

Guidance for Determining Contract Times

The attached pages should be considered as general guidance for determining the contract time for a municipal construction project. NCDOT Central Letting Office uses these same guidelines in determining completion dates for their Raleigh let projects. Keep in mind that each project is unique and has its own set of criteria that should be considered. In many cases there are outside factors that must be taken in to account such school schedules and the like.

The NCDOT Division office can be an invaluable and necessary source of information in making final determination. Please contact them early on so as to avoid a conflict just prior to advertisement.

CONTRACT TIME COMMITTEE GUIDELINES FOR DETERMINING CONTRACT TIME

To calculate the contract time to be recommended to the Contract Time Committee, the number of work days must be determined. In estimating production rates and the number of work days required to do a certain phase of work, consideration is given to the following.

- Weather conditions for that area of the state
- Size of project in terms of quantities
- Number of projects in the area
- Availability of materials where material delivery time is the controlling operation
- Special construction features or sequences
- Degree of urgency of the proposed improvement as determined by the collective evaluation of management and those involved in planning, design, and construction
- Staging and handling of traffic
- "Time of year" restrictions for work that may be included in permits received from various agencies or included in Specification limits for temperature/seasonal limitations for paving, markings (paint, thermoplastic, polyurea, etc.)
- Heavy congested areas or seasonal traffic areas

Taking the above factors into consideration, a production rate is selected for each of the controlling operations. Using the production rate ranges below as a guide, production rates and overlapping operations are selected which reflect the consideration of the eight factors listed above. The total number of working days, thus computed, can be converted into a completion date by applying the following guides:

Allow 16 work days per calendar month for projects that are primarily of a type that the controlling operation would be delayed by wet weather or soil conditions. Allow 17 or 18 work days per calendar month for projects that are largely unaffected by wet weather or soil conditions or projects with an urgency for completion.

Additional contract time will be allowed delays caused by winter weather conditions. One, two, or three months additional contract time will be allowed for each winter period beginning December 15 for projects East of a line from Henderson to Charlotte. West of that line, three months additional contract time will be allowed for each winter period beginning December 15. Additional contract time allowed for winter working conditions may be reduced for projects or operations largely unaffected by winter weather conditions.

The maximum contract time for projects with "A+B" provision is determined on a nonaccelerated basis allowing the bidder to determine the most cost effective contract time.

Contract time for incentive payment is based upon higher production rates and will allow more than 16 days per calendar month.

Specification Limits to be Observed When Calculating Contract Time Periods

Statutes	Statutory legal load limits must be observed.
Clearing and Grubbing accumulated.	No more than 17 acres of exposed, erodible surface area may be accumulated.
Grading	<p>A. Truck hauled borrow is to be used when specified in special provisions.</p> <p>B. Unclassified Excavation must be exhausted prior to borrow being utilized.</p>
Structures	<p>A. Concrete cannot be placed when air temperature is below 35°F unless special measures are taken.</p> <p>B. Painting cannot be performed below 50°F.</p>
Pavement	<p>A. Cement stabilized base or soil cement base cannot be produced when air temperature is below 40° or between November 1 and the following March 15, and shall be covered by pavement by December 1.</p> <p>B. Prime coat cannot be placed when air temperature is below 40°F for plant mix and 50°F for AST.</p> <p>C. Tack coat cannot be placed when air temperature is below 35°F.</p> <p>D. Asphalt Pavement Limitations:</p>

<i>ACBC & ACIC</i>	35°F
<i>ACSC, Types S4.75A, SF9.5A, S9.5B</i>	40°F
<i>ACSC, Types S9.5C, S12.5C</i>	45°F
<i>ACSC, Types S9.5D, S12.5D</i>	50°F
<i>OGAFC</i>	None to be placed between October 31 and April 1
<i>AST</i>	None to be placed between October 15 and March 16 except where overlaid with plant mix
<i>Surface Course Final Layer</i>	None between December 15 and March 16 if greater than 1" or between November 15 and April 1 if less than 1".
<i>Ultrathin</i>	-/50°F None to be placed between October 31 and April 1

E. Portland Cement Pavement cannot be placed on frozen subgrade or base or when air temperature is 35°F and falling but can be placed when temperature is 35°F and rising.

F. Lime treated soil cannot be placed below 45°F or between November 1 and the following March 15 and shall be covered by pavement by December 1.

G. Pavement Markings:

Thermoplastic

50°F

East of I-95: December 15 to March 16

East of I-77 to & including I-95: November 30 to April 1

West of & including I-77: November 15 to April 16

Polyurea

40°F

Paint

40°F – 160°F

General Items to be Considered

The high production rates are not used except on very large and lengthy rural projects. Items of work which can be performed concurrently with work which is considered a controlling operation will be considered to overlap, and no working days will be assigned for such overlapping work. With the many and varied types of Contractors bidding on these projects, production anticipated is based on the average size Contractor. If production were based on the least productive Contractor, the time limits would be too lengthy.

When projects are sent to field inspection, one of the questions asked is that is the Division's recommendation on contract time. Taking this recommendation into consideration, each project is analyzed by Proposal and Contract Section personnel, and the Assistant Head of Bridge Design, and where appropriate, by the Roadway Project Engineer. The calculations are shown on the form entitled "Recommended Contract Time."

- (1) Nature or Scope of Project and Special Construction Features: Unique construction problems associated with maintaining traffic, long hauls, utilities, rock, and phasing of construction are all factors to be considered when assigning production rates.
- (2) Urgency: Where a special traffic hazard is being corrected and the need for speedy improvement warrants the additional cost, the contract time is calculated for the most efficient Contractor.

General Items to be Considered When Calculating Contract Time Periods for Resurfacing Projects:

Time restrictions for Lane Closures
Work Zone Traffic Control General Requirements
Shoulder Reconstruction/Construction (ASB, Shoulder Borrow, Handwork)
Erosion Control (seeding and mulching)
Milling (depth) and Mill + Filling requirements
Sidewalk and Handicap Ramps
Traffic signal & loops
Utility Adjustments
Number of Intersections

Resurfacing and Surfacing

Roadway Operation	Rate Per Working Day
Asphalt Concrete Base Course	300 to 600 tons/day
Asphalt Intermediate Course	500 to 1,000 tons/day
Asphalt Concrete Surface Course	0.6" to 1" – 500 to 800 tons/day 1" – 500 to 1,000 tons/day
Asphalt Base Course for Widening or Leveling	100 to 400 tons/day
Asphalt Surface Treatment (AST)	5,000 to 10,000 SY/day
Manhole and Water Valve Adjustments	8 to 10/day

**Grading & Paving Projects
(Grading Less Than 1,000,000 Cubic Yards)**

Roadway Operation	Rate Per Working Day
Clearing and Grubbing	1 to 8 acres/day, not to exceed 16 working days (grading will govern after 16 days)
Excavation (Unclassified Ditch, Undercut & Borrow)	2,000 to 6,000 CY/day
Aggregate Base Course	1,000 to 2,500 tons/day
Chemical Stabilized Subgrade and Base	Show overlaps with paving except 12 work days for placement and curing (see Seasonal Limitations), additional time may be required when performed in phases
Asphalt Surface Treatment	5,000 to 10,000 SY/day
Asphalt Pavement	300 to 2,000 tons/day
Concrete Pavement	3,000 to 5,000 SY/day (1,000 to 1,500 SY/day for ramps)
Fine Grading	Show overlaps except 4, additional time may be required due to phases
Pipe	100 to 300 LF/day
Curbs and Curb and Gutter	100 to 500 LF/day
Guardrail	300 to 500 LF/day straight, 50 to 100 LF/day shop curved, additional time allowed for excessive amount of anchors
Fencing	500 to 1,000 LF/day
Seeding and Mulching	1 to 3 acres/day, not to exceed 16 working days (most seeding is performed concurrently with grading)

**Major Urban and Rural Projects
(Grading in Excess of 1,000,000 Cubic Yards)**

Roadway Operation	Rate Per Working Day
Clearing and Grubbing	1 to 10 acres/day, not to exceed 16 working days (grading will govern after 16 days, may not be valid unless all grading can be done at once and burned)
Excavation (Unclassified Ditch, Undercut & Borrow)	6,000 to 8,000 CY/day (adjust for rock at rate of 500 to 2,000 CY/day, truck excavation and hauling restrictions)
Aggregate Base Course	1,000 to 2,500 tons/day on mainline, 500 to 1,200 tons/day on Y-Lines and ramps, additional time may be required when performed in phases
Chemical Stabilized Subgrade and Base	Show overlaps with paving except 12 work days for placement and curing (see Seasonal Limitations), additional time may be required when performed in phases
Asphalt Surface Treatment	5,000 to 10,000 SY/day
Asphalt Pavement	800 to 2,000 tons/day on mainline, less than 800 on ramps and Y-Lines, additional time may be required when performed in phases
Concrete Pavement	3,000 to 5,000 SY/day (for ramps, use 1,000 to 1,500 SY/day, plus 2 days each for turnout tapers on diamond interchange ramps – 2 days each ramp)
Fine Grading	Show overlaps except 4, additional time may be required due to phases
Pipe	100 to 300 LF/day
Curbs and Curb and Gutter	500 to 1,000 LF/day on ML 200 to 400 LF/day on –Y- Lines
Drainage Structures	20 to 50 each – show overlaps not to exceed 8, more than 50 each – show overlaps not to exceed 16

**Major Urban and Rural Projects
(Grading in Excess of 1,000,000 Cubic Yards) continued**

Roadway Operation	Rate Per Working Day
Guardrail	500 to 1,500 LF/day straight, 50 to 100 LF/day shop curved, additional time allowed for excessive amount of anchors
Fencing	1,000 to 2,000 LF/day (on most projects, fencing will overlap with grading time)
Seeding and Mulching	1 to 3 acres/day, not to exceed 16 working days (most overlaps with grading)

Small Rural Widening Projects

Roadway Operation	Rate Per Working Day
Clearing and Grubbing	1 acre/day
Excavation (Unclassified, Dr. Ditch, Undercut, Borrow)	200 to 400 CY/day
Aggregate Base Course	300 to 500 tons/day
Chemical Stabilized Subgrade and Base	Show overlaps with paving except 12 work days for placement and curing, additional time may be required when performed in phases (see Seasonal Limitations)
Asphalt Surface Treatment	5,000 to 10,000 SY/day
Asphalt Pavement	200 to 600 tons/day
Fine Grading	Show overlaps except 4, additional time may be required due to phases
Pipe	100 to 200 LF/day
Curbs and Curb and Gutter	100 to 300 LF/day
Guardrail	100 to 500 LF/day
Fencing	300 to 500 LF/day
Seeding and Mulching	1 to 2 acres/day, not to exceed 16 working days

**Small Urban Projects – Grading and Paving
(Widening and New Location)**

Roadway Operation	Rate Per Working Day
Clearing and Grubbing	1/4 to 1 acre/day
Excavation (Unclassified, Dr. Ditch, Undercut, Borrow)	100 to 500 CY/day
Aggregate Base Course	200 to 500 tons/day
Chemical Stabilized Subgrade and Base	Show overlaps with paving except 12 work days for placement and curing, additional time may be required when performed in phases (see Seasonal Limitations)
Soil Type Base Course	200 to 500 CY/day
Asphalt Surface Treatment	2,000 to 5,000 SY/day
Asphalt Pavement	200 to 500 tons/day
Fine Grading	Show overlaps except 4, additional time may be required due to phases
Pipe	50 to 200 LF/day
Curbs and Curb and Gutter	100 to 300 LF/day
Guardrail	50 to 300 LF/day
Fencing	300 to 500 LF/day
Seeding and Mulching	1 to 2 acres/day

Paving Projects

Roadway Operation	Rate Per Working Day
Fine Grading	500 to 1,000 LF/day, show overlap except 8 for each phase
Aggregate Base Course	1,000 to 2,500 tons/day on mainline, if total quantity is over 40,000 tons, 500 to 1,200 tons/day on Y-lines and ramps
Chemical Stabilized Subgrade and Base	Show overlaps with paving except 12 work days for placement and curing, additional time may be required when performed in phases (see Seasonal Limitations)
Soil Type Base Course	2,000 to 3,000 tons/day
Bituminous Surface Treatment	5,000 to 10,000 SY/day
Asphalt Pavement	800 to 2,000 tons/day on mainline, less than 800 on ramps and Y-Lines
Concrete Pavement	3,000 to 5,000 SY/day (for ramps, use 1,000 to 1,500 SY/day, plus 2 days each for turnout tapers on diamond interchange ramps – 2 days each ramp)
Shoulder Construction	500 to 1,000 CY/day
Curbs and Curb and Gutter	500 to 1,000 LF/day
Guardrail	500 to 1,500 LF/, additional time allowed for excessive amount of anchors
Seeding and Mulching	1 to 3 acres/day, not to exceed 16 working days

NCDOT Working Days Guidelines for Structure Construction

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Operation

Days / Production Rate

Bridge Construction:

Temporary Detour Bridge

48 calendar days should be allowed for design, submittal, review and approval of temporary bridge plans. Only apply these if the detour is the controlling operation. Do not include this 48 days in the computed time to construct the bridge.
10 days for construction of the first span, on average.
7 days for construction of each additional span.

Bridge Demolition/Removal
Per Span

1 day for timber structures.
2 days for concrete decking on steel or prestress concrete girders.
4-5 days for concrete deck girders.

Unclassified Structure
Excavation

500 CY per day. This is typically a concurrent operation.

Temporary Access
Construction and Removal
Per Phase - 1000 SF or less

2 days for a causeway.
6 days for a work bridge.
May be concurrent with other operations. Consult with BCE for larger access areas.

Drilled Piers $\leq 60''$ in diameter

2 days for setup and preparation for the first pier in each stage.
25' per day if drilling in soil.
5' per day if drilling not in soil.
2 piers per day for steel and concrete placement.

Drilled Piers $> 60''$ in diameter

2 days for setup and preparation for the first pier in each stage.
18' per day if drilling in soil.
3' per day if drilling not in soil.
2 piers per day for steel and concrete placement.

Drilled Pier - Slurry Construction

3 days for setup and preparation for the first pier in each stage.
Follow drilling rates above, depending on diameter.
2 days per pier for slurry management, steel and concrete placement.

Footing Excavation -
2 Column Bent

1 day in soil.
5 days in rock.
10 days if cofferdam in water.

Piles - End Bent, Interior Bent,
or Pile Cluster (6-10 piles)

3 days for concrete piles.
2 days for steel H-piles.
3 days for steel pipe piles, includes pipe plugs.

	<p>1 day for each PDA. Add 1 day per bent or per cluster if the piles are steel and over 40'.</p>
Test Piles	<p>1 day per bridge for an average job. 2 days for assessment and design. 8 days to cast (2), cure (5), and haul (1). May be a concurrent operation.</p>
Sheeting	<p>640 SF per day. Includes driving and extracting.</p>
Form/Pour Footings	<p>2 days per footing. More time required for large footings or pile footings in water.</p>
Form/Pour Columns	<p>2 days per 2 column bent. Add 1 day if > 25' in height. 4 days for oval, hammer head columns.</p>
Form/Pour Caps	<p>4 days for caps ≤ 40' wide. Includes back wall/wings on end bents. 10 days for hammer head. 5 days curing. Applies to last cap only, typically a concurrent operation. 1 day per bridge, for epoxy coating the tops of caps at expansion joints, if applicable.</p>
Slope Protection	<p>2 days for rip-rap on avg. per structure. 4 days min. for concrete per structure. Allows for 2 days per end bent for alternate bay construction. May vary widely - dependent on the shape and the proximity/depth in water. Increase for wider bridges.</p>
Placing Girders	<p>1 day to first span for prep time. 1 day per span for precast concrete girders. 2 days per span for rolled beams. 3 days per span for steel girders ≤ 6' deep. 4 days per span for steel girders > 6' deep. This includes time for girder splices and diaphragm installation. Increase time for wide bridges. Consider adding 1 day per span over traffic, depending on restrictions.</p>
Cored Slabs/Box Beams	<p>1 day per span to place. 3 days per span to post-tension, grout shear keys, dowels, and PT block-outs. Curing of grout typically concurrent with work on an adjacent span or approach slab construction.</p>
Deck Forming per Span (Assumed 85' - 90' typical span)	<p>5 days per simple span on precast concrete girders or steel beams. 7 days for continuous steel girder or precast concrete girders. Add 1 day for concrete diaphragms.</p>

	Applies to most bridges regardless of width due to overhang work controlling.
Deck Pour, Curing, Stripping	9 days for the first pour. Includes time for setting up the screed, dry runs, curing and stripping forms. Add 4 days for bridges with integral end bents. 7 days for each additional pour, to allow concrete to reach minimum strength before the next pour.
Concrete Overlays for Cored Slab or Box Beam Spans	8 days for 1 to 4 spans. For bridges with more than 4 spans, use 2 days for each additional span.
Approach Slabs	8 days per slab for 25' approach slabs. 7 days per slab for 12' approach slabs. Includes installation of Reinforced Bridge Approach Fill or Sub-regional Tier Bridge Approach Fill, and curing time. Some of this work is likely concurrent with other operations, or deck curing times.
Expansion Joints	2 days per elastomeric concrete joint with foam seals. 3 days per expansion joint seal. Includes water test. 3 days per modular expansion joint.
Barrier Rails and Concrete Parapet	500 LF per day if slip-formed. 100 LF per day if formed and poured. 25 LF per day if classic or other special rail, formed and poured. Includes placing reinforcing steel.
Metal Bar Rails	1 day per span for 1 or 2 bar metal rails. 2 days per span for 3 bar rails.
Sidewalk and Median Island	3 days per span for sidewalk. 2 days per span for median island.
Grooving Deck	3 spans per day on a 2 lane bridge.
Erosion Control	2 days for installation of EC devices for bridge replacements over stream crossings.
Utility Systems and Closed Drainage Systems	1 day per 100 LF of bridge.
Rideability Testing and Corrective Work	5 days allowance on avg. Required for bridges over 1500 ft. in length. Occasionally required in Contracts for bridges shorter than 1500 ft. Must be completed prior to joint construction, where it may keep joints from being concurrent with other work.
Railroad Bridge Adjustments	Construction of an Overpass (Over the RR) - Add 50% to time associated with bridge demolition and girder erection. Add 10% to all other operations that take place within the RR R/W, including but not limited to substructure and bridge deck work.

Construction of an Underpass (RR over Road) - **Add 50%** for substructure and superstructure, which includes waterproofing and drainage systems.

RR Detour (typical track underpass)

25 days (10 days grading, 3 days ballast, 12 days for fine grading ballast, ties, turnouts, and track). **15 days** additional when trestle is required.

Bridge Deck Rehabilitation:

Concrete Milling

2000 SY per day.

Hydrodemolition

400 SY per day. May be concurrent with milling as work can begin after milling progresses ahead of the operation.

Latex Modified Concrete Overlay

375 SY per day.

Class II Patching

20 SY per day. May be concurrent with LMC setup or other operations.

Cure patches

5 days. May be concurrent with other operations.

Cure overlay

5 days.

Very Early Strength LMC

1 lane of 1 span, per day. Includes milling, hydro-demolition, VES LMC, cure, and open to traffic.

Other Bridge Rehabilitation:

Shotcrete

125 CF per 5 days (500 SF) (Includes removal of unsound concrete, surface prep, placement, shaping, and curing.

Epoxy Injection

50 LF per day

Painting Structural Steel

2 days per span for avg. length and width of roadway (1 day per 2 beams). Includes cleaning, touch-up, and up to 3 coats. Additional time will be needed for removal of existing paint and time reduced if shop painting is required.

Culverts:

Excavation

5 days for a single barrel RCBC up to 70 ft., based on an excavation rate of 200 CY per day. Varies depending on site conditions and the amount of excavation required, presence of rock and need for diversion channel. Time includes placement of foundation conditioning material.

Forming	<p>2 days for wing footing and bottom slab for single barrel culvert. 2 days for walls in a single barrel culvert. 2 days for top slab in a single barrel culvert. 50% increase for double barrel culvert. 100% increase for triple barrel culvert. 150% increase for quadruple barrel culvert. All based on 70 ft. length. If the culvert is to be constructed in stages, apply times to each stage.</p>
Placing Concrete	<p>1 day for each culvert component listed above in each phase. Increase by 1 day for each additional barrel. If the culvert is to be constructed in stages, apply times to each stage.</p>
Cure, Strip, Backfill	<p>10 days after final concrete pour on any single or multi-barrel culvert up to 70 ft. Apply to each stage.</p>
Culvert Extensions	<p>Add 2 days to the above times to remove the existing wings and install dowels.</p>
Precast Culverts	<p>1 unit per day for casting. 5 days for curing, added to the last unit cast. 1-3 units per day delivered to the project, may be concurrent with casting and curing. 1 unit every 45 minutes to set in place.</p>
Walls:	
Retained Earth Walls	<p>800 SF per day average. Varies according to geometry of the wall and shape of the panels. Generally 400 - 1200 SF per day.</p>
Soil Nail Wall	<p>10 nails per day. Includes grouting of nails and shotcrete. 3 days additional to form and pour 100 LF of cast in place (fascia) wall. 1 day additional when form liners are required.</p>
Pile Panel Sound Barrier Wall	<p>10 holes per day for drilling. Reduce to 5 if rock is expected. 10 holes per day to set piles and pour concrete. May be concurrent with drilling. 32 panels per day, set in place.</p>
Reinforced Earth Wall	<p>200 CY per day for excavation. 2 days for the initial section to prepare the bed. 2 days to pour the pad. 5 days to cure the pad. 500 SF per day to place panels. 200 LF per day for coping.</p>

Guidelines for Applying Concurrent Operations

- Start with bridge removal, unclassified structure excavation and foundations. Sometimes a portion of the existing bridge will be removed to allow foundation work to proceed concurrently with bridge removal.
- If drilled piers are required, they control the project until complete. However, for multiple bent bridges, column and cap work will progress concurrently with the drilled piers.
- For longer structures, girder or cored slab erection may begin as substructure work advances.
- If access is provided outside the bridge, approach fills and end bent construction will also begin. If access is not provided, end bent construction will not be concurrent and will not start until interior bents are constructed and girders or cored slabs are erected.
- For cast-in-place decks:
 - Once the beams are erected, overhang construction and decking will take place concurrently, followed by reinforcing steel layout. The screed assembly and set up will take place concurrently with these operations.
 - A 7 day wet cure is required and is included in deck pour time, but will not keep subsequent approach slab work from progressing.
 - For dual bridges, many times the bridges will be constructed in a manner that decks will be cast concurrently so that waiting time is minimized. However, if grading work is controlling, there may be more advantage to complete one structure to allow access to other areas of the project.
- Approach slabs can begin as soon as an end span has been cast or cored slabs erected. Typically, approach slab work will start during the deck-curing period. If top down construction, approach slabs are not typically started until all cored slabs are erected. If cored slabs have a concrete overlay the approach slab cannot begin until after the overlay has been cast.
- After approach slabs are constructed, the remaining bridge work, such as barrier rail, joints, and grooving, are typically concurrent with roadway operations.
- Waiting periods on end bent embankment fills should be considered when determining workdays.
- In stream moratoriums should be considered when determining working days.