

CECO

CONCRETE CONSTRUCTION

FROM CONCEPT
TO COMPLETION



YOUR CECO TEAM

FROM CONCEPT...



PEOPLE:

Engineers, forming specialists, project managers and trained field crews who, from 20 locations, build more than 200 projects representing over 30 million gross square feet every year. This translates into concerned, knowledgeable and experienced construction professionals in your area who are ready to serve you.

PRECONSTRUCTION SERVICES:

Ideas and information from experienced Ceco Concrete Construction professionals that will be of direct benefit to you. When you contact your local Ceco representative at the schematic stage for value engineering support, the result will be the most cost-effective site-cast concrete alternative for your project. Innovative input makes your project happen when Ceco is on your design team.



EQUIPMENT:

Shoring systems and forms. Shoring systems that range from conventional wood, steel and aluminum to customized ganged and sophisticated flying systems. We will work with your team to select the system which best fits your project. When it comes to forms, nobody has a larger or more complete inventory, from standard plyforms and steelforms to custom fiberglass, steel and aluminum.



CONSTRUCTION SERVICES:

Ceco provides support by using the most efficient construction techniques to build your project on time and within budget. Ceco is a formwork subcontractor for site-cast concrete projects, providing field labor for erection and removal of forms and supporting centering materials... a complete forming package customized for your project. With Ceco on your construction team, you have the leader in the industry.

... TO COMPLETION

TOTAL CONCRETE CONSTRUCTION SERVICES

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HOW CECO HELPS YOU

Ceco's business is based on helping you build concrete structures and providing the most value for each dollar spent. Ceco's concrete systems mean faster, more flexible construction for a faster delivery date. Our responsive approach and value management system focus on:

Safety... for all construction workers at the project site, as well as the public at large, means less risk for you. Our construction safety record speaks for itself at 60 percent below industry average, which is lower than any other subcontractor providing similar services.

Quality... for the clients we serve: building owners, designers, builders and users. Meeting or exceeding requirements - even if we must "go the extra mile" to do so. We do what we say we will do - that is our commitment to you.

Performance... for our customers and their customers...responsive reliable and on-time. Since 1912, Ceco has performed as promised, a record of performance unmatched in the industry.

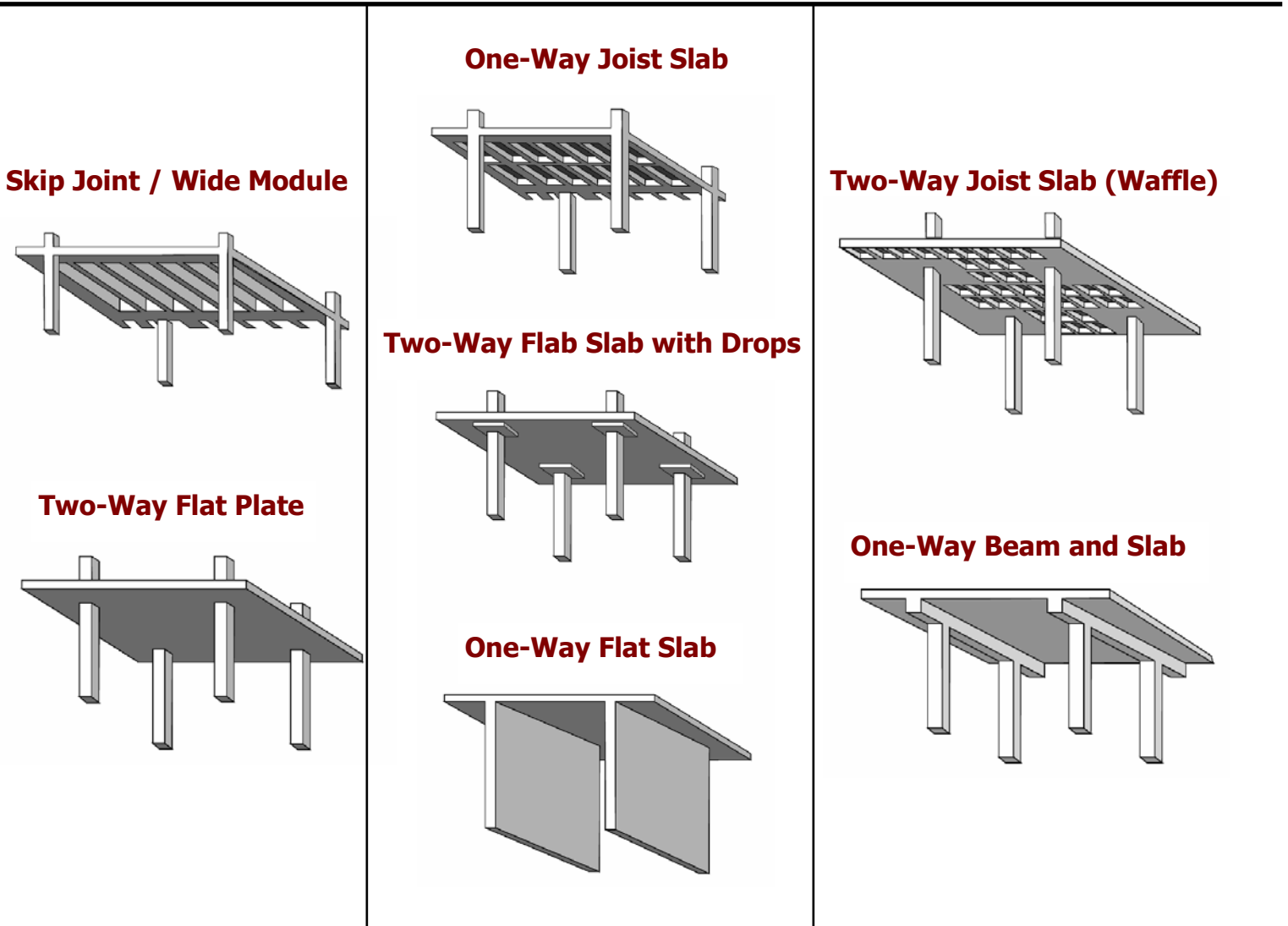
With your construction plan and frame duration, we will generate a workable schedule for efficient cycling and planning of resources.

SQP is our operational philosophy which adds up to value for you. With our resources, size and local presence, Ceco is ready to serve you. As the nation's largest formwork subcontractor, we will support you from the schematic design stage through topping-out the structural frame for your site-cast building. You will have a partner you can depend on with Ceco, at a known cost and with a firm schedule.

FRONT COVER

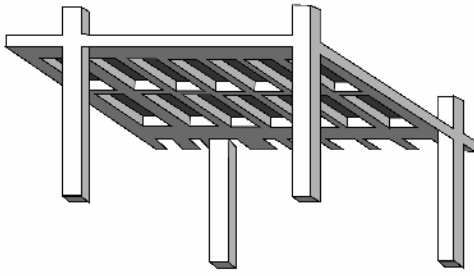
The 311 South Wacker Drive Building, tallest reinforced concrete building in the United States at 969 feet high. Formwork Subcontractor - CECO CONCRETE CONSTRUCTION Photography©, 1993 Wayne Cable, Cable Studios, Inc.

HORIZONTAL STRUCTURAL SYSTEMS



Standard System Selection Guide						
Horizontal Structural System	Office Buildings	Hotels	Multi-Family	Institutional *Hospitals *Schools	Parking Garages	Mixed Use
Standard One-Way Joist						
Wide Module One-Way Joist						
Standard Two-Way Joist						
Two-Way Flat Plate						
Beam and Slab						

Selection Guide								
Horizontal Structural System	FLANGE Forms	LONG-Flange Forms	LONG Forms	FIBERGLASS and LONGDomes	Flat Systems			Fenolic Resin
					BB	MDO	HDO	
Standard One-Way Joist								
Wide Module One-Way Joist								
Standard Two-Way Joist								
Two-Way Flat Plate								
Beam and Slab								



FLANGEforms

FLANGEforms are available in standard 2- and 3-foot modules. These forms are among the most popular because of their flexibility to accommodate various layouts and joist widths where required. They are efficient for projects with heavy superimposed loads and provide a two hour fire rating by using a 4 1/2- inch hard-rock concrete topping. They are efficient for projects of smaller size and for moderate size projects with irregular layouts or unusual building shapes. They are also efficient for projects where the structure is not required to provide a two-hour fire rating by using 3-inch or 3 1/2-inch top slab.

The varying depths provide flexibility to meet a wide range of spans and loads. Further, they will accommodate in-the-floor raceway electrical and communication distribution systems. Ceco FLANGEforms are capable of producing sound structural concrete, but are incapable of producing tight tolerances and smooth finishes. This form is a segmented steelform and the concrete will have irregular joists, a rough finish, and offsets at both the laps and flanges.

If a higher quality finish is required, you may wish to consider Ceco LONGforms (please see page 6.) The additional cost of higher quality forms are often offset by finishing costs. Contact your Ceco representative for assistance.

Concrete Quantities/30" Widths*

Depth of Steelform	Width of Joist	Cubic feet of concrete per square foot by slab thickness*	
		3"	4 1/2"
14"	5"	.456	.581
	6"	.483	.608
	7"	.508	.633
16"	6"	.522	.647
	7"	.550	.675
20"	6"	.605	.730
	7"	.640	.765
24"	6"	.694	.819
	7"	.736	.861
	8"	.776	.901

* Apply only for areas over FLANGEforms and joists between them. Bridging joists, special headers, beam tees, etc., not included. 10" and 12" depths are also available. Contact your Ceco Concrete Construction Engineer.

Concrete Quantities/20" Widths*

Depth of Steelform	Width of Joist	Cubic feet of concrete per square foot for various slab thickness*	
		3"	4 1/2"
14"	5"	.538	.663
	6"	.572	.697
	7"	.603	.728
16"	6"	.626	.751
	7"	.662	.787
	8"	.694	.819
20"	6"	.741	.867
	7"	.785	.910
	8"	.825	.950

* Apply only for areas over FLANGEforms and joists between them. Bridging joists, special headers, beam tees, etc., not included. 10" and 12" depths are also available. Contact your Ceco Concrete Construction Engineer.



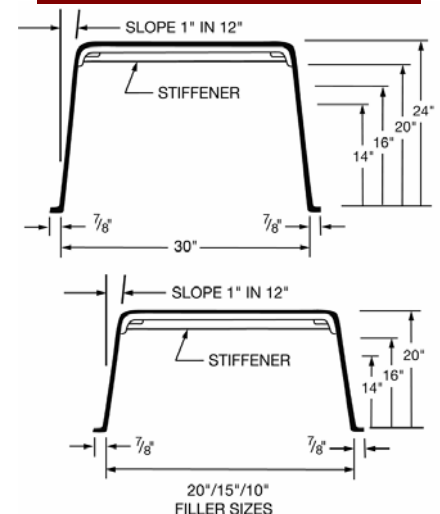
Voids Created by Various Size FLANGEforms

Shaded areas below indicate standard filler widths

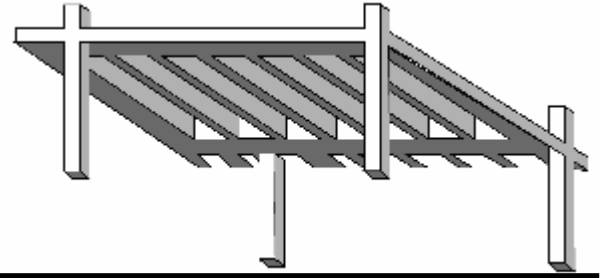
Depth of Steelform	Cubic feet of void created per linear foot by width of FLANGEform				*Added Cu. Ft. of Concrete per Tapered End Condition	
	30" Width	20" Width	15" Width	10" Width	30" Width	20" Width
10"	2.023	1.329	.982	.634	.521	.418
12"	2.414	1.581	1.165	.748	.625	.500
14"	2.801	1.829	1.343	.857	.730	N.A.
16"	3.183	2.072	1.516	.961	.834	N.A.
20"	3.933	2.544	1.850	1.155	1.043	N.A.
24"	4.667	3.000	Not Available	Not Available	Not Available	Not Available

** Total void width tapers from 30" to 25" or 20" to 16" in 3 feet.

Dimensions



WIDE FLANGEforms



WIDE FLANGEforms are available in standard 53 and 66-inch widths. When used with 7 and 6-inch joists they produce 5 and 6-foot modules respectively. ACI 318 requires the “joist” to be designed as a beam with minimum shear reinforcement. Any joist width can be used in combination with standard width pans to address span and load requirements. This system is very efficient for projects where the structural floor must provide a two-hour fire rating.

Using hard rock concrete, a 4 1/2-inch slab and minimum slab reinforcement will result in sufficient capacity for a variety of superimposed loads while reducing structure dead load. Shallower depth forms are appropriate for spans in the 25- to 35-foot range. Deeper depths are appropriate, under moderate loads, for spans in the 35- to 45-foot range using mild steel, while spans up to 60 feet can be achieved with post-tensioning.

By varying joist widths, different loading conditions can be accommodated using standard forming equipment without the need to add drop beams. Distribution ribs, which add unnecessary cost, are not required with wide module construction.

These forms are appropriate for structural concrete only, and should not be specified for critically exposed surfaces where appearance is important. They are a segmented steel form that will impart irregular lap and flange marks to the finished concrete, though many believe the finished product is acceptable for non-critically exposed work.

If a higher quality of finish is desired, for additional cost, you may wish to consider Ceko LONGforms (please see page 6). Your Ceko representative can assist in form type selection.



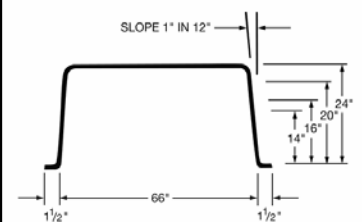
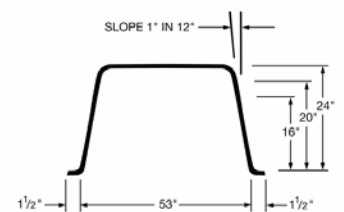
Voids Created with 53" Design Module

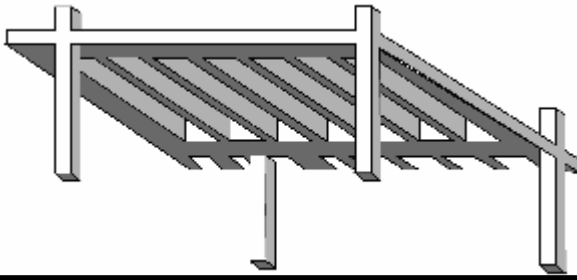
Depth of Void	Cubic feet of void created per linear foot
14"	Not Available
16"	5,741
20"	7,130
24"	8,500

Voids Created with 66" Design Module

Depth of Void	Cubic feet of void created per linear foot
14"	6,303
16"	7,185
20"	8,935
24"	10,667

Dimensions





WIDE LONG FLANGEforms

WIDE LONG FLANGEforms have been used in standard 8, 12, and 16-foot lengths. **WIDE LONG FLANGEforms** are hybrid pans that resemble conventional **FLANGEforms** in use, but provide an improved finish, for a marginal cost increase. As with **WIDE FLANGEforms**, standard length pans are lapped over one another to achieve the desired void length. Since fewer pan units are used to form any given void, fewer lap marks are left on the finished concrete. These forms have a standard flange and will impart flange marks at the joist and beam soffits. These forms easily accommodate non-standard joist widths and can be sued to make any economical joist module (for instance, 12" + 66" = 78" module).

Repetitious void lengths that will accommodate standard length pans are the key to economy. Standard **WIDE FLANGEforms** are used together with **WIDE LONG FLANGEforms** where standard length long pans do not fit the voids designed. **WIDE LONG FLANGEforms** are capable of producing sound structural concrete only. They are not appropriate for critically exposed surfaces where appearance is important. **WIDE LONG FLANGEforms** are a segmented steel form that will have irregular lap marks in the finished concrete. However, with careful consideration given for void lengths, the underside finish of a **WIDE LONG FLANGEform** project will have an improved finish over a **WIDE FLANGEform** project due to fewer lap and flange marks. Some find this finish acceptable for non-critically exposed areas.

If a higher quality of finish is desired, for additional cost, you may wish to consider **Ceco LONGforms** (please see page 6). If you desire, your **Ceco** representative will assist in form type selection



WIDE LONG FLANGEform Concrete Quantities for 53" and 66" Void Widths

Depth of Steelform	Width of Joist	Cubic feet of concrete per square foot For 4 1/2" thick topping slab*	
		53" Void	66" Void
14"	6"		.491
	9"	Not Available	.533
	12"		.572
16"	6"	.541	.511
	9"	.597	.559
	12"	.648	.603
20"	6"	.592	.553
	9"	.662	.612
	12"	.725	.667
24"	6"	.646	.597
	9"	.730	.668
	12"	.806	.734

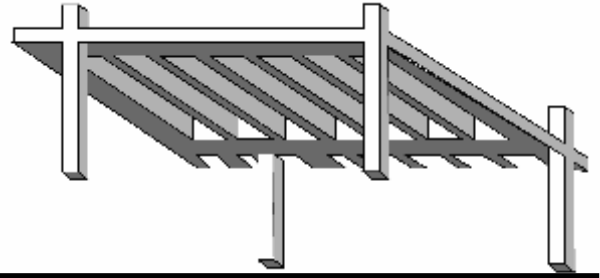
* Apply only for areas over **FLANGEforms** and joists between them. Bridging joists, special headers, beam tees, etc., not included.



Voids Created by Design Module

Depth of Void	Cubic feet of void created per linear foot	
	53" Void	66" Void
14"	Not Available	6.303
16"	5.741	7.185
20"	7.130	8.935
24"	8.500	10.667

LONGforms



LONGforms are available to produce a 6-foot and 3-foot module for one-way joist construction. LONGforms can be very cost efficient when sufficient reuse within the project is possible for a repetitious layout.

LONGforms are customized for each project and should be specified when a good appearance is required. These forms are made into a single piece by butt-welding heavy gauge steel for the main form body and are installed by lapping over and end cap at each end to complete the void forming. These forms will have a small grout fin at the joint between forms at the joist soffit. Since there are no intermediate laps and the joists are formed against a continuous steel surface, the concrete formed will yield a quality finish.

Since these are steel forms, the concrete may have blotches or a mottled color from the iron oxide. If required, this surface color can be easily removed with a light sand blast.

LONGforms are commonly used with a 6" joist resulting in a 3-foot or 6-foot module depending on the pan width selected. For additional cost, other joist widths can be accommodated with fillers installed in the soffits of the LONGform pans, but the finish will suffer due to doubling the number of grout finds at the joist soffits. Limited inventories of 53" wide LONGforms that produce a 5-foot module are also available. Your Ceco representative can review your options with you.



Concrete Quantities/30" Widths*

Depth of LONGform	Width of Joist	Cubic feet of concrete per square foot For various slab thickness*	
		3"	4 1/2"
14"	6"	.482	.607
16"	6"	.522	.647
20"	6"	.605	.730
24"	6"	.694	.819

* Apply only for areas over FLANGEforms and joists between them. Bridging joists, special headers, beam tees, etc., not included.

Concrete Quantities/66" Widths*

Depth of LONGform	Width of Joist	Cubic feet of concrete per square foot for various slab thickness*	
		3"	4 1/2"
14"	6"	.366	.491
16"	6"	.388	.511
20"	6"	.427	.552
24"	6"	.472	.597

* Apply only for areas over LONGforms and joists between them. Bridging joists, special headers, beam tees, etc., not included.

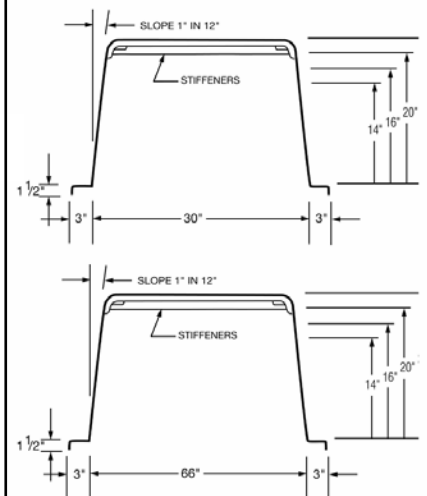
Voids Created by Various Size FLANGEforms

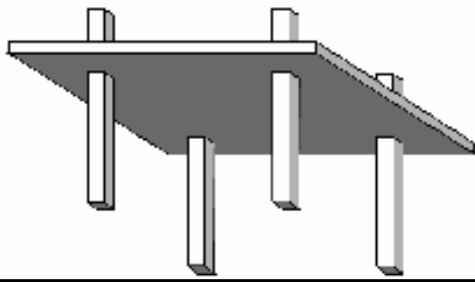
Shaded areas below indicate standard filler widths

Depth of LONGform	Cubic feet of void created per linear foot by width of LONGform		
	66" Width	30" Width	20" Width
14"	6.303	2.801	1.829
16"	7.185	3.183	2.072
20"	8.935	3.933	2.544
24"	10.667	4.667	3.000

Shaded areas above indicate standard filler widths.

Dimensions





FLAT PLATE

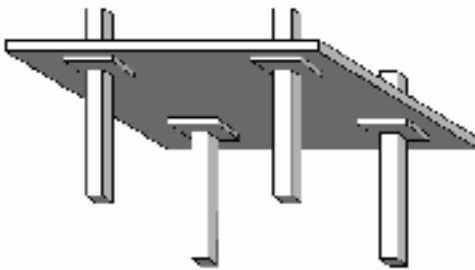
The FLAT PLATE system can be the most economical system to form, although it usually requires more concrete and more reinforcing steel than a ribbed system. It's ease of construction makes it cost-effective for projects with moderate to light loads, relatively square bays where there are multiple bays in each direction, and where spans are in the 15- to 25-foot range. With the FLAT PLATE system, floor-to-floor heights are less than with other systems, creating a savings in exterior skin and other vertical components of the finished building.

The FLAT PLATE system is the predominant framing method for hotels and multi-family housing projects over three stories. The 6- to 8-inch floor thickness is a minimum structural

depth creating shorter building heights while exceeding code-required fire ratings. The flat soffit readily accepts a cost-effective, spray-on ceiling finish, eliminating the need for more costly alternatives.

FLAT PLATES are normally formed against a wood plyform panel whose uncut, standard size is 4 x 8 feet. Plyform panels are available with a wide range of surface treatments which produce a range of finishes in the concrete. The variation in finishes are slight. Surface treatments have more to do with panel durability than concrete finish (See APA PS 7-83). Taping and caulking of form panels should be avoided since this typically leads to increased costs and unsightly form joints. Specifying an applied finished

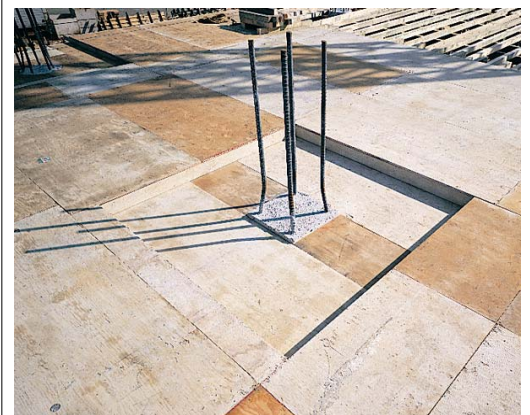
ceals broken grout fins and minor panel offsets is one way to smooth out joints when necessary. A Ceco representative can discuss various approaches to help you find the one most appropriate for your project.



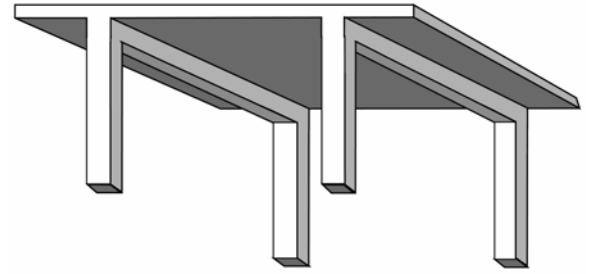
FLAT SLAB

The FLAT SLAB system is more costly to form than the FLAT PLATE system, but has similar characteristics. It uses more concrete and reinforcement than a ribbed system, but its ease of construction makes it cost effective for projects with moderate to moderately heavy loads, relatively square bays where there are multiple bays in each direction, and where spans are in the 25- to 30-foot range. The addition of the drop panels at the columns to handle the increased shear makes this possible. The premium cost for this sys-

tem for longer spans and moderately heavy loads may well be justified to accommodate zoning restrictions on building heights, or relatively expensive building exterior surface treatments, by minimizing the total footage of exterior cladding. The FLAT SLAB system has been used for a wide range of building occupancy uses, but as structural concrete, has been left exposed in subterranean parking areas with acceptable results. Ceco's preconstruction services can be valuable in determining applicability to your project.



BEAM & SLAB PARKING SYSTEMS



Usually BEAM & SLAB systems are recommended only for special applications, as there are often more cost-effective alternatives. One of the special applications is the long-span, post-tensioned beam and slab system that is popular for column-free, free-standing parking structures.

Ceco MEGA STEEL BEAM SYSTEM

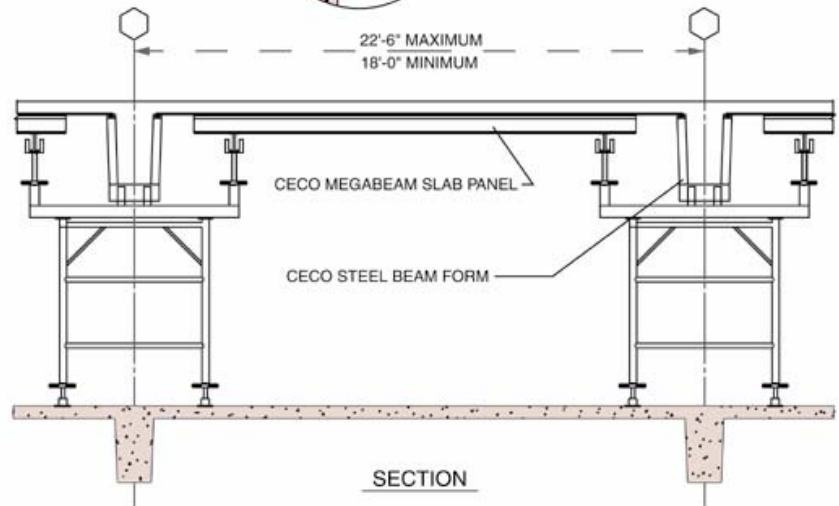
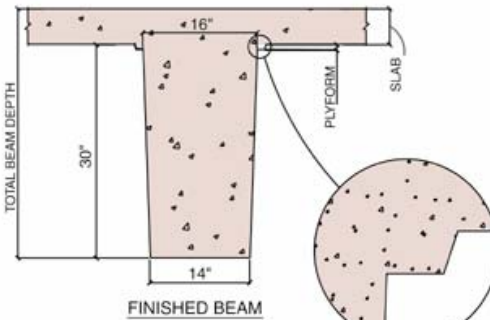
Ceco's MEGA STEEL BEAMform is the primary component for the BEAM & SLAB PARKING SYSTEM.

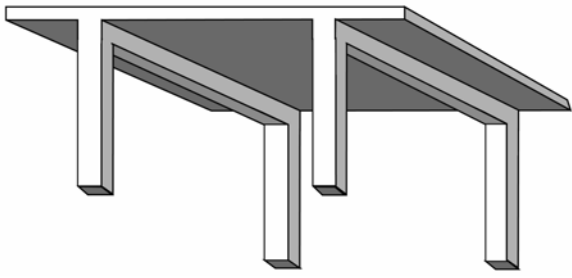
Ceco's MEGA STEEL BEAMform is built with either a 14" fixed or 16" split-bottom width and 30" beam side depth. The fixed width eliminates the seam in the soffit, while the split-bottom allows for adjustability in form width by adding fillers. Both Shoring & Reshoring of slabs are eliminated when using this system.

Slab soffits are formed utilizing Ceco's aluminum MEGA BEAM and plyform. Panels are fabricated capable of free spanning from beam side to beam side (up to 21' 2"). The finish produced is smooth and even-colored complimenting the MEGA STEEL BEAMform finish.

Ceco STEEL BEAM SYSTEM

Ceco's standard STEEL BEAMforms accommodate beam widths of 14 to 24 inches and beam side depths of 27 to 31 inches. Soffit width adjustability is achieved by splitting the soffit to add fillers to increase the width. Adding form increments to the top or build-ups in the soffit can modify beam depth.

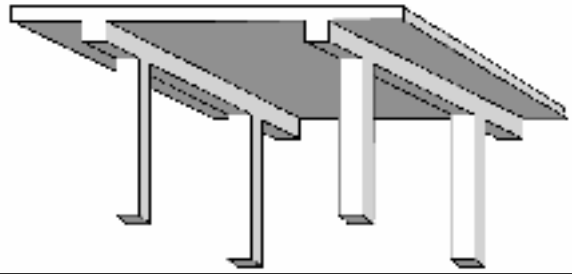




BEAM & SLAB PARKING SYSTEMS

Slab soffits can be handset or made into panels. Using either method, more shoring and reshoring will be required than the MEGA BEAM system. Both beam-forming systems will produce a smooth concrete finish without through ties.

Typical Beam forms (up to 60') along with eight-foot wide slab panels can be easily installed and removed with the aid of mechanical equipment, which reduces the number of construction workers required, and does so while minimizing crane requirements.



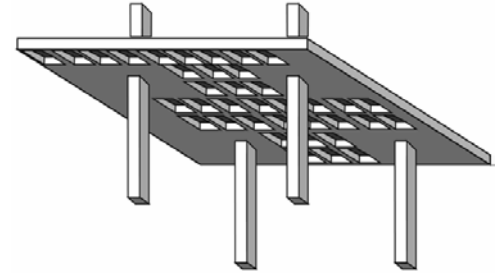
BEAM & SLAB HANDSET SYSTEM

BEAM & SLAB construction is generally the most expensive framing method due to the high material and labor cost involved. Maintaining a constant beam depth throughout the project can minimize costs. For instance, where spans or loads require added capacity, increase the beam width instead of the depth.

For parking structures that can't accommodate Ceco's MEGA STEEL BEAM-form or standard STEEL BEAM-form system, beam framing systems are available that will accommodate other beam widths and depths. Repetition of beams sizes and bay spacing are the key to minimizing cost.



FIBERGLASSdomes



FIBERGLASSdomes are available in 3, 4 and 5-foot modules for two-way joist or waffle slab construction. Other modules and depths are available on a custom basis at additional cost. Because these forms are available in wider modules and deeper depths, longer spans up to 50 feet can be accommodated efficiently.

forced plastic manufactured to exacting requirements. They are installed by butting one form to the next for standard joist widths. This butt joint will be reflected in the finished concrete. Ceco representatives can share their insights with you regarding form selection.

Though fiberglass forms are more costly than other forms, high reuse within a project and the elimination of applied finish such as ceilings, can make this system very cost efficient.

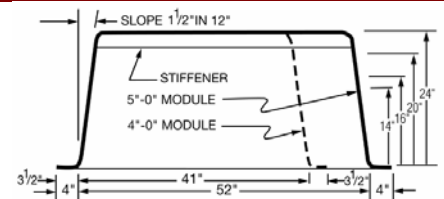
For critically exposed work, these are the forms to specify. These forms are one-piece, molded, fiberglass rein-

FIBERGLASSdomes

Depth of Dome	Cubic feet of Void Created by Design Module		
	3'-0" Module (30"x30" Void)	4'-0" Module (41"x41" Void)	5'-0" Module (52"x52" Void)
14"	6.44	12.45	20.42
16"	7.24	14.06	23.11
20"	8.74	17.14	28.33
24"	10.18	20.05	33.33



Dimensions



VERTICAL SYSTEMS

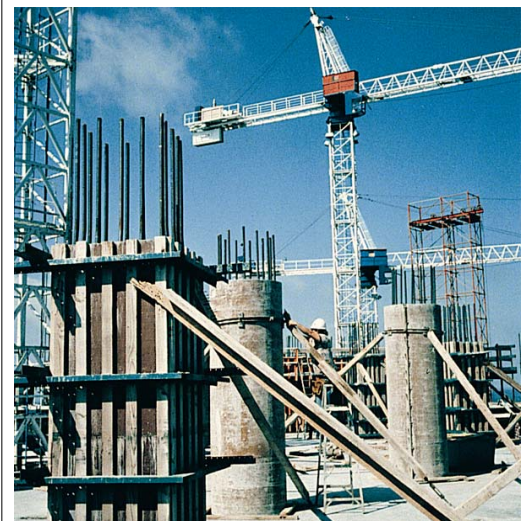
COLUMNS - Ceco has a variety of forms for round, square or rectangular columns made of steel, wood or fiberglass reinforced plastic. The most cost effective columns are round and are a constant size vertically through the building. Next are square and rectangular forms of constant modular dimensions (see CRSI Structural Bulletin No. 11). However, if special shapes are required, Ceco will customize columns to meet your requirements.

WALLS - Ceco has a variety of forms for various wall forming requirements. Plyform-faced are the most common and are available with a wide range of surface treatments which produce a range of finishes on the concrete. The

Variation in finish is slight. Surface treatment of plyform has more to do with panel durability for reuse than with concrete finish (see APA PS 7-83). There is a wide variety of form liners for architectural treatment, but architectural concrete, which is covered in Chapter 5 of ACI 374, is beyond the scope of this publication. Straight interior walls, without offsets, corners, pilasters or special facings are the least costly. Ceco representatives will work with you to accommodate the conditions of our project.

STAIRS, SPANDRELS & MISCELLANEOUS - Much of the foregoing discussion on walls applies to these building elements as well. By

contacting your local Ceco office, you can tap into a valuable resource for assistance on these and other special features of your project.

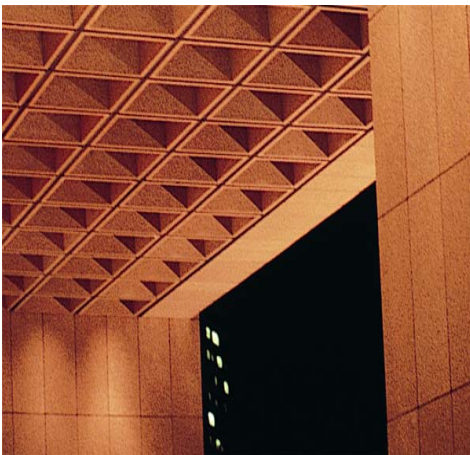


GENERAL SPECIFICATIONS

CONCRETE JOIST CONSTRUCTION

FORM MATERIAL

- 1) Pan form units used to form ribbed slab or concrete joist construction shall be manufactured to standard dimensions unless otherwise shown. Standard dimensions are as specified in ANSI A48.2-1986 for two-way systems as referenced in the Manual of Standard Practice, published by CRSI.
- 2) The pan form units shall be of sufficient gauge material with stiffeners or bracing to safely support the loads from wet concrete and construction operations while maintaining tolerances referenced herein. Steelforms shall be 14 gauge, cold formed, hot-rolled, high carbon steel. Fiberglass reinforced plastic forms shall have a minimum of 1/8-inch thickness of fiberglass material with a 15-mil thickness gel-coat finish.
- 3) The pan form units may be either new or conditioned and may contain holes up to 1/8 inch in size. Steelform units may have surface rust, but shall be free from scaling.
- 4) Filler size units of similar characteristics shall be used as required or shown on the structural drawings.
- 5) Form units shall be slope-sided for easy form removal. Slope shall be a minimum of 1 inch in 12 inches.



INSTALLATION

- 1) Pan form units shall be fastened to the supporting framework in such a way that the required position is maintained throughout concreting operations.
- 2) A non-staining form release agent shall be applied to all form surfaces prior to the installation of reinforcement or other embedded items.
- 3) Attachment to form units shall be accomplished using a special dome rivet supplied by the forming company. The use of sheet metal screws is prohibited.
- 4) Grout leakage at joint locations is permitted.
- 5) In-place concrete shall not be structurally damaged during form removal operations.
- 6) Pan form units may be reused to complete project forming requirements, provided they are free from concrete build-up and meet the tolerances listed herein.

STRUCTURAL SLABS, BEAMS, COLUMNS, WALLS, STAIRS AND MISCELLANEOUS STRUCTURAL CONCRETE ELEMENTS

FORM MATERIAL

- 1) Form material shall be flat and true, conforming to the elevations and lines on the structural drawings.
- 2) The forms shall be of sufficient material thickness with stiffeners or bracing to safely support the loads from wet concrete and construction operations while maintaining tolerances referenced herein.

INSTALLATIONS

- 1) Forms shall be fastened to the supporting framework in such a way that the required position is maintained throughout concreting operations.
- 2) Grout leakage at joint locations is permitted.
- 3) In-place concrete shall not be structurally damaged during form removal operations.
- 4) Irregular offsets at joint locations are acceptable provided they do not affect the structural integrity of the slab construction.
- 5) Permitted irregularities in formed surface of slab construction shall not exceed those listed for Class B (exposed) or Class C (unexposed) in Section 3.4 of Guide to Formwork for Concrete, published by ACI (formerly Section 3.3.8 of ACI 347-78, Recommended Practice for Concrete Formwork.)
- 6) A form release agent shall be applied to all form surfaces prior to the installation of reinforcement or other embedded items.
- 7) Forms may be reused to complete project forming requirements, provided they are free from concrete build-up and meet the tolerances listed herein.



FORM SPECIFICATIONS

Note: See General Specifications on Page 11 for Form Materials.

WIDE FLANGEforms

- 1) Pan form units used to form ribbed slab (beam and slab) construction and shall be steel, segmented, lap-type, mail-down pan forms as provided by Ceco Concrete Construction.
- 2) Standard lengths units shall be 4 feet or 5 feet 9 inches. Filler units shall be 2 feet. No skip joist forming or plating will be allowed.

INSTALLATION

- 1) Irregular offsets at lap and flange locations are acceptable provided they do not affect the structural integrity of the rib slab construction.
- 2) Permitted irregularities in formed surface of rib slab construction shall not exceed those listed for Class D in Section 3.4 of Guide to Formwork for Concrete, published by ACI, (formerly Section 3.3.8 of ACI 347-78, Recommended Practice for Concrete Formwork.)

FLANGEforms

- 1) Pan form units shall be used to form the ribbed slab (one-way joist) construction and shall be steel, segmented, lap-type, nail-down pan forms as provided by Ceco Concrete Construction.
- 2) Filler units, standard single tapered end forms, and cover plates shall be used as required.
- 3) Standard length units shall be 3 feet. Filler units shall be 1 or 2 feet. Standard single tapered end units shall be 3 feet.

INSTALLATION

- 1) Irregular offsets at lap and flange locations are acceptable provided they do not affect the structural integrity of the rib slab construction

- 2) Permitted irregularities in formed surface of rib slab construction shall not exceed those listed for Class D in Section 3.4 of Guide to Formwork for Concrete, published by ACI, (formerly Section 3.3.8 of ACI 347-78, Recommended Practice for Concrete Formwork.)

WIDE FLANGEforms

- 1) Pan form units used to form ribbed slab (beam and slab) construction and shall be steel, segmented, lap-type, pan forms as provided by Ceco Concrete Construction.
- 2) Standard lengths units shall be 8 feet, 12 feet and 16 feet, and shall be used in combinations with standard FLANGEforms to achieve the desired void lengths. WIDE LONG FLANGEforms shall be used wherever possible.

INSTALLATION

- 1) Irregular offsets at lap and flange locations are acceptable provided they do not affect the structural integrity of the rib slab construction.
- 2) Permitted irregularities in formed surface of rib slab construction shall not exceed those listed for Class D in Section 3.4 of Guide to Formwork for Concrete, published by ACI, (formerly Section 3.3.8 of ACI 347-78, Recommended Practice for Concrete Formwork.)

LONGforms

- 1) Pan form units used to form the ribbed slab (one-way joist) construction and shall be single-piece steel body with end caps as provided by Ceco Concrete Construction.
- 2) The pan form body units shall be fabricated to accommodate the void lengths required by the structural drawings.

INSTALLATION

- 1) Permitted irregularities in formed surface of rib slab construction shall

Not exceed those listed for Class C in Section 3.4 of Guide to Formwork for Concrete, published by ACI, formerly Section 3.3.8 of ACI 347-78, Recommended Practice for Concrete Formwork.)

FIBERGLASSdomes

- 1) Dome type pan form units shall be used to form ribbed slab (two-way joist) construction and shall be one-piece fiberglass dome pan forms as provided by Ceco Concrete Construction.

INSTALLATION

- 1) Irregular offsets at flange joint locations are acceptable provided they do not affect the structural integrity of the rib slab construction.
- 2) Permitted irregularities in formed surface of rib slab construction shall not exceed those listed for Class C in Section 3.4 of Guide to Formwork for Concrete, published by ACI, (formerly Section 3.3.8 of ACI 347-78, Recommended Practice for Concrete Formwork.)

FIBERGLASS LONGdomes

- 1) Pan form units shall be used to form ribbed slab (one-way joist/beam and slab) construction and shall be one-piece fiberglass pan forms as provided by Ceco Concrete Construction.

INSTALLATION

- 1) Irregular offsets at flange joint locations are acceptable provided they do not affect the structural integrity of the rib slab construction.
- 2) Permitted irregularities in formed surface of rib slab construction shall not exceed those listed for Class C in Section 3.4 of Guide to Formwork for Concrete, published by ACI, (formerly Section 3.3.8 of ACI 347-78, Recommended Practice for Concrete Formwork.)



Representative Projects

clockwise from upper left



Hyatt Regency, Baltimore, MD

Ritz Carlton Hotel, Dearborn, MI

CenTrust Tower, Miami, FL

Spiral Stair Ramps at
Joe Robbie Stadium
Miami, FL

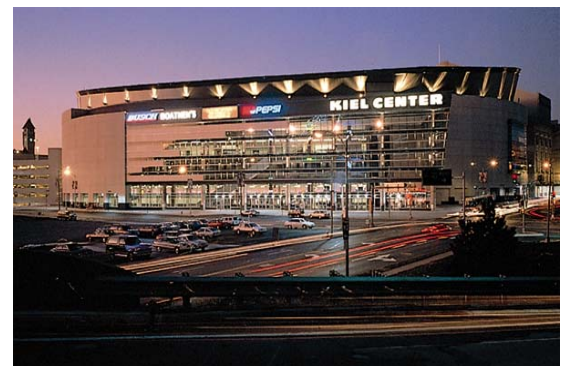
Kiel Center Arena
St. Louis, MO

Corporate Woods #84
Overland Park, KS



Lincoln Center
Minneapolis, MN

Kiel Center Arena
St. Louis, MO





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Phoenix, AZ

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Tempe, AZ 85284
(480) 838-4230

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