CEI)	
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	
<b>Have you encountered problematic PT construction details?</b>	YES	
	NO	NO
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details	
	Mid-tendon vents	
	Inspection ports	
	Duct placement	
	Duct splicing	
	Heat-shrink sleeves	
	Confinement reinforcement	
	Segment mating during erection	
	Match-cast joints	
	Precast quality	
	Deck drainage details	
Other. Please describe:		
<b>Have you encountered problematic construction techniques/methods?</b>	YES	
	NO	NO
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test	
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	
	Permanent grout cap placement	
	Grouting/filler procedures	
	Vacuum grouting	
	Preparing anchorage area for block-out pour	
	Other. Please specify.	
<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES	
	NO	NO



# WASHINGTON

Name(s)	
Title(s)	State Bridge Engineer
Agency	Washington State DOT
State/Province	WA
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">180</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">01/01/2015</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response <span style="float: right;">ASBI/PTI</span>
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications <span style="float: right;">In-house/DOT created specifications</span>
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO <span style="float: right;">NO</span>
	YES, Please specify source:
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental <span style="float: right;">Cast-in-place segmental</span>
	Precast segmental <span style="float: right;">Precast segmental</span>
	Cast-in-place, non-segmental <span style="float: right;">Cast-in-place, non-segmental</span>
	PT decks <span style="float: right;">PT decks</span>
	PT slab bridges <span style="float: right;">PT slab bridges</span>
	Box girders <span style="float: right;">Box girders</span>
	Pier caps <span style="float: right;">Pier caps</span>
	Spliced girder <span style="float: right;">Spliced girder</span>
Other	

# WASHINGTON

<b>Are your PT structures designed for a specific service life?</b>	NO <span style="float: right;">NO</span>
	YES, What is the design service life (number of years)?
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO <span style="float: right;">NO</span>
	YES
	YES, What is the level specified?
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response <span style="float: right;">pre-bagged, proprietary non-segregating (like SikaGrout 300 PT)</span>
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO
	YES <span style="float: right;">YES</span>
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental <span style="float: right;">Cast-in-place segmental</span>
	Precast segmental
	Cast-in-place, non-segmental <span style="float: right;">Cast-in-place, non-segmental</span>
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
	Other
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO <span style="float: right;">NO</span>
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor <span style="float: right;">Contractor</span>
	Other. Please describe:

# WASHINGTON

<b>Has your agency encountered issues requiring repair during construction?</b>	NO	
	YES, Please describe issue and performed repair:	Poorly-grouted tendons requiring vacuum grouting to fill voids in the ducts.
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO	NO
	YES, Please describe issue and performed repair:	
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO	Bridge deck overlays on PT box girder bridges. The original deck is left in place with limited repair.
	YES, Please describe issue and performed repair:	
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage	
	Re-grouting of tendons	
	During construction	During construction
	At a later stage when structure in-service	At a later stage when structure in-service
	NDT-aided inspection of PT system	
	Invasive inspection of PT system	
	Repair of pour-back (anchor block-out)	
	FRP wrapping	
	Injection of corrosion inhibitor	
	Crack injection	
	Repair or replacement of deck on a PT superstructure	
	Internal/bonded tendon replacement	
	External/unbonded tendon replacement	
	Other. Please specify:	
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO	NO
	YES, Please provide a link or location where procedure can be accessed:	

# WASHINGTON

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods	
	Magnetic methods (i.e., magnetic flux leakage)	
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)	
	Radiation methods (i.e., x-ray diffraction, radiography)	
	Electrochemical techniques (i.e., half-cell potential)	
	Other, or not sure how to classify. Please describe:	
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification	ASBI grouting certification
	PTI Level 1 installer	
	PTI Level 2 installer	
	Other, please describe:	
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response	Verification of tendon profiles, stressing elongation checks, pre-grouting pressure test of the tendons, verification of grout properties.
	NO	NO
<p><b>Does your agency have grout storage requirements?</b></p>	YES, Please specify guiding document, provide link, or describe:	
	NO	NO
<p><b>Who conducts QA? Please check all that apply.</b></p>	Contractor	
	In-house	In-house
	Consultant inspection (CEI)	Consultant inspection (CEI)
	Other, please specify:	

# WASHINGTON

<b>Who conducts QC? Please check all that apply.</b>	Contractor	Contractor
	In-house	
	Consultant inspection (CEI)	
	Other, please specify:	
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	Open-Ended Response	
<b>Have you encountered problematic PT construction details?</b>	YES	
	NO	NO
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details	
	Mid-tendon vents	
	Inspection ports	
	Duct placement	
	Duct splicing	
	Heat-shrink sleeves	
	Confinement reinforcement	
	Segment mating during erection	
	Match-cast joints	
	Precast quality	
	Deck drainage details	
Other. Please describe:		
<b>Have you encountered problematic construction techniques/methods?</b>	YES	
	NO	YES
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test	
	Vacuum test	
	Deck-level vent removal/permanent vent cap placement	
	Permanent grout cap placement	
	Grouting/filler procedures	Grouting/filler procedures
	Vacuum grouting	
	Preparing anchorage area for block-out pour	
	Other. Please specify.	
<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES	
	NO	NO

## WASHINGTON

<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	<p>Open-Ended Response <span style="float: right;">None.</span></p>
<p><b>How have you rectified these issues?</b></p>	<p>Open-Ended Response</p>
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	<p>NO <span style="float: right;">NO</span></p>
<p><b>YES, Please describe how it was performed:</b></p>	
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	<p>Open-Ended Response</p>

# WISCONSIN

Name(s)	
Title(s)	Structural Development Engineer
Agency	WisDOT
State/Province	WI
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	NO
	YES, please specify approximate quantity: <span style="float: right;">6</span>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date <span style="float: right;">01/01/2015</span>
<b>What were the reference documents used for updating? Please specify/explain:</b>	<p style="text-align: right;">For Integral Pier Caps: -AASHTO LRFD Bridge Design Spec - AASHTO LRFD Construction Spec -1999 AASHTO Guide Spec for Design and Construction of Segmental Concrete Bridges For Wall Tiebacks: - AASHTO LRFD Bridge Design Spec - AASHTO LRFD Construction Spec - "Guide Specification for Post-Tensioning Materials," "Post-Tensioning Manual, Post Tensioning Institute. - "Specification for Unbonded Single Strand Tendons," "Post-Tensioning Institute. - "Recommendations for Prestressed Rock and Soil Anchors," "Post-Tensioning.</p> <p>Open-Ended Response</p>



# WISCONSIN

	NO
	YES
<p><b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b></p>	<p>WisDOT specifications do not call out a specific protection level, however Integral Pier Caps and Anchored Retaining Wall Systems are generally PL-2 (Engineered grout, permanent grout cap, and an enclosed envelope for a permanent leak-light barrier). For adjacent box girders PT transversely, they are either PL1A or PL1B, depending on the grout used. Engineered premixed grouts are often used with permanent grout caps.</p> <p>YES, What is the level specified?</p>
<p><b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b></p>	<p>For PT pier caps: Grouts shall be prebagged in plastic lined or coated bags, proprietary. For adjacent box girders PT transversely: Use a grout composition of 94 pounds of Type 1 cement, 5 gallons of water and 1 pound of approved plasticizer or a pre-mixed packaged non-shrink grout</p> <p>Open-Ended Response</p>
<p><b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b></p>	NO
	YES
<p><b>On what types of PT structures have you performed repairs? Please check all that apply.</b></p>	<input type="checkbox"/> Cast-in-place segmental <input type="checkbox"/> Precast segmental <input type="checkbox"/> Cast-in-place, non-segmental <input type="checkbox"/> PT decks <input type="checkbox"/> PT slab bridges <input type="checkbox"/> Box girders <input type="checkbox"/> Pier caps <input type="checkbox"/> Spliced girder <input type="checkbox"/> Other
<p><b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b></p>	NO
	YES, Please provide a link:

# WISCONSIN

<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO
	YES, Please provide a link:
<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO
	YES, Please describe issue and performed repair:
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons
	During construction
	At a later stage when structure in-service
	NDT-aided inspection of PT system
	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)
	FRP wrapping
	Injection of corrosion inhibitor
	Crack injection
	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement
	External/unbonded tendon replacement
	Other. Please specify:

# WISCONSIN

<b>Does your agency have established inspection procedures specific to PT bridges?</b>	<p style="text-align: center;">NO <span style="float: right;">NO</span></p>
<b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b>	<p>YES, Please provide a link or location where procedure can be accessed:</p> <p>Visual methods</p> <p>Magnetic methods (i.e., magnetic flux leakage)</p> <p>Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)</p> <p>Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)</p> <p>Direct measurement of tendon force (i.e. gages on strands)</p> <p>Radiation methods (i.e., x-ray diffraction, radiography)</p> <p>Electrochemical techniques (i.e., half-cell potential)</p> <p>Other, or not sure how to classify. Please describe:</p>
<b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b>	<p>ASBI grouting certification</p> <p>PTI Level 1 installer</p> <p>PTI Level 2 installer</p> <p>Other, please describe:</p>
<b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b>	<p>Open-Ended Response</p>
<b>Does your agency have grout storage requirements?</b>	<p>NO</p> <p>YES, Please specify guiding document, provide link, or describe:</p>
<b>Who conducts QA? Please check all that apply.</b>	<p>Contractor</p> <p>In-house</p> <p>Consultant inspection (CEI)</p> <p>Other, please specify:</p>

# WISCONSIN

<b>Who conducts QC? Please check all that apply.</b>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<b>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</b>	
	Open-Ended Response
<b>Have you encountered problematic PT construction details?</b>	YES
	NO
<b>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</b>	Anchorage pour-back details
	Mid-tendon vents
	Inspection ports
	Duct placement
	Duct splicing
	Heat-shrink sleeves
	Confinement reinforcement
	Segment mating during erection
	Match-cast joints
	Precast quality
	Deck drainage details
Other. Please describe:	
<b>Have you encountered problematic construction techniques/methods?</b>	YES
	NO
<b>Please identify construction methods that are problematic. Please check all that apply.</b>	Air (pressure) test
	Vacuum test
	Deck-level vent removal/permanent vent cap placement
	Permanent grout cap placement
	Grouting/filler procedures
	Vacuum grouting
	Preparing anchorage area for block-out pour
	Other. Please specify.
<b>Have you found encountered issues with any of the materials used in PT construction?</b>	YES
	NO

# WISCONSIN

<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	Open-Ended Response
<p><b>How have you rectified these issues?</b></p>	Open-Ended Response
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	NO
	YES, Please describe how it was performed:
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	<p>Open-Ended Response <span style="float: right;">I'm not aware of any PT repair cases.</span></p>

# WYOMING

Name(s)	
Title(s)	
Agency	
State/Province	WY
Email Address(es)	
Phone Number(s)	

## INTERVIEW QUESTIONS

<b>Does your agency have post-tensioned (PT) structures in its bridge inventory?</b>	<p style="text-align: center;">NO <span style="margin-left: 100px;">NO</span></p> <p>YES, please specify approximate quantity:</p>
<b>Why not? Please check all that apply.</b>	Lack of familiarity with post-tensioned structures
	Concerns related to quality/durability
	Expense <span style="margin-left: 100px;">Expense</span>
	Time consuming design/construction
	Other, Please describe:
<b>When were your PT Specifications last updated (approximately)?</b>	Date
<b>What were the reference documents used for updating? Please specify/explain:</b>	Open-Ended Response
<b>What PT specifications are you using? Please check all that apply.</b>	ASBI/PTI M50
	PTI M55
	In-house/DOT created specifications
	Other, please provide a link:
<b>Are your PT specifications very similar to or derived from another state's?</b>	NO
	YES, Please specify source:
<b>What type of PT structures are in your inventory? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
Other	

# WYOMING

<b>Are your PT structures designed for a specific service life?</b>	NO
	YES, What is the design service life (number of years)?
<b>Do you specify a protection level (PL-1a or PL-1b, PL-2, PL-3 as specified in ASBI/PTI M50) for your PT structures?</b>	NO
	YES
	YES, What is the level specified?
<b>What type of PT grout do you specify for initial construction (i.e., "pre-bagged, proprietary", "cement/water")? Please describe:</b>	Open-Ended Response
<b>Has your agency initiated repairs on any post-tensioned structures (either during construction or while the structure is in service)?</b>	NO
	YES
<b>On what types of PT structures have you performed repairs? Please check all that apply.</b>	Cast-in-place segmental
	Precast segmental
	Cast-in-place, non-segmental
	PT decks
	PT slab bridges
	Box girders
	Pier caps
	Spliced girder
	Other
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT tendon replacement specifically?</b>	NO
	YES, Please provide a link:
<b>Does your agency have standard or commonly-used plans, specifications, procedures or details for PT repairs?</b>	NO
	YES, Please provide a link:

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<b>Who performs repairs? Please check all that apply.</b>	In-house staff
	Contractor
	Other. Please describe:
<b>Has your agency encountered issues requiring repair during construction?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency encountered issues requiring repair related to corrosion?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repairs to PT structures due to damage by vessel/vehicle impact?</b>	NO
	YES, Please describe issue and performed repair:
<b>Has your agency performed repair/replacement of decks on PT bridges?</b>	NO
	YES, Please describe issue and performed repair:
<b>Have your agency performed (or initiated) the following types of maintenance, inspection or repairs related to PT structures? Please check all that apply.</b>	Member strengthening to address corrosion/impact damage
	Re-grouting of tendons
	During construction
	At a later stage when structure in-service
	NDT-aided inspection of PT system
	Invasive inspection of PT system
	Repair of pour-back (anchor block-out)
	FRP wrapping
	Injection of corrosion inhibitor
	Crack injection
	Repair or replacement of deck on a PT superstructure
	Internal/bonded tendon replacement
	External/unbonded tendon replacement
	Other. Please specify:
<b>Does your agency have established inspection procedures specific to PT bridges?</b>	NO
	YES, Please provide a link or location where procedure can be accessed:

# WYOMING

<p><b>Have you used any NDT methods for evaluating the post-tensioning system? Please check all that apply, including if used in a research effort.</b></p>	Visual methods
	Magnetic methods (i.e., magnetic flux leakage)
	Mechanical wave propagation and vibration methods (i.e., acoustic emission, impact echo, ultrasonic)
	Electromagnetic wave propagation (i.e., infrared thermography, impulse radar, ground penetrating radar)
	Direct measurement of tendon force (i.e. gages on strands)
	Radiation methods (i.e., x-ray diffraction, radiography)
	Electrochemical techniques (i.e., half-cell potential)
	Other, or not sure how to classify. Please describe:
<p><b>Please select install certifications/qualifications required by your agency for PT installers. Please check all that apply.</b></p>	ASBI grouting certification
	PTI Level 1 installer
	PTI Level 2 installer
	Other, please describe:
<p><b>Please describe your QA/QC procedures during construction. For example, inspections prior to casting, stressing elongation checks, pre-duct fill pressure/vacuum checks, post-duct fill grout quality checks, certification of (e.g. ASBI-certified) PT inspectors, mud balance, or flow meter? Please provide a link, if possible.</b></p>	Open-Ended Response
<p><b>Does your agency have grout storage requirements?</b></p>	NO
	YES, Please specify guiding document, provide link, or describe:
<p><b>Who conducts QA? Please check all that apply.</b></p>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:
<p><b>Who conducts QC? Please check all that apply.</b></p>	Contractor
	In-house
	Consultant inspection (CEI)
	Other, please specify:

# WYOMING

<p>Please identify any preferred or “best practice” construction details. (Details which perform as intended and are worthy of note.) Please provide a link, if possible.</p>	<p>Open-Ended Response</p>
<p>Have you encountered problematic PT construction details?</p>	<p>YES</p>
<p>Please identify construction details that are problematic. Check all that apply, to the best of your knowledge.</p>	<p>NO</p> <p>Anchorage pour-back details</p> <p>Mid-tendon vents</p> <p>Inspection ports</p> <p>Duct placement</p> <p>Duct splicing</p> <p>Heat-shrink sleeves</p> <p>Confinement reinforcement</p> <p>Segment mating during erection</p> <p>Match-cast joints</p> <p>Precast quality</p> <p>Deck drainage details</p> <p>Other. Please describe:</p>
<p>Have you encountered problematic construction techniques/methods?</p>	<p>YES</p>
<p>Please identify construction methods that are problematic. Please check all that apply.</p>	<p>NO</p> <p>Air (pressure) test</p> <p>Vacuum test</p> <p>Deck-level vent removal/permanent vent cap placement</p> <p>Permanent grout cap placement</p> <p>Grouting/filler procedures</p> <p>Vacuum grouting</p> <p>Preparing anchorage area for block-out pour</p> <p>Other. Please specify.</p>
<p>Have you found encountered issues with any of the materials used in PT construction?</p>	<p>YES</p>
	<p>NO</p>

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<p><b>Please identify materials which have been problematic. Please check all that apply.</b></p>	Grout filler material
	Flexible filler material (non-cementitious, wax, grease, etc.)
	Prestressing steel
	Elastomeric coatings
	Epoxy grouts
	Pour-back materials
	Other, please specify:
<p><b>What specific problems with deterioration of CIP post-tensioned bridges have you encountered?</b></p>	Open-Ended Response
<p><b>How have you rectified these issues?</b></p>	Open-Ended Response
<p><b>Have you replaced a deck on CIP post-tensioned box girder or segmental concrete bridge?</b></p>	NO
	YES, Please describe how it was performed:
<p><b>If you know of a particular PT repair for consideration as a case study, please provide some general information (for example: bridge name, location, issue type):</b></p>	Open-Ended Response <span style="float: right;">NA</span>