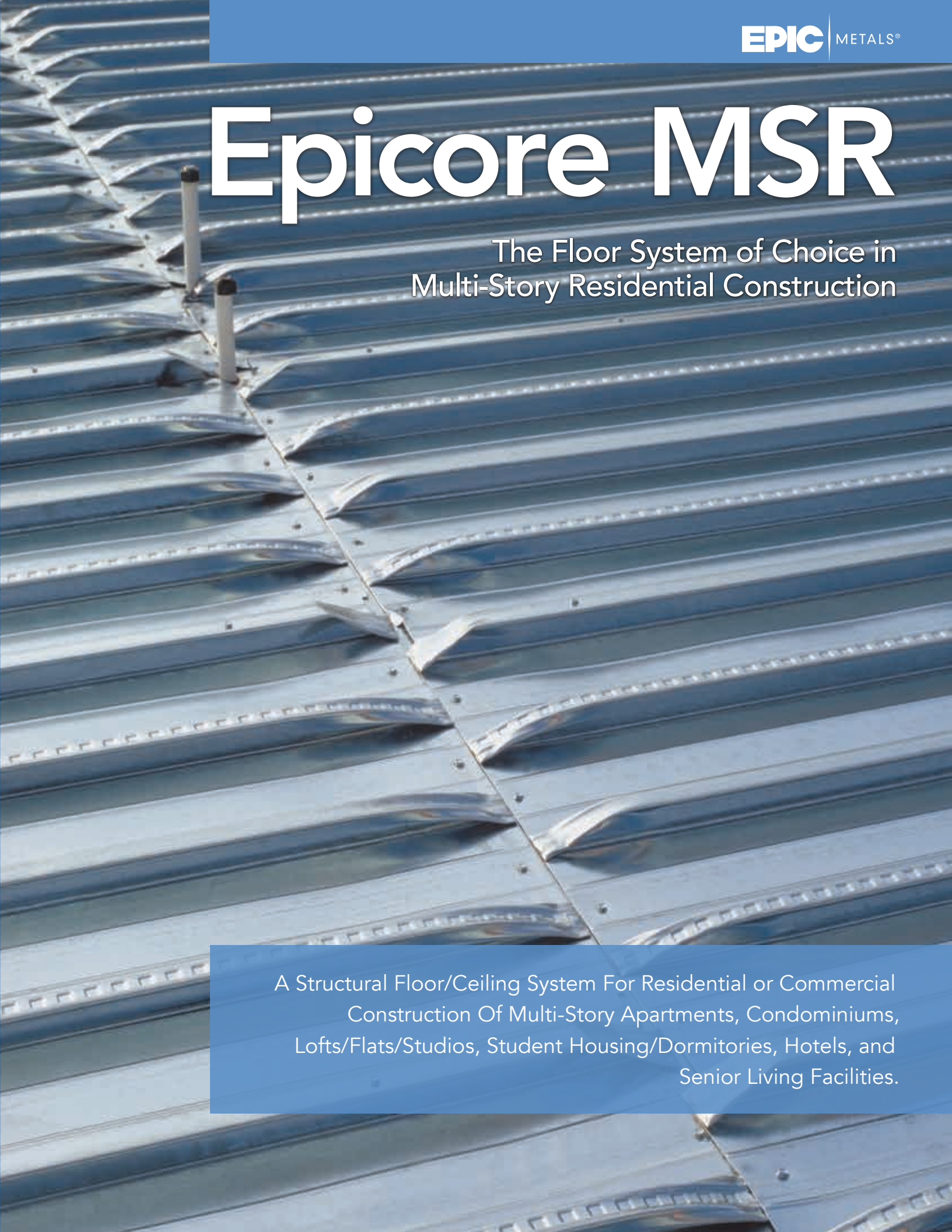
EPIC METALS®

Epicore MSR

The Floor System of Choice in Multi-Story Residential Construction



A Structural Floor/Ceiling System For Residential or Commercial Construction Of Multi-Story Apartments, Condominiums, Lofts/Flats/Studios, Student Housing/Dormitories, Hotels, and Senior Living Facilities.

EPICORE Multi-Story Residential® Composite Floor System

The strongest and fastest floor system to design and install is also the most cost-effective—The EPICORE Multi-Story Residential® Composite Floor System.

Designed for multi-story residential construction, EPICORE MSR is the floor system of choice for high-rise and low-rise apartment buildings, condominiums, townhouses, time-shares, senior living facilities, motels, hotels, and other structures with residential-type loading requirements.

The EPICORE MSR Floor System is a long-span composite slab system utilizing high-strength EPICORE MSR Composite Floor Deck as a permanent and positive reinforcing steel form. The keys to the system are the dovetail rib configuration and the closed ends of EPICORE MSR.*

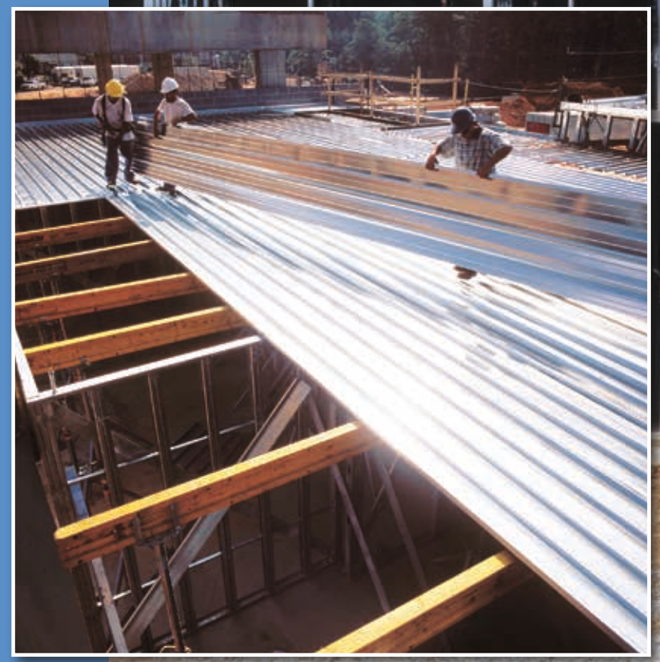
*U.S. Patent Number 6,357,191

1. EPICORE MSR is a 32″ wide permanent steel form that eliminates the need for temporary forms and is substantially faster to erect than standard 24″ width forms.
2. Because EPICORE MSR acts compositely with the concrete, it provides total positive reinforcing for the slab.
3. EPICORE MSR slabs can span up to 27 feet, thus requiring fewer structural supports.
4. Steel beams, load-bearing metal studs, masonry, insulated concrete block forms, and poured concrete are all compatible with the EPICORE MSR system.
5. EPICORE MSR slabs can be designed with a U.L. fire rating of one or two hours without applying drywall or spray-on fireproofing to the deck. Due to EPICORE MSR's closed-rib construction, flame spread from room to room is stopped by solid concrete.
6. Independent sound transmission (STC) tests prove that EPICORE MSR slabs outperform other floor systems.
7. EPICORE MSR uses less concrete than a traditional solid slab, reducing total concrete volume by 3 to 6 percent.
8. The EPICORE MSR slab beam is a reinforced concrete beam the same depth as the slab, which allows for long, uninterrupted spans. The slab beam is supported by columns that can be hidden in partition walls, eliminating the need for dropped beams or other visible support members.
9. Because the EPICORE MSR slab is of a monolithic-type construction, when tied into the load-bearing walls it becomes a single unit of great strength. Diaphragm action of the EPICORE MSR slab braces the walls; therefore, the use of tie beams is not required.
10. EPICORE MSR slabs allow low floor-to-floor height, which keeps overall building height to a minimum while maximizing the interior usable height.

EPIC Metals Corporation offers a network of experienced franchised installers, making EPICORE MSR Composite Floor Deck the system to specify for your next multi-story residential project.

One truck can transport up to 15,000 square feet of EPICORE MSR deck, saving transportation costs on delivery compared with other systems. Unloading can be completed quickly and efficiently, and the material can be easily stacked and stored until installation begins.

Once the bearing walls and shoring are in place, installation of EPICORE MSR deck panels is quick and efficient. Individual panels are easily installed by hand without the use of a crane or lift. Shoring is usually placed approximately 5´ on center to minimize deck deflection and provide a flat surface for the finished ceiling. See shoring tables 3 and 8 on pages 10 and 12.



The form of the EPICORE MSR® Slab Beam is installed before the deck erection begins. The slab beam is a flat reinforced concrete beam supported by columns concealed in partition walls, eliminating the need for dropped beams and other visible supporting members. For details, see page 17.

Once the EPICORE MSR deck is in place, electricians, plumbers, and other tradesmen can make their installations before the concrete is poured. Edge forming can be accomplished with wood, metal, or concrete blocks. For details, see page 16.

Work can progress quickly from floor to floor. Depending on individual requirements, the bottom of the deck can be painted or a finished ceiling can be applied. See information on pages 6 and 7.

MSR Fire Ratings* (U.L. Design Number D938)

Restrained Rating Required*	Total Slab Depth (in.)	Type and Weight of Concrete (pcf)
1 hour	4	RW (150)
1 hour	3¾	LW (110)
1½ hours	4½	RW (150)
1½ hours	4	LW (110)
2 hours	5	RW (150)
2 hours	4¼	LW (110)

*For unrestrained rating refer to *Underwriters Laboratories, Inc. Fire Resistance Directory*

NOTE:
RW = Regular Weight Concrete
LW = Lightweight Concrete

MSR Head of Wall Assembly Rating: 1, 1 ½ and 2 hours. Consult the U.L. directory for more information on assembly # HW-S-0115 and to learn more about specific joint details to achieve the above referenced hourly ratings.

Hat Channels and Drywall

Finishing Methods for EPICORE MSR

For the highest quality level ceiling finish, it is recommended that furring strips and drywall be used.

Other options are to leave the EPICORE MSR deck exposed giving the room a galvanized ceiling finish.

For a stucco finish, a glass mesh adhesive tape can be used to cover the rib joints, allowing the plaster to be applied simply and evenly across the surface. For exterior applications, mesh followed by stucco can be directly applied.

Hat Channels and Drywall

A common approach is to shoot metal hat channels to the bottom side of the EPICORE MSR deck after the concrete has been poured and then screw drywall to the hat channels (Note that the drywall is not required to achieve the U.L. rating). In an apartment or condo project with a lot of overhead electrical, it is preferable to use 1.5″ or 2″ hat channels to run the electrical conduit underneath the EPICORE MSR and have enough plenum depth for the conduit and electrical boxes. Electrical conduit and boxes may be placed in the EPICORE MSR slabs; however, using the 1.5″ hat channels with the electrical below keeps the electrician out of the critical path, enabling a faster pour schedule. The STC rating is slightly higher with drywall ceilings as well.

Exposed Galvanized Deck

On urban loft projects, the architect may desire to simply leave the bottom of the EPICORE MSR deck as an exposed galvanized finish. Thoughtfully combined with exposed ductwork and sprinkler piping, the exposed EPICORE MSR deck can achieve a high-tech industrial loft look while also providing the cost savings of eliminating the drywall ceilings.*

*EPIC recommends using 20 gage EPICORE MSR in lieu of 22 gage when the deck remains exposed as the ceiling.

Exposed Galvanized Deck

Application of Plaster and Stucco

Interior Application

Direct interior application of plaster to the underside of the EPICORE MSR Composite Floor Slab (Refer to illustration at bottom)

A. It is important that the EPICORE MSR be clean and free from oils and construction dust and dirt. It should be cleaned at the site. Illustration, item 1.

B. A glass mesh adhesive tape shall be applied over the rib joints on the underside of the EPICORE MSR slab. Illustration, item 2.

C. A suitable bonding agent shall be applied over the EPICORE MSR and the glass mesh tape. Illustration, items 1 & 2.

D. The same day as applying the bonding agent, trowel on a thin leveling coat of veneer plaster. Illustration, item 3.

E. Apply a textured coating. In some projects, a second coat is applied as a finish coat. Illustration, item 4.

Exterior Application

Exterior application of cement plaster (stucco) to the underside of the EPICORE MSR Composite Slab

The recommendation for the application of cementitious products on the underside of the EPICORE MSR Composite Slab System in exposed areas is as follows:

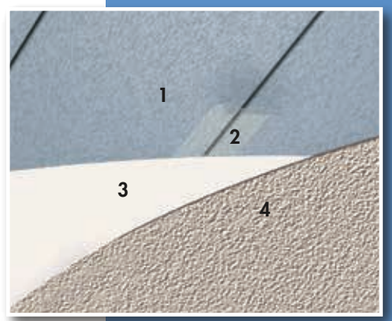
A. It is important that the EPICORE MSR be clean and free from oils and construction dust and dirt. It should be cleaned at the site.

B. A suitable bonding agent and/or mesh should be applied over the EPICORE MSR.

C. The same day as applying the bonding agent, spray or trowel into the rib joints an amount of cement plaster sufficient to provide a bond for the subsequent coat. This operation shall be performed in temperatures above 55°F.

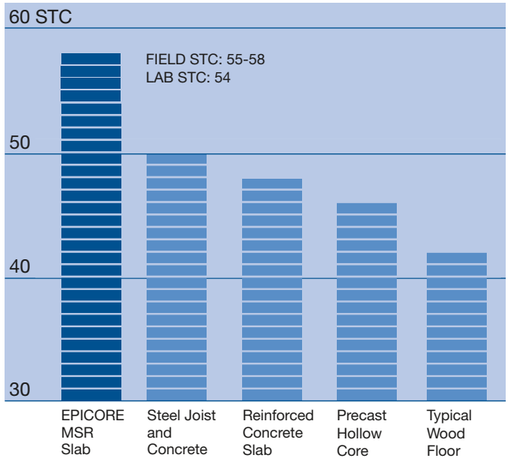
D. When the cement plaster is set but not dry (approximately 2 hours), trowel on a coat of cement base stucco to the bottom surface. The total thickness should not exceed ⅜ inch.

NOTE: All applications shall be according to the manufacturer's specifications. Contact EPIC Metals Corporation for details.



Interior Application of Plaster

The EPICORE MSR® Composite Floor System scores the highest rating for airborne noise control in multifamily dwellings.



In multi-family or hotel projects floor/ceiling systems provide a significant sound barrier between the units on different floors. The measurement of the quality of the sound barrier is based upon two rating systems. The air-borne noise rating are expressed as a Sound Transmission Class (STC) and impact noise which is rated by Impact Insulation Class (IIC). The higher the STC the less air-borne noise is transmitted between the floor/ceiling system. The impact noise is predominately caused by foot traffic on the floor above. Carpet and pad are some of the best materials to reduce impact noise since they reduce the source of the noise. The higher the IIC the less impact noise is transmitted between floors of a building.

The INTERNATIONAL BUILDING CODE® requires for floor/ceiling assemblies between dwelling units:

A. STC rating of 50 (if field tested a rating of 45) when tested in accordance with ASTM E90.

B. IIC rating of 50 (if field tested a rating of 45) when tested in accordance with ASTM E 492.

C. Typically field measurement are 5 points lower than the laboratory tests used for testing systems.

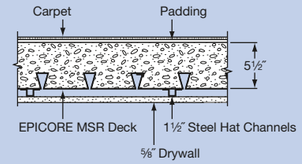
The Code requires that penetrations or openings for piping, electrical devices, heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings.

EPICORE MSR IIC Rating: 41-81*

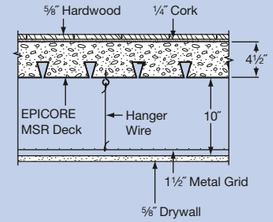
The Impact Insulation Class rating of the EPICORE MSR Floor System has been field tested at FIIC: 81. IIC ratings will vary depending upon slab thickness, floor covering, ceiling treatment, etc. (Consult EPIC for further details)

*STC and IIC test reports available upon request.
See U.S. Department of Housing Guide to Airborne, Impact & Structural Borne Noise for STC Values on other systems shown.

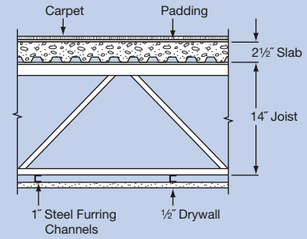
EPICORE MSR: STC = 54-55



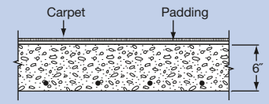
EPICORE MSR: STC = 58



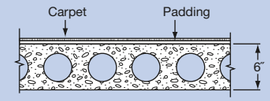
Steel Joist & Concrete Floor



Reinforced Concrete Slab



Precast Hollow Core



General Notes

All designs are based on the use of regular weight concrete (150 pcf), with a compressive strength of 4,000 psi. Reinforcing steel other than EPICORE MSR shall have a yield strength of 60,000 psi. Maximum allowable deflection under the total load (live + dead) is limited to L/360 in all cases. For lightweight concrete consult EPIC Metals.

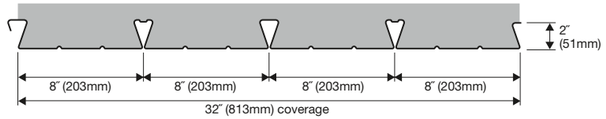


Table 1: Moment Coefficients

Simple Spans

$wl^2/8$

Continuous Spans—Positive Moments

$wl^2/11$ $wl^2/11$
2 Spans

$wl^2/11$ $wl^2/16$ $wl^2/16$ $wl^2/11$
3 or more Spans

Continuous Spans—Negative Moments

$wl^2/9$
2 Spans

$wl^2/10$ $wl^2/11$ $wl^2/10$
3 or more Spans

Table 2: Section Properties of EPICORE MSR Deck

Gage	22
Weight (psf)	2.0
A_S (in.²/ft.)	0.577
I_S (in.⁴/ft.)	0.272
$\bar{Y}$ (in.)	0.476
Yield (ksi)	50

NOTE: Section properties have been computed in accordance with *the A.I.S.I. Cold-Formed Steel Design Manual.*

Table 3: Shoring/Temperature Mesh Requirements

Total Slab Depth (in.)	Max. Unshored Clear Span (ft.-in.) 22 Gage	Temperature Mesh Required
4	5-0	6x6-W1.4xW1.4
4.5	5-0	6x6-W1.4xW1.4
5	5-0	6x6-W1.4xW1.4
5.5	5-0	6x6-W2.1xW2.1
6	5-0	6x6-W2.1xW2.1
6.5	4-6	6x6-W2.1xW2.1
7	4-6	6x6-W2.9xW2.9
7.5	4-6	6x6-W2.9xW2.9
8	4-6	6x6-W2.9xW2.9

Note: The determination of the time for removal of supporting shores may be controlled by the presence of construction loads or deflection limitations. The removal of shores may have to occur after the concrete has reached its full compressive strength f´c and stiffness Ec, particularly in those instances where the construction loads may be as high as the specified live load. If shoring is removed too early, more significant deflection may occur and may even result in permanent damage. The strength and stiffness of the concrete during the various stages of construction should be substantiated by job-constructed and job-cured test specimens (cylinders). See ACI 318 for more information.

Table 4: Maximum Spans For EPICORE MSR 22 Gage (ft.-in.), f´c = 4000 psi

Total Slab Depth (in.)	Simple Spans (ft.-in.)			Continuous Spans (ft.-in.)					
	LL = 40 psf DL = 20 psf	LL = 80 psf DL = 5 psf	LL = 100 psf DL = 5 psf	LL = 40 psf DL = 20 psf		LL = 80 psf DL = 5 psf		LL = 100 psf DL = 5 psf	
				interior span	end span	interior span	end span	interior span	end span
4	14-0	13-1	12-5	17-3	17-3	16-1	16-1	15-5	15-5
4.5	15-3	14-4	13-8	18-10	18-10	17-8	17-8	16-11	16-11
5	16-6	15-6	14-11	20-5	20-5	19-2	19-2	18-5	18-4
5.5	17-9	16-9	16-1	21-11	21-11	20-8	20-6	19-10	19-2
6	18-11	17-10	17-0	23-5	23-5	22-1	21-3	21-3	19-11
6.5	20-1	18-9	17-7	24-10	24-7	23-6	22-0	22-8	20-7
7	21-2	19-3	18-1	26-2	25-2	24-10	22-7	23-11	21-3
7.5	21-11	19-9	18-7	27-7	25-9	26-2	23-2	25-3	21-10
8	22-4	20-3	19-1	28-10	26-3	27-6	23-9	26-7	22-4

Notes:
1. For simple spans:
   a. No reinforcing steel other than EPICORE MSR is required.
2. For continuous spans:
   a. Reinforcing steel is required over interior supports. See table 5 for suggested rebar sizes. Table assumes 3/4″ concrete cover for reinforcing steel over supports.
   b. Spans should be approximately equal with the larger of the two adjacent spans not greater than the shorter by more than 20 percent. See ACI 318.
   c. Reinforcing over supports should extend a minimum of .3 x L on both sides of the supports. See ACI 318 Development and Splices of Reinforcement.
3. Temperature and shrinkage reinforcement, consisting of welded wire fabric, shall have a minimum area of 0.00075 times the area of concrete above the top flange of the deck but not be less than the area of 6x6-W1.4xW1.4. See table 3.
4. All listed spans are assumed to be measured from center to center of the supports.

Table 5: Required Reinforcing Steel Area for Continuous Span 22 Gage MSR® Slabs with 4,000 psi Concrete (in²/ft)

Total Slab Depth (in.)	Slab Span (ft.)	Continuous Spans														
		LL = 40, DL = 20					LL = 80, DL = 5					LL = 100, DL = 5				
		Between Supports		Over Supports			Between Supports		Over Supports			Between Supports		Over Supports		
		$WL^2/11$	$WL^2/16$	$WL^2/9$	$WL^2/10$	$WL^2/11$	$WL^2/11$	$WL^2/16$	$WL^2/9$	$WL^2/10$	$WL^2/11$	$WL^2/11$	$WL^2/16$	$WL^2/9$	$WL^2/10$	$WL^2/11$
4	14	MSR	MSR	0.267	0.239	0.216	MSR	MSR	0.359	0.320	0.288	MSR	MSR	0.427	0.379	0.341
	15	MSR	MSR	0.310	0.277	0.250	MSR	MSR	0.420	0.373	0.335	MSR	MSR	0.501	0.443	0.398
	16	MSR	MSR	0.358	0.319	0.287	MSR	MSR	0.487	0.431	0.387					
	17	MSR	MSR	0.410	0.364	0.328										
4.5	14	MSR	MSR	0.235	0.210	0.190	MSR	MSR	0.310	0.277	0.250	MSR	MSR	0.363	0.324	0.292
	15	MSR	MSR	0.272	0.243	0.220	MSR	MSR	0.360	0.321	0.289	MSR	MSR	0.423	0.377	0.339
	16	MSR	MSR	0.312	0.279	0.252	MSR	MSR	0.415	0.369	0.333	MSR	MSR	0.489	0.435	0.391
	17	MSR	MSR	0.356	0.318	0.287	MSR	MSR	0.475	0.422	0.380					
	18	MSR	MSR	0.404	0.360	0.324										
5	16	MSR	MSR	0.281	0.251	0.227	MSR	MSR	0.366	0.327	0.295	MSR	MSR	0.428	0.381	0.344
	17	MSR	MSR	0.319	0.285	0.258	MSR	MSR	0.418	0.373	0.336	MSR	MSR	0.489	0.435	0.392
	18	MSR	MSR	0.361	0.322	0.291	MSR	MSR	0.474	0.422	0.380	MSR	MSR	0.556	0.494	0.444
	19	MSR	MSR	0.406	0.362	0.327	MSR	MSR	0.535	0.475	0.428					
	20	MSR	MSR	0.454	0.405	0.365										
5.5	15	MSR	MSR	0.225	0.202	0.183	MSR	MSR	0.289	0.259	0.234	MSR	MSR	0.334	0.299	0.270
	16	MSR	MSR	0.257	0.230	0.209	MSR	MSR	0.331	0.296	0.268	MSR	MSR	0.384	0.343	0.310
	17	MSR	MSR	0.292	0.262	0.237	MSR	MSR	0.377	0.337	0.304	MSR	MSR	0.437	0.390	0.352
	18	MSR	MSR	0.330	0.295	0.267	MSR	MSR	0.426	0.380	0.344	MSR	MSR	0.495	0.442	0.398
	19	MSR	MSR	0.370	0.331	0.299	MSR	MSR	0.480	0.428	0.386	MSR	MSR	0.559	0.497	0.448
	20	MSR	MSR	0.413	0.369	0.333	MSR	MSR	0.537	0.478	0.431					
	21	MSR	MSR	0.460	0.410	0.370										
6	16	MSR	MSR	0.239	0.215	0.194	MSR	MSR	0.304	0.272	0.247	MSR	MSR	0.350	0.313	0.284
	17	MSR	MSR	0.272	0.243	0.220	MSR	MSR	0.346	0.309	0.280	MSR	MSR	0.399	0.356	0.322
	18	MSR	MSR	0.306	0.274	0.248	MSR	MSR	0.390	0.349	0.316	MSR	MSR	0.451	0.402	0.364
	19	MSR	MSR	0.343	0.307	0.278	MSR	MSR	0.438	0.392	0.354	MSR	MSR	0.507	0.452	0.408
	20	MSR	MSR	0.382	0.342	0.309	MSR	MSR	0.490	0.437	0.395		MSR	0.567	0.505	0.455
	21	MSR	MSR	0.425	0.379	0.343	MSR	MSR	0.545	0.486	0.438		MSR	0.632	0.562	0.506
	22	MSR	MSR	0.469	0.419	0.378		MSR	0.604	0.538	0.484					
	23	MSR	MSR	0.517	0.461	0.416										
6.5	18	MSR	MSR	0.287	0.257	0.233	MSR	MSR	0.362	0.324	0.294	MSR	MSR	0.416	0.372	0.336
	19	MSR	MSR	0.322	0.288	0.261	MSR	MSR	0.406	0.363	0.329	MSR	MSR	0.467	0.417	0.377
	20	MSR	MSR	0.358	0.321	0.290	MSR	MSR	0.453	0.405	0.366	MSR	MSR	0.521	0.465	0.420
	21	MSR	MSR	0.397	0.355	0.321	MSR	MSR	0.503	0.450	0.406		MSR	0.580	0.517	0.466
	22	MSR	MSR	0.439	0.392	0.354	MSR	MSR	0.557	0.497	0.448		MSR	0.642	0.572	0.516
	23	MSR	MSR	0.482	0.431	0.389		MSR	0.614	0.547	0.493					
	24	MSR	MSR	0.529	0.472	0.426										
7	19	MSR	MSR	0.304	0.273	0.247	MSR	MSR	0.381	0.341	0.308	MSR	MSR	0.435	0.389	0.352
	20	MSR	MSR	0.339	0.303	0.275	MSR	MSR	0.424	0.379	0.343	MSR	MSR	0.485	0.433	0.392
	21	MSR	MSR	0.375	0.336	0.304	MSR	MSR	0.470	0.421	0.380	MSR	MSR	0.538	0.481	0.434
	22	MSR	MSR	0.414	0.370	0.335	MSR	MSR	0.520	0.464	0.420		MSR	0.595	0.531	0.480
	23	MSR	MSR	0.455	0.407	0.368		MSR	0.572	0.511	0.461		MSR	0.656	0.585	0.528
	24	MSR	MSR	0.498	0.445	0.402		MSR	0.628	0.560	0.505					
	25	MSR	MSR	0.544	0.486	0.439										
	26		MSR	0.592	0.528	0.477										
7.5	21	MSR	MSR	0.357	0.320	0.290	MSR	MSR	0.444	0.397	0.359	MSR	MSR	0.505	0.451	0.408
	22	MSR	MSR	0.394	0.352	0.319	MSR	MSR	0.490	0.438	0.396		MSR	0.558	0.498	0.450
	23	MSR	MSR	0.432	0.387	0.350	MSR	MSR	0.538	0.481	0.435		MSR	0.614	0.548	0.495
	24	MSR	MSR	0.473	0.423	0.383		MSR	0.590	0.527	0.476		MSR	0.673	0.601	0.542
	25	MSR	MSR	0.516	0.461	0.417		MSR	0.644	0.575	0.519		MSR	0.736	0.656	0.592
	26		MSR	0.561	0.501	0.453		MSR	0.702	0.626	0.565					
	27		MSR	0.609	0.543	0.491										
8	21	MSR	MSR	0.342	0.306	0.278	MSR	MSR	0.421	0.377	0.341	MSR	MSR	0.477	0.427	0.386
	22	MSR	MSR	0.377	0.337	0.306	MSR	MSR	0.464	0.416	0.376	MSR	MSR	0.527	0.471	0.426
	23	MSR	MSR	0.413	0.370	0.335	MSR	MSR	0.510	0.456	0.413		MSR	0.579	0.517	0.468
	24	MSR	MSR	0.452	0.405	0.366		MSR	0.559	0.499	0.452		MSR	0.634	0.567	0.512
	25	MSR	MSR	0.493	0.441	0.399		MSR	0.610	0.545	0.492		MSR	0.693	0.618	0.558
	26	MSR	MSR	0.535	0.479	0.433		MSR	0.663	0.592	0.535		MSR	0.755	0.673	0.607
	27		MSR	0.580	0.519	0.469		MSR	0.720	0.642	0.580					
	28		MSR	0.627	0.560	0.506										

NOTE: See notes under Table 4 on page 10.
See Table 13 for rebar size and spacing on page 14.

General Notes

All designs are based on the use of regular weight concrete (150 pcf), with a compressive strength of 4,000 psi. Reinforcing steel other than EPICORE MSR shall have a yield strength of 60,000 psi. Maximum allowable deflection under the total load (live + dead) is limited to L/360 in all cases. For lightweight concrete consult EPIC Metals.

For temporary shoring of architecturally exposed MSR ceilings: It is recommended to use minimum 12 inch wide shoring support bearing surfaces so that permanent indentations to the deck/ ceiling (under the shoring supports) are minimized.

If construction loads are higher than normal (ie loads from riding trowels), further precautions may be necessary.

Table 6: Moment Coefficients

Simple Spans

$wl^2/8$

Continuous Spans—Positive Moments

$wl^2/11$ $wl^2/11$

2 Spans

$wl^2/11$ $wl^2/16$ $wl^2/16$ $wl^2/11$

3 or more Spans

Continuous Spans—Negative Moments

$wl^2/9$

2 Spans

$wl^2/10$ $wl^2/11$ $wl^2/10$

3 or more Spans

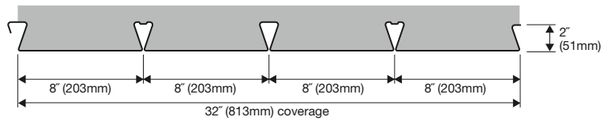


Table 7: Section Properties of EPICORE MSR Deck

Gage	20
Weight (psf)	2.5
A_S (in.²/ft.)	0.700
I_S (in.⁴/ft.)	0.330
$\bar{Y}$ (in.)	0.480
Yield (ksi)	50

NOTE: Section properties have been computed in accordance with the *A.I.S.I. Cold-Formed Steel Design Manual.*

Table 8: Shoring/Temperature Mesh Requirements

Total Slab Depth (in.)	Max Unshored Clear Span (ft-in) 20 Gage		Temperature Mesh Required
	Exposed Ceilings	Covered by Drywall	
4	5-0	6-0	6x6-W1.4xW1.4
4.5	5-0	6-0	6x6-W1.4xW1.4
5	5-0	5-6	6x6-W1.4xW1.4
5.5	4-6	5-6	6x6-W2.1xW2.1
6	4-6	5-6	6x6-W2.1xW2.1
6.5	4-6	5-0	6x6-W2.1xW2.1
7	4-0	5-0	6x6-W2.9xW2.9
7.5	4-0	5-0	6x6-W2.9xW2.9
8	4-0	5-0	6x6-W2.9xW2.9

Note: The determination of the time for removal of supporting shores may be controlled by the presence of construction loads or deflection limitations. The removal of shores may have to occur after the concrete has reached its full compressive strength f´c and stiffness Ec, particularly in those instances where the construction loads may be as high as the specified live load. If shoring is removed too early, more significant deflection may occur and may even result in permanent damage. The strength and stiffness of the concrete during the various stages of construction should be substantiated by job-constructed and job-cured test specimens (cylinders). See ACI 318 for more information.

Table 9: Maximum Spans For EPICORE MSR 20 Gage (ft-in) f´c = 4000 psi

Total Slab Depth (in.)	Simple Spans (ft.-in.)			Continuous Spans (ft.-in.)					
	LL = 40 psf DL = 20 psf	LL = 80 psf DL = 5 psf	LL = 100 psf DL = 5 psf	LL = 40 psf DL = 20 psf		LL = 80 psf DL = 5 psf		LL = 100 psf DL = 5 psf	
				interior span	end span	interior span	end span	interior span	end span
4	14-3	13-4	12-9	17-8	17-8	16-6	16-6	15-9	15-9
4.5	15-7	14-7	13-11	19-3	19-3	18-0	18-0	17-3	17-3
5	16-10	15-10	15-2	20-10	20-10	19-7	19-7	18-9	18-9
5.5	18-1	17-1	16-4	22-4	22-4	21-1	21-1	20-3	20-3
6	19-3	18-3	17-6	23-10	23-10	22-6	22-6	21-8	21-8
6.5	20-5	19-4	18-8	25-3	25-3	23-11	23-11	23-0	22-6
7	21-7	20-6	19-9	26-8	26-8	25-4	24-9	24-5	23-3
7.5	22-8	21-7	20-4	28-0	28-0	26-8	25-4	25-8	23-10
8	23-9	22-2	20-10	29-4	28-8	27-11	26-0	27-0	24-6

Notes:
1. For simple spans:
   a. No reinforcing steel other than EPICORE MSR is required.
2. For continuous spans:
   a. Reinforcing steel is required over interior supports. See table 10 for suggested rebar sizes. Table assumes ¾″ concrete cover for reinforcing steel over supports.
   b. Spans should be approximately equal with the larger of the two adjacent spans not greater than the shorter by more than 20 percent. See ACI 318.
   c. Reinforcing over supports should extend a minimum of 0.3 x L on both sides of the supports. See ACI 318 Development and Splices of Reinforcement.
3. Temperature and shrinkage reinforcement, consisting of welded wire fabric, shall have a minimum area of 0.00075 times the area of concrete above the top flange of the deck but not be less than the area of 6x6-W1.4xW1.4. See table 8.
4. All listed spans are assumed to be measured from center to center of the supports.

Table 10: Required Reinforcing Steel Area for Continuous Span 20 Gage MSR® Slabs with 4,000 psi Concrete (in²/ft)

Total Slab Depth (in.)	Slab Span (ft.)	Continuous Spans														
		LL = 40, DL = 20					LL = 80, DL = 5					LL = 100, DL = 5				
		Between Supports		Over Supports			Between Supports		Over Supports			Between Supports		Over Supports		
		$\frac{WL^2}{11}$	$\frac{WL^2}{16}$	$\frac{WL^2}{9}$	$\frac{WL^2}{10}$	$\frac{WL^2}{11}$	$\frac{WL^2}{11}$	$\frac{WL^2}{16}$	$\frac{WL^2}{9}$	$\frac{WL^2}{10}$	$\frac{WL^2}{11}$	$\frac{WL^2}{11}$	$\frac{WL^2}{16}$	$\frac{WL^2}{9}$	$\frac{WL^2}{10}$	$\frac{WL^2}{11}$
4	14	MSR	MSR	0.268	0.240	0.217	MSR	MSR	0.361	0.321	0.289	MSR	MSR	0.428	0.380	0.342
	15	MSR	MSR	0.312	0.278	0.251	MSR	MSR	0.421	0.374	0.336	MSR	MSR	0.502	0.444	0.399
	16	MSR	MSR	0.360	0.320	0.288	MSR	MSR	0.489	0.433	0.388					
	17	MSR	MSR	0.412	0.366	0.329										
4.5	15	MSR	MSR	0.273	0.244	0.221	MSR	MSR	0.361	0.322	0.290	MSR	MSR	0.424	0.378	0.340
	16	MSR	MSR	0.314	0.280	0.253	MSR	MSR	0.416	0.370	0.334	MSR	MSR	0.491	0.436	0.392
	17	MSR	MSR	0.358	0.319	0.288	MSR	MSR	0.477	0.423	0.381	MSR	MSR	0.564	0.500	0.449
	18	MSR	MSR	0.406	0.361	0.326	MSR	MSR	0.543	0.481	0.433					
	19	MSR	MSR	0.458	0.407	0.366										
5	16	MSR	MSR	0.282	0.252	0.228	MSR	MSR	0.367	0.328	0.296	MSR	MSR	0.429	0.382	0.345
	17	MSR	MSR	0.321	0.287	0.259	MSR	MSR	0.419	0.374	0.337	MSR	MSR	0.490	0.436	0.393
	18	MSR	MSR	0.362	0.324	0.292	MSR	MSR	0.475	0.423	0.381	MSR	MSR	0.558	0.495	0.446
	19	MSR	MSR	0.408	0.364	0.328	MSR	MSR	0.537	0.477	0.429					
	20	MSR	MSR	0.456	0.406	0.366										
5.5	16	MSR	MSR	0.258	0.231	0.210	MSR	MSR	0.332	0.297	0.269	MSR	MSR	0.385	0.344	0.311
	17	MSR	MSR	0.293	0.263	0.238	MSR	MSR	0.378	0.338	0.305	MSR	MSR	0.438	0.391	0.353
	18	MSR	MSR	0.331	0.296	0.268	MSR	MSR	0.428	0.382	0.345	MSR	MSR	0.497	0.443	0.399
	19	MSR	MSR	0.372	0.332	0.300	MSR	MSR	0.481	0.429	0.387	MSR	MSR	0.560	0.498	0.449
	20	MSR	MSR	0.415	0.370	0.335	MSR	MSR	0.539	0.480	0.432	MSR	MSR	0.628	0.558	0.502
	21	MSR	MSR	0.461	0.411	0.371	MSR	MSR	0.601	0.534	0.481					
	22	MSR	MSR	0.511	0.455	0.410										
6	16	MSR	MSR	0.240	0.215	0.195	MSR	MSR	0.305	0.273	0.247	MSR	MSR	0.351	0.314	0.284
	17	MSR	MSR	0.272	0.244	0.221	MSR	MSR	0.347	0.310	0.281	MSR	MSR	0.400	0.357	0.323
	18	MSR	MSR	0.307	0.275	0.249	MSR	MSR	0.392	0.350	0.317	MSR	MSR	0.452	0.403	0.364
	19	MSR	MSR	0.344	0.308	0.279	MSR	MSR	0.440	0.393	0.355	MSR	MSR	0.508	0.453	0.409
	20	MSR	MSR	0.384	0.343	0.310	MSR	MSR	0.491	0.438	0.396	MSR	MSR	0.568	0.506	0.457
	21	MSR	MSR	0.426	0.381	0.344	MSR	MSR	0.546	0.487	0.439	MSR	MSR	0.633	0.564	0.508
	22	MSR	MSR	0.471	0.420	0.380	MSR	MSR	0.606	0.539	0.486					
	23	MSR	MSR	0.519	0.463	0.418										
6.5	19	MSR	MSR	0.323	0.289	0.262	MSR	MSR	0.407	0.364	0.330	MSR	MSR	0.468	0.418	0.378
	20	MSR	MSR	0.359	0.322	0.291	MSR	MSR	0.455	0.406	0.367	MSR	MSR	0.522	0.466	0.421
	21	MSR	MSR	0.399	0.357	0.323	MSR	MSR	0.505	0.451	0.407	MSR	MSR	0.581	0.518	0.467
	22	MSR	MSR	0.440	0.393	0.356	MSR	MSR	0.558	0.498	0.450	MSR	MSR	0.644	0.573	0.517
	23	MSR	MSR	0.484	0.432	0.391	MSR	MSR	0.616	0.549	0.495		MSR	0.711	0.632	0.569
	24	MSR	MSR	0.531	0.474	0.428										
	25	MSR	MSR	0.580	0.517	0.467										
7	19	MSR	MSR	0.305	0.274	0.248	MSR	MSR	0.382	0.342	0.309	MSR	MSR	0.436	0.390	0.353
	20	MSR	MSR	0.340	0.304	0.276	MSR	MSR	0.425	0.380	0.344	MSR	MSR	0.486	0.434	0.393
	21	MSR	MSR	0.376	0.337	0.305	MSR	MSR	0.472	0.422	0.381	MSR	MSR	0.540	0.482	0.435
	22	MSR	MSR	0.415	0.372	0.336	MSR	MSR	0.521	0.466	0.421	MSR	MSR	0.597	0.533	0.481
	23	MSR	MSR	0.456	0.408	0.369	MSR	MSR	0.574	0.512	0.462	MSR	MSR	0.658	0.586	0.529
	24	MSR	MSR	0.500	0.447	0.404	MSR	MSR	0.629	0.561	0.506		MSR	0.723	0.643	0.580
	25	MSR	MSR	0.546	0.487	0.440		MSR	0.688	0.613	0.553					
	26	MSR	MSR	0.594	0.530	0.478										
7.5	22	MSR	MSR	0.395	0.354	0.320	MSR	MSR	0.491	0.439	0.397	MSR	MSR	0.559	0.499	0.451
	23	MSR	MSR	0.433	0.388	0.351	MSR	MSR	0.540	0.482	0.436	MSR	MSR	0.615	0.549	0.496
	24	MSR	MSR	0.474	0.424	0.384	MSR	MSR	0.591	0.528	0.477		MSR	0.675	0.602	0.543
	25	MSR	MSR	0.517	0.463	0.418	MSR	MSR	0.646	0.576	0.520		MSR	0.738	0.658	0.593
	26	MSR	MSR	0.563	0.503	0.454		MSR	0.704	0.627	0.566					
	27	MSR	MSR	0.611	0.545	0.492										
	28	MSR	MSR	0.661	0.589	0.532										
8	22	MSR	MSR	0.378	0.338	0.307	MSR	MSR	0.466	0.417	0.377	MSR	MSR	0.528	0.472	0.427
	23	MSR	MSR	0.414	0.371	0.336	MSR	MSR	0.511	0.458	0.414	MSR	MSR	0.580	0.519	0.469
	24	MSR	MSR	0.453	0.406	0.367	MSR	MSR	0.560	0.501	0.453	MSR	MSR	0.636	0.568	0.513
	25	MSR	MSR	0.494	0.442	0.400	MSR	MSR	0.611	0.546	0.493		MSR	0.695	0.620	0.560
	26	MSR	MSR	0.537	0.480	0.434	MSR	MSR	0.665	0.594	0.536		MSR	0.757	0.675	0.609
	27	MSR	MSR	0.582	0.520	0.470		MSR	0.722	0.644	0.581		MSR	0.822	0.732	0.660
	28	MSR	MSR	0.629	0.562	0.508										
	29		MSR	0.679	0.606	0.547										

NOTE: See notes under Table 9 on page 12.
See Table 13 for rebar size and spacing on page 14.

Table 11: Continuous Span Slab Beams

Slab Beam Depth (in.)	Tributary Slab Span (ft.)	Slab Beam Span (ft.)	Reinforcing Steel Required				
			Between Supports		Over Supports		
			+WL²/11	+WL²/16	-WL²/9	-WL²/10	-WL²/11
5	18	10.5	8-#6	8-#4	•	9-#5	8-#5
		10	8-#5	6-#4	9-#5	8-#5	7-#5
		9	5-#5	5-#4	7-#5	7-#5	6-#5
	16	11	8-#6	7-#4	•	9-#5	8-#5
		10	5-#5	5-#4	8-#5	7-#5	7-#5
		9	6-#4	4-#4	6-#5	6-#5	5-#5
	14	11.5	8-#6	6-#4	•	9-#5	8-#5
		11	6-#6	6-#4	9-#5	8-#5	7-#5
		10	5-#5	5-#4	7-#5	6-#5	6-#5
5.5	18	11.5	9-#6	5-#6	11-#5	7-#6	6-#6
		11	6-#6	5-#5	10-#5	6-#6	8-#5
		10	5-#5	6-#4	8-#5	7-#5	7-#5
	16	12	9-#6	6-#5	11-#5	7-#6	9-#5
		11.5	6-#6	6-#4	10-#5	6-#6	8-#5
		11	6-#5	6-#4	8-#5	8-#5	7-#5
	14	12.5	9-#6	7-#4	10-#5	9-#5	8-#5
		12	6-#6	6-#4	9-#5	8-#5	7-#5
		11.5	6-#5	6-#4	8-#5	7-#5	7-#5
6	18	12.5	9-#6	6-#6	12-#5	8-#6	7-#6
		12	7-#6	7-#4	11-#5	7-#6	6-#6
		11.5	7-#5	7-#4	10-#5	9-#5	8-#5
	16	13	9-#6	7-#5	11-#5	7-#6	7-#6
		12.5	7-#6	7-#4	10-#5	7-#6	8-#5
		12	5-#6	7-#4	10-#5	8-#5	8-#5
	14	13.5	8-#6	7-#4	8-#6	7-#6	6-#6
		13	6-#6	7-#4	10-#5	6-#6	8-#5
		12.5	5-#6	6-#4	9-#5	8-#5	7-#5
6.5	20	12.5	8-#6	6-#5	12-#5	8-#6	7-#6
		12	6-#6	5-#5	11-#5	7-#6	6-#6
		11	6-#5	7-#4	9-#5	8-#5	7-#5
	18	13.5	10-#6	7-#6	9-#6	8-#6	7-#6
		13	8-#6	5-#5	8-#6	8-#6	7-#6
		12	7-#5	7-#4	10-#5	6-#6	8-#5
	16	14	10-#6	6-#6	9-#6	8-#6	7-#6
		13	6-#6	7-#4	10-#5	7-#6	8-#5
		12	6-#5	6-#4	8-#5	8-#5	7-#5
7	20	13.5	9-#6	7-#5	10-#6	8-#6	8-#6
		13	7-#6	6-#5	9-#6	8-#6	7-#6
		12	7-#5	7-#4	10-#5	7-#6	8-#5
	18	14.5	11-#6	8-#6	10-#6	9-#6	8-#6
		14	9-#6	7-#5	9-#6	8-#6	7-#6
		13	5-#6	5-#5	11-#5	7-#6	6-#6
	16	15.5	12-#6	9-#6	10-#6	9-#6	8-#6
		15	10-#6	9-#5	9-#6	8-#6	8-#6
		14	7-#6	8-#4	11-#5	7-#6	6-#6

• Concrete overstressed

NOTES:
1. Design of slab beam is based on superimposed load of 40 psf LL + 20 psf DL + slab weight and width of 3′-10″.
2. Spans should be approximately equal with the larger of the two adjacent spans not greater than the shorter by more than 20 percent. See ACI-318.
3. Tributary slab spans must be continuous. See table 5 on page 11, and table 10 on page 13.
4. Reinforcing over supports should extend a minimum of 0.3 x L on both sides of the supports. See ACI 318 Development and Splices of Reinforcement.
5. See Details 12 and 13 on page 17 for general construction of slab beam system.
6. All reinforcing is to be equally spaced along the 3′-10″ width.
7. Table assumes f′c = 4000 psi.
8. All listed spans are assumed to be measured from center to center of the supports.

Table 12: Cantilever Slabs, Balconies, and Walkways

Total Slab Depth† (in.)	Span (ft.)	Reinforcing Steel Required Over Supports (in²/ft)	
		60 psf Live Load*	100 psf Live Load**
4.5	6	#4@8	#4@6
	5	#4@13	#4@9
	4	#4@18	#4@14
5	7	#4@7	#5@7
	6	#4@10	#4@7
	5	#4@14	#4@10
	4	#4@18	#4@17
5.5	7	#4@8	#4@6
	6	#4@11	#4@8
	5	#4@15	#4@12
	4	#4@15	#4@15
6	8	#4@6	#5@7
	7	#4@9	#4@6
	6	#4@12	#4@9
	5	#4@13	#4@13
6.5	9	#5@8	#5@6
	8	#4@7	#5@8
	7	#4@9	#4@7
	6	#4@12	#4@10
	5	#4@12	#4@12
7	9	#4@6	#5@7
	8	#4@8	#4@6
	7	#4@10	#4@8
	6	#4@11	#4@11
	5	#4@11	#4@11
7.5	10	#5@8	#5@6
	9	#4@6	#5@7
	8	#4@8	#4@6
	7	#4@10	#4@8
	6	#4@10	#4@10
	5	#4@10	#4@10

* 65 psf superimposed
** 105 psf superimposed
† at point of maximum moment

NOTES:
1. Cantilever slabs shall be formed with ribs of EPICORE MSR parallel to span.
2. See Details 8 & 9 on page 16 for general construction of cantilever slabs.
3. Table assumes f′c = 4000 psi.
4. Table assumes 1.5″ concrete cover for reinforcing steel over supports.
5. All listed spans are assumed to be measured from the center of the supports to the end of the cantilever.

Table 13: Rebar Size and Spacing Chart (in²/ft)

Bar Spacing (in.)	Rebar Size (#)		
	4	5	6
6	0.393	0.614	0.884
7	0.337	0.526	0.757
8	0.295	0.460	0.663
9	0.262	0.409	0.589
10	0.236	0.368	0.530
11	0.214	0.335	0.482
12	0.196	0.307	0.442
13	0.181	0.283	0.408
14	0.168	0.263	0.379
15	0.157	0.245	0.353
16	0.147	0.230	0.331

Table 14: Simple Span Slab Beams

Slab Beam Depth (in.)	Tributary Slab Span (ft.)	Slab Beam Span (ft.)	Reinforcing Steel Required Between Supports	
			LL = 40 DL = 20	LL = 100 DL = 5
5	12	5	4-#4	4-#4
		6	4-#4	4-#4
		7	4-#4	6-#4
		8	5-#4	11-#4
	14	5	4-#4	4-#4
		6	4-#4	5-#4
		7	5-#4	7-#4
		8	6-#4	11-#5
	16	5	4-#4	4-#4
		6	4-#4	6-#4
		7	5-#4	9-#4
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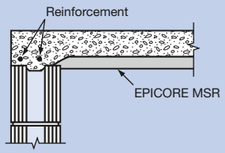
	26	7	6-#4	8-#4
		8	8-#4	7-#5
		9	7-#5	•
		10	10-#5	•

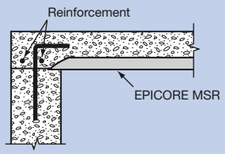
• Concrete overstressed

NOTES:
1. Epicore MSR slab span must be checked against Epicore MSR catalog to ensure that Epicore MSR slab is sufficient.
2. Epicore MSR Slab span must be designed with negative moment resisting steel placed in the top portion of the slab and running through the Slab Beam.
3. Epicore MSR slab span is measured from center of support to center of slab beam (or from center of slab beam to center of slab beam if Epicore MSR slab is continuous).
4. Table assumes the use of Normal Weight Concrete (approx. 150 pcf) and f′c= 4000 psi.
5. Slab beam width is 3′-10″. Reinforcing steel is to be equally spaced along the 3′-10″ width.
6. Placement and coverage of reinforcing steel shall be in accordance with the recommendations of the latest edition of ACI-318.
7. Vertical shear is based on uniformly end-supported slab beams. If columns and plates are used to support slab beams, punching shear must be checked and the columns and plates must be sized accordingly.

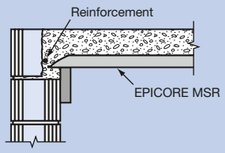
1. Spandrel-Block



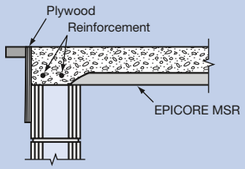
2. Spandrel-Concrete



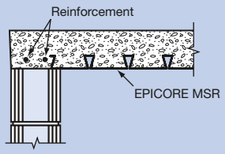
3. Spandrel-Form Block



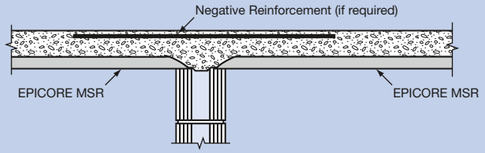
4. Spandrel-Wood Block



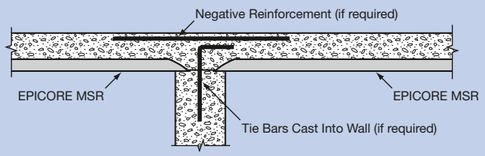
5. Spandrel-EPICORE MSR Parallel



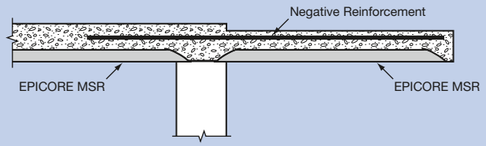
6. Interior Wall-Block



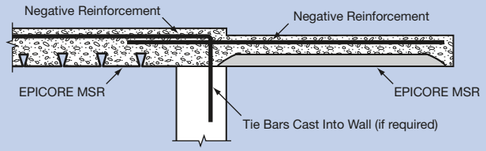
7. Interior-Wall Concrete



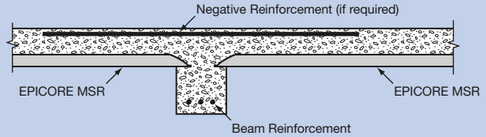
8. Cantilever Parallel to Span



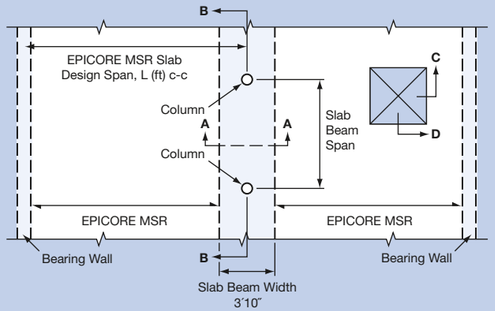
9. Cantilever Perpendicular to Span



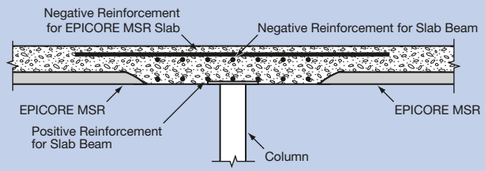
10. Dropped Concrete Beam



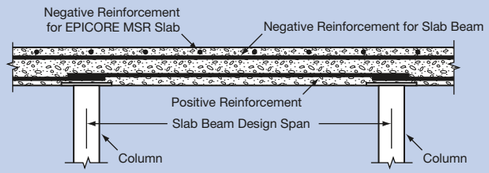
11. Sample Floor Layout



12. Slab Beam: Section A-A

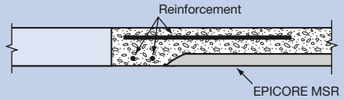


13. Slab Beam: Section B-B

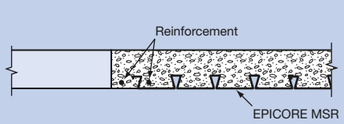


NOTE:
Temperature and shrinkage reinforcement is required for all EPICORE MSR Slabs. See tables 3 and 8, pages 10 and 12.

14. Opening Perpendicular to Deck Span: Section C



15. Opening Parallel to Deck Span: Section D



PART 1: GENERAL

1.1 SUMMARY

A. The requirements of this specification section include all materials, equipment, and labor necessary to furnish and install a Composite Floor Deck System.

B. Related work: The following related work is not part of this section:

DIVISION 3	1. Cast in place concrete: Concrete fill, reinforcing steel, and temporary shoring.
DIVISION 5	2. Structural steel: Supplementary framing, deck supports, and edge angle.
DIVISION 9	3. Finishes: Preparation for and application of field finishes.

1.2 SUBMITTALS

A. Product data: Submit manufacturer's specifications, section properties, load tables, diaphragm shear tables, dimensions, finishes, and fire resistance ratings.

B. Shop drawings: Submit panel placement drawings showing profiles, material thicknesses, finishes, layout, anchorage, shoring requirements, and openings as dimensioned on the structural drawings, if required.

C. Samples: Submit full width sample if requested to verify compliance with the specifications and the level of quality.

1.3 QUALITY ASSURANCE

A. Deck manufacturer shall have been regularly engaged in the production of dovetail rib profiles for a period of ten years.

B. Composite floor deck panels shall be cold-formed by the continuous roll-forming process to assure quality and uniformity of profile.

C. Section properties: Shall be computed in accordance with the *American Iron and Steel Institute (AISI) Cold Formed Steel Design Manual.*

D. Materials: Shall be in accordance with the American Society for Testing and Materials (ASTM).

E. Welding: Shall comply with applicable provisions of the *American Welding Society (AWS) D1.3 Structural Welding Code—Sheet Steel.*

F. Superimposed load and diaphragm shear capacities: Loads and capacities shall be computed in accordance with the requirements of the manufacturer's design manual and the Steel Deck Institute (SDI). Superimposed load capacity shall be verified by full scale tests.

G. Fire resistance: Composite floor deck panels shall be listed in the *Underwriters Laboratories (U.L.) Fire Resistance Directory*. All panels shall bear the appropriate U.L. classification marking.

H. Deck installer shall have installed products similar in material, design, and extent to that specified for this project and whose work has resulted in construction with a record of successful in-service performance for a period of at least 5 years.

I. Cast in place concrete: Shoring and reinforcing shall be in accordance with the applicable section of the *ACI 318 Building Code Requirements for Reinforced Concrete.* Minimum compressive strength shall be 4000 psi. Admixtures containing chloride salts shall not be used. Additionally, all concrete constituents including but not limited to aggregates, sand, and water shall be closely monitored to assure that chlorides do not exceed the limits proscribed in ACI 318.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Composite floor deck panels shall be protected from damage during delivery, storage, and handling.

B. Composite floor deck panels shall be elevated above the ground, sloped to provide drainage, and if required, protected from weather with a ventilated covering.

1.5 COORDINATION

A. Coordinate concrete type, strength, slump, shoring, and reinforcing to achieve composite slab performance and U.L. fire ratings.

B. Coordinate field cleaning and finishes to achieve proper adhesion to the composite floor deck panels.

C. Protection: When the composite floor slab is used in an exterior application (such as a balcony), the steel deck panels shall be adequately protected by field priming and painting with a rust inhibitive paint or by stuccoing the deck. The surface of the concrete shall also be adequately sealed. The composite deck provides positive reinforcement for the slab; therefore, the finish on the steel deck must be specified by the architect and engineer for the environment it will be used in to protect the steel deck for the life of the structure.

PART 2: PRODUCTS

2.1 MANUFACTURER

A. In accordance with the requirements of this specification section, provide products manufactured by EPIC Metals Corporation, Rankin, Pennsylvania.

B. The composite floor deck panels, design thickness, section properties, and composite slab capacities shall be as shown on the structural design drawings. These panels shall be capable of supporting the design loads shown.

2.2 MATERIALS

A. The composite floor deck panels shall be cold-formed from steel coils conforming to ASTM A653, Structural Quality, Grade 50 with a minimum yield strength of 50 ksi.

B. Before forming, the steel coils shall have received a hot-dip protective coating of zinc conforming to ASTM A924, Class G60 or G90 as defined in ASTM A653.

C. The minimum uncoated thickness of materials furnished shall not be less than 95% of the design thickness.

2.3 FABRICATION

A. The composite floor deck panels shall be cold-formed by the continuous roll forming process.

1. The composite floor deck panels shall have continuous dovetail-shaped ribs spaced at 8″ on center and formed to the following nominal dimensions: 2″ depth, 1⅛″ minimum rib width at top, and ⅛″ maximum rib opening at bottom.
2. Alternating ribs shall have integral embossed locking lugs to enhance shear bond.
3. The composite floor deck panels shall have full depth positive registering sidelaps that can be fastened by welds or screws.

   (OMIT THE FOLLOWING PARAGRAPH IF PRIME PAINTING IS NOT REQUIRED.)
4. Prime paint option—Prior to forming, galvanized steel shall be chemically cleaned and pre-treated followed by an oven-cured epoxy primer and a second coat of oven-cured polyester prime paint in the manufacturer's standard color of off-white. Compatibility of field applied finish paint with factory applied prime paint shall be the responsibility of the painting contractor.

2.4 ACCESSORIES

A. Manufacturer's standard column closures and side closures shall be provided as indicated on the structural drawings.

B. Openings and reinforcement for openings noted specifically "by the deck manufacturer" on the structural drawings shall be provided.

C. Slab edge forms of 10 gage or less material thickness shall be provided as indicated on the structural drawings.

PART 3: EXECUTION

3.1 GENERAL

The Composite Floor Deck System shall be installed in strict accordance with the manufacturer's instructions, approved erection drawings (if required), and all applicable safety regulations.

3.2 EXAMINATION

A. The supporting frame or other related work shall be inspected and accepted by the erector of the Composite Floor Deck System before start of installation.

B. The need for temporary shoring shall be investigated. Shoring tables furnished by the manufacturer and shown on the approved erection drawings (if required) shall be consulted. Allowable unshored spans shall be reduced if greater construction loads are anticipated or if less deflection is allowable.

C. The determination of the time for removal of supporting shores may be controlled by the presence of construction loads or deflection limitations. The removal of shores may have to occur after the concrete has reached its full compressive strength f´c, modules Ec and stiffness, particularly in those instances where the construction loads may be as high as the specified live load. If shoring is removed too early, more significant deflection may occur and may even result in permanent damage. The strength and stiffness of the concrete during the various stages of construction should be substantiated by job-constructed and job-cured test specimens (cylinders). See ACI 318-99 for more information.

3.3 PREPARATION

A. Bundles of material shall be located on the supporting frame in such a manner that overloading of any of the individual framing members does not occur. Composite floor deck panels shall not be placed on concrete supports until supports have adequately cured or properly designed formwork is in place.

3.4 INSTALLATION

A. The composite floor deck panels and related accessories shall be installed in accordance with manufacturer's approved erection drawings, SDI Publication No. ANSI/SDI Standard for Composite Steel Floor Deck Slabs, *SDI Manual of Construction with Steel Deck*, and all federal and state safety regulations.

B. Before being permanently fastened, the composite floor deck panels shall be placed on the supporting frame and adjusted to final position with ends adequately bearing on the supporting frame. A minimum bearing of 1½″ shall be maintained. Consistent coverage shall be maintained.

C. Cutting of the panels to suit job site conditions shall be performed in a neat and professional manner. Only those openings indicated on the structural drawings shall be cut. Other openings shall be cut and reinforced by those requiring the opening as approved by the structural engineer.

D. The composite floor deck panels shall be fastened to all supporting members with fasteners as specified at 8″ on center or as indicated on the erection drawings. Fasten to formwork and masonry supports as required for safety.

1. The sides of the panels located at the perimeter of the building shall be fastened to supporting members at a maximum spacing of 36″ on center or less as indicated on the manufacturer's erection drawings.

E. The sidelaps of the panels shall be fastened together by 1″-long fillet welds or #10 screws, (1½″-long fillet welds or #12 screws if a shear diaphragm is required) at a maximum spacing of 36″ on center or less as indicated on the erection drawings.

F. Construction loads shall not be applied to the panels until after the panels are permanently fastened to supporting members and sidelaps have been attached, and shall not exceed the load-carrying capacity of the panels.

3.5 COMPOSITE SLAB BEAMS

A. Composite slab beams shall be designed in strict accordance with accepted engineering practices. Slab beams shall be formed and shored in accordance with the ACI Code and with local code provisions. The formwork shall provide a level and continuous support for the adjacent composite floor deck panels. After form removal, the exposed beam shall provide a surface level with the panels and acceptable for directly applied ceiling materials.

DESIGNER'S RESPONSIBILITY

The information presented in this brochure has been prepared in accordance with generally recognized engineering principles. We recommend that this information not be used or relied upon for any application without a thorough review by a licensed professional engineer, designer, or architect who shall be competent to evaluate the significance and limitations of this material and who will accept responsibility for the application of this material for any specific application.

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Since hazards may be associated with the handling, installation, or use of steel and its accessories, prudent construction practices should always be followed. We recommend that the parties involved in such handling, installation, or use review all applicable manufacturer's material safety data sheets, applicable rules and regulations of the Occupational Safety and Health Administration, and other government agencies having jurisdiction over such handling, installation, or use, and other relevant construction practice publications, including the *Steel Deck Institute (SDI) Manual for Construction with Steel Deck*.

WARRANTY

EPIC Metals Corporation warrants that materials to be furnished, insofar as they are manufactured by EPIC Metals Corporation, shall be free from structural defects. In the event of the failure of the material within one year from the date of delivery, and providing that such failure is attributed to defects found to have existed at the time of delivery, EPIC Metals Corporation's liability hereunder shall be limited to furnishing necessary replacement material. EPIC Metals Corporation assumes no liability for damages, losses, or injuries, direct or consequential, that may arise from use or inability to use the products.

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EPIC actively supports the efforts of the Steel Deck Institute to establish uniform industry standards for design, engineering, manufacturing, and installation of steel decks.

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