SECTION 031000

CONCRETE FORMING AND ACCESSORIES

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**NOTE TO SPECIFIER**

*Use this Specification Section for Mail Processing Facilities.*

***This is a Type 2 Specification with primarily editable text; therefore, most of the text can be edited, but there is some required text which is noted within the Section with a “Note to Specifier.” Do not revise these paragraphs without an approved Deviation from USPS Headquarters, Facilities Program Management, through the USPS Project Manager.***

*For Design/Build projects, do not delete the Notes to Specifier in this Section so that they may be available to Design/Build entity when preparing the Construction Documents.*

*For the Design/Build entity, this specification is intended as a guide for the Architect/Engineer preparing the Construction Documents.*

*The MPF specifications may also be used for Design/Bid/Build projects. In either case, it is the responsibility of the design professional to edit the Specifications Sections as appropriate for the project.*

*Text shown in brackets must be modified as needed for project specific requirements.* *See the “Using the USPS Guide Specifications” document in Folder C for more information.*

*The last date that USPS revised this standard specification section occurs in two places, at the end of this section and in the Table of Contents. If the date in this section matches the date in the Table of Contents, then you are using the latest version. Do not delete or revise the “last revised” date at the end of the section during the development of the Project Manual.*

*The footer in this section should be edited to replace the text, “USPS MPF SPECIFICATION” with the project name, and the blank date in the center should be replaced with the submission date, for interim design reviews, or the issue date of the completed Project Manual.*

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1. GENERAL
	1. SUMMARY
		1. Section Includes
			1. Formwork for cast-in place concrete, with shoring, bracing and anchorage.
			2. Openings for other work.
			3. Form accessories.
			4. Form stripping.
		2. Related Documents: The Contract Documents, as defined in Section 011000 - Summary of Work, apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other documents.
		3. Related Sections:
			1. Section 032000 - Concrete Reinforcement: Coordination between formwork and reinforcement.
			2. Section 033000 - Cast-in-Place Concrete: Supply of concrete accessories for placement by this section.
	2. REFERENCES
		1. American Concrete Institute (ACI) Codes and Standards latest editions:
			1. ACI 301 - Structural Concrete for Buildings.
			2. ACI 318 - Building Code Requirements for Reinforced Concrete.
			3. ACI 347 - Recommended Practice for Concrete Formwork.
			4. [ ]
		2. United States Department of Commerce Product Standard (PS):
			1. PS 1 - Construction and Industrial Plywood.
	3. SUBMITTALS
		1. Section 013300 - Submittal Procedures: Procedures for submittals.
			1. Product Data: Provide data on void form materials and installation requirements. Submit data on form-coating materials.
			2. Shop Drawings: Indicate pertinent dimensions, materials, required installation and removal of bracing, shoring [, and reshoring] and arrangement of joints and ties.

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**NOTE TO SPECIFIER:**

Retain section below if LEED criteria is required for project.

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* + 1. LEED Submittals:

1. Product data and statements for credits being considered.

* 1. QUALITY ASSURANCE
		1. Perform Work in accordance with ACI 347.
		2. Where necessary, design formwork, shoring [, and reshoring] under direct supervision of a Professional Engineer experienced in design of formwork and licensed in State where Project is located.

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**NOTE TO SPECIFIER**

Retain option below if retained in submittal section of this specification.

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* 1. DELIVERY, STORAGE, AND HANDLING
		1. Section 016000 - Product Requirements: Transport, handle, store, and protect products.
		2. Deliver void forms and installation instructions in manufacturer's packaging.
		3. Store off ground in ventilated and protected manner to prevent deterioration from moisture.
	2. ENVIRONMENTAL REQUIREMENTS
		1. Environmental Impact:
			1. Formwork: Reuse forms to greatest extent possible without damaging structural integrity of concrete and without damaging aesthetics of exposed concrete.
1. PRODUCTS
	1. WOOD FORMS
		1. Forms for Exposed Finish Concrete: Plywood panels, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.
			1. Plywood complying with U.S. Product Standard PS‑1 "B‑B (Concrete Form) Plywood," Class I, Exterior Grade or better, mill‑oiled and edge‑sealed, with each piece bearing legible inspection trademark.
		2. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
		3. Lumber: Construction grade; with grade stamp clearly visible.

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**NOTE TO SPECIFIER**

Edit PREFABRICATED FORMS below for specific requirements of Project design.

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* 1. PREFABRICATED FORMS
		1. Preformed Steel Forms: Minimum 16 gage, well matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
		2. Void Forms (Carton Forms): Moisture resistant treated paper faces, biodegradable, structurally sufficient to support weight of wet concrete mix until initial set. Thickness indicated on drawings.
		3. Tubular Column Type: Metal or fiberglass‑reinforced plastic. Provide units with sufficient wall thickness to resist wet concrete loads without deformation.
		4. Forms for Textured Finish Concrete: Units of face design, size, arrangement, and configuration to match Architect's control sample. Provide solid backing and form supports to ensure stability of textured form liners.
	2. ACCESSORIES
		1. Form Ties: Factory-fabricated, removable or snap-off type, metal, of fixed or adjustable length as applicable, with cone ends. Designed to prevent form deflection and to prevent spalling concrete upon removal. Back break dimension, 1-1/2 inch from exposed concrete surface. Provide ties that, when removed, will leave holes not larger than 1 inch diameter in concrete surface.

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**NOTE TO SPECIFIER**

\*\*REQUIRED Paragraph (Form Release Agent) follows. Do not revise this Paragraph, unless noted otherwise, without an approved Deviation from USPS Headquarters Facilities Program Management, through the USPS Project Manager.”

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* + 1. Form Release Agent: 100 percent biodegradable colorless agent which will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of subsequent coatings intended for use on concrete surfaces. Zero VOC.
			1. Envirolux by Conspec, Kansas City, KS, (800) 348-7351 or (913) 287-1700.
			2. SMD-10 Soy Form Release by Strategic Market Development (800) 959-1071 or (815) 935-0863.
			3. Bio-Form by Leahy-Wolf, Franklin Park, IL, (888) 873-5327 or (847) 455-5710.
			4. Section 016000 - Product Requirements: Product options and substitutions. Substitutions: Permitted.
		2. Corners: Chamfered, wood strip 3/4 x 3/4 inch size; maximum possible lengths.
		3. Dovetail Anchor Slot: Galvanized steel, 22 gage thick, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
		4. Nails, Spikes, Lag Bolts, Through Bolts, and Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

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**NOTE TO SPECIFIER**

Use WATERSTOPS below where waterstops are required by Project design.

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* + 1. Waterstops (Rubber/PVC): Rubber or Polyvinyl chloride, minimum 1,750 tensile strength, minimum 50 degrees F to plus 175 degrees F working temperature range, width as indicated on Drawings, maximum possible lengths, ribbed profile, preformed corner sections, heat welded jointing.
1. EXECUTION
	1. EXAMINATION
		1. Section 017300 - Execution: Verification of existing conditions before starting work.
		2. Verification of Conditions: Verify that field measurements, surfaces, and conditions are as required, and ready to receive Work.
			1. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with Drawings.
		3. Report in writing to Contracting Officer prevailing conditions that will adversely affect satisfactory execution of the Work of this Section. Do not proceed with Work until unsatisfactory conditions have been corrected.
		4. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to United States Postal Service.

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**NOTE TO SPECIFIER**

Use EARTH FORMS below where earth forms are permitted for Project.

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* 1. EARTH FORMS
		1. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.
	2. FORMWORK INSTALLATION
		1. Install formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 347R.
		2. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
		3. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores upon approval by the Professional Engineer responsible for their design.
		4. Align joints and make watertight. Furnish in largest available sizes to minimize number of joints and to conform to joint system indicated on Drawings.
		5. Obtain approval from the Engineer or Architect before framing openings in structural members which are not indicated on Drawings.
		6. Provide chamfer strips on external corners of concrete members, to produce uniform, smooth lines and tight edge joints.

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**NOTE TO SPECIFIER**

Use paragraph below when VOID FORMS are used.

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* + 1. Install void forms in accordance with manufacturer's published instructions. Protect forms from moisture or crushing.
	1. FORM RELEASE AGENT APPLICATION
		1. Apply form release agent on formwork in accordance with manufacturer's published instructions.
		2. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
		3. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings which are effected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.
	2. INSERTS, EMBEDDED PARTS, AND OPENINGS
		1. Provide formed openings where required for items to be embedded in passing through concrete work.
		2. Locate and set in place items which will be cast directly into concrete.
		3. Coordinate with work of other sections in forming and placing openings, slots, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.
		4. Install accessories in accordance with manufacturer's published instructions, straight, level, and plumb. Ensure items are not disturbed during concrete placement.
		5. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
		6. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

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**NOTE TO SPECIFIER**

Use paragraph below where waterstops are required by Project design.

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* + 1. Install waterstops in accordance with manufacturer's published instructions continuous without displacing reinforcement. Seal joints watertight.
	1. FORM CLEANING
		1. Clean forms as erection proceeds, to remove foreign matter within forms.
		2. Clean formed cavities of debris prior to placing concrete.
		3. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
		4. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

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**NOTE TO SPECIFIER**

Retain option below if retained in submittal section of this specification.

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* 1. CONSTRUCTION
		1. Site Tolerances:
			1. Construct formwork to maintain tolerances required by ACI 301 and ACI 347.
			2. Camber slabs and beams 1/4 inch per 10 feet in accordance with ACI 301.
	2. FIELD QUALITY CONTROL
		1. Section 014000 - Quality Requirements: Field inspection and testing.
		2. Inspect erected formwork, shoring [, and reshoring], and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.
	3. FORM REMOVAL
		1. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
		2. Do not remove shoring without approval from the Professional Engineer responsible for their design.
		3. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
		4. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

END OF SECTION

USPS MPF Specification Last Revised: 10/1/2022