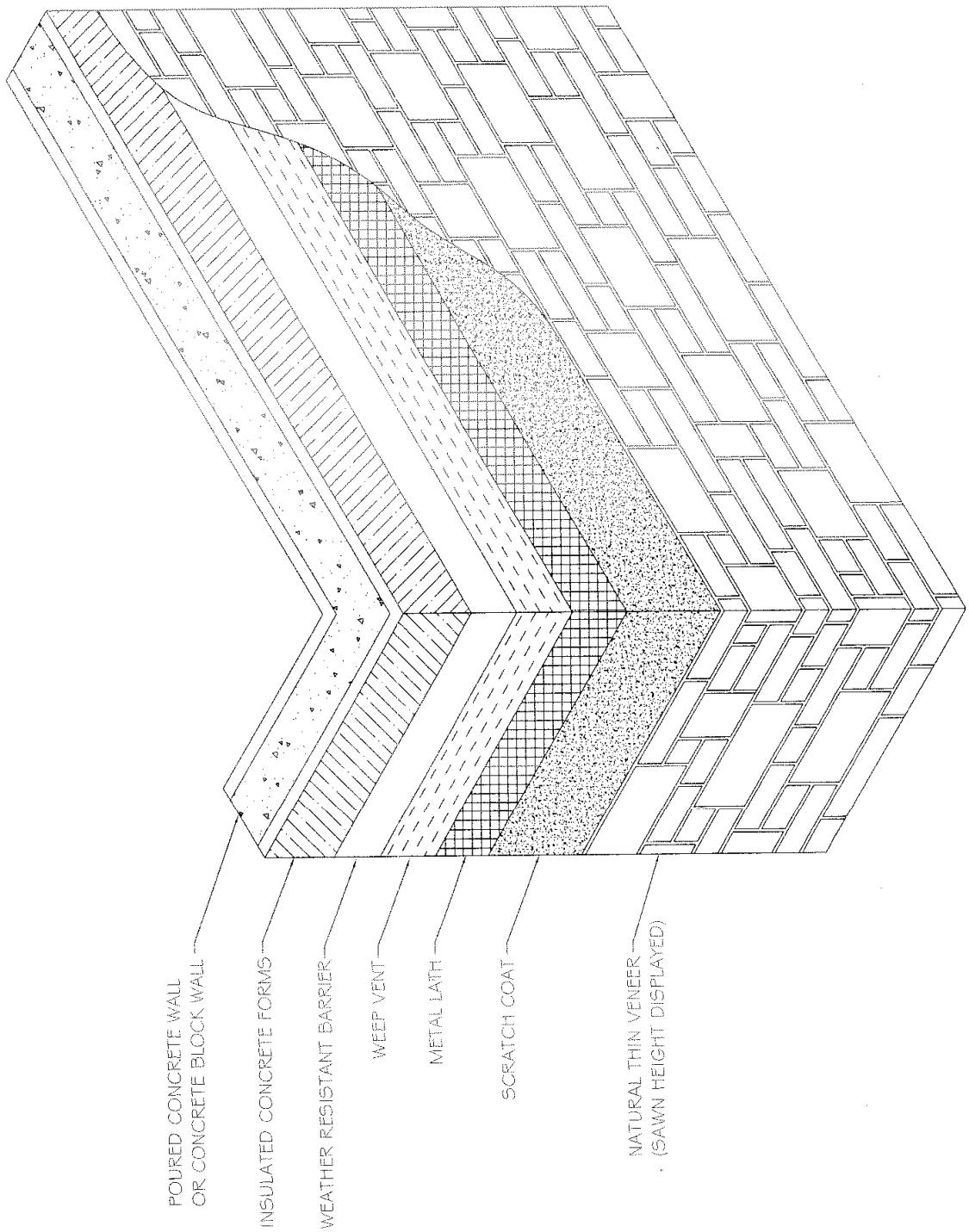


TYPICAL INSULATED CONCRETE FORM WALL

GLACIER STONE SUPPLY LLC

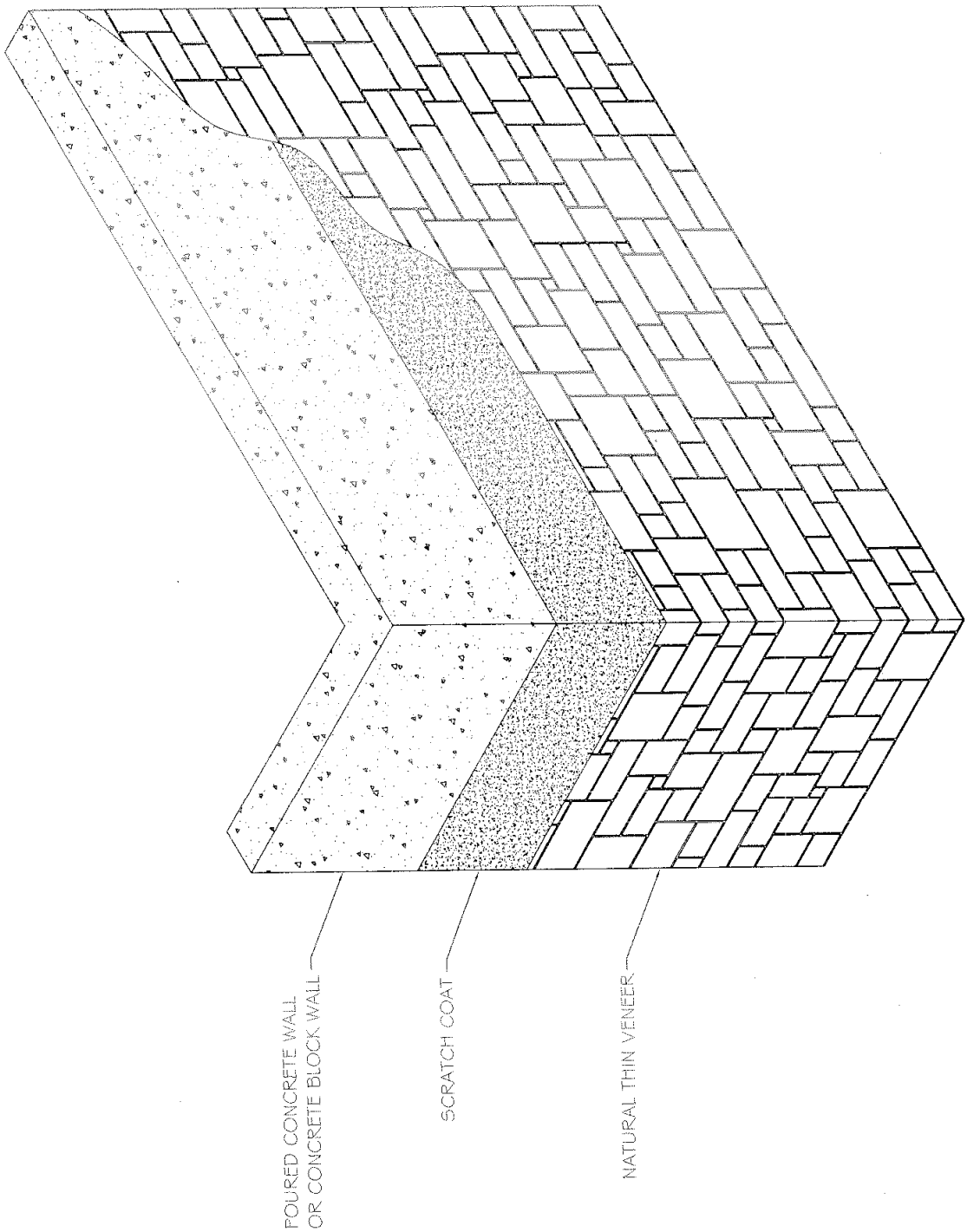
ARCHITECTURAL & LANDSCAPE STONE

Corporate Office
955 Whitefish Stage Road
Kalispell, MT 59901

406-755-5717 Phone
406-755-5718 Fax

Scale: None

Last Revision 09-10-09



TYPICAL BLOCK OR POURED CONCRETE WALL

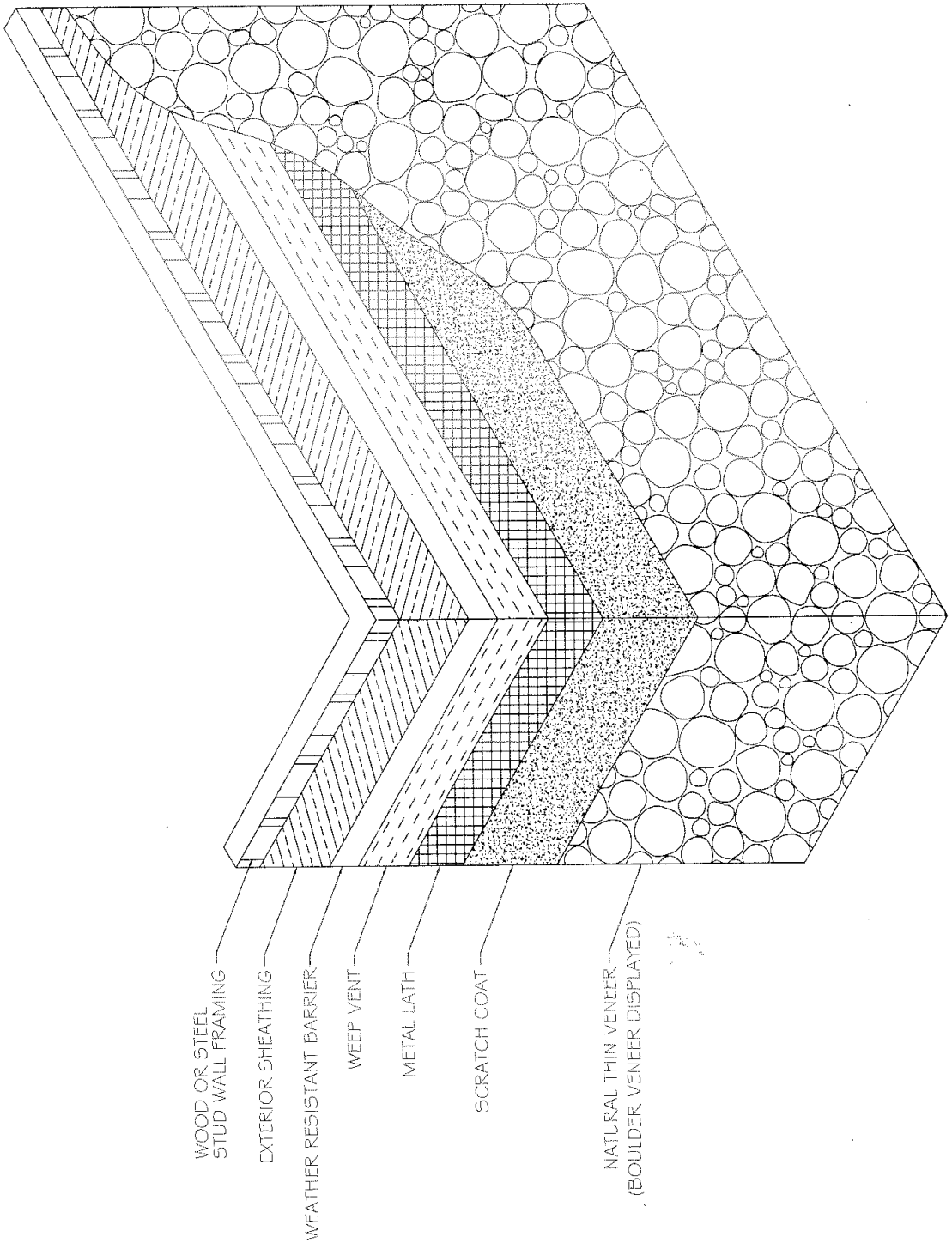
GLACIER STONE SUPPLY LLC
ARCHITECTURAL & LANDSCAPE STONE

Corporate Office
955 Whitefish Stage Road
Kalispell, MT 59901

406-755-5717 Phone
406-755-5718 Fax

Scale: None

Last Revision 09-10-09



TYPICAL WOOD OR STEEL EXTERIOR STUD WALL

GLACIER STONE SUPPLY LLC

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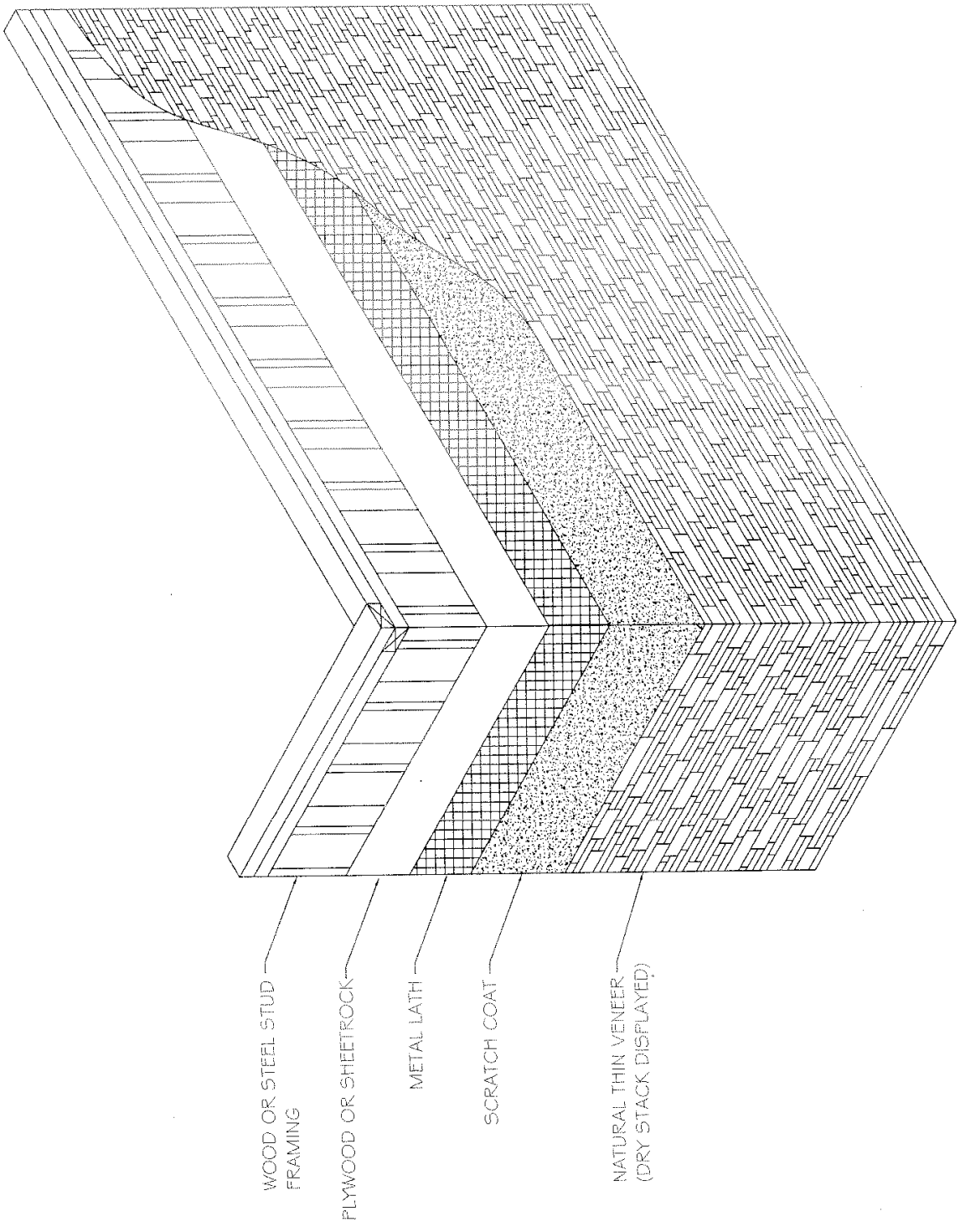

TYPICAL INTERIOR STUD WALL

GLACIER STONE SUPPLY LLC

ARCHITECTURAL & LANDSCAPE STONE

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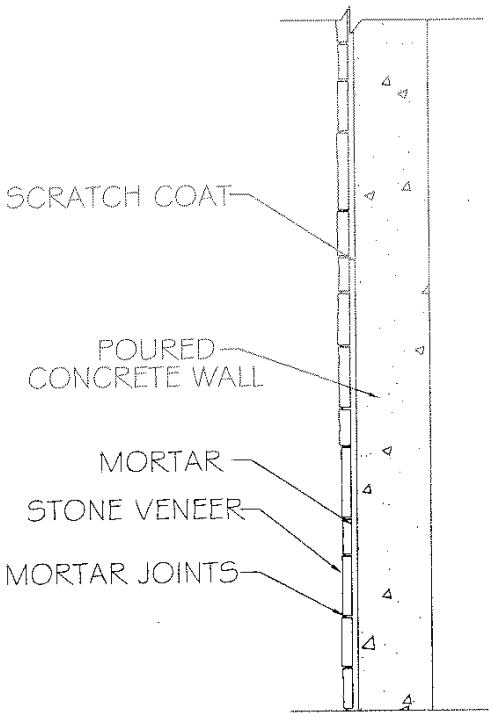
955 Whitefish Stage Road
Kalispell, MT 59901

406-755-5717 Phone
406-755-5718 Fax

Scale: None

Last Revision 09-10-09



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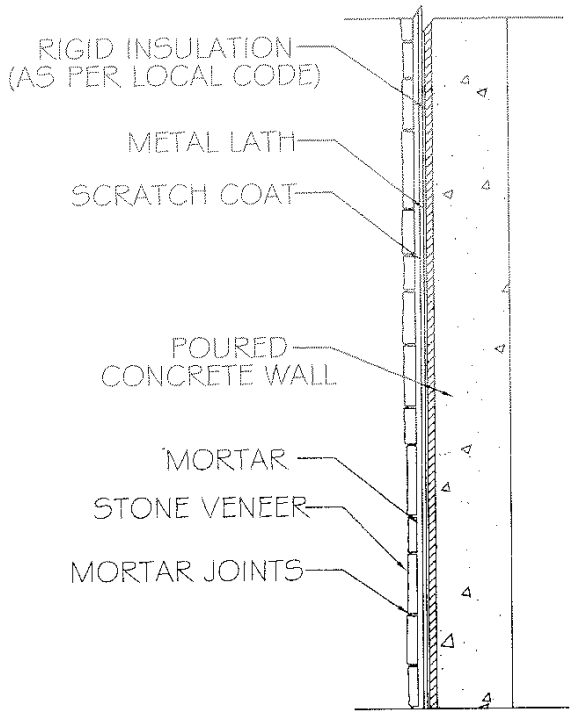

WITH INSULATION

THIN VENEER
TYPICAL SECTION FOR
POURED CONCRETE WALL

GLACIER STONE SUPPLY LLC
ARCHITECTURAL & LANDSCAPE STONE

Corporate Office
955 Whitefish Stage Road
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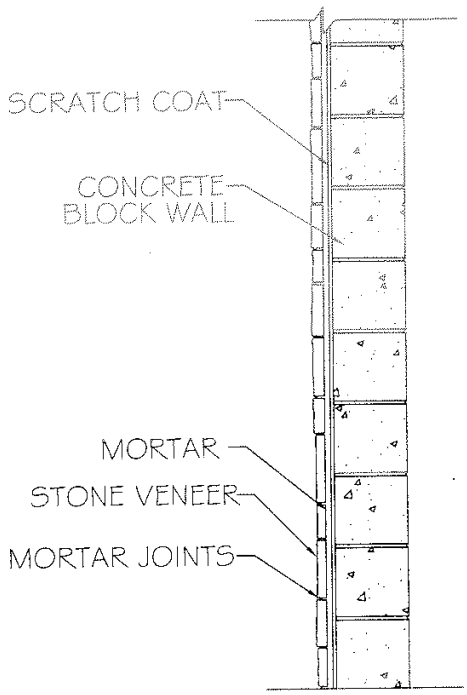

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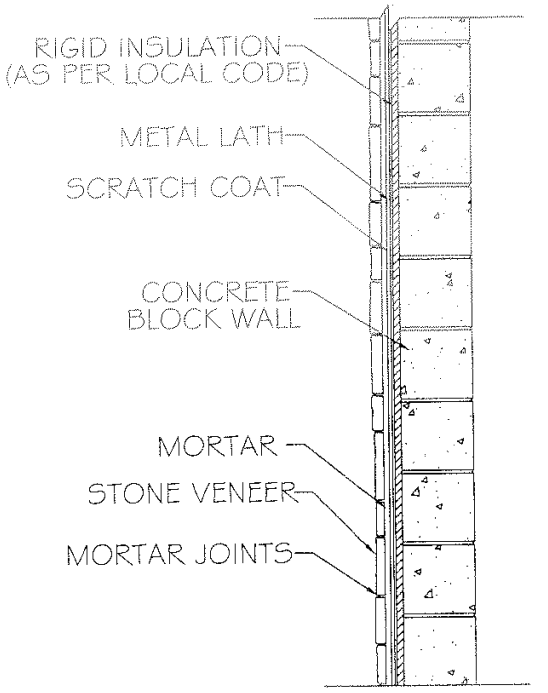

WITH INSULATION

THIN VENEER
TYPICAL SECTION FOR
CONCRETE BLOCK WALL

GLACIER STONE SUPPLY LLC
ARCHITECTURAL & LANDSCAPE STONE

Corporate Office
955 Whitefish Stage Road
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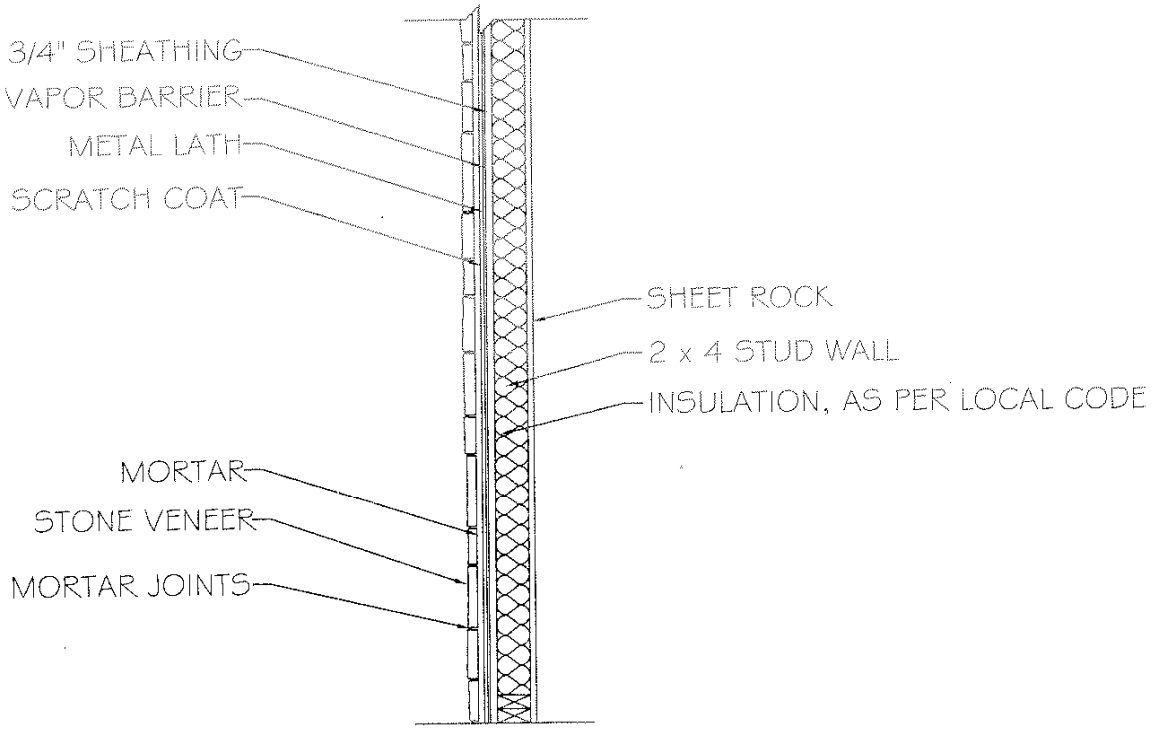

THIN VENEER
TYPICAL SECTION FOR
EXTERIOR STUD WALL

GLACIER STONE SUPPLY LLC
ARCHITECTURAL & LANDSCAPE STONE

Corporate Office
955 Whitefish Stage Road
Kalispell, MT 59901

406-755-5717 Phone
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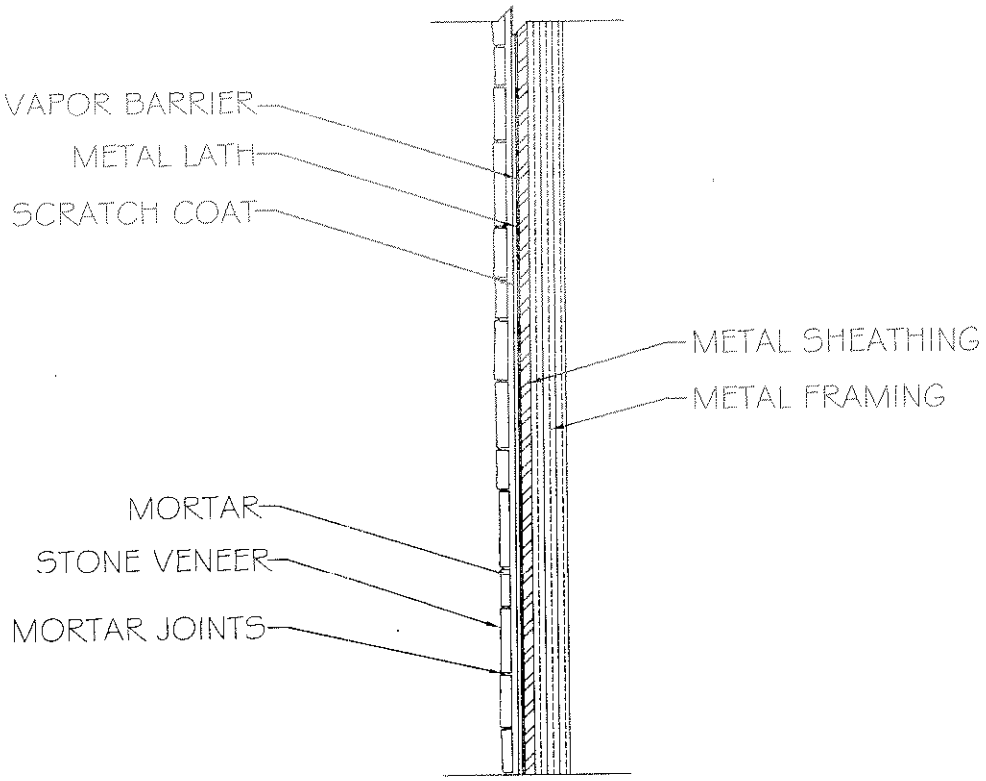

THIN VENEER
TYPICAL SECTION FOR
METAL FRAMED BUILDING

GLACIER STONE SUPPLY LLC
ARCHITECTURAL & LANDSCAPE STONE

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406-755-5718 Fax

Scale: None

Last Revision 09-10-09

Architectural Stone
Natural Stone Sawn Thin Veneer Installation Instructions

PART 1—NATURAL STONE SAWN THIN VENEER GENERAL

Work Included:
All labor and material for the furnishing and installing of exterior or interior stone building veneer.

Related Work:
Masonry Contractor shall include building into the masonry equipment and materials furnished through other divisions such as lintels steel framing, shelf angles, anchors sleeves, thimbles, piping, flashings, and other miscellaneous items, and shall also be required to do the cutting and patching of masonry where necessary to accommodate work of other trades, all as hereinafter specified, shown on plans, or reasonably implied in: either, providing a complete job.

System Description:
Non-structural building wall veneer comprised of naturally occurring quarried stone saw thin to ½"–1½" ±/- thick, set in cement mortar.

Samples:
Natural stone materials are products of nature. Samples provided display a sufficient range of color, size, and character of the natural stone. Since the sample is a small representation of the product there may be colors, size and characteristics beyond what was provided in the sample, exact matches are not likely in natural stone and cannot be binding.

Delivery, Storage, and Handling:
1. Stone shall be delivered on pallets.
2. General Contractor shall provide a dry, stable roadway for stone delivery truck and equipment for removing loaded pallets from truck.
3. Pallets shall be placed on level ground and shall not be stacked.
4. Contractor shall provide tarpaulin covering during inclement weather.

Site Conditions:
Before commencing with work, tarpaulins shall be provided to protect newly laid masonry from damage by inclement weather. This protection shall be placed and removed as required. Ambient temperature shall be 40 degrees or above while masonry is being erected. When ambient temperature falls below 50 degrees the mortar mixing water and that used for wetting down stone shall be heated.

PART 2 — SELECT THIN VENEER PRODUCT

BITTERROOT

The Bitterroot family of stone features vibrant hues of burgundy, gold and bronze set against a neutral background of grays and browns.

Argillite stone is any compact sedimentary rock composed mainly of clay materials.

Thin Veneer

Coverage based upon a 1/2" mortar joint. Weight approximately 12-13 lbs / square foot

Grade	Product Code	Thickness	Height	Length
BR Ledge Flats	BRLV	½"-1½"	2-8"	6-16"+
BR Corners	BRC	½"-1½"	2-8"	2-10"
BR Tumbled Ledge Flats	BRTLV	½"-1½"	2-8"	6-16"+
BR Tumbled Corners	BRTC	½"-1½"	2-8"	2-10"
BR Squares and Recs Flats	BRSRLV	½"-1½"	8-11"+	8-20"+
BR Squares and Recs Corners	BRSRC	½"-1½"	8-14"	2-10"
BR Tumbled Squares and Recs Flats	BRTSRLV	½"-1½"	8-11"+	8-20"+
BR Tumbled Squares and Recs Corners	BRTSRC	½"-1½"	8-14"	2-10"
BR Random Flats	BRRV	½"-1½"	3-8"	6-24"
BR Big Face Random Flats	BRBFRV	½"-1½"	6-16"+	6-24"+
BR Random Corners	BRRC	½"-1½"	3-8"	2-10"
BR Stacked Ledge Flats - (see index)	BRSLV	½"-1½"	2-8"	6-16"+
BR Stacked Corners	BRSC	½"-1½"	2-8"	2-10"
BR VE Ledge Flats - (see index)	BRDSLV	½"-1½"	2-8"	6-16"+
BR Dimensional 3-Coursed Veneer	BR3CLV	½"-1½"	2-8"	6-16"+

BIGHORN CREEK

Bighorn Creek has a wide range of rich multi-colored hues of rust, bronze and copper created by the stone's iron content.

Flagstone is a stratified stone that splits into pieces suitable as paving stones

There is no warranty against bleeding by Glacier Stone Supply. Bighorn Creek products contain a certain amount of iron, thus bleeding may occur.

Thin Veneer

Coverage based upon a 1/2" mortar joint. Weight approximately 12-13 lbs / square foot

Grade	Product Code	Thickness	Height	Length
BH Ledge Flats	BHLV	½"-1½"	2-8"	6-16"+
BH Corners	BHC	½"-1½"	2-8"	2-10"
BH Squares and Recs Flats	BHSRLV	½"-1½"	8-11"+	8-20"+
BH Squares and Recs Corners	BHSRC	½"-1½"	8-14"	2-10"
BH Random Flats	BHRV	½"-1½"	3-8"	6-24"
BH Random Corners	BHRC	½"-1½"	2-8"	2-10"
BH Stacked Ledge Flats - (see Index)	BHSLV	½"-1½"	2-8"	6-16"+
BH Stacked Corners	BHSC	½"-1½"	2-8"	2-10"
BH Dimensional 3-Coursed Veneer	BH3CLV	½"-1½"	2-8"	6-16"+

*** BIGHORN CREEK IS NOT AVAILABLE IN TUMBLED**

FALLS CREEK

Falls Creek is a lighter toned product ranging from light tan to gold with occasional buff hues accenting the soft, warm texture.

Argillite stone is any compact sedimentary rock composed mainly of clay materials.

Thin Veneer

Coverage based upon a 1/2" mortar joint. Weight approximately 12-13 lbs / square foot

Grade	Product Code	Thickness	Height	Length
FC Ledge Flats	FCLV	½”-1½”	2-8”	6-16”+
FC Corners	FCC	½”-1½”	2-8”	2-10”
FC Tumbled Ledge Flats	FCTLV	½”-1½”	2-8”	6-16”+
FC Tumbled Corners	FCTC	½”-1½”	2-8”	2-10”
FC Squares and Recs Flats	FCSRLV	½”-1½”	8-11”+	8-20"+
FC Squares and Recs Corners	FCSRC	½”-1½”	8-14”	2-10”
FC Tumbled Squares and Recs Flats	FCTSRLV	½”-1½”	8-11”+	8-20"+
FC Tumbled Squares and Recs Corners	FCTSRC	½”-1½”	8-14”	2-10”
FC Stacked Ledge Flats - (see Index)	FCSLV	½”-1½”	2-8”	6-16”+
FC Stacked Corners	FCSC	½”-1½”	2-8”	2-10”
FC VE Ledge Flats - (see Index)	FCDSLV	½”-1½”	2-8”	6-16”+
FC Dimensional 3-Coursed Veneer	FC3CLV	½”-1½”	2-8”	6-16”+

CANYON CREEK

One of our most popular stones featuring rich colors ranging from chocolate brown, tans, and blue/gray tones — true to the Northern Rockies.

Argillite stone is any compact sedimentary rock composed mainly of clay materials.

Thin Veneer

Coverage based upon a 1/2" mortar joint. Weight approximately 12-13 lbs / square foot

Grade	Product Code	Thickness	Height	Length
CC Ledge Flats	CCLV	½”-1½”	2-8”	6-16”+
CC Corners	CCC	½”-1½”	2-8”	2-10”
CC Tumbled Ledge Flats	CCTLV	½”-1½”	2-8”	6-16”+
CC Tumbled Corners	CCTC	½”-1½”	2-8”	2-10”
CC Squares and Recs Flats	CCSRLV	½”-1½”	8-11”+	8-20"+
CC Squares and Recs Corners	CCSRC	½”-1½”	8-14”	2-10”
CC Tumbled Squares and Recs Flats	CCTSRLV	½”-1½”	8-11”+	8-20"+
CC Tumbled Squares and Recs Corners	CCTSRC	½”-1½”	8-14”	2-10”
CC Random Flats	CCRV	½”-1½”	3-8”	6-24”
CC Big Face Random Flats	CCBFRV	½”-1½”	6-16"+	6-16"+
CC Random Corners	CCRC	½”-1½”	2-8”	2-10”
CC Stacked Ledge Flats - (see Index)	CCSLV	½”-1½”	2-8”	6-16”+
CC Stacked Corners	CCSC	½”-1½”	2-8”	2-10”
CC VE Ledge Flats - (see Index)	CCDSLV	½”-1½”	2-8”	6-16”+
CC Dimensional 3-Coursed Veneer	CC3CLV	½”-1½”	2-8”	6-16”+

LOON LAKE

Loon Lake comes in a wide array of colors including greens, bronze, browns, tans and slate grays with subtle sedimentary striations.

Argillite stone is any compact sedimentary rock composed mainly of clay materials.

Thin Veneer

Coverage based upon a 1/2" mortar joint.
Weight approximately 12-13 lbs / square foot

Grade	Product Code	Thickness	Height	Length
LL Ledge Flats	LLLV	½"-1½"	2-8"	6-16"+
LL Corners	LLC	½"-1½"	2-8"	2-10"
LL Squares and Recs Flats	LLSRLV	½"-1½"	8-11"+	8-20"+
LL Squares and Recs Corners	LLSRC	½"-1½"	8-14"	2-10"
LL Random Flats	LLRV	½"-1½"	3-8"	6-24"
LL Big Face Random Flats	LLBFRV	½"-1½"	6-16"+	6-16"+
LL Random Corners	LLRC	½"-1½"	2-8"	2-10"
LL Stacked Ledge Flats - (see Index)	LLSLV	½"-1½"	2-8"	6-16"+
LL Stacked Corners	LLSC	½"-1½"	2-8"	2-10"
LL VE Ledge Flats - (see Index)	LLDSLV	½"-1½"	2-8"	6-16"+
LL Dimensional 3-Coursed Veneer	LL3CLV	½"-1½"	2-8"	6-16"+

GLACIER MOUNTAIN

This family of stone has a cream base with hues of gold, black and light grays running throughout.

Argillite stone is any compact sedimentary rock composed mainly of clay materials.

Thin Veneer

Coverage based upon a 1/2" mortar joint.
Weight approximately 12-13 lbs / square foot

Grade	Product Code	Thickness	Height	Length
GM Ledge Flats	GMLV	½"-1½"	2-8"	6-16"+
GM Corners	GMC	½"-1½"	2-8"	2-10"
GM Tumbled Ledge Flats	GMTLV	½"-1½"	2-8"	6-16"+
GM Tumbled Corners	GMTC	½"-1½"	2-8"	2-10"
GM Squares and Recs Flats	GMSRLV	½"-1½"	8-11"+	8-20"+
GM Squares and Recs Corners	GMSRC	½"-1½"	8-14"	2-10"
GM Tumbled Squares and Recs Flats	GMTSRLV	½"-1½"	8-11"+	8-20"+
GM Tumbled Squares and Recs Corners	GMTSRC	½"-1½"	8-14"	2-10"
GM Random Flats	GMRV	½"-1½"	3-8"	6-24"
GM Big Face Random Flats	GMBFRV	½"-1½"	6-16"+	6-16"+
GM Random Corners	GMRC	½"-1½"	2-8"	2-10"
GM Stacked Ledge Flats - (see index)	GMSLV	½"-1½"	2-8"	6-16"+
GM Stacked Corners	GMSC	½"-1½"	2-8"	2-10"
GM VE Ledge Flats - (see index)	GMDSLV	½"-1½"	2-8"	6-16"+
GM Dimensional 3-Coursed Veneer	GM3CLV	½"-1½"	2-8"	6-16"+

Buckskin Sandstone

Buckskin is darker sandstone with a range of colors that are tan to darker grays.

A common sedimentary rock formed mostly of sand held together with a cement like substance.

Square Footage: Based on ½" mortar joint.
Weight: Approximately 150 lb. per cubic foot.

Thin Veneer

Coverage based upon a 1/2" mortar joint. Weight approximately 12-13 lbs / square foot

Grade	Product Code	Thickness	Height	Length
BS Ledge Flats	BSLV	½"-1½"	2-8"	6-16"+
BS Corners	BSC	½"-1½"	2-8"	2-10"
BS Tumbled Ledge Flats	BSTLV	½"-1½"	2-8"	6-16"+
BS Tumbled Corners	BSTC	½"-1½"	2-8"	2-10"
BS Squares and Recs Flats	BSSRLV	½"-1½"	8-11"+	8-20"+
BS Squares and Recs Corners	BSSRC	½"-1½"	8-14"	2-10"
BS Tumbled Squares and Recs Flats	BSTSRLV	½"-1½"	8-11"+	8-20"+
BS Tumbled Squares and Recs Corners	BSTSRC	½"-1½"	8-14"	2-10"
BS Random Flats	BSRV	½"-1½"	3-8"	6-24"
BS Random Corners	BSRC	½"-1½"	2-8"	2-10"
BS Stacked Ledge Flats - (see Index)	BSSLV	½"-1½"	2-8"	6-16"+
BS Stacked Corners	BSSC	½"-1½"	2-8"	2-10"
BS VE Ledge Flats - (see Index)	BSDSLV	½"-1½"	2-8"	6-16"+
BS Split-Faced Stacked Ledge Flats - (see Index)	BSSFSLV	½"-1½"	2-8"	6-16"+

Rainbow Cobble / Montana Gold Cobble Stone

Rainbow Cobble has colors ranging from greens, blues, grays, mauves and golds. Montana Gold Cobble has colors ranging from golden brown to grays, tans and buckskin

A rounded or partially rounded rock or mineral fragment shaped by glacial activity.

Thin Veneer

Coverage based upon a 1/2" mortar joint. Weight approximately 12-13 lbs / square foot

Grade	Product Code	Thickness	Height	Length
MT Gold Cobble Veneer	GRV	½"-1½"	4-12"	4-12"
MT Gold Corners	GRC	½"-1½"	4-10"	4-10"
Rainbow Cobble Veneer	RRV	½"-1½"	4-12"	4-12"
Rainbow Cobble Corners	RRC	½"-1½"	4-10"	4-10"

*** COBBLE IS NOT AVAILABLE IN TUMBLED**

Thin Veneer

Coverage based upon a 1/2" mortar joint. Weight approximately 12-13 lbs / square foot

Grade	Product Code	Thickness	Height	Length
VE - Stillwater Blend Split-Face Flats	STSFLV	½"-1½"	2-8"	6-16"+
VE - Stillwater Blend Split-Face Corners	STSFC	½"-1½"	2-8"	2-10"
VE - Stacked Ledge Flats (parallel top/bottom)	XXSLV	½"-1½"	2-8"	6-16"+
VE - Ledge Flats - (see index)	XXDSLV	½"-1½"	2-8"	6-16"+
VE - Small Faced Random Flats (BR, LL, CC)	XXRV	½"-1½"	2-8"	6-12"+
VE - 3/4" Minus Ledge Flats (BR, CC)	XX0.75MLV	½"-1½"	2-8"	6-12"+
VE - 1.5" Plus Ledge Flats (BR, CC)	XX1.5PLV	½"-1½"	2-8"	6-12"+
VE - Bighorn Thin Strip 1 Course	BHVE1CV	½"-1½"	1-6"	6-10"+
VE - Bighorn Thin Strip 2 Course	BHVE2CV	½"-1½"	1-6"	6-10"+
VE - Bighorn Thin Strip 3 Course	BHVE3CV	½"-1½"	1-6"	6-10"+

PART 3— STEPS TO PREPARATION

MEASURE AREA

1. FLATS: Find your square footage by multiplying the length of your area times the height of your area. Then measure the square footage of any doors, windows, etc. and subtract this amount from the total square footage. Handy packs hold a maximum of 10' length thin veneer flats. Pallets hold 200 square feet and also 100 square feet.
2. CORNERS: Measure the linear footage of the corners needed. Handy packs hold 5 linear feet, Pallets hold 125 linear feet.
3. Final measurement should be calculated by the mason

Please note: You need to round up to the nearest 10 square feet. Handy packs hold 10 square feet. Thin veneer pallets hold 100 OR 200 square feet. (Example; If after subtracting your windows, doors, etc. from the total square footage, you have 121 square feet, you would have to round up to 130 square feet. Then you would order 1 (100 sq foot pallet and 3 handy packs.)

SELECT MATERIAL

Determine the look you are trying to achieve. Choose the material that best meets the color, shape, and size for your design.

PURCHASE MATERIAL

1. **Stone**
   Please plan on appropriate lead times for production and/or delivery.

2. **Weather-Resistant Barrier**
   ASTM D 226, Type 1 No. 15 felt

3. **Metal Lath**
   Minimum 2.5 lb. expanded metal lath (diamond mesh) galvanized or 18 gauge galvanized woven wire mesh or other code accepted mesh or lath. For metal buildings & open stud construction minimum 3.4 lb. 3/8" rib expanded galvanized metal lath.

4. **Fasteners**
   Galvanized nails, staples, or concrete nails.

5. **Mortar**
   Mortar: Type N
   Mortar Color: iron oxide color (if desired).

GET READY

1. Gather all the material needed for you project.
   -Veneer material
   -Weather Resistant Barrier
   -Galvanized Metal Lath
   -Type "N" Mortar or Pre-blended mortar mix
   -Mason Sand
   -Water
   -Wheelbarrow or cement mixer
   -Masonry Hammer or Nippers
   -Strike Tool or Joiner
   -Whisk Broom
   -Grout Bag
   -Safety glasses
   -Dust Mask

   Optional Materials / Tools
   - Skill saw with diamond/masonry blade
   - Stone Sealer
   - Liquid bonding agent

2. Follow all safety procedures.
   -Wear gloves and safety classes to protect your hands and eyes.

3. Tips
   For irregular shaped material cutting or trimming may be required. To shape veneer material us a hammer and stone chisel to score a line where you want the stone to break. Do not hit the chisel too hard or it will cause the stone to break unpredictably or in many pieces. Another way to cut the stone is by using a wet circular saw with a diamond tipped blade,

PART 4—VENEER STONE EXECUTION

BUILDING CODE REQUIREMENTS

Building code requirements vary from area to area. Check with local authorities for building code requirements in your area.

PREPARE YOUR SURFACE

1. Concrete wall

Glacier Stone Supply's Natural Lite™ Thin Veneer can be mortared directly to Concrete (poured or block walls) or Brick on interior and exterior surfaces. Concrete that is painted or coated must be cleaned using sand or water-blast. if unable to thoroughly clean, a metal lath will need to be adhered and a scratch coat of mortar applied.

2. Wood or Metal frame surface

On Wood or Metal frame surfaces (1/2" plywood, drywall, wallboard, cement board, wood paneling or metal building) you would need to prepare the surface by doing the following steps.

a. Apply a moisture control barrier ('15 lb. building paper or equivalent) over the rigid sheathing. Lap the barrier 4" at all seams,

b. Tightly apply metal lath 6" on center vertically with heavy staples or galvanized roofing nails long enough to penetrate 1" into studs, If going around a corner make sure to wrap the metal lath around the corner at least 16".

c. Attach the lath with the correct side up (horizontally-the small cups should be pointing upward).

3. Metal Building

On metal buildings lap and install paper backed 3/8" rib expanded metal lath to metal cladding supports of 20 gauge to 12 gauge. Using U.S. Gypsum Co.'s 1¼" type S-12 Pancake Head Super Tight Screws. Screws must penetrate 3/8" beyond the inside face of metal surface.

Screws should be installed on center equal to 1 screw per square foot and shall not exceed 6" on center in one direction.

4. Open Studs

Apply a Polystyrene insulation board over the open studs.

Lap and install paper backed metal lath to studs using nails which penetrate a minimum of 1" at 4" on center.

LAYOUT OF STONES

Before applying stone, it is best to layout an area of stone near the work area to help find color, shape and size to design your pattern. This will allow you to layout and rearrange the stone in the most pleasing design.

Because this is real stone from a quarry, you may need to remove debris from some stones; a few pieces may need to be cleaned with water and a brush prior to application.

MIXING THE MORTAR

Type "N" or pre-blended: stone mortar mix, Use one part Type "N" mortar with two parts mason sand. Mix enough water to achieve a workable consistency.
This mortar will be used for the scratch coat, buttering the stone and to grout the joints.

A liquid bonding agent can be added to the mortar for additional bonding strength. *Follow manufacturer's instructions.*

SCRATCH COAT APPLICATION

Install a scratch coat 1/2" to 3/4" thick coat of mortar to the metal lath in a workable area.

Do not apply scratch coat to the entire area. Only work in sections, approx. 5-10 square feet, so stones can be applied before mortar dries.

Allow the scratch coat to set for 30 minutes.

If you are applying the stone directly to concrete and masonry surfaces you will need to improve the wall's adhesion capabilities. To do this dampen the wall prior to installation or add a liquid bonding agent to the mortar mix.

APPLY THE STONE

Install cornerstones first starting at the bottom and working up. Apply an even, ½ - 1" thick layer of mortar to the back of the stone (a.k.a. "buttering"). Because each stone will be a different thickness you'll need to adjust the amount of mortar applied to the back of each piece.

You may need to insert galvanized screws around stones that need to be held in place while mortar sets.

Attempt to keep the joints between stones a consistent height and width no larger than 1/2" if possible (because of the natural contour of the stone there will be areas where joints will be greater than 1/2") and avoid having joints that line up vertically between rows.
Press the stone firmly into place until the mortar behind the stone squeezes out on all sides. Wiggle the stone as you press to assure a firm bond.

Clean stones as necessary during installation. Do not allow the mortar to dry on stone's surface overnight.

Note: *Stones can be cut and shaped with a masonry hammer, nippers, or cut to length using a Skill saw with either a dry or wet cut diamond or masonry blade. Position cut edges away from view when possible.*

GROUTING & STRIKING THE JOINTS

After the stones have all been applied, fill the joints with mortar using a grout bag. Conceal any noticeable broken or cut stone edges by covering with mortar.

Wait for the mortar to firm in the joints and then rake out the excess using a wood or metal strike tool. Joints can remain flush or raked for the desired look. Seal all joint edges by applying pressure on the mortar, causing mortar to move in to the joints.

Note*: The mortar joints will smear if they are worked too soon.*

BRUSHING AND CLEANING THE AREA

When the mortar becomes crumbly use a dry bristle brush or a small whisk broom to clean spots of mortar off the stone's face.

Note: *Loose mortar and mortar spots should not be allowed to dry overnight.*

Using just a stiff brush and clean water is recommended for cleaning the stonework. For more thorough cleaning alternatives, please refer to the instructions in our Cleaning and Sealing section.

Once all cleaning is complete a stone sealer may be applied to enhance the stone's color and give it a shiny appearance. Be sure to test the sealer on an unused stone before applying to make sure you will like the results.

End of Section

SAWN THIN VENEER STONE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Section includes thin cut masonry construction of natural stone set in cement mortar over a structural wall backing of:
    a. Plywood sheathing
    b. Concrete masonry
    c. Metal building
    d. Other _____
B. Section includes special decorative sawn thin veneer stone shapes for trim.
C. Section includes installation of built-in accessories.

1.2 RELATED SECTIONS

A. Section 03300 - Cast-in-Place Concrete: Concrete Foundations.
B. Section 04810 - Unit Masonry Assemblies: Masonry supporting wall,
C. Section 05500 - Metal Fabrications: Lintels, Shelf angles] structural supports] anchors and other built-in components for building into stone veneer masonry by this section.
D. Section 05400 - Cold-Formed Metal Framing: Formed steel framed supporting wall.
E. Section 06112- Framing and Sheathing: Wood frame supporting wall.
F. Section 07620.- Sheet Metal Flashing and Trim,
G. Section 07900- Joint Sealers: Sealant for perimeter and control joints.
H. Section 09220 - Cement Plaster: Metal Lath and scratch coat back-up over supporting walls.

1.3 REFERENCES

A. ASTM C 91 - Standard Specification for Masonry Cement.
B. ASTM C 97 - Standard Specification for Absorption and Bulk Specific Gravity of Dimension Stone.
C. ASTM C 99 - Standard Specification for Modulus of Rupture of Dimension Stone.
D. ASTM C 144 - Aggregate for Masonry Mortar.
E. ASTM C 150 - Standard Specification for Portland Cement.
F. ASTM C 170 - Standard Specification for Compressive Strength of Dimension Stone.
G. ASTM C 207 - Standard Specification for Hydrated Lime for Masonry Purposes.
H. ASTM C 270 - Mortar for Unit Masonry.
I. ASTM C 615 - Standard Specification for Granite Dimension Stone.
J. ASTM C 616 - Standard Specification for Quartz-Based Dimension Stone.
K. ASTM C 780 - Preconstruction Evaluation of Mortar for Plain & Reinforced Masonry.
L. ASTM C 847 – Standard Specification for Metal Lath
M. ASTM C 1063 – Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster.
N. ASTM D 226 - Standard Specification for Asphalt Saturated Organic Felt Used in Roofing and Waterproofing.
O. ACl 530 / ASCE 5/TMS 402 - Building Code Requirements for Masonry Structures.
P. ACl 530.1/ ASCE 6 / TMS 602 - Specifications for Masonry Structures.
Q. PCA – Portland Cement Plaster (Stucco) Manual.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300
B. Product Data: Quarrier or natural stone data sheets on stone and mortar mix to be used, including:
    1. Preparation instructions and recommendations.
    2. Storage and handling requirements and recommendations.
    3. Installation methods.
    4. Cleaning methods.
C. Design Data: Submit design mix when Property specification of ASTM C270 is to be used, with required environmental conditions, and admixture limitations.
D. Selection Samples: For each stone product specified, submit two samples, minimum size 48 inches (1216 mm) square, representing actual product, color and texture.
E. Samples: Submit samples of mortar representing actual mortar color and color range.
F. Quarrier's Certificate: Certify stone properties and mortar mix will conform to specified requirements.
G. Construct sample panel at location indicated or directed, and as follows:
    1. Recommended Size: 8 feet x 8 feet (2.4 m by 2.4 m) or a size that satisfies the architect. This size should be no less than 4 feet x 4 feet (1.2 m by 1.2 M).
    2. Include all stone unit types and sizes to be used including a typical corner condition, special shapes and mortar joint treatment. Clean the sample panel using the same materials and tools as planned for the final stone masonry construction.
    3. Obtain architect's acceptance of sample panel before beginning construction activities of this section.
    4. Do not remove sample panel until construction activities of this section have been accepted by the Architect.

1.5 QUALIFICATIONS

A. Stone Quarrier: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
B. Stone Masonry Company: Company specializing in performing Work of this section with minimum five years documented experience.

1.6 QUALITY ASSURANCE

A. Preconstruction Meetings: Conduct preconstruction meetings including the Architect, Contractor, stone masonry subcontractor, and the flashing subcontractor to verify project requirements, substrate conditions, manufacturer's installation instructions and other requirements. Comply with Division 1 requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products on pallets, under cover and in manufacturers unopened packaging until ready for installation.
B. Store stone materials on pallets on a dry level surface. Pallets shall not be stacked and shall be covered with tarps.
C. Store mortar under cover and in an area where temperature is maintained between 4 degrees C (40 degrees F) to 43 degrees C (110 degrees F).

1.8 PROJECT CONDITIONS

A. Hot and Cold Weather Requirements: In accordance with ACI 530.1/ASCE 6/TMS 602 Specifications for Masonry Structures.
B. Ambient temperature shall be 40 degrees F (4.4 degrees C) or above during erection of stone masonry. When ambient temperature falls below 50 degrees F, mortar mixing water shall be heated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Stone Quarrier: Glacier Stone Supply LLC, 955 Whitefish Stage Road, Kalispell, Montana 59901. Phone: 406-755-5717, Fax: 406-755-5718, Internet: www.glacierstonesupply.com .
B. Substitutions: Not permitted.
C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 VENEER STONE

A. General: All natural stone sawn veneers shall vary in depth ½ to I ½ inches (12.5 mm to 38mm) plus or minus ½ inch (12.5 mm), heights of 1-8" (25 to 203 mm), or higher where indicated and is furnished in random lengths from 6-16+" (151 mm to 406+ mm).

2.3 SPECIAL SHAPES

A. Provide special shapes as indicated on the Drawings and as follows:
    1. Quoins
    2. Keystones
    3. Edge stones
    4. Cornerstones
    5. Sills
    6. Ledges
    7. Medallions
    8. Other _____

B. Stone shall be furnished in sizes indicated plus or minus ½ inch (12.5 mm). Material shall conform to C 616 for Quartzite Sandstone with the following properties:
    1. Maximum absorption rate of 0.5 percent average when tested in accordance with ASTM C97.
    2. Average dry density of 158 lb per CF (2530 kg/m3) when tested in accordance with ASTM C97.
    3. Average compressive strength of 17,000 psi (122 Mpa) when tested in accordance with ASTM C170.
    4. Average modules of rupture 1,800 psi (12 Mpa) when tested in accordance with ASTM C99.

C. Color shall be:
    1. Match the veneer stone.
    2. _____

2.4 ACCESSORIES

A. Expanded Metal Lath Paper Backed: ASTM C847 galvanized self furring mesh of weight to suit application: backed with paper.

B. Expanded Metal Lath: ASTM C847, galvanized, self-furring, minimum 2.5 lb or 18 gauge.

C. Anchorage: Tie wire, nails, screws and other metal supports, galvanized, of type and size to suit application and to rigidly secure materials in place.

D. Building Paper: ASTM D 226, Type 1, No. 15 asphalt saturated felt.

E. Concrete Bonding Agent: Thorobond water-based polyvinyl acetate type as approved by the stone quarrier.

F. Setting buttons or shims: Lead or plastic

2.5 MORTAR

A. Masonry Cement: Complying with ASTM C91
   1. Type N
   2. Color, gray
   3. Color, white or colored is optional
   4. Color _____

B. Portland Cement: Complying, with ASTM C150:
   1. Type l
   2. Type _____
   3. Color, gray.
   4. Color, white or colored is optional.
   5. Color _____

C. Mortar Aggregate: Complying with ASTM C144, standard masonry type.

D. Hydrated Lime: Complying with ASTM C207:
   1. Type S.
   2. Type SA.

E. Water: Clean and potable.

2.6. MIXES

A. Mortar Mixes:
   1. Mortar for Structural Masonry: Complying with ASTM C270, using Proportion Specification.
      a. Type N.

B. Mortar Mixing:
   1. Mix mortar ingredients in accordance with ASTM C270. Mix only in quantities needed for immediate use.
   2. Do not use anti-freeze compounds to lower freezing point of mortar.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until backing structure is plumb, bearing surfaces are level and substrates are clean and properly prepared.

B. Verify that built-in items are in proper location, and ready for roughing into stone masonry.

C. Notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION FOR INSTALLATION FOR PLYWOOD SHEATHING

A. Cover sheathing with waterproof building paper with all joints lapped shingle style a minimum of 4 inches (102 mm) \

B. Install metal lath in accordance with ASTM C1063. Apply metal lath taut, with long dimension perpendicular to supports. Lap ends minimum 1 inch (25 mm) Secure laps with tie wire where they occur between supports.

C. Attach metal lath to wood supports using galvanized nails at maximum 6 inches (152 mm) on center vertically and 16 inches (406 mm) on center horizontally. Fasten with a minimum of a 1 inch (25 mm) penetration of the wood studs. Stop lath 1 inch (25 mm) from finished edges.

D. Continuously reinforce internal angles with corner mesh.

E. Place lath vertically above each top corner and each side of door and glazed frames.

3.3 PREPARATION FOR INSTALLATION OVER CONCRETE OR CONCRETE MASONRY

A. Clean or sandblast concrete masonry to assure a proper mortar bond. Verify no bituminous water repellent, or form release agents exist on concrete surface that are detrimental to mortar bond.

B. Apply bonding agent in accordance with the manufacturers printed instructions.

C. Install metal lath in accordance with ASTM C1063. Apply metal lath taut, with long dimension perpendicular to supports. Lap ends minimum 1 inch (25 mm) Secure end laps with tie wire where they occur between supports.

D. Attach metal lath to concrete using galvanized concrete nails at maximum 6 inches (152 mm) on center vertically and 16 inches (406 mm) on center horizontally. Stop lath 1 inch (25 mm) from finished edges.

E. Continuously reinforce internal angles with corner mesh.

F. Place lath vertically above each top corner and each side of door and glazed frames.

3.4 PREPARATION FOR INSTALLATION OVER METAL SIDING OR OPEN STUD

A. Install paperbacked metal lath in accordance with ASTM C1063. Apply metal lath taut, with long dimension perpendicular to supports. Lap ends minimum 1 inch (25 mm) Secure end laps with tie wire where they occur between supports.

B. Attach metal lath to support members using galvanized 1-1/4 inch (32 mm) type S-12 Pan-head Super Tight Screws as manufactured by United States Gypsum. Screws shall penetrate a minimum of' 3/8 inch (0.9525 cm) into the metal siding support members. Provide 1 fastener per SF of surface area and do not exceed 6 inches (152 mm) on center in any one direction.

C. Place minimum 4 inch (100 mm) wide strips of metal lath centered over junctions of dissimilar backing materials. Secure rigidly in place.

D. Place lath vertically above each too corner and each side of door and glazed frames.

E. Apply scratch coat in accordance with PCA. Plaster (Stucco) Manual.

F. Apply scratch coat to nominal thickness of 1/2 to 3/4 inch. (12.5 to 19 mm) over metal lath surfaces

G. Moist cure scratch coat for minimum period of 43 hours.

H. After curing, dampen previous coat prior to applying mortar and thin stone veneer

3.5 PREPARATION FOR INSTALLATION OF THIN VENEER STONE:

A. Stone must be water saturated, surface-dry when placed, Water down the stone 24 hours prior to placement until saturated. Reapply water to keep stone saturated as required by weather conditions.

B. Coordinate placement of reinforcement, anchors and accessories, flashings and other moisture control products supplied by other sections.

C. Clean all built-in items of loose rust, ice, mud, or other foreign matter before incorporating into the wall. All ferrous metal built into the wall shall be primed or galvanized.

D. If required, provide temporary bracing during installation of masonry work, Maintain bracing in place until building structure provides permanent support.

3.6 INSTALLATION OF THIN VENEER STONE

A. Install thin veneer stone and mortar in accordance with ACI 530.1/ASCE 6/TMS 602 Specifications for Masonry Structures.

B. Maintain masonry courses to uniform dimension(s). Form vertical and horizontal joints of uniform thickness.

C. Pattern Bond:
   1. Lay stone with the bed-face, split-face or weather edge exposed, as material is described in stone veneer section 2.2. Take care to avoid a concentration of any one color to any one wall surface.
   2. Maintain an approximate 1/2 inch (12.5 mm) joint, as stone allows.
   3. Do not use stacked vertical joints.

4. Lay out work in advance and distribute color range of stone uniformly over total work area.

D. Placing and Bonding:
   1. Dampen substrate as required to reduce excessive suction.
   2. Apply mortar in accordance with PCA Plaster (Stucco) Manual to a thickness of 1/2 to 3/4 inch (12.5 mm to 19mm) Do not spread more than a workable area of 5 to 10SF (.46 to .93 SM) so that mortar will not set before stone is applied.
   3. Lay thin veneer stone in a full bed of mortar with full head joints.
   4. Work from the bottom up laying corner pieces first.
   5. Remove excessive mortar as work progresses.
   6. Do not shift or tap veneer stone after mortar has achieved initial set. Where adjustment is required, remove mortar and replace.
   7. Isolate top of veneer stone from horizontal structural framing members and slabs or decks with compressible joint filler and sealant in accordance with Section 07900.

E. Joining Work: Where fresh masonry joints partially set masonry.
   1. Remove loose stone and mortar.
   2. Clean and lightly wet surface of set masonry.
   3. To avoid a horizontal run of masonry rack back 1/2 (12.5 mm) the length of stone in each course.
   4. Toothing is not permitted.

F. Joints:
   1. Lay stone with an approximate 1/2 inch (12.5 mm.) mortar joint, as stone allows.
   2. Tool joints when “thumb-print” hard with a round jointer slightly larger than the width of the joint.
   3. Trowel point or concave tool exterior joints below grade.
   4. Flush cut joints to be finished with a soft brush only.
   5. Retempering of mortar is not permitted.
   6. Use non-corrosive stone shims as required to maintain uniform joint thickness.

G. Flashing:
   1. Clean surface of masonry smooth and remove any projections, which could damage flashings,
   2. Place flashing on a bed of mortar.
   3. Cover flashing with mortar.
   4. Provide weep vents at head joints placed every 16 inches (406 mm) along the first course immediately above flashing or as recommended by weep vent manufacturer.

H. Control and Expansion Joints: Keep joints open and free of debris. Coordinate control joint in accordance with Section 07900 for sealant performance.

I. Sealant Recesses: Provide open joint 3/4 inch (19 mm) deep and 1/4 inch (6 mm) wide, where masonry meets doors, windows and other exterior openings. Coordinate sealant joints in accordance with Section 07900 for sealant performance.

J. Cutting And Fitting: Cut and fit for chases, pipes, conduit, sleeves, grounds, and other penetrations and adjacent materials. Coordinate with other sections of work to provide correct size, shape, and location.

3.4 FIELD QUALITY CONTROL

A. Test mortar and grout in accordance with Section 01110.

B. Testing of Mortar Mix: In accordance with ASTM C780, Annex A4, for mortar aggregate ratio and ASTM C 780, Annex A5, for mortar water content.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Cover the top of unfinished stone masonry work to protect it from the weather.

C. Touch-up, repair or replace damaged products before Substantial Completion.

3.8 CLEANING

A. Promptly remove excess wet mortar from the face of the stone as work progresses. Clean stone masonry with a stiff nylon brush and clean water. For more thorough cleaning alternatives, please refer to the instructions in our Cleaning and Sealing section.

END OF SECTION