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The following wall systems are preapproved for use in WSDOT projects:

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<th>Wall Supplier</th>
<th>System Name and Appendix Location</th>
<th>System Description and Appendix Location</th>
<th>ASD/LFD or LRFD?</th>
<th>Height, or Other Limitations</th>
<th>Year Initially Approved</th>
<th>Last Approved Update</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hilfiker Retaining Walls</strong></td>
<td>1902 Hilfiker Lane</td>
<td>Welded Wire Retaining Wall Appendix 15-H</td>
<td>ASD/LFD</td>
<td>33 feet</td>
<td>Unknown</td>
<td>Approved 12/1/21</td>
</tr>
<tr>
<td></td>
<td>Eureka, CA 95503-5711 707-443-5093</td>
<td>Welded wire facing that is continuous with welded wire soil reinforcement</td>
<td></td>
<td></td>
<td>(submitted 9/15/03)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Denver, CO 80237 303-790-1481</td>
<td>Precast concrete 5’×5’ facing panels and steel strip soil reinforcement</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Tensar Earth Technologies, Inc.</strong></td>
<td>2500 Northwinds Parkway Suite 500</td>
<td>ARES Wall Appendix 15-K</td>
<td>ASD/LFD</td>
<td>33 feet</td>
<td>1998</td>
<td>Approved 11/9/04</td>
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<tr>
<td></td>
<td>Alpharetta, GA 30009 770-344-2090</td>
<td>Precast concrete 5’×5’ facing panels and Tensar geogrid soil reinforcement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tensar Earth Technologies, Inc.</strong></td>
<td>2500 Northwinds Parkway Suite 500</td>
<td>MESA Wall Appendix 15-L</td>
<td>ASD/LFD</td>
<td>33 feet</td>
<td>2000</td>
<td>Approved 11/9/04</td>
</tr>
<tr>
<td></td>
<td>Alpharetta, GA 30009 770-344-2090</td>
<td>Modular dry cast concrete block facing with Tensar geogrid soil reinforcement</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Tensar Earth Technologies, Inc.</strong></td>
<td>2500 Northwinds Parkway Suite 500</td>
<td>Welded Wire Form Wall Appendix 15-M</td>
<td>ASD/LFD</td>
<td>33 feet*</td>
<td>2006</td>
<td>Approved 3/3/06</td>
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<tr>
<td></td>
<td>Alpharetta, GA 30009 770-344-2090</td>
<td>Tensar geogrid wrapped face wall with welded wire facing form</td>
<td></td>
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<tr>
<td><strong>SSL, LLC</strong></td>
<td>4740 Scotts Valley Dr., Suite E</td>
<td>MSEPlus Wall Appendix 15-N</td>
<td>LRFD</td>
<td>33 feet</td>
<td>1999</td>
<td>Approved 8/5/13</td>
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<tr>
<td></td>
<td>Scotts Valley, CA 95066 831-430-9300</td>
<td>Precast concrete 5’×5’ facing panels and steel welded wire strip soil reinforcement</td>
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<tr>
<td><strong>Anchor Wall Systems, Inc.</strong></td>
<td>5959 Baker Rd, Suite 390</td>
<td>Landmark Appendix 15-O</td>
<td>LRFD</td>
<td>33 feet</td>
<td>2012</td>
<td>Approved 4/2/12</td>
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<tr>
<td></td>
<td>Minnetonka, MN 55345-5996 952-933-8855</td>
<td>Modular dry cast concrete block facing with Miragrid geogrid soil reinforcement</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

*If the vegetated face option is used for the Hilfiker Welded Wire Retaining Wall or the Tensar Welded Wire Form Wall, the maximum wall height shall be limited to 20 feet. Greater wall heights for the vegetated face option for these walls may be used on a case by case basis as a special design if approved by the State Geotechnical Engineer and the State Bridge Engineer.

1 For those systems still identified as ASD/LFD, use of the current AASHTO LRFD Bridge Design Specifications is preferred.
Appendix 15-D Preapproved Proprietary Wall Systems

Table 15-D-1 Preapproved Proprietary Walls

<table>
<thead>
<tr>
<th>Wall Supplier</th>
<th>System Name and Appendix Location</th>
<th>System Description and Appendix Location</th>
<th>ASD/LFD or LRFD?</th>
<th>Height, or Other Limitations</th>
<th>Year Initially Approved</th>
<th>Last Approved Update</th>
</tr>
</thead>
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<tr>
<td>Allan Block Corporation</td>
<td>Allan Block Wall (battered face)</td>
<td>Modular dry cast concrete block facing with Miragrid or Stratagrid geogrid soil reinforcement</td>
<td>LRFD</td>
<td>33 feet</td>
<td>2009</td>
<td>Approved 7/15/09</td>
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<tr>
<td>Redi-Rock International LLC</td>
<td>Redi-Rock PC (Positive Connection) Wall</td>
<td>Precast concrete block facing with Miragrid strip soil reinforcement</td>
<td>LRFD</td>
<td>33 feet</td>
<td>2015</td>
<td>Approved 8/3/15</td>
</tr>
<tr>
<td>Lock and Load Retaining Walls LTD</td>
<td>Lock and Load Wall</td>
<td>Precast concrete panel facing attached to wrapped face geogrid wall</td>
<td>LRFD</td>
<td>33 feet</td>
<td>2013</td>
<td>Approved 7/10/13</td>
</tr>
<tr>
<td>Keystone Retaining Wall Systems, LLC</td>
<td>Keystone Keygrid (Compac II and III Units)</td>
<td>Modular dry cast concrete block facing with Miragrid geogrid soil reinforcement</td>
<td>LRFD</td>
<td>33 feet</td>
<td>2015</td>
<td>Approved 8/3/15</td>
</tr>
<tr>
<td>Basalite Concrete Products, LLC</td>
<td>GEOWALL Structural Earth Retaining Wall</td>
<td>Modular dry cast concrete block facing with Miragrid or Stratagrid geogrid soil reinforcement</td>
<td>LRFD</td>
<td>33 feet</td>
<td>2018</td>
<td>Approved 1/2/18</td>
</tr>
</tbody>
</table>

*If the vegetated face option is used for the Hilfiker Welded Wire Retaining Wall or the Tensar Welded Wire Form Wall, the maximum wall height shall be limited to 20 feet. Greater wall heights for the vegetated face option for these walls may be used on a case by case basis as a special design if approved by the State Geotechnical Engineer and the State Bridge Engineer.

1 For those systems still identified as ASD/LFD, use of the current AASHTO LRFD Bridge Design Specifications is preferred.
In addition to the general design requirements provided in Appendix 15-A, the following specific design requirements shall be met:

No HITEC or IDEA evaluation report is currently available for this wall system. Design procedures for specific elements of the wall system have been provided to WSDOT in a letter dated September 7, 2021. The design procedures used by Hilfiker Retaining Walls shall be in full conformance with the AASHTO LRFD Bridge Design Specifications (2020).

Regarding the soil reinforcement material, the minimum wire size acceptable for permanent walls is W4.5 for the longitudinal wires. For the transverse wires, the minimum wire size shall be W3.5. For all permanent walls, the welded wire shall be galvanized in accordance with the AASHTO LRFD specifications. For temporary walls, galvanization is not required, but the life of the wire shall be designed to be adequate for the intended life.

Regarding the backing mats used in the welded wire facing, the minimum clear opening dimension of the backing mat shall not exceed the minimum particle size of the wall facing backfill. The maximum particle size for the wall facing backfill shall be 6 inches.

The maximum vertical spacing of soil reinforcement shall be 24 inches.

The culvert penetration and obstruction avoidance details are preapproved up to a diameter of 4 feet. Larger diameter culverts or obstructions are not considered preapproved. This wall is also preapproved for use with traffic barriers.

This wall system is preapproved for a welded wire/gravel fill face for vertical to near vertical facing batter and welded wire vegetated face for wall face batters as steep as 6V:1H. This preapproval presumes that the facing tolerances in the WSDOT Standard Specifications Section 6-13.3(1) for welded wire faced walls are met.

The following standard details shall be used for the Hilfiker Welded Wire Faced Wall system:
Appendix 15-H Preapproved Wall Appendix: Specific Requirements and Details for Hilfiker Welded Wire Faced Walls

Vegetative Wall Face Detail

Typical Section - Vegetative Face

Construction Sequence - Vegetative Face

Not to Scale

Wall Components

Hilfiker Retaining Walls

Vegetative Face

Welded Wire Retaining Wall

Standard Details
WELDED WIRE WALL COMPONENTS WITH RETURN MAT

RETURN MATS AND TOP OF WALL DETAIL

LEGEND

HORIZONTAL WAPS

SLOPED CAP MAT DETAIL*

DEFLECTED LONGITUDINAL WIGES

CONNECT BACKING MAT AT FACE OF WALL

RETURN MATS AND TOP OF WALL DETAIL

SHEET 1 OF 1
Appendix 15-H Preapproved Wall Appendix: Specific Requirements and Details for Hilfiker Welded Wire Faced Walls

RETURN WALL DETAIL
NOT TO SCALE

CONCAVE RIGHT ANGLE DETAIL
NOT TO SCALE

CONCAVE CURVE
NOT TO SCALE

CONCAVE ACUTE ANGLE DETAIL
NOT TO SCALE

OBTUSE CONVEX ANGLE
NOT TO SCALE

CONCAVE ANGLE DETAIL
NOT TO SCALE

CONCAVE LEFT ANGLE DETAIL
NOT TO SCALE

CONVEX CURVE
NOT TO SCALE

CONVEX RIGHT ANGLE
NOT TO SCALE

CONVEX ACUTE ANGLE DETAIL
NOT TO SCALE

CONVEX ANGLE DETAIL
NOT TO SCALE

RETURN WALL DETAIL
NOT TO SCALE

Geotechnical Design Manual M.46-03.15
December 2021
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