**Civil Works master Specification**

**Division 05**

**User Guide**

**ALBERTA TRANSPORTATION**

|  |
| --- |
|  |

Use this section to specify requirements for concrete formwork.

Edit this section to suit the Contract requirements.

| **Heading of Specification Text** | **Specification Note** |
| --- | --- |
|  |  |
| Part 1 General |  |
|  |  |
| 1.1 References |  |
|  |  |
| 1.2 [Submittals] | Include this clause in conjunction with clause 1.3. In general, submittal of formwork design drawings is only required where formwork is required to support significant loads or is large and complex. |
|  |  |
| 1.3 Quality Control |  |
|  |  |
| .1.1 | Include and edit if form liner is used. Co-ordinate with clauses 1.4.2, 2.1.6, and 3.1.3, and 3.3. |
|  |  |
| [.1.2] | Include if required and co-ordinate with clause 1.2. In general stamping (APEGGA) of formwork design drawings is only required where formwork is required to support significant loads or is large and complex. |
|  |  |
| 1.4 Delivery, Storage, and Handling |  |
|  |  |
| [.2] | Include if form liner is used. Co-ordinate with clauses 1.3.1.1, 2.1.6, and 3.1.3, and 3.3. |
|  |  |
| Part 2 Products |  |
|  |  |
| 2.1 Materials |  |
|  |  |
| [.6] | Include product specifications for the form liner, if required. Co-ordinate with clauses 1.3.1.1, 1.4.2, 3.1.3, and 3.3. |
|  |  |
| Part 3 Execution |  |
|  |  |
| 3.1 Preparation |  |
|  |  |
| [.3] | Edit if form liner is used. Co-ordinate with clauses 1.3.1.1, 1.4.2, and 2.1.6, and 3.3. |
|  |  |
| 3.2 Installation |  |
|  |  |
| 3.3 [Form Liner Installation] | Include and edit this clause, if form liner is used. Co-ordinate with clauses 1.3.1.1, 1.4.2, 2.1.6, and 3.1.3. and concrete finish specified in Sections 03300 and 03305 – Cast-in-Place Concrete. |
|  |  |
| 3.4 Tolerances |  |
|  |  |
| .3 | Edit as required. |
|  |  |
| .3.1 to .3.5 | Edit tolerances as required. |
|  |  |
| [.4] | Include if required and modify tolerances within the gate bays as required. |
|  |  |
| .5 | Review CSA standard and confirm clause. |
|  |  |
| 3.5 Concrete Placement |  |
|  |  |
| 3.6 Formwork Removal |  |
|  |  |
| .3 | Edit as required. |
|  |  |
| 3.7 Clean-up |  |

**END OF COVER SHEET**

Use this section to specify requirements for Polyvinyl Chloride (PVC) waterstop.

Edit this section to suit the Contract requirements.

| **Heading of Specification Text** | **Specification Note** |
| --- | --- |
|  |  |
| Part 1 General |  |
|  |  |
| 1.1 Detail Drawings | Attach the appropriate detail drawings to this section. Alternatively add required details on the Drawings and delete this clause. |
|  |  |
| 1.2 References |  |
|  |  |
| 1.3 Submittals |  |
|  |  |
| 1.4 [Quality Control] |  |
|  |  |
| .1 | Edit as required. |
|  |  |
| [.2] | Use this clause for large structures that requires complex fittings and extensive field splicing. |
|  |  |
| 1.5 Delivery, Storage, and Handling |  |
|  |  |
| Part 2 Products |  |
|  |  |
| 2.1 Materials |  |
|  |  |
| .2 | Confirm grade and physical properties of the waterstop material. Note Arctic grade may require additional lead time therefore this should be reviewed with manufacturers/suppliers. |
|  |  |
| .4 & .5 | Provide shape and dimensions of each type of waterstop, fittings, and splices on the Drawings. Review and co-ordinate with the detail drawings provided in clause 1.1. |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
| Part 3 Execution |  |
|  |  |
| 3.1 Installation |  |
|  |  |
| .6 | Edit and include waterstop support details on the Drawings as required. |

**END OF COVER SHEET**

Use this section to specify requirements for concrete accessories such as jointing materials, bituminous coatings, dirt stops, etc.

Edit this section to suit the Contact requirements.

| **Heading of Specification Text** | **Specification Note** |
| --- | --- |
|  |  |
| Part 1 General |  |
|  |  |
| 1.1 References | Co-ordinate with clause 2.1 and edit as required. |
|  |  |
| 1.2 Submittals |  |
|  |  |
| 1.3 Delivery, Storage, and Handling |  |
|  |  |
| 1.4 Quality Control |  |
|  |  |
| .1 | Edit as required. |
|  |  |
| Part 2 Products |  |
|  |  |
| 2.1 Materials | Co-ordinate with clause 1.1. |
|  |  |
| [.2.1] | Include and edit as required. Review the design requirements for the joint filler, and confirm the properties required. The properties shown are for a semi-rigid PVC foam. Asphalt impregnated fibre board is another common type of joint filler, however it does not have the same recovery characteristics as the PVC foam and its compatibility with the joint sealant should be confirmed. |
|  |  |
| [.2.3] | Include and edit as required. |
|  |  |
| [.2.5] | Include and edit as required. |
|  |  |
| [.3] | Include and edit as required. |
|  |  |
| [.4] | Include and edit as required. |
|  |  |
| [.5] | Include concrete adhesive anchors either in this section or in other sections as required |
|  |  |
| [.6] | Include other products as required. |
|  |  |
|  |  |
|  |  |
| Part 3 Execution |  |
|  |  |
| 3.1 Installation |  |
|  |  |
| [.3 to .5] | Include and edit as required. |

**END OF COVER SHEET**

Use this section to specify requirements for reinforcing steel.

The designer should review the concrete clear cover considering the operating conditions and environmental exposure conditions for the specific structure. Some guidance is available in Alberta Transportation’s Water Control Structures - Selected Design Guidelines, CAN/CSA-S6 Canadian Highway Bridge Design Code, CSA-A23.3 Design of Concrete Structures (intended for buildings).

Edit this section to suit the Contract requirements.

| **Heading of Specification Text** | **Specification Note** |
| --- | --- |
|  |  |
| Part 1 General |  |
|  |  |
| 1.1 References |  |
|  |  |
| [.5.1 & .6] | Include if epoxy coated reinforcement is used. Co-ordinate with clauses 1.2.4, 1.3.3, 1.4.2, 2.1.3, 2.1.5, and 3.4 |
|  |  |
| 1.2 Submittals |  |
|  |  |
| 1.3 Delivery, Storage, and Handling |  |
|  |  |
| [.3] | Include and edit as required. |
|  |  |
| 1.4 Quality Control |  |
|  |  |
| .1 | Edit as required. |
|  |  |
| [.2] | Include if epoxy coated reinforcement is used. |
|  |  |
| Part 2 Products |  |
|  |  |
| 2.1 Materials |  |
|  |  |
| .2 | Confirm Grade required for 10M bars and edit as required. |
|  |  |
| [.3 & .5] | Include if epoxy coated reinforcement is used. |
|  |  |
| [.6] | Include if mechanical splices are used. Co-ordinate with clause 3.2. |
|  |  |
| 2.2 Fabrication |  |
|  |  |
| .3 | Confirm that the lap splice specified is adequate. |
|  |  |
| Part 3 Execution |  |
|  |  |
| 3.1 Placement |  |
|  |  |
| .8 | Edit if epoxy coated reinforcement is used. |
|  |  |
| .9 | Modify the clear concrete cover as required. |
|  |  |
| 3.2 [Mechanical Splicing] | Include if mechanical splices are used. Co-ordinate with clause 2.1.6. |
|  |  |
| 3.3 Field Bending and Welding |  |
|  |  |
| [3.4] [Field Touch-Up] | Include if epoxy coated reinforcement is used. |

**END OF COVER SHEET**

Use this section to specify requirements for cast-in-place concrete for major Contracts where a significant quantity of concrete is required.

Within this section, specification items that refer to sections, clauses, tables, figures or tests from CAN/CSA-A23.1/A23.2 are based on the 2004 edition. Therefore the applicability of these references should be reviewed and confirmed if a later revision of the CAN/CSA-A23.1/A23.2 has been published.

Edit this section to suit the Contract requirements.

For smaller projects, consider using Section 03305 – Cast-in-Place Concrete.

| **Heading of Specification Text** | **Specification Note** |
| --- | --- |
|  |  |
| Part 1 General |  |
|  |  |
| 1.1 Forms | Attach the Concrete Pour Release Form to the end of this section. |
|  |  |
| 1.2 References |  |
|  |  |
| 1.3 Submittals |  |
|  |  |
| .4 | Delete if concrete aggregates are not being delivered to the Site for use by an on-Site batch plant. |
|  |  |
| 1.4 Quality Control |  |
|  |  |
| .2.3 | Edit additional aggregate testing as required. Factors to consider include possible concrete suppliers and concrete aggregate sources. |
|  |  |
| .2.3.1 | Edit additional aggregate testing as required, particularly where excessive fines content may be a concern. |
|  |  |
| .3.2 | Confirm the limit for total alkali content. Refer to CAN/CSA-A23.2-27A – Standard Practice to Identify Degree of Alkali-Reactivity of Aggregates and to Identify Measures to Avoid Deleterious Expansion in Concrete. |
|  |  |
| [.3.3] | Include if pumping concrete for all or part of the work is permitted, and co-ordinate with clauses 2.1.7.3, 3.7.1.1, and 3.7.2. |
|  |  |
| .3.6 | Edit as required. |
|  |  |
| .4.2.1 | Edit as required. Cylinder diameter should be at least 3 times the nominal maximum coarse aggregate size. |
|  |  |
| .6.3 | Edit for 90–day compressive strength. |
|  |  |
| [.7] | Include if required and co-ordinate with clauses 2.1.6, 3.11.7, and 3.11.8. |
|  |  |
| 1.5 Quality Assurance |  |
|  |  |
| .2 | Edit for specified compressive strength requirements. |
|  |  |
| Part 2 Products |  |
|  |  |
| 2.1 Materials |  |
|  |  |
| .2 | Edit cement type. |
|  |  |
| .3 | Confirm total alkali and oxide contents for fly ash in conjunction with the fly ash content specified in clause 2.2.1. Refer to CAN/CSA-A23.2-27A – Standard Practice to Identify Degree of Alkali-Reactivity of Aggregates and to Identify Measures to Avoid Deleterious Expansion in Concrete. |
|  |  |
| .6 | Include if required and co-ordinate with clauses 1.4.6, 3.11.7, and 3.11.8 |
|  |  |
| .7.3 | Include if required and co-ordinate with clauses 1.4.3.3, 3.7.1.1, and 3.7.2. |
|  |  |
| .8.2 | Confirm gradation for coarse aggregate also edit clause 2.2.1 as required. |
|  |  |
| 2.2 Concrete Mixes |  |
|  |  |
| .1 | Modify Classes of Concrete to suit the design requirements and class of exposure. Clearly specify or delineate extent of the various Classes of Concrete in the Contract Document. Confirm fly ash percentage in conjunction with clauses 1.4.3.2 and 2.1.3. |
|  |  |
| Part 3 Execution |  |
|  |  |
| 3.1 Aggregates |  |
|  |  |
| 3.2 Concrete Production |  |
|  |  |
| .2.2 | Confirm batch plant location requirements. |
|  |  |
| .2.3 | Confirm batch plant capacity requirements. |
|  |  |
| .2.9 | Confirm preset mix requirements. |
|  |  |
| .2.12 | Confirm material storage bin requirements. |
|  |  |
| 3.3 Mixing and Transporting Concrete |  |
|  |  |
| 3.4 Concrete Temperature |  |
|  |  |
| 3.5 Hot Weather Requirements |  |
|  |  |
| 3.6 Cold Weather Requirements |  |
|  |  |
| 3.7 Placing of Concrete |  |
|  |  |
|  |  |
|  |  |
| .1.1 | Co-ordinate with clauses 1.4.3.3, 2.1.7.3, and 3.7.2, and edit as required. |
|  |  |
| [.2] | Use this clause. Co-ordinate with clauses 1.4.3.3, 2.1.7.3, and 3.7.1.1. |
|  |  |
| 3.8 Consolidating Concrete |  |
|  |  |
| .5 | Edit as required. |
|  |  |
| 3.9 Construction Joints |  |
|  |  |
| 3.10 Concrete Finishing | Confirm finish requirements. |
|  |  |
| .4.2.2.2 & .4.2.3.3 | Confirm tolerances for surface irregularities. |
|  |  |
| .4.2.2.4 & .4.2.3.4 | Coordinate with Section 03110 – Concrete Formwork and delete sack-rubbed finish where form liner is specified. |
|  |  |
| .4.3.2.3 & .4.2.3.3 | Confirm tolerances for surface irregularities. |
|  |  |
| .4.3.4.3 | Confirm tolerances for surface irregularities. |
|  |  |
| 3.11 Curing and Protection |  |
|  |  |
| [.7] & [.8] | Include if required and co-ordinate with clauses 1.4.6 and 2.1.6. |
|  |  |
| 3.12 Repair of Concrete |  |
|  |  |
| .6 & .7 | Confirm use of bonding agent for repairs. |
|  |  |
| 3.13 Environmental Requirements |  |

**END OF COVER SHEET**

Use this section to specify requirements for cast-in-place concrete for minor projects where a relatively small quantity of concrete is required.

Within this section, specification items that refer to sections, clauses, tables, figures or tests from CAN/CSA-A23.1/A23.2 are based on the 2004 edition. Therefore the applicability of these references should be reviewed and confirmed if a later revision of the CAN/CSA-A23.1/A23.2 has been published.

Edit this section to suit the Contract requirements.

For major projects, consider using Section 03300 – Cast-in-Place Concrete [Major Projects].

| **Heading of Specification Text** | **Specification Note** |
| --- | --- |
|  |  |
| Part 1 General |  |
|  |  |
| 1.1 Forms | Attach the Concrete Pour Release Form to the end of this section. |
|  |  |
| 1.2 References |  |
|  |  |
| 1.3 Submittals |  |
|  |  |
| 1.4 Quality Control |  |
|  |  |
| .3.1 | Confirm the limit for total alkali content. Refer to CAN/CSA-A23.2-27A – Standard Practice to Identify Degree of Alkali-Reactivity of Aggregates and to Identify Measures to Avoid Deleterious Expansion in Concrete. |
|  |  |
| 1.5 Quality Assurance |  |
|  |  |
| Part 2 Products |  |
|  |  |
| 2.1 Materials |  |
|  |  |
| .2 | Edit cement type. |
|  |  |
| .3 | Confirm the total alkali and oxide contents for fly ash in conjunction with the fly ash content specified in clause 2.2.1. Refer to CAN/CSA-A23.2-27A – Standard Practice to Identify Degree of Alkali-Reactivity of Aggregates and to Identify Measures to Avoid Deleterious Expansion in Concrete. |
|  |  |
| .6.2 | Confirm coarse aggregate gradation. Also edit clause 2.2.1 as required. |
|  |  |
|  |  |
|  |  |
| [.7] | Include curing compound if allowed. Co-ordinate with clauses 3.10.7 and 3.10.8. |
|  |  |
| 2.2 Concrete Mixes |  |
|  |  |
| .1 | Modify the Classes of Concrete to suit the design and class of exposure requirements. Clearly specify or delineate the extent of the various Classes of Concrete in the Contract Documents. Confirm the fly ash percentage in conjunction with clauses 1.4.2.1 and 2.1.3. |
|  |  |
| Part 3 Execution |  |
|  |  |
| 3.1 Concrete Production |  |
|  |  |
| .2 | Edit as required. |
|  |  |
| 3.2 Mixing and Transporting Concrete |  |
|  |  |
| 3.3 Concrete Temperature |  |
|  |  |
| 3.4 Hot Weather Requirements |  |
|  |  |
| 3.5 Cold Weather Requirements |  |
|  |  |
| 3.6 Placing of Concrete |  |
|  |  |
| 3.7 Consolidating Concrete |  |
|  |  |
| 3.8 Construction Joints |  |
|  |  |
| 3.9 Concrete Finishing |  |
|  |  |
| .4.2.2 | Since this section applies to minor projects with small quantities of concrete, an F3 formed sack-ribbed finish is proposed for permanently exposed and water passage surfaces. This should be reviewed and confirmed, and coordinated with clause 3.9.4.2.4. Confirm tolerances for surface irregularities. |
|  |  |
| .4.2.4 | Coordinate with Section 03110 – Concrete Formwork and delete sack-rubbed finish where form liner is specified. |
|  |  |
| .4.3 | Add other formed finish requirements where required. Refer to Section 03300 – Cast-in-Place Concrete [Major Projects]. |
|  |  |
| .5.2.2 | Since this section applies to minor projects with small quantities of concrete, a U3 unformed finish is proposed for permanently exposed and water passage surfaces. This should be reviewed and confirmed. Confirm tolerances for surface irregularities. |
|  |  |
| .5.3 | Add other unformed finish requirements where required. |
|  |  |
| 3.10 Curing and Protection |  |
|  |  |
| [.7] & [.8] | Include if required and co-ordinate with clause 2.1.7. |
|  |  |
| 3.11 Repair of Concrete |  |
|  |  |
| .6 & .7 | Confirm the use of a bonding agent for repairs. |
|  |  |
| 3.12 Environmental Requirements |  |
|  |  |
|  |  |
| [.2] | Confirm that a Minister’s on-Site laboratory is provided. |

**END OF COVER SHEET**

Use this section to specify requirements for roller compacted concrete (RCC). In general, this section is developed primarily for RCC spillways and similar facilities, therefore significant modifications will be required for other structures such as RCC dams or other water retention facilities.

The section specifies that the Contractor is responsible for the RCC mix design. However since this approach will require significant lead time, and since the properties of RCC are not as predictable as for conventional concrete, the need to consider having the Minister provide the mix designs on a particular Contract, because of schedule or design requirements, should be reviewed with Alberta Transportation.

This section is also based on the use of a formed RCC facing system, therefore revisions will be required if a different system is contemplated.

Edit this section as required to suit the Contract requirements.

| **Heading of Specification Text** | **Specification Note** |
| --- | --- |
|  |  |
| Part 1 General |  |
|  |  |
| 1.1 References |  |
|  |  |
| 1.2 Submittals |  |
|  |  |
| .3 | Edit as required. Co-ordinate with clauses 1.3.3, 1.4.6, 2.2.2, and 3.8.3. |
|  |  |
| 1.3 Quality Control |  |
|  |  |
| .2.3 | Edit as required. |
|  |  |
| .3 | This clause is based on the Contractor being responsible for the RCC mix design. Co-ordinate with clause 1.2.3, and edit as required. |
|  |  |
| .3.2 | Edit as required. |
|  |  |
| .4 | This clause is based on the Contractor being responsible for the RCC mix design. Co-ordinate with clause 1.2.3, and edit as required. |
|  |  |
| .4.1 & .4.9 | Edit as required. |
|  |  |
| 1.4 Quality Assurance |  |
|  |  |
| .5.1 | Edit as required. |
|  |  |
| [.5.4] | Include if required, and co-ordinate with clauses 1.2.3, 1.4.6, 2.2.2, and 3.8.3. |
|  |  |
| .6 | Edit as required. |
|  |  |
| Part 2 Products |  |
|  |  |
| 2.1 Materials |  |
|  |  |
| .3 | Edit as required. |
|  |  |
| .6.2 | Review and edit the gradation of the fine aggregate as required. The gradation shown was obtained from “Guide for Developing RCC Specifications and Commentary” (Portland Cement Association, 2000). It is noted that the gradation specified in CSA-A23.1, Table 4 has much less fines than that suggested by PCA. The availability of the specified gradation and its impact on the RCC mix design needs to be considered. |
|  |  |
| .6.3 | Co-ordinate the fineness modulus to suit the fine aggregate gradation specified in clause 2.1.6.2. |
|  |  |
| .7.2 | Confirm the required nominal size and gradation of the coarse aggregate. |
|  |  |
| 2.2 Mixes |  |
|  |  |
| .1.1, .1.2, & .1.3 | Edit as required. |
|  |  |
| [.2] | Include and edit as required. Co-ordinate with clauses 1.3.3 and 3.8.3 |
|  |  |
| .3 | Edit as required. |
|  |  |
| [2.3] [Contraction Joints] | Add as required. |
|  |  |
| Part 3 Execution |  |
|  |  |
| 3.1 Aggregate |  |
|  |  |
| 3.2 RCC Production |  |
|  |  |
| .1 | Edit as required. |
|  |  |
| 3.3 Mixing and Transporting RCC |  |
|  |  |
| 3.4 RCC Temperature |  |
|  |  |
| 3.5 Hot Weather Requirements |  |
|  |  |
| 3.6 Cold Temperature Requirements |  |
|  |  |
| 3.7 Placing, Spreading, and Compaction |  |
|  |  |
|  |  |
| .1, .13, & .15 | Edit as required. |
|  |  |
| 3.8 Surface Preparation |  |
|  |  |
| [.3] | Include as required and co-ordinate with clauses 1.4.6, 2.2.2, and 1.4.5.4. |
|  |  |
| 3.9 Construction Joints |  |
|  |  |
| 3.10 [Contraction Joints] | Add as required. |
|  |  |
| 3.11 Facing Formwork |  |
|  |  |
| 3.12 [Drainpipes] |  |
|  |  |
| [.2 & .3] | Edit as required. |
|  |  |
| 3.13 Curing and Protection |  |
|  |  |
| 3.14 Repair of RCC |  |
|  |  |
| 3.15 Environmental Requirements |  |

**END OF COVER SHEET**

Use this section to specify requirements for shotcrete. This section is prepared based primarily on steel-fibre reinforced shotcrete that will be exposed for a long duration. It can also used for specifying requirements for plain (unreinforced) shotcrete that will be exposed for a relatively short duration (e.g. protecting foundations).

In cases where steel fibres exposed on the surfaces of reinforced shotcrete are considered objectionable (sharp projections or rust staining), a thin cover layer (flash coat) of plain shotcrete may be used.

Edit this section to suit the Contract requirements.

| **Heading of Specification Text** | **Specification Note** |
| --- | --- |
|  |  |
| Part 1 General |  |
|  |  |
| 1.1 Definitions |  |
|  |  |
| [.10] | Include if required and co-ordinate with clauses 2.3, 3.6, 3.2.4, and 1.2.4.4. |
|  |  |
| 1.2 References |  |
|  |  |
| [.4.4], [.4.5], & [.4.6] | Include if required. |
|  |  |
| 1.3 Submittals |  |
|  |  |
| .3 | Edit as required. |
|  |  |
| 1.4 Quality Control | Review requirements and modify to suit the shotcrete design requirements (i.e., purpose and exposure conditions and duration) and quantities. |
|  |  |
| .3.1 | Edit as required. |
|  |  |
| .4.3 & .4.4 | Edit as required. |
|  |  |
| [.5] | Include if required and co-ordinate with clauses 2.4 and 3.7. |
|  |  |
| 1.5 Quality Assurance |  |
|  |  |
| 1.6 Delivery, Storage, and Handling |  |
|  |  |
| Part 2 Products |  |
|  |  |
| 2.1 Materials |  |
|  |  |
| [.8] | Edit as required and co-ordinate with clause 2.2.3. |
|  |  |
| 2.2 Shotcrete Mix |  |
|  |  |
|  |  |
| .1 | Review specified properties with design requirements. |
|  |  |
| [.3] | Include as required and co-ordinate with clause 2.1.8. |
|  |  |
| [2.3] [Weep Drains] | Include if required and co-ordinate with clauses 3.6, 1.1.10, 3.2.4, and 1.2.4.4. |
|  |  |
| [.1] | Edit as required. |
|  |  |
| [2.4] [Shotcrete Anchors] | Include if required and co-ordinate with clauses 3.7 and 1.4.5. |
|  |  |
| [.2] | Include detail of “bow tie” shotcrete anchor on the Drawings. |
|  |  |
| [.3] | Edit as required. Instead of grout, the use of pre-packed resin may also be considered. Modify the section as required if resin is used. |
|  |  |
| Part 3 Execution |  |
|  |  |
| 3.1 Batching, Mixing, and Conveyance |  |
|  |  |
| 3.2 Surface Preparation |  |
|  |  |
| 3.3 Temperatures |  |
|  |  |
| 3.4 Application |  |
|  |  |
| [.8] | Include if required. |
|  |  |
| 3.5 Curing and Protection |  |
|  |  |
| 3.6 [Installation of Weep Drains] | Include as required and co-ordinate with clauses 2.3, 1.1.10, 3.2.4, and 1.2.4.4. |
|  |  |
| [.2] | Edit as required. |
|  |  |
| 3.7 [Installation of Anchors] | Include if required and co-ordinate with clauses 2.4 and 1.4.5. |
|  |  |
| 3.8 Repair of Shotcrete |  |
|  |  |
| 3.9 Environmental Requirements |  |

**END OF COVER SHEET**

Use this section to specify requirements for precast concrete structures. This section is intended for small structures such as measurement weirs; inlets for turnouts, pipelines, pumpwells; vaults; and small instrumentation and control buildings.

Precast concrete pipe and manholes are covered under separate sections.

Given the ongoing changes in the grout manufacturing industry, review the latest product and technical data from grout manufacturers to confirm the applicability of the proposed grout for the intended use and as well its availability.

Edit this section as required to suit the Contract requirements.

| **Heading of Specification Text** | **Specification Note** |
| --- | --- |
|  |  |
| Part 1 General |  |
|  |  |
| 1.1 References |  |
|  |  |
| 1.2 Submittals |  |
|  |  |
| 1.3 Quality Control |  |
|  |  |
| [.3] | Include if required. |
|  |  |
| 1.4 Delivery, Storage, and Handling |  |
|  |  |
| Part 2 Products |  |
|  |  |
| 2.1 Materials |  |
|  |  |
| .2.1.1 to .2.1.6 | Include and edit as required. |
|  |  |
| .3, .4, .6, & .7 | Edit as required. |
|  |  |
| 2.2 Concrete Mix |  |
|  |  |
| .2 | Edit concrete specifications as required. |
|  |  |
| 2.3 Shop Fabrication |  |
|  |  |
| .6 | Include additional finish (e.g., for the control building) or other requirements if needed. |
|  |  |
| Part 3 Execution |  |
|  |  |
| 3.1 Excavation and Preparation of the Foundation |  |
|  |  |
| .2 | For excavation required by the Minister beyond the specified lines, grades, slopes, and elevations, the preference is that this excavation be classified by the Minister and measured and paid for under the applicable Unit Price. The use of the term, Authorized Over-Excavation, should be avoided so that the conditions in the Contract authorizing Changes in the Work are not compromised. However, for canal rehabilitation contracts, Structure Excavation is typically included in the Lump Sum price of the structure. In this case the inclusion of Authorized Structure Over-Excavation paid for under an unforeseen work allowance may be required. Edit as required. |
|  |  |
| 3.2 Installation |  |
|  |  |
| 3.3 Repair and Replacement of Damaged Concrete |  |
|  |  |
| .6 | Edit as required. |
|  |  |
| 3.4 Repair of Damaged Galvanized Coating |  |
|  |  |

**END OF COVER SHEET**

Use this section to specify requirements for bedding grout typically used beneath equipment base plates.

Determine requirement for quality control testing based on importance of the application, quantity, etc.

Given the ongoing changes in the grout manufacturing industry, review the latest product and technical data from grout manufacturers to confirm the applicability of the proposed grout for the intended use and as well its availability.

Edit this section as required to suit the Contract requirements.

| **Heading of Specification Text** | **Specification Note** |
| --- | --- |
|  |  |
| Part 1 General |  |
|  |  |
| 1.1 References |  |
|  |  |
| [1.2] [Quality Control] | Include if required and coordinate with 1.4.3 |
|  |  |
| 1.3 Quality Assurance |  |
|  |  |
| 1.4 Submittals |  |
|  |  |
| [.3] | Include if required and coordinate with 1.2. |
|  |  |
| 1.5 Delivery, Storage, and Handling |  |
|  |  |
| Part 2 Products |  |
|  |  |
| 2.1 Materials |  |
|  |  |
| .2 | Confirm applicability and availability and edit as required. |
|  |  |
| Part 3 Execution |  |
|  |  |
| 3.1 Mixing |  |
|  |  |
| 3.2 Preparation |  |
|  |  |
| 3.3 Installation |  |

**END OF COVER SHEET**

**END OF DIVISION 03 USER GUIDE**