ClarkDietrich

AN INTRODUCTION TO COLD-FORMED STEEL FRAMING

INTERIOR FRAMING • EXTERIOR FRAMING • FLOOR FRAMING
INTERIOR FINISHING • METAL LATH/ACCESSORIES • CLIPS/CONNECTORS

ClarkDietrich

Today, ClarkDietrich is not only a company of size and scope- but one of much broader vision. Beyond the strength of our steel framing products, we find that real integrity is found in working with you as a confident partner who delivers unmatched insight and remarkable perspective.

Like you, we look out upon a construction landscape that's continually evolving at a rapid pace. The challenges are many, but the trends toward higher performance and greater efficiencies in all aspects of construction are promising. As the trends take hold and the demands rise, we can truly say walls are getting smarter.

No longer just studs, tracks and headers. No longer just a division between space. We see what the future for walls holds, and we are acting on it with products that perform as a system, backed by intelligent design tools and fully capable engineering services.

Be assured, we're always ready to talk about your specific needs. Regardless of your project's size or complexity, ClarkDietrich is able to listen, consult and deliver on all your projects. And we can do it coast to coast.

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How to use this book.

This guide is designed to introduce you to ClarkDietrich cold-formed steel framing and its applications. By understanding the various ClarkDietrich products, you can recommend construction materials that effectively address the needs of your customers.

Divided into sections that allow you to quickly find information about specific ClarkDietrich products and their applications. It may also be used as a quick reference guide to help answer questions commonly asked by contractors, builders or do-it-yourself homeowners.

As the world's leading producer of cold-formed steel framing, ClarkDietrich manufactures a full range of products for any application. If you have questions or need additional technical information about a specific product, contact us. We're committed to helping both you and your customers.

The benefits of cold-formed metal framing.

ClarkDietrich cold-formed steel framing offers the unbeatable combination of durability, strength and stability. Ideal for use in commercial buildings, houses and schools, steel framing offers the following benefits:

Corrosion Resistance

- Steel framing members built into wall cavities, attic spaces or crawl spaces will last over 300 years when not exposed to water, according to a study conducted in England.

- Forensic studies conducted on Oahu, HI residences built over 40 years ago with steel wall studs showed no visible signs of corrosion.

- Material is compliant with relevant ASTM protective coating standards design to resist corrosion.

Fire Resistance

- Steel framing is non-combustible and will not add fuel to a fire. It actually improves fire safety compliance with local codes and regulations.

- Steel framing offers code-approved increases in allowable floor area and/or allowable building heights, compared to conventional wood framing.

- One-third of all fires start in wall cavities.

- Actual case studies show steel houses perform extremely well in house fires, and experience little or no damage to the structural framing.

Termites

• Over $1 billion is spent annually for prevention and control of termites, and to address the damage they create.

• Steel framing provides a termite-proof solution for the structural integrity of your project.

• The most ferocious termite is the Formosan Subterranea "Super Termite".

• An average colony of termites consists of about 3 million insects, but can be as large as 10 million insects. A single colony normally survives approximately 35 years.

• A well-fed Formosan queen termite can live for 25 years and lay 1,000 eggs a day.

Mold

• Steel does not promote the growth of mold and reduces the threat of staggering litigation and expenses.

• Mold requires an organic nutrient source and moisture to grow and flourish. Unlike wood, steel is inorganic and does not contain moisture. Kiln-dried lumber still contains 11-14% residual water content.

• California has already passed mold-related laws, and nine other states have legislation pending.

Costs

• Steel is more economical than traditional masonry, concrete and other types of construction materials.

• Steel reduces or eliminates callback costs for nail pops, floor squeaks and wall cracks due to shrinkage.

• Steel lowers construction and homeowners insurance costs.

Environmental Compatibility

• Steel offers builders an environmentally friendly alternative to wood. There is little waste when steel framing materials are used.

• Builders can reduce their disposal costs and divert material from local landfills.

• Building an average wood-frame home generates approximately 50 cubic feet of landfill waste. A comparable steel-frame home generates about 1.5 cubic feet of waste.

Pollution Control

• The American Lung Association encourages the use of steel framing with its Healthy House program. This program recommends steel framing to support good indoor air quality.

• Homeowners sensitive to chemicals, and those susceptible to asthma, are exposed to fewer toxins in a steel-framed home.

• Steel resists mold spores that can lead to chronic illness.

• No pesticides or toxins are required to protect steel framing from termites or vermin.

• No emissions from resins, adhesives or chemicals normally used for wood construction occurs with steel.

• Better insulation values can be achieved with a combination of steel and EPS foam to reduce outside noise pollution.

Recyclability

• Steel is 100% recyclable and considered to be a green building material.

• Steel framing materials contain, on average, 69% recycled steel.

• Steel can be a significant factor in the LEED certification process.

• It takes 25 old-growth trees to build a 2,500 square-foot home, compared with 7 recycled automobiles for the same home with steel framing.

• 80 million tons of steel scrap is recycled each year – more than paper, aluminum, glass and plastic combined.

Handling

• Interior non-structural studs are cut easily with metal snips (aviator snips). They do not require the use of a circular saw.

• Metal studs simply twist into place and attach with screws. Mistakes can be corrected by reversing the screw gun.

- Steel studs are up to 50% lighter than wood.

- Pre-punched knock-outs eliminate drilling for electrical and plumbing lines.

- Special order cut-to-length material eliminates field cutting and waste.

Earthquakes and Hurricanes

- Steel framing can be engineered to meet the highest seismic and wind loads prescribed by building codes.

- Steel has the highest strength-to-weight ratio of any framing material – a lighter structure with stronger connections results in less damage from seismic forces.

- Steel's strength and resiliency help it to survive earthquakes.

- With a steel structure, there is a smaller probability of wind damage due to stronger (screwed vs. nailed) connections.

- For generations, we have relied on the strength and durability of steel in our commercial buildings, hospitals and schools.

Lightning Resistance

- Steel buildings are lightning resistant because steel framing provides multiple conductive paths directly to the ground.

- Steel skyscrapers have provided occupants with safe offices and residences for decades. A steel frame reduces the likelihood of explosions, secondary fires or personal injury.

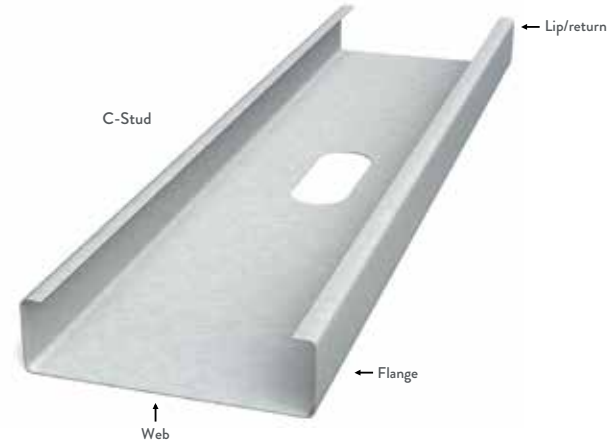
A basic overview of metal framing.

Metal framing (also referred to as metal or steel studs) has been used in noncombustible commercial construction for more than 50 years. Recently, however, metal framing has become more commonly used to frame entire structures, including non-structural interior walls, load-bearing exterior walls, floor joists, curtain walls and roof trusses.

Regardless of the application, steel framing offers strength, quality and performance that is superior to wood. Those characteristics have broadened the capabilities of architects, and enabled them to design structures that are safer, as well as durable and dynamic.

The two primary applications for cold-formed metal framing are curtain wall or load bearing framing (structural framing) and interior non-structural (drywall framing).

Approximately 60% of metal studs used in the United States are interior non-structural wall partitions. This means they are not designed to carry a load other than wallboard. Unlike conventional wood studs, where 2x4s are used as top and bottom plates, metal framing requires runners or tracks on the top and bottom.



Common steel framing terms.

Wooden boards are described as having faces and edges. Steel studs are described differently. Please note the following differences:

- Instead of a face, a steel stud has a web
- Instead of edges, steel studs have flanges and returns

Metal track also has its own terminology. Features of metal track are described in the following way:

- Instead of a face, metal track also has a web dimension.
- Flanges on metal studs are known as legs for track.
- Studs are manufactured in multiple lengths.

Most building centers commonly stock steel studs in 8', 10' and 12' lengths. Track is available only in 10' lengths. Large orders may be cut to size at the plant.

Metal vs. wood sizing.
Wood framing is commonly referenced in nominal terms. A 2x4, for example, is really 3-1/2" x 1-1/2". Metal framing, on the other hand, is referenced by actual size. As a result, you will get exactly what you order. If you request a 3-5/8" stud, you will get a full 3-5/8" width. When a contractor asks for a metal 2x4, does he or she want an actual 2x4 stud or 3-5/8" metal stud? Be sure to ask for specifics, or call your ClarkDietrich sales representative for assistance.

ClarkDietrich interior framing studs are easily distinguished by their unique ProSTUD® diamond pattern. Punch-outs provide mechanical access and reduce or eliminate the need to cut or drill holes.

When running wire or pipe through the punch-outs, protection is required to:
- Avoid damaging wire insulation.
- Prevent the potential for chemical reactions between dissimilar metals.
- Eliminate the potential for components to rattle inside wall.
- Comply with building codes.

Protection for pipe or wire is easily handled with plastic grommets or sections of pipe insulation.

Drywall Stud
Size (web): 1-5/8", 2-1/2", 3-1/2", 3-5/8", 4", 5-1/2", 6"
Gauge: 25EQ, 20EQ DW and 20 STR
Flange: 1-1/4"
Market Synonyms: Tin Can, Drywall Stud (DWS) SS, Light Gauge Stud (LGS)

Applications: Non-structural partition walls, ceilings, column fire proofing. **Not all sizes are available in all markets.*

- **Drywall Track**

Size (web): 1-5/8", 2-1/2", 3-1/2", 3-5/8", 4", 5-1/2", 6"
Gauge: 25EQ, 20EQ DW and 20 STR
Flange: 1-1/4", 2", 3"
Market Synonyms: Runner, Plate, Drywall Track (DWT)

Applications: Drywall track is attached to floors and ceilings to hold studs in place.

The 3-5/8" width is the most common web size used in interior non-structural wall framing. Matching track is available for each stud size with 1-1/4", 2" and 3" leg heights.

Non-structural interior framing (often called drywall framing) is only used for construction of interior walls that do not support any load from above and walls that will not be exposed to any wind forces.

ProSTUD drywall studs are used for non-structural partition walls and ceilings. Knockouts (pre-punched holes) are conveniently placed in the studs to facilitate the installation of electrical wiring, plumbing, and bridging.

At the job site, ProSTUD drywall studs are:
- Connected to floor and ceiling tracks (runners) with pan head screws.
- Spaced at either 12", 16" or 24" on-center spacing.
- Covered with wallboard or other sheathing.

Like most products, drywall studs can be purchased in stock lengths or custom ordered to match specific job requirements. This flexibility allows the end user to more efficiently control labor costs at the job site.

How to build an interior non-structural wall.
Interior non-structural walls can be quickly and easily built when the following steps are followed:

Calculate the room dimensions: It is recommended that you sketch a top view of your project. Measure the lineal footage of all walls with a tape measure and write each wall's length on the layout.

Determine the stud spacing: Based on the room height you will space studs on the following guidelines:
Interior Partition – Allowable Wall Height
Stud Spacing: 12", 16", 24"

Calculate the number of studs needed: Based on spacing requirements, divide the wall length in feet by 1 (12" on-center), 1.3 (16" on-center), or 2 (24" on-center) in order to calculate the number of studs needed. Be sure to add additional studs to accommodate corners and openings.

Calculate the amount of track needed: Take the total lineal feet of wall and multiply by 2 to figure the amount of track needed for both the floor and ceiling. Track is only sold in 10' lengths. Add additional track for door and window headers and sills.

Determine the project layout: According to your plan, use the plumb bob, a marker, and a chalk line, to establish top and bottom track positions. It is also beneficial to mark for door openings at this time.

Helpful hints.
Most wood trim can be attached with adhesive, and may require temporary screws while the adhesive sets. If mechanical attachment is required, consider inserting sections of wood 2x4 inside the track for nailing.

Door-frames may be attached directly to steel framing, but some installers prefer wood 2x4 framing around the rough opening. If this option is chosen, frame the rough opening 3" wider to allow for wood studs.

If framing is used to support insulation blankets, the insulation must be ordered to the full 16" or 24" width dimension.

Pictures or artwork can be easily hung with a standard drywall hanging hardware. Drywall screws are recommended, however, to attach directly to studs.

Extremely heavy shelving and other heavy objects should be anticipated and accommodated within the wall structure. Cross bracing with C-runners is recommended.

LIMITATION: 25-gauge steel studs are designed only for use in non-structural construction. Check your local building codes before beginning construction.

The 1•2•3's of steel framing.

1

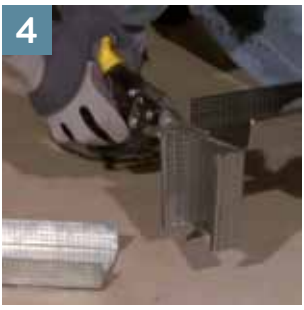
Attach ceiling runner to bottom of joist or truss.

2

Use plumb line to set top and bottom runners.

3

Attach floor runner using concrete anchors.

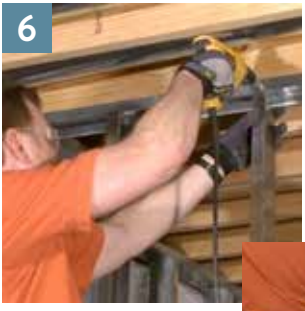


4 Cut studs and runners with tin snips.

5 Twist studs into place. Make sure studs are level and knockouts/ punch-outs are aligned.

The 1•2•3's of steel framing.

6

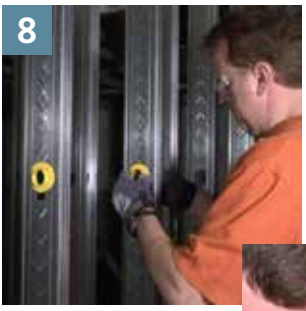


Screw studs to top and bottom runners using 7/16" pan screws.

7

Cut and install runners and cripples around doors and windows.

8



Snap in grommets for electric and plumbing.

9

Attach drywall. Use corner bead around corners. Tape, spackle and finish drywall.

Drywall framing.

Interior non load-bearing walls.
ProSTUD® Drywall Framing System for non-structural interior walls.

The ProSTUD® Drywall Framing System can be called many things. Strong. Versatile. Fast. And without a doubt—revolutionary. But one of the biggest benefits to keep in mind is this: ProSTUD was developed, tested and approved by pros in the field who demanded nothing less than achieving absolute ease of use. Its performance has also been proven by the most extensive laboratory evaluations available. All of which means ProSTUD comes with complete confidence and no questions about code compliance.

The industry's product of choice.
Gauge equivalent (EQ) drywall framing must meet the minimum performance requirements of conventional drywall framing as defined by the Steel Framing Industry Association (SFIA). For interior drywall framing members, bending strength (or allowable moment) is the criteria most important to the strength of a wall or ceiling. ProSTUD employs modern roll-forming and steel-making technology that enhances the shape and strength with greater efficiency. ProSTUD—the product of choice—exceeds the performance of conventional drywall framing for allowable moment and screw connection strength.

Life Safety
Life Safety is the primary concern and duty of all construction and design professionals. ProSTUD features a number of technological advances to

enhance its stiffness and strength, contributing to its allowable moment performance. When it comes to fire-rated systems, ProSTUD is UL-approved for the most common UL design assemblies including V450, U419, V438 and chase wall assemblies.

Sound Performance

ProSTUD also has exceptional sound performance in over 50 tested sound assemblies—more testing than any other manufacturer in the industry.

ProSTUD Drywall Framing and ProTRAK® Drywall Track were created specifically to work as a system. This means they work better together for you in achieving strength, fire and sound ratings. It's also an approach that leads to enhanced performance on the job—during installation and long after.

- High-strength steel combined with low-profile flange stiffening grooves and double offset web planking increases strength and provides greater limiting heights.

- Diamond embossed web creates stiffness, reducing flange fade and screw spin-out during drywall installation.

- Strong, lightweight stud and track cuts and handles easier than conventional flat steel studs.

- Flange grooves provide sight line for drywall alignment and aid in positioning screws at drywall joints to maintain the 3/8" edge requirement.

- Web and leg enhancements in ProTRAK provide straight and rigid legs, making it the best choice for framing walls, headers, soffits, and bulkheads.

ProSTUD® 25 (15MIL) DRYWALL STUD

ClarkDietrich ProSTUD 25 (15mil) physical and structural properties

Member	Design thickness (in)	Fy (ksi)	Gross Section Properties						Effective Section Properties at Fy						Torsional Properties					Lu (in)
			Area (in^2)	Weight (lb/ft)	Ix (in^4)	Rx (in)	Iy (in^4)	Ry (in)	Ae (in^2)	Ix (in^4)	Sx (in^3)	Ma (in-lbs)	Vag (lb)	Vanet (lb)	Jx1000 (in^4)	Cw (in^6)	Xo (in)	Ro (in)	β Beta	
162PDS125-15	0.0158	50	0.071	0.24	0.033	0.688	0.015	0.466	0.033	0.030	0.024	719	232	104	0.00589	0.009	-1.088	1.369	0.368	24.8
250PDS125-15	0.0158	50	0.085	0.29	0.088	1.020	0.018	0.459	0.033	0.080	0.044	1198	147	141	0.00704	0.023	-0.959	1.473	0.576	24.5
362PDS125-15[1]	0.0158	50	0.102	0.35	0.206	1.420	0.020	0.442	0.034	0.190	0.056	1689	100	100	0.00852	0.051	-0.837	1.706	0.760	24.3
400PDS125-15[1]	0.0158	50	0.108	0.37	0.260	1.549	0.021	0.436	0.034	0.233	0.062	1870	90	90	0.00901	0.064	-0.803	1.798	0.800	24.2
600PDS125-15[2]	0.0158	50	0.140	0.48	0.683	2.209	0.023	0.404	0.034	0.537	0.105	2781	60	60	0.01164	0.161	-0.666	2.343	0.919	23.6

Notes:

- Calculated properties are based on AISI S100-12, North American Specification for Design of Cold-Formed Steel Structural Members and AISI S220-15, North American Standard for Cold-Formed Steel Framing—Nonstructural Members.
- Effective properties incorporate the strength increase from the cold work of forming as applicable per AISI A7.2.
- Tabulated gross properties, including torsional properties, are based on full-unreduced cross section of the studs, away from punchouts.
- Tabulated gross properties, including torsional properties, are based on full-unreduced cross section of the tracks.
- For deflection calculations, use the effective moment of inertia.
- Allowable moment includes cold work of forming.
- Allowable moment is taken as the lowest value based on local or distortional buckling. Distortional buckling strength is based on a k-phi = 0.
- Web depth for track sections is equal to the nominal height plus two times the design thickness plus the bend radius. Hems on nonstructural track sections are ignored.

1 Web-height to thickness ratio exceeds 200.

2 Web-height to thickness ratio exceeds 260.

ProSTUD® 20 (18MIL) DRYWALL STUD

ClarkDietrich ProSTUD 20 (18mil) physical and structural properties

Member	Design thickness (in)	Fy (ksi)	Gross Section Properties						Effective Section Properties at Fy						Torsional Properties					Lu (in)
			Area (in^2)	Weight (lb/ft)	Ix (in^4)	Rx (in)	Iy (in^4)	Ry (in)	Ae (in^2)	Ix (in^4)	Sx (in^3)	Ma (in-lbs)	Vag (lb)	Vanet (lb)	Jx1000 (in^4)	Cw (in^6)	Xo (in)	Ro (in)	β Beta	
162PDS125-18	0.0190	70	0.086	0.29	0.040	0.685	0.019	0.468	0.039	0.035	0.028	1194	405	149	0.01032	0.012	-1.105	1.382	0.361	24.8
250PDS125-18	0.0190	70	0.104	0.35	0.107	1.017	0.023	0.470	0.043	0.099	0.056	2361	256	204	0.01250	0.031	-1.004	1.504	0.555	24.5
362PDS125-18	0.0190	70	0.126	0.43	0.254	1.421	0.026	0.456	0.044	0.234	0.074	3102	174	170	0.01512	0.070	-0.884	1.734	0.740	24.3
400PDS125-18[1]	0.0190	70	0.133	0.45	0.321	1.551	0.027	0.453	0.046	0.286	0.084	3532	157	157	0.01605	0.089	-0.859	1.830	0.780	24.2
600PDS125-18[2]	0.0190	70	0.173	0.59	0.855	2.223	0.032	0.431	0.046	0.669	0.141	5891	104	104	0.02083	0.233	-0.739	2.382	0.904	23.6

Notes:

- Calculated properties are based on AISI S100-12, North American Specification for Design of Cold-Formed Steel Structural Members and AISI S220-15, North American Standard for Cold-Formed Steel Framing—Nonstructural Members.
- Effective properties incorporate the strength increase from the cold work of forming as applicable per AISI A7.2.
- Tabulated gross properties, including torsional properties, are based on full-unreduced cross section of the studs, away from punchouts.
- Tabulated gross properties, including torsional properties, are based on full-unreduced cross section of the tracks.
- For deflection calculations, use the effective moment of inertia.
- Allowable moment includes cold work of forming.
- Allowable moment is taken as the lowest value based on local or distortional buckling. Distortional buckling strength is based on a k-phi = 0.
- Web depth for track sections is equal to the nominal height plus two times the design thickness plus the bend radius. Hems on nonstructural track sections are ignored.

1 Web-height to thickness ratio exceeds 200.

2 Web-height to thickness ratio exceeds 260.

Structural framing.

Load bearing and curtain wall applications.

ClarkDietrich cold-formed steel framing systems offer the most diverse range of framing components available in the industry. The flexibility to choose from a wide selection of gauges, yield strengths, sizes and flange widths enables building designers to obtain optimal, cost-effective performance.

Structural framing members are used to construct exterior and load-bearing walls for residential or commercial buildings. They may also be utilized in curtain wall assemblies (the outer skin of commercial buildings), or for floor and ceiling joists. In addition, structural framing members may be used in combination to create roof trusses and a variety of sophisticated assemblies. These studs do not support the floors and roof of a building.

ClarkDietrich curtain wall/cold-formed metal framing systems offer the most diverse range of products available in the industry today. The flexibility to choose from a wide selection of gauges, yield strengths (KSIs), sizes and flanges allows designers to achieve optimal structural performance as economically as possible.

Cold-formed metal framing is ideal for use in low-rise and mid-rise construction, multifamily housing, and most commercial, institutional and industrial structures.

Structural or curtain wall framing is available in a variety of gauges, ranging from 20 to 12 gauge. The gauge or thickness is determined based on application, load and spacing.

Structural Gauges

Steel Thickness		Design Thickness		Minimum Thickness	
Gauge	Mils	(in)	(mm)	(in)	(mm)
20	33	0.0346	0.88	0.0329	0.84
18	43	0.0451	1.14	0.0428	1.08
16	54	0.0566	1.44	0.0538	1.37
14	68	0.0713	1.81	0.0677	1.72
12	97	0.1017	2.58	0.0966	2.45

Proper use of these materials requires evaluation of a number of factors, including end uses and load criteria. Load tables, construction details and other important support information for proper selection and application of these members is available from any of the ClarkDietrich locations shown at the back of this publication, or at www.clarkdietrich.com.

ClarkDietrich also provides assistance through ClarkDietrich Engineering Services, our design services company. Our design group is equipped with a unique computer design aid that is optimized to analyze construction parameters, and provide critical comparisons based on required design criteria. The system will also recommend the most effective and economical products from our metal framing product line.

ClarkDietrich metal framing components are optimized for use in prefabricated panel construction, and provide exceptional performance and economy.

Curtain Wall Framing Systems support the exterior skin or cladding of commercial and industrial buildings. The studs for these framing systems must be able to withstand:

- The weight of the cladding material (metal, stone, tile, etc.).
- The wind loads to which they will be subjected.

Structural Stud
Web: 2-1/2", 3-1/2", 3-5/8", 4", 5-1/2", 6", 8", 10", 12" and 14"
Gauge: 20, 18, 16, 14 and 12
KSI Rating: 18ga, 20g of 33 KSI
16ga and heavier of 50 KSI

Applications: Axial and Curtain Wall Framing, Floor Joists, Roof Trusses

Structural Track
Web: 2-1/2" 3-5/8", 4", 6", 8", 10", 12" and 14"
Gauge: 20, 18, 16, 14 and 12
KSI Rating: 18ga, 20g of 33 KSI
16ga and heavier of 50 KSI

Applications: Axial Load Bearing Interior Walls, Axial Load Bearing Exterior Walls, Non-Axial Interior & Exterior Walls

Hole Placement

ClarkDietrich studs and joists are made with pre-punched 1-1/2" wide holes in the web to accommodate plumbing and electrical installation. Holes are 12" on-center from each end, with intermediate holes placed at 24" on-center intervals. Webs less than 3-1/2" are punched with a 3/4" wide hole, unless otherwise specified.

Flange Dimensions

The key variation among stud styles is in the flange dimension. For most projects, the flange is the attachment surface for cladding materials. It also is a key contributor to the load-bearing capacity of the member.

Curtain Wall Studs - (CWN) 1-3/8" flange stud used in light duty applications.

Standard Studs and Joists – (CSJ) Outfitted with a 1-5/8" flange, these components are ClarkDietrich's most popular structural members, and provide the vertical strength necessary for demanding curtain wall and load-bearing structural applications.

Wide Studs and Joists – (CSW) These members have a wide 2" flange dimension that provides a larger bearing surface for attaching sub flooring or panel materials.

Extra Wide Studs and Joist –(CSE) These components feature an extra wide flange of 2-1/2". The additional 1/2" makes this member even more rigid in certain applications.

Super Wide Studs and Joist –(CSS) These components have the widest flange of 3". The super wide flange is especially useful for reducing the number of members needed for jamb or king stud conditions.

Structural Track – Designed to serve as channel runners at the top and base of curtain wall and load-bearing wall constructions, these members also work as end caps for joists.

Framing accessory products.

ClarkDietrich manufactures a number of accessories for use in a wide variety of framing configurations.

Drywall Furring Channel

Size (web): 7/8" and 1-1/2"
Gauge: 25, 20, 18, 16
Market Synonyms: Hat Channel, DWC, High Hat, Drywall Channel

Applications: Roll formed, hat-shaped section available in three gauges of galvanized steel. DWC-25 channel is used for attachment of:

- Gypsum panels.
- Veneer or conventional plaster base in ceiling construction.
- Noncombustible furring for interior or exterior walls.

Heavier channels permit greater spans and load capacity. The channels are available in 7/8" and 1-1/2" depths.

Z-Furring

Size: 1", 1-1/2", 2" and 2-1/2"
Gauge: 25, 20

Applications: Made of 25 gauge, galvanized steel, is used to attach the following:

- Rigid foam and other types of insulation
- Gypsum panels

Corner Angle

Size: 1-1/2" x 1-1/2" , 2" x 2", 3" x 3", 1-3/8" x 7/8"
Gauge: 25, 20, 18, and 16
Market Synonyms: L-Angle, Utility Angle, Angle

Applications: Metal Angle is made of 25 and 20 gauge, galvanized steel. All-purpose metal angle is available in three common sizes. The 1-3/8" x 7/8" size is used to secure core board to floors and ceilings in laminated drywall and veneer plaster systems. Other sizes are used for a variety of purposes.

Resilient Channel

Size: 1/2" (Single Leg and Double Leg)
Gauge: 25 and 20
Market Synonyms: RC-1, RC-2, RC Channel

Applications: Resilient channel is one of the most efficient low-cost methods developed to reduce transmission of airborne sound through partition and ceiling assemblies. Dampens sound waves effectively, dissipating the energy and reducing sound transmission by suspending gypsum wallboard 1/2" from the stud or joist. Sound absorption can be maximized by utilizing sound attenuation blankets within the wall or floor cavity.

Bridging

The TradeReady® SPAZZER® 5400 Bar

Size: 50"
Gauge: 16
Market Synonyms: Bridging Bar

The TradeReady® SPAZZER® 5400 bar provides bridging for structural stud systems without mechanical attachment (Except in axial load bearing applications) in much the same way the SPAZZER 9200 bar works for drywall partitions. The 5400 is galvanized 16-gauge bar that is 50" long and is notched to rigidly hold studs on 12", 16" or 24" centers.

The SPAZZER bar's slots are engineered to use "shear" to bridge steel studs into a rigid, accurate pattern grid work. The 5400 bar is simply passed through the stud punch outs, rotated 90 degrees, and then the pre-notched slots are seated down over the web of the stud.

The TradeReady® SPAZZER® 9200 Bar

Size: 50"
Gauge: 20
Market Synonyms: Bridging Bar

The TradeReady® SPAZZER® 9200 bar provides bridging for drywall stud systems without mechanical attachment. The 9200 is a 20-gauge bar that is 50" long and is pre-notched to rigidly hold studs on 12", 16" and 24" centers. A new concept in bridging, the 9200 bar is simply passed through the stud punch-outs, rotated 90 degrees, and then the pre-notched slots are seated down over the web of the stud.

The TradeReady® SPAZZER® System provides excellent resistance to stud rotation and displacement. This is particularly important for eliminating the bow that can occur in the middle of tall interior studs. The SPAZZER 9200 enables head-of-wall deflection without the need for:

- Slotted Head Tracks
- Double Head Tracks
- Proprietary Profile Head Tracks

Backing

Danback® Flexible Backing System the perfect backing solution for any project that requires heavy-duty backing.

- Reduces installation time up to 90%
- Available for 16" and 24"
- Eliminates cutting, notching, ripping and routing

U-Channel

Size (web): 3/4", 1-1/2" and 2"
Gauge: 16
Market Synonyms: Cold Rolled Channel, CRC, Black Iron, Horizontal Bracing

Applications: Used to laterally brace studs or with furring channels in ceiling applications. When used as lateral bracing, a clip angle is attached to both the stud and U-Channel to prevent stud rotation.

Clips

ClarkDietrich's exclusive Clip Express℠ Service is a dedicated, streamlined support and delivery system for steel framing connection products. No matter what your needs are, the Clip Express Service can provide you with the products, pricing and quantities you need to keep your project on track. With huge finished product inventories and a ship-it-now mentality, we'll keep you on time and under budget.

We offer hundreds of varieties of clips and connectors, allowing you to choose the components that work best for you. ClarkDietrich's Clip Express Service offers a wide range of accessory clips, including:

- ***Deflection Connectors*** – Fast Clip™ Deflection Connectors are commonly used for bypass framing that require vertical movement.
- ***Rigid Connectors*** – Uni-Clip™ Connectors can be used for numerous rigid connections and conditions, including two axis loading, shear and tension. SwiftClip™ L-Series Support Clips are precut clips that can be used for multiple construction applications.
- ***Interior Bridging*** – The Spazzer® 9200 Spacing Bar is a pre-notched bridging and spacing bar that facilitates the rapid erection of interior, non-structural studs onto a rigid grid that resists stud rotation and displacement.
- ***Exterior Bridging*** – The Spazzer® 5400 Spacing Bar is a pre-notched bridging and spacing bar engineered to facilitate the rapid erection of exterior curtain wall framing, load-bearing walls and high interior partitions constructed with structural studs.

CLIP EXPRESS

Head of wall.

BlazeFrame® FireStop Deflection Track

BlazeFrame is an innovative steel framing, firestop system. An intumescent strip affixed to steel profiles simultaneously frames, firestops, and sound seals both dynamic and static joints.

The cured intumescent is odor free, effective immediately, and remains unaffected by freezing, wet or humid conditions. BlazeFrame provides joint protection for up to 1" with UL 2079 Class II or III Movement Capabilites. Designs utilizing BlazeFrame assemblies eliminate caulks, sprays, drywall rips, and contour drywall 'castle' cuts throughout the joint systems. Our UL (Underwriters Laboratories) classified joint systems provide for positive attachment of wall framing, smaller installed joints, and sound control with no fatigue or degradation.

BlazeFrame Advantages:

- UL Classified and Listed Joint Systems
- Shaft, Single, and Chase Walls
- 2 1/2" - 8" Wall Framing
- Dynamic and Static Joint Protection up to 1"
- Up to 3 Hour Ratings
- Lowest Achievable L-Rating (air/smoke leakage)
- UL 2079 Level II and Level III Cyclical Certification

MaxTrak™ Slotted Deflection Track

For superior head-of-wall vertical deflection, and the added benefit of horizontal drift movement, CD introduces two solutions—MaxTrak™ Slotted Deflection Track and MaxTrak™ 2D Slotted Deflection & Drift Track. The MaxTrak System allows the top of the wall stud to float within the track legs. This connection allows for vertical live load movement of the primary structure without transferring axial loads to the wall studs. In addition, MaxTrak 2D also has slots in the web to allow for horizontal drift when seismic designs are required.

Finishing accessories.

As the leader in steel construction products, ClarkDietrich produces a number of finishing accessories for both drywall and veneer systems, including:

- Beads
- Trims

We also offer a full selection of plastering products, including:

- Metal Lath
- Rib Laths
- Casing Beads
- Corner Beads
- Control Joints
- Expansion Joints
- Other Specialized Plastering Products

Beads and Trims

The correct corner bead and trim products are essential to achieving superior drywall finishing. ClarkDietrich's metal beads and trims are recognized as the industry's finest finishing products.

Our family of trim products provides crisp, clean corners, sweeping archways, and straight ends at abutments. ClarkDietrich bead and trim products are offered in metal, vinyl and paper-faced metal.

They are intended for the following applications:

- Metal beads are the most common and widely used.
- Vinyl beads and trims provide a stronger and more corrosion-resistant finish.
- Paper-faced beads provide an even stronger finish and are significantly more resistant to cracking.

Metal Corner Bead & Trims

Size: 1-1/4" x 1-1/4" x 8’ or 10’

Corner Beads

ClarkDietrich’s 103 Deluxe and Quicksilver products are galvanized steel angles that ensure straight, protective, clean-finished drywall corners. They may be nailed or stapled into place, and can be completely concealed with joint compound.

The premium 103 Deluxe has a dull, electro-galvanized and wiped finish. The Quicksilver is a bright, hot-dip galvanized bead offering superior corrosion protection. Both models are supplied with holes for nail attachment.

Bullnose Corner Bead

Equipped with a 3/4" radius for gently rounded corners, bullnose corner bead is available for 90 degree and 135 degree corners.

Metal Trims

ClarkDietrich offers a wide array of metal trims for termination points around doors and windows. Contact your sales representative for more details.

Vinyl Beads

Vinyl beads and trims provide a exceptionally durable and moisture-resistant finish. Vinyl Corp. is one of the largest full-line vinyl bead and trim manufacturers in the U.S. Product categories include vinyl beads, trims and control joints for stucco/plaster, drywall, exterior insulation finish systems (EIFS) and direct-applied Exterior Finish Systems (DEFS).

Corner Bead

Vinyl Corner Bead serves as a durable reinforcement for finishing square gypsum corners. It's flexibility resists dents and helps to speed the finishing process.

Bullnose Corner Bead

Bullnose Corner Bead creates a smooth rounded corner that resists dents, and will not corrode. Gypsum panels must be cut back 3/4" to accommodate the bullnose radius.

Tear-Away L-Bead

Provides an easy, top quality finish at intersections of gypsum board and ceiling grid. Once joint compound is applied, the tear-away strip is removed to form a clean, crisp edge.

Archway Corner Bead

Reinforces corners on radius windows and doors. The notched flange adapts to virtually any radius condition.

J-Bead

Forms a finish at gypsum stops around door and window openings, and at ceiling intersections. When J-bead is used, no joint compound is necessary.

Paper-Faced Corner Bead

Paper-faced tape-on beads combine galvanized metal corner and edge protection with high-grade paper tape, to provide cost-effective, problem-free outside drywall corner finishing. Finished corners and edges are stronger than with metal or vinyl beads. Joint compound bonds with wallboard, resisting edge cracking. Select a metal flange width that will successfully bridge and protect board ends and edges. Paper-facing extends beyond the metal to bond securely with the wallboard face paper.

Bullnose Bead

Bullnose corner bead is used to create a smooth, rounded look to standard drywall corners. Bullnose adds contemporary styling and a sense of openness to any room. Bullnose bead is nailed, screwed or stapled in place and finished with joint compound.

Inside Corner, Tape-On Bead

Platinum tape-on inside 90° paper-faced corner bead provides very straight and precise inside corners. The rigid, steel-reinforced inside corners provide a durable guide to achieve exceptionally straight and sharp inside corners.

Paper-faced Metal L, Tape-On Trim

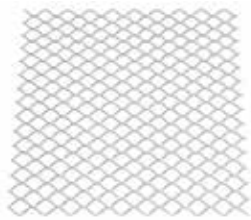
Platinum L-trims are used to finish the ends of wallboard where it abuts dissimilar surfaces, such as suspended ceilings, beams, plaster, masonry or untrimmed door and window jambs. Applied in the same manner as all other tape-on beads—joint compound embeds the paper-faced bead to the wallboard paper.

Metal Lath

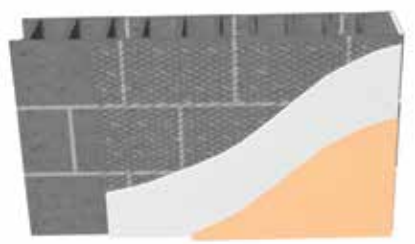
Conventional plaster continues to provide the highest quality wall finish. Typically applied in three applications scratch, brown and finish coats – conventional plaster provides extraordinary fire protection, sound control and highly refined surfaces. Metal lath and finishing products enhance the capabilities of conventional plaster.

Junior Diamond Mesh Lath or Self Furring

Size: 27" x 97"
Weights: 1.75 lb/yd^2
2.5 lb/yd^2
3.4 lb/yd^2



Applications: This is a small mesh, galvanized metal plaster base. A general all-purpose lath is best for contour plastering. Small meshes conserve plaster and reduce droppings.



Fire-rated assemblies.

Shaftwall Framing

ClarkDietrich provides fully tested and approved assemblies for shaftwall construction. The ClarkDietrich system has been tested with almost every gypsum board and shaft liner manufacturer in the country. Unlike competing systems, the ClarkDietrich CT Stud and J-Tabbed Track system provide maximum flexibility to choose from a variety of board manufacturers. Other systems are only tested with one type of gypsum board and shaftliner.

CT Cavity Shaftwall Stud

Size (web): 2-1/2", 4", and 6"
Gauge: 25 and 20 (18ga for Interior Systems only)
Applications: Elevator shafts and stairwells in multi-story buildings.

J-Tabbed Track

Size (web): 2-1/2", 4", and 6"
Long Leg Size: 2-1/4" and 3"
Gauge: 25 and 20
Applications: Used as a jamb strut around closure details, including duct and door openings, abutments and intersections.

Area Separation Wall Framing

The ClarkDietrich Area Separation Wall System provides a lightweight, easy-to-install 2-hour fire-rated barrier for common walls in apartment, condominiums and townhouses up to 50 feet high.

This system consists of 2" x 25 gauge steel H-studs, (8' or 10' and special order sizes), 2" x 25 gauge steel C-runners (10') and Aluminum breakaway clips. Completing the area separation wall system are standard 1" thick gypsum liner panels. The system itself achieves a 2-hour fire rating, and offers a level of protection against spreading fire that is simply not attainable with common partition walls. Steel H-Studs are the key to the structural integrity of the area separation wall system.

Pairs of 1" thick liner panels are gripped on either side by the H-Studs. Tops and bottoms of the paired panels are housed within C-runners. Assembled in series, the system creates a solid-core wall of noncombustible material.

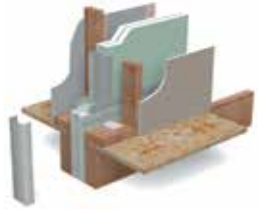
H-Stud

Size (web): 2-1/16"
Gauge: 25

Applications: Used with top and bottom track commonly utilized in multi-family construction.

C Runner

Size (web): 2-1/8"
Gauge: 25



Applications: Used as top and bottom track for the H-studs. When gypsum board and shaft liner are properly installed the H-stud and track provide a fire rated system.

Residential applications.

A growing number of home builders are turning to metal framing. Rapidly changing wood prices, diminishing wood quality and continued tool and engineering advancements have continued to sway more builders toward metal framing. Many builders have made the change to steel floors using the ClarkDietrich TradeReady® Steel Joist System, and have discovered the many benefits the system provides.

Some builders have made the leap to framing the entire home with metal framing. In both cases, steel simply produces a higher-quality, stronger home. Homeowners and basement finish contractors are also using interior non-structural studs, due to their superior framing quality, ease of use, and low costs.

Perhaps the greatest advance in the use of light gauge steel in residential applications is the TradeReady® Steel Joist System. The system includes specially designed joists to make electrical, mechanical and plumbing installations easier, pre-punched joist rim components to simplify joist layout and construction, and pre-cut structural blocking to stabilize the system and prevent joist rotation.

The uniquely designed TradeReady® Joist Rim drastically reduces framing layout by providing pre-punched tabs at either 12, 16, 19.2 or 24 inch o.c. The pre-cut structural blocking easily installs to the underside of the joists to prevent rotation.

The TradeReady® System is available in a variety of sizes and thicknesses from 18-12 gauge 7-1/4" – 14" deep web members and the joist can single span in excess of 33 feet. Hole sizes range from 4-1/4" x 7", 6-1/4" x 9", 8" or 10" round based on web member size.

A good idea to build on.

ClarkDietrich engineers residential steel flooring systems for performance and construction efficiency. Our galvanized steel joists use a trade-friendly C-shaped design with flanged openings to accommodate electrical, plumbing and technology lines. Steel floor joists integrate easily with other building materials such as concrete and wood.

Buyers love the feel of steel.

Homeowners will notice the difference in a house built with the ClarkDietrich System. The feel is solid underfoot. It's perfectly flat with no warps – ever. And, steel floors are virtually squeak-proof. Since strong TradeReady® Systems permit greater design flexibility, you have more exciting options to consider in your design.

There are some things in your design it won't do.

The TradeReady® Steel Floor System won't interfere with portable radios, cordless phones, TV signals or cellular phones. It won't rust, because all framing members, screws and accessories are galvanized.

Why Steel Floors?

You can have confidence in the strength of steel under your feet.

Floor framing made from cold-formed steel is stronger and more versatile. Its high strength-to-weight ratio provides strong loading capacity and maximum spanning capability. It can be used with all traditional flooring materials such as plywood, OSB, concrete-filled steel deck or one of the many varieties of fiber-reinforced cement board. It doesn't squeak when you walk across it.

What's more is that the exclusive TradeReady® Floor System is designed with large extruded openings in the joists to accommodate electrical, mechanical, plumbing and technology lines. These pre-punched openings also eliminate drilling and soffit framing during installation. For all of these reasons, steel floor framing has become the standard for low- and mid-rise commercial structures such as hotels, apartments, condominiums and assisted living, as well as residential homes.

- Available in a variety of web sizes, flanges, gauges and yield strengths
- Pre-spaced joist tabs
- Greater spanning capabilities
- Pre-punched openings
- Full system of joist components, accessories, hangers and connectors

TradeReady® Floor System

TradeReady® Joist

Size: 1-3/4" Flange
(7-1/4", 8", 9-1/4", and 11- 1/4" depths)
Size: 2" Flange
(10", 12", and 14" depths)
Gauge: 18, 16, 14, 12
KSI: 33, 50
Nomenclature: TDJ (1-3/4" Flange), TDW 2" Flange)
Applications: Floor Joist for the TRFS.

TradeReady® Rim

Size: 7-1/4", 8", 9-1/4", 10", 11-1/4", 12", and 14"
Gauge: 18, 16, 14, 12
KSI: 33, 50
Nomenclature:
- TD12 = 12" o.c. spacing
- TD16 = 16" o.c. spacing
- TD19 = 19.2" o.c. spacing
- TD24 = 24" o.c. spacing

Applications: Joist Rim for the TRFS.

TradeReady® Blocking

Size: 2-1/2" width
Gauge: 18
KSI: 33
Nomenclature: TDSB

Applications: Blocking for the
TRFS, used to prevent rolling of joists.

Fasteners.

A variety of screws and power-actuated fasteners can be used to connect framing components and also to fasten other materials to the framing.

Self-Drilling Screws

These externally threaded fasteners have the ability to drill their own hole and form, or "tap", their own internal threads without deforming their own thread and without breaking during assembly. These screws are used with 33-mil (20 gauge) steel or thicker.

Sharp-Point Screws

These externally threaded fasteners are self-piercing and are used to attach rigid materials, such as gypsum wallboard, and sub flooring. They are used with 25 and 20 gauge components.

Fasteners for Drywall Systems

Pan Head Type "S" Framing Screws - Used for attachment of steel stud to steel track.

Bugle Head Type "S" Drywall Screws - Utilized for attachment of drywall to steel framing.

Trim Head Type "S" Trim Screw - Used to attach wood trim to steel framing.

Masonry Screws or Powder Actuated Fasteners - Used to attach steel track to concrete floor.

**Screws available from others.*

Fasteners for Steel to Steel and Wood to Steel

Pan Head

- 8 x 7/16 Framing Screw
- Used with 20-25 gauge steel
- Unique grip-tight, high-torque pan head

Hex Head 8 x 1/2

- Attaches fixtures, backup plates, door frames and lathers channel to structural studs, metal decks and trusses, etc.
- Used with 20-14 gauge steel

Wafer Head

- 8 x 1/2
- Attaches metal K-lath, wire lath, wood grounds, etc. to lathers channel, structural studs, metal decks, etc.
- Used for attachment of steel studs to track 20-14 gauge

Wafer Head Winged

- 10 x 1-7/16
- Used to attach 3/16" to 3/4" plywood to 20-14 gauge metal

Bugle Head

- 10 x 1-7/16
- Used to attach 3/16" to 3/4" plywood to 20-14 gauge metal

**Screws available from others.*

How to sell steel framing.

At first, selling metal framing may seem very complicated and intimidating. It really isn't. Unlike wood framed construction, gypsum supply houses, lumberyards, or home centers do not provide take-off services for metal framing projects. The take-off (also referred to as a materials or cut list) is provided by the contractor. Almost all commercial contractors have an estimator who compiles and develops a list of materials.

The sales process starts by contacting the contractor and asking for the opportunity to bid. Once they provide the materials list, email it to your local ClarkDietrich facility for quotation.

We maintain strict confidentiality in pricing. Once you send the materials list to us, we will work to prepare the quote. The completed quotation will be emailed directly back to your attention so that you can add in coordination costs and markup.

During the sales process, you will need to ask the contractor a few questions to help you determine the appropriate mark-up on the project.

Frequently Asked Questions

Q. Will the contractor bulk buy the job?
A. If not, base the pricing coming out of your yard inventory.

Q. Is there equipment to unload material at the job site?
A. If yes, will they unload the material and can you direct ship from the ClarkDietrich facility? Job site-direct shipments are not available in all locations.

Q. If you need to unload, will the material get dropped to the ground or do you need to load and scatter the material in the building?
A. Remember, you should not be asked nor should you do a take-off for metal framing. There are simply too many nonstandard members and lengths.

If you have any questions or you are unsure of how to proceed, call the nearest ClarkDietrich facility and ask for help.

www.clarkdietrich.com

From plan and specification development, to design assistance and member sizing, to product submittals, to application assistance and material procurement, this site provides many tools that will assist during all phases of the building process.

- Cold-Formed Metal Framing Specifications
- Extensive CAD Library
- SubmittalPro® Product Submittal System
- Design, Load and Span Tables
- BIM Services and Project Gallery
- ClarkDietrich iTools
- Product and Catalog Library
- LEED Request Forms

WARRANTY Our products are manufactured in accordance with company standards and/or industry standards, as applicable. All ClarkDietrich Building Systems products are covered by our standard warranty which is contained in our Standard Terms and Conditions of Sale and which will be provided upon request. Generally, we warrant our products will be free from defects in material and workmanship at the time of shipment, subject to the limitations stated in the warranty. Unless specifically agreed in writing by us with respect to specific orders, we do not make any warranty of merchantability or fitness for a particular purpose. The buyer is responsible to assure that buyer orders the appropriate product for any applicable code or specification requirements.

NOTICE Our liability is expressly limited to replacement of defective products. We shall not be liable for incidental and consequential damages, nor for any loss caused by misuse or misapplication of our products. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from the date it was or reasonably should have been discovered.

NOTE ClarkDietrich Building Systems has prepared this literature with the utmost diligence and care for accuracy and conformance to standards. ClarkDietrich intends this information to be accurate, informative, and helpful as a selection guide for choosing ClarkDietrich Building Systems products. However, this information is only to be used for guidance and is not intended to replace the design, drawings, specifications, and decisions of a professional architect or engineer.

ClarkDietrich Building Systems or its affiliates shall not be responsible for incidental or consequential damages, directly or indirectly sustained, nor for loss caused by application of our products for other than their intended uses. Our liability is limited to replacement of defective products. Claims shall be deemed waived unless they are made to us in writing within thirty (30) days of the date a problem was or reasonably should have been discovered.

ClarkDietrich Building Systems reserves the right to modify or change any information contained in this literature without notification.

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Georgia, McDonough
P 678.304.5500

Illinois, Rochelle
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Maryland, Baltimore
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Ohio, Vienna
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Ohio, Warren-East
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Texas, Dallas
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Turn to ClarkDietrich for a complete lineup of steel construction products and services nationwide:

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