NDS, Inc. April 2015

851 North Harvard Avenue

Lindsay, California 93247

Toll Free 800-726-1994

Phone 559-562-9888

Toll Free Fax 800-726-1998

Fax 559-562-4488

Website [www.ndspro.com](http://www.ndspro.com)

Email nds[@ndspro.com](mailto:bbb@aaaa.com)

Product Guide Specification

Specifier Notes: This product guide specification is written in Construction Specifications Institute (CSI) 3-Part Format in accordance with *The CSI Construction Specifications Practice Guide,* including *MasterFormat, SectionFormat,* and *PageFormat.*

This section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with Division 1, other specification sections, and the Drawings. Delete all Specifier Notes after editing this section.

Section numbers and titles are based on *MasterFormat 2014 Update.*

1. 33 44 16

UTILITY TRENCH DRAINS

Specifier Notes: This section covers NDS, Inc. “Dura Slope” trench drain system. Consult NDS, Inc. for assistance in editing this section for the specific application.

Use of “Dura Slope” trench drain system may contribute to LEED credits. Consult NDS, Inc. for more information.

* 1. GENERAL
     1. SECTION INCLUDES
        1. Trench drain system.
     2. RELATED REQUIREMENTS

Specifier Notes: Edit the following list of related sections as necessary. Limit the list to sections with specific information that the reader might expect to find in this section, but is specified elsewhere.

* + - 1. Section 03 30 00 – Cast-in-Place Concrete.
      2. Section 31 23 00 – Excavation and Fill.
      3. Section 33 41 00 – Storm Utility Drainage Piping.
    1. PREINSTALLATION MEETINGS

Specifier Notes: Edit preinstallation meetings as necessary. Delete if not required.

* + - 1. Convene preinstallation meeting [1 week] [2 weeks] before start of Work of this Section.
      2. Require attendance of parties directly affecting Work of this Section, including Contractor, Architect, installer, and manufacturer’s representative.
      3. Review the Following:
         1. Materials.
         2. Installation.
         3. Adjusting.
         4. Cleaning.
         5. Protection.
         6. Coordination with other Work.
    1. SUBMITTALS

Specifier Notes: Edit submittal requirements as necessary. Delete submittals not required.

* + - 1. Comply with Division 1.
      2. Product Data: Submit manufacturer’s product data, including installation instructions.
      3. Shop Drawings: Submit manufacturer's shop drawings, indicating layout, dimensions, materials, components, and accessories.
      4. Samples: Submit manufacturer’s sample of trench drain, including grate.
      5. Manufacturer’s Certification: Submit manufacturer’s certification that materials comply with specified requirements and are suitable for intended application.
      6. Manufacturer’s Project References: Submit manufacturer’s list of successfully completed trench drain system projects, including project name and location, name of architect, and type and quantity of trench drain systems furnished.
      7. Installer’s Project References: Submit installer’s list of successfully completed trench drain system projects, including project name and location, name of architect, and type and quantity of trench drain systems installed.
      8. Warranty Documentation: Submit manufacturer’s standard warranty.
    1. QUALITY ASSURANCE
       1. Manufacturer’s Qualifications: Manufacturer regularly engaged, for a minimum of 10 years, in the manufacturing of trench drain systems of similar type to that specified.
       2. Installer's Qualifications:
          1. Installer regularly engaged, for a minimum of 5 years, in installation of trench drain systems of similar type to that specified.
          2. Employ persons trained for installation of trench drain systems.
    2. DELIVERY, STORAGE, AND HANDLING
       1. Delivery Requirements: Deliver materials to site in manufacturer’s original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
       2. Storage and Handling Requirements:
          1. Store and handle materials in accordance with manufacturer’s instructions.
          2. Keep materials in manufacturer’s original, unopened containers and packaging until installation.
          3. Store materials in clean areas, protected from exposure to harmful weather conditions.
          4. Store materials out of direct sunlight.
          5. Protect materials during storage, handling, and installation to prevent damage.
    3. AMBIENT CONDITIONS
       1. During Cold Weather:
          1. Do not use frozen materials.
          2. Do not use materials mixed or coated with ice or frost.
          3. Do not build on frozen Work.
       2. During Wet Weather: Do not build on wet, saturated, or muddy subgrade.
  1. PRODUCTS
     1. MANUFACTURERS
        1. Manufacturer: NDS, Inc., 851 North Harvard Avenue, Lindsay, California 93247. Toll Free 800-726-1994. Phone 559-562-9888. Toll Free Fax 800-726-1998. Fax 559-562-4488. Website [www.ndspro.com](http://www.ndspro.com). Email nds@ndspro.com.

Specifier Notes: Specify if substitutions will be permitted.

* + - 1. Substitutions: [Not permitted] [Comply with Division 1].
      2. Single Source: Provide materials from single manufacturer.
    1. UTILITY TRENCH DRAINS
       1. Trench Drain System: “Dura Slope” trench drain system, including the following components:
          1. Channel drains.
          2. Channel grates.
          3. Catch basins.
          4. Accessories.
    2. CHANNEL DRAINS
       1. Channel Drains: “Dura Slope” channel drains.
          1. Material: Gray, injection-molded, structural-foam, high-density polyethylene (HDPE) with UV inhibitors.
          2. Dimensions:

Length of Each Modular Channel Section: 48 inches.

Outside Top Width: 6-5/8 inches.

Nominal Inside Flow Path Width: 4 inches.

Bottom Radius: 2 inches.

Maximum Inner Depth, Range: 3.998 inches to 12.062 inches.

* + - * 1. Channel Weight per Section, Range: 7.452 lbs. to 16.06 lbs.
        2. Channel Sections: Neutral and pre-sloped sections to provide variable trench depth.
        3. Slope of Pre-sloped Channel Sections: 0.7 percent.
        4. Pre-Sloped Run Lengths:

Continuous Slope: Maximum 194 feet.

With Neutral Sections Added: Maximum 266 feet.

Specifier Notes: Specify load rating.

* + - * 1. Load Rating: [Class A] [Class B] [Class C] [Class D].
        2. Material Strength:

Compressive Strength: 2,900 psi.

Tensile Stress: 4,550 psi.

Flexural Strength: 5,800 psi.

* + - * 1. Material Absorption: Maximum 0.01 percent.
        2. Molded bottom outlet.

Specifier Notes: Specify pipe outlet size.

* + - * 1. Pipe Outlet Size: [3 inches] [4 inches] [6 inches] [8 inches] [Indicated on the Drawings].
        2. Integral Joint Lock: “DuraLoc” interlocking tongue-and-groove joints to secure alignment and ensure straight channel runs.
        3. Grate Lock: “ProFit” locking system locks grate to integral frame.
        4. Rebar Supports: “LeveLoc”.

Integral protruding knob levels channel and grips rebar.

Grips No. 3 and No. 4 rebar to provide channel height adjustment during installation.

Spacing: 24-inch intervals along each side of channel.

* + - * 1. Withstands freeze/thaw cycles.
    1. CHANNEL GRATES

Specifier Notes: Specify required channel grates. Delete grates not required.

* + - 1. Polyolefin Channel Grates:

Specifier Notes: Specify part number and color.

* + - * 1. Part Number and Color: [660, White] [661, Dark Gray] [661LG, Gray] [662, Green] [663, Black] [664, Sand] [665, Brick Red].
        2. Material: Structural-foam polyolefin with UV inhibitors.
        3. Load Rating: Class B.
        4. ADA compliant.
        5. Dimensions:

Length: 24 inches.

Width: 6 inches.

Depth: 3/4 inch.

* + - * 1. Grate Openings: 1/2 inch by 3-13/16 inches.
        2. Open Surface Area per Foot: 25.40 square inches.
        3. Inflow Capacity per Foot: 77.70 gpm.
      1. Polyolefin Channel Grates:
         1. Part Number: DS-670.
         2. Material: Structural-foam polyolefin with UV inhibitors.
         3. Color: Gray.
         4. Perforated.
         5. Load Rating: Class B.
         6. Heel proof.
         7. ADA compliant.
         8. Dimensions:

Length: 24 inches.

Width: 6 inches.

Depth: 3/4 inch.

* + - * 1. Grate Openings: 1/4-inch-round holes.
        2. Open Surface Area per Foot: 8.75 square inches.
        3. Inflow Capacity per Foot: 26.77 gpm.
      1. Polyolefin Channel Grates:
         1. Part Number: DS-671.
         2. Material: Structural-foam polyolefin with UV inhibitors.
         3. Color: White.
         4. Perforated.
         5. Load Rating: Class B.
         6. Heel proof.
         7. ADA compliant.
         8. Dimensions:

Length: 24 inches.

Width: 6 inches.

Depth: 3/4 inch.

* + - * 1. Grate Openings: 1/4-inch-round holes.
        2. Open Surface Area per Foot: 8.75 square inches.
        3. Inflow Capacity per Foot: 26.77 gpm.
      1. Stainless Steel Channel Grates:
         1. Part Number: DS-226.
         2. Material: Stainless steel.
         3. Color: Steel.
         4. Perforated.
         5. Heel proof.
         6. ADA compliant.
         7. Dimensions:

Length: 24 inches.

Width: 6 inches.

Depth: 3/4 inch.

* + - * 1. Grate Openings: 1/4-inch-round holes.
        2. Open Surface Area per Foot: 8.75 square inches.
        3. Inlet Capacity per Foot: 23.34 gpm with 1/2 inch of head.
        4. Load: 1 to 60 psi. Pedestrian traffic only.
      1. Galvanized Steel Channel Grates:
         1. Part Number: DS-228.
         2. Material: Galvanized steel.
         3. Color: Steel.
         4. Perforated.
         5. Heel proof.
         6. ADA compliant.
         7. Dimensions:

Length: 24 inches.

Width: 6 inches.

Depth: 3/4 inch.

* + - * 1. Grate Openings: 1/4-inch-round holes.
        2. Open Surface Area per Foot: 8.75 square inches.
        3. Inlet Capacity per Foot: 23.34 gpm with 1/2 inch of head.
        4. Load: 1 to 60 psi. Pedestrian traffic only.
      1. Cast Iron Channel Grates:
         1. Part Number: DS-231.
         2. Material: Cast iron.
         3. Color: Black.
         4. ADA compliant.
         5. Dimensions:

Length: 24 inches.

Width: 6 inches.

Depth: 3/4 inch.

* + - * 1. Grate Openings: 5/16 inch by 4-11/16 inches.
        2. Open Surface Area per Foot: 20.85 square inches.
        3. Inlet Capacity per Foot: 63.78 gpm with 1/2 inch of head.
        4. Load: 326 to 575 psi. H-20 rated at speeds less than 20 mph.

Specifier Notes: Delete ductile iron frames if not required.

* + - * 1. Ductile Iron Frames:

Part Number: DS-200H.

Color: Black.

Load Rating: Class D.

* + - 1. Ductile Iron Channel Grates:
         1. Part Number: DS-232.
         2. Material: Ductile iron.
         3. Color: Black.
         4. ADA compliant.
         5. Dimensions:

Length: 24 inches.

Width: 6 inches.

Depth: 3/4 inch.

* + - * 1. Grate Openings: 5/16 inch by 4-11/16 inches.
        2. Open Surface Area per Foot: 20.85 square inches.
        3. Inlet Capacity per Foot: 63.78 gpm with 1/2 inch of head.
        4. Load: 326 to 575 psi. H-20 rated at speeds less than 20 mph.

Specifier Notes: Delete ductile iron frames if not required.

* + - * 1. Ductile Iron Frames:

Part Number: DS-200H.

Color: Black.

Load Rating: Class D.

* + - 1. Galvanized Steel Channel Grates:
         1. Part Number: DS-221.
         2. Material: Galvanized steel.
         3. Color: Steel.
         4. Dimensions:

Length: 24 inches.

Width: 6 inches.

Depth: 3/4 inch.

* + - * 1. Grate Openings: 3/4 inch by 4-7/16 inches.
        2. Open Surface Area per Foot: 23.09 square inches.
        3. Inlet Capacity per Foot: 70.64 gpm with 1/2 inch of head.
        4. Load: 176 to 325 psi. H-20 rated at speeds less than 20 mph.
    1. DECORATIVE CHANNEL GRATES

Specifier Notes: Specify required decorative channel grates. Delete grates not required.

* + - 1. Decorative Channel Grates:
         1. Part Number: DS-601.
         2. Pattern: Weave.
         3. Material: Ductile iron.

Specifier Notes: Specify powder coat color.

* + - * 1. Powder Coat Color: [Black] [White] [Silver] [Bronze] [Green] [Blue] [Orange] [Gray] [Brown].
        2. Heel proof.
        3. ADA compliant.
        4. Dimensions:

Length: 24 inches.

Width: 6 inches.

Depth: 3/4 inch.

* + - * 1. Grate Openings: 1/4 inch by 1 inch.
        2. Open Surface Area per Foot: 6.75 square inches.
        3. Inlet Capacity per Foot: 20.65 gpm with 1/2 inch of head.
        4. Load: 326 to 575 psi. H-20 rated at speeds less than 20 mph.
      1. Decorative Channel Grates:
         1. Part Number: DS-602.
         2. Pattern: Diamond.
         3. Material: Ductile iron.

Specifier Notes: Specify powder coat color.

* + - * 1. Powder Coat Color: [Black] [White] [Silver] [Bronze] [Green] [Blue] [Orange] [Gray] [Brown].
        2. Heel proof.
        3. ADA compliant.
        4. Dimensions:

Length: 24 inches.

Width: 6 inches.

Depth: 3/4 inch.

* + - * 1. Grate Openings: 1/4 inch by 0.75 inch.
        2. Open Surface Area per Foot: 9.55 square inches.
        3. Inlet Capacity per Foot: 29.21 gpm with 1/2 inch of head.
        4. Load: 326 to 575 psi. H-20 rated at speeds less than 20 mph.
      1. Decorative Channel Grates:
         1. Part Number: DS-603.
         2. Pattern: Tile.
         3. Material: Ductile iron.

Specifier Notes: Specify powder coat color.

* + - * 1. Powder Coat Color: [Black] [White] [Silver] [Bronze] [Green] [Blue] [Orange] [Gray] [Brown].
        2. Heel proof.
        3. ADA compliant.
        4. Dimensions:

Length: 24 inches.

Width: 6 inches.

Depth: 3/4 inch.

* + - * 1. Grate Openings: 1/4 inch by 0.9 inch.
        2. Open Surface Area per Foot: 7.95 square inches.
        3. Inlet Capacity per Foot: 24.32 gpm with 1/2 inch of head.
        4. Load: 326 to 575 psi. H-20 rated at speeds less than 20 mph.
      1. Decorative Channel Grates:
         1. Part Number: DS-604.
         2. Pattern: Brick.
         3. Material: Ductile iron.

Specifier Notes: Specify powder coat color.

* + - * 1. Powder Coat Color: [Black] [White] [Silver] [Bronze] [Green] [Blue] [Orange] [Gray] [Brown].
        2. Heel proof.
        3. ADA compliant.
        4. Dimensions:

Length: 24 inches.

Width: 6 inches.

Depth: 3/4 inch.

* + - * 1. Grate Openings: 1/4 inch by 1.38 inches.
        2. Open Surface Area per Foot: 11.35 square inches.
        3. Inlet Capacity per Foot: 34.72 gpm with 1/2 inch of head.
        4. Load: 326 to 575 psi. H-20 rated at speeds less than 20 mph.
      1. Decorative Channel Grates:
         1. Part Number: DS-609.
         2. Pattern: Slot.
         3. Material: Ductile iron.

Specifier Notes: Specify powder coat color.

* + - * 1. Powder Coat Color: [Black] [White] [Silver] [Bronze] [Green] [Blue] [Orange] [Gray] [Brown].
        2. Heel proof.
        3. ADA compliant.
        4. Dimensions:

Length: 24 inches.

Width: 6 inches.

Depth: 3/4 inch.

* + - * 1. Grate Openings: 1/4 inch by 2.40 inches.
        2. Open Surface Area per Foot: 16.75 square inches.
        3. Inlet Capacity per Foot: 51.24 gpm with 1/2 inch of head.
        4. Load: 326 to 575 psi. H-20 rated at speeds less than 20 mph.
    1. CATCH BASINS
       1. In-Line Catch Basins:
          1. Part Number: DS-340.
          2. Material: Polyethylene.
          3. Color: Gray.
          4. Dimensions:

Length: 24 inches.

Width: 6 inches.

Depth: 27 inches.

Outlet Depth: 16-7/8 inches.

* + - * 1. Fits all depth ranges of trench drain sections.
        2. Inlets: Sized as required to accept trench drain sections.
        3. Outlets: Both sides of basin.
        4. Universal adapter plug.
        5. Blank grate insert.
        6. Grate screws.
        7. Trash Bucket:

Material: Zinc-plated steel.

Fits inside catch basins.

Dimensions:

Length: 22 inches.

Height: 10 inches.

Bottom Width: 2 inches.

Metal Thickness: 0.04 inch.

Handle: For easy removal for cleaning.

* + 1. ACCESSORIES
       1. Blank Grate Inserts:
          1. Temporary use to keep concrete, sediment, and debris out of channel drains during installation of trench drain system.
          2. Recyclable.
  1. EXECUTION
     1. EXAMINATION
        1. Examine areas to receive trench drain system.
        2. Notify Architect of conditions that would adversely affect installation or subsequent use.
        3. Do not begin installation until unacceptable conditions are corrected.
     2. INSTALLATION
        1. Install trench drain system in accordance with manufacturer’s instructions at locations indicated on the Drawings.
        2. Excavate trenches to ensure proper thickness of concrete beneath and on both sides of channels are maintained and are in accordance with specified load rating.
        3. Install trench drain system to elevations and slopes indicated on the Drawings.
        4. Ensure directional flow arrows located on channels are pointing in direction of flow, toward catch basins and evacuation outlets.
        5. Install catch basins at elevations indicated on the Drawings.
        6. Apply silicon sealant to make joints watertight.
        7. Install temporary blank grate inserts to keep concrete, sediment, and debris out of channel drains during installation of trench drain system.
        8. Concrete:
           1. Place concrete beneath and on both sides of trench drain system in accordance with specified load rating and as indicated on the Drawings.

Specifier Notes: Specify minimum compressive strength of concrete.

* + - * 1. Concrete Minimum Compressive Strength: \_\_\_\_\_\_\_\_\_\_\_\_ psi at 28 days.
        2. Concrete shall be as specified in Section 03 30 00.
      1. Recess Top of Trench Drain System:
         1. Pedestrian Applications: 1/8 inch below concrete finish grade.
         2. Traffic-Bearing Applications: 1/4 inch below concrete finish grade.
      2. Allow concrete to cure to specified compressive strength.
      3. Ensure sediment and debris does not collect in trench drain system.
      4. Install channel grates in accordance with manufacturer’s instructions to meet load rating, using stainless steel screws with grate lock.
    1. ADJUSTING
       1. Remove and replace with new material, damaged components that cannot be successfully repaired, as determined by Architect.
    2. CLEANING
       1. Clean trench drain system of accumulated sediment and debris before final project completion.
    3. PROTECTION
       1. Protect Work of this Section to ensure that, except for normal weathering, Work will be without damage or deterioration at time of Substantial Completion.

END OF SECTION