

# ROADWAY BULLETIN

## NCDOT CONSTRUCTION UNIT



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### TRAFFIC BEARING DRAINAGE STRUCTURES

The use of traffic bearing masonry drainage structures is governed by the Roadway Design Manual, and the Drainage Summary in the plans will indicate where a traffic bearing drainage structure is required and what type of grate and frame is specified. These designations should always be confirmed in the field prior to construction. Temporary alignments, detours, or field adjustments may dictate a change from the original plan requirements.

Use traffic bearing drainage structures in the following locations:

- Within a travel lane, whether on a permanent, detour, or temporary alignment.
- Within 4 feet of a travel lane, unless:
  - The structure is a catch basin that stays entirely within the 2'-6" curb and gutter section, or only extends behind the curb, away from the travel lane, or
  - The inlet is inset into a raised median or concrete traffic island.

While both drop inlets and catch basins rest on drainage structures, drop inlets are more commonly installed in locations directly exposed to traffic, without the protection of curb and gutter, medians, or islands, and therefore more often require traffic bearing construction. Catch basins within the curb and gutter section typically do not require traffic bearing structures—unless a large pipe size, misalignment, or construction issue causes the structure to encroach beneath the travel lane side of the curb. In such cases, the structure must be traffic bearing.



The contractor or precast manufacturer may choose to offset the pipe toward the back of curb to avoid the structure encroaching into the roadway. If a non-traffic bearing structure ends up beneath the travel lane, corrective action will be required.

When a traffic bearing drop inlet is required:

- Use Std. No. 840.35 (conventional cast frame and grate) for typical applications.
- Use Std. No. 840.36 (steel frame) paired with Std. No. 840.37 (steel-pinned grate) when a steel frame is needed due to high traffic loading or other project-specific durability needs.

On controlled access projects where pedestrian traffic is not anticipated:

- Use steel frames and grates (Std. Nos. 840.36 and 840.37) for traffic-bearing drainage structures located within or immediately adjacent to the travel lanes.
- Use wide slot grates (Std. Nos. 840.20 and 840.22) for non-traffic-bearing drainage structures located outside of travel lanes.

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The Work Zone Traffic Control Unit or the Hydraulics Unit may also require the use of steel frames and grates in other locations due to factors such as high wheel loads, work zone phasing, or proximity to the travel way.

Grate type should also be selected based on pedestrian usage and roadway classification:

- Use narrow slot grates (Std. Nos. 840.24 and 840.29) where pedestrian traffic is anticipated. In temporary or transitional areas where both pedestrian and vehicle traffic are expected, steel frames and grates may be required.

For structures placed in shoulder berm gutter or expressway gutter, traffic bearing construction is required if the structure is located within 4 feet of the travel lane.

Finally, note that precast waffle boxes (Std. No. 840.45) are not considered traffic bearing and must not be used under traffic loads. Only solid wall precast boxes (Std. No. 840.46) are approved for use in traffic bearing conditions.

## USE OF WATER IN CONCRETE AND GROUT

Questions continue to arise regarding the use of river or creek water in concrete and grout production. As outlined in Section 1024-4 of the Standard Specifications, water must come from wells or public water systems suitable for drinking and must comply with the chemical and physical criteria shown in Table 1024-2.

- Wells used as water sources should be tested.
- In some coastal counties, even water from public systems may require verification.
- No exceptions to water source or testing requirements are permitted without express approval from the Engineer, following consultation with the Area Construction Engineer and the Materials and Tests Unit.

When in doubt, consult your Area Construction Engineer.

## MATERIAL & EQUIPMENT STORAGE NEAR THE TRAVEL WAY

Project limits and work areas don't often have an abundance of extra space, which can present challenges for storing materials and parking equipment. For the safety of the traveling public and to ensure that the flow of traffic is not hindered, the Department has specified certain offsets from active travel lanes based on the posted speed limit that materials and equipment must be while work is not in progress. The distance is reduced to 5 ft from concrete barrier or guardrail if these protection measures are in place. A recent Work Zone Safety Review identified a concern that these offsets were not being adhered to. Per 1101-8, when work is not in progress, keep all personnel, equipment, machinery, tools, construction debris, materials and supplies away from active travel lanes per Table 1101-1:



| Posted Speed Limit (mph) | Distance (ft) |
|--------------------------|---------------|
| 40 or less               | ≥ 18          |
| 45-50                    | ≥ 28          |
| 55                       | ≥ 32          |
| 60 or higher             | ≥ 40          |

When vehicles, equipment and materials are protected by concrete barrier or guardrail, they shall be offset at least 5 feet from the barrier or guardrail.



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