TO:

MAIN OFFICE

ENGINEERING INSTRUCTION

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

SUBJECT: Structure Check List

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APPROVED:

R. M. Kamp

Deputy Chief Engineer (Structures)

The attached check list is to be used for reviewing structure plans prepared by the various design groups.

One of these check lists is to be completed by the Bridge Design Unit Supervisor (Project Engineer), not the Project Co-ordinator, for the work done under his supervision.

The check list is to accompany the final tracings when they are presented to the Plan Review Unit Supervisor.

In the memorandum to the Plan Review Unit Supervisor, the subject should include the Project Identification Number, the Bridge Identification Number, the complete job description and the county. This memorandum should be signed.

This check list can be used by the drafting and design personnel when preparing a set of detail plans to prevent the need of adding details and notes once a sheet has been completed.

Additional copies of this check list may be obtained from the Bridge Design Section Supervisor.

MEMORANDUM
DEPARTMENT OF TRANSPORTATION

DATE

JECT

FROM _____, Project Engineer

TO Review Unit Supervisor

I have completed the check list for the review of the plans, specifications and estimate on the above noted project. The special specifications are in accordance with the plans and the estimate of quantities table on the plans agree with the Engineer's Estimate.

In addition, FHWA Form 475 is enclosed.

BD 129-1a (1/74)

STRUCTURE CHECK LIST

GENERAL

If a curved highway is involved, a schematic layout should be shown somewhere and should include the following:

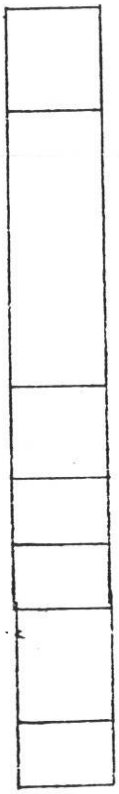
- ℄ bearings of abutments with stations and azimuths.
- ℄ piers with stations and azimuths.
- ℄ shown.
- Station line shown with azimuths of tangents.

Estimate of quantities table showing neat and proposal quantities and a column for final quantities.

Location Map (Scale 1" = 24000' usually).

Index to drawings.

Breakdown of neat quantities for the different types of steel for the structural steel item should be shown somewhere, preferably on the same sheet as the estimate of quantities table.



LAYOUT SHEET

(PLAN - Scale 1"=20'-0" usually)

Show bridge begins and ends stations.

Reinforced concrete approach slab shown.

Skew angle structure makes with road, stream or track below.

Label station line and TGL line.

Base line shown. Show coordinates.

Borings plotted and number indicated.

North Arrow

Equality stations for intersection of road above and road, stream or track below.

No contours on final plans.

Show limits of all slopes.

Location of point at which minimum vertical clearance occurs.

Horizontal clearances to be checked with Geometric Design Policy.

Horizontal clearances to piers.

Check for 30'-0" minimum horizontal clearance to abutments and piers when required.

Show elevation of top of stone filling at streams.

Show by stations and item numbers limits of stone filling parallel to stream and roadway.

Show spur dikes if necessary (Make sure compatible with highway plans).

Show lane, shoulder and mall width for approaches.

Show location of lighting posts.

Show sign location if supported on structure.

Approach drainage shown correctly.

Plot existing substructure and superstructure from existing plans or field survey and show items for their removal.

Show guiderail location (posts need not be shown).

Show utilities on the structure.

Show scupper location (Type and Item).

Existing topography should be shown.

Indicate traffic direction on track or highway (→ to Syracuse).

Show direction of stream flow.

Show span lengths.

Show hydraulic data (Review signed bridge data sheet).

Show highway pavement ends and begins stations at ends of reinforced concrete approach pavement.

Show 3'-0" minimum berm.

Show ℄ pier stations.

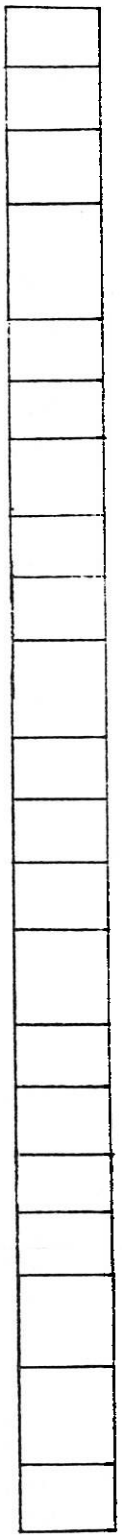
Alignment and curve data for road above.

Alignment and curve data for road, stream or track below.

Show limits of dry block paving for highway grade separations.

Show limits of item for select granular fill, slope protection at RR crossings.

Show limits of stone fill for stream crossings.



LAYOUT SHEET

(ELEVATION - Scale 1"=10'-0" usually)

Show section of under roadway.

Label T.G.L. and station line of under roadway.

Show cross slopes of under roadway.

Show actual minimum horizontal clearance (show guide rail, where required.)

Label expansion and fixed bearings (piers and abutments.)

Locate and indicate actual minimum vertical clearance over travel lane or useable shoulder (clearance must be shown for highway and railroad, if over both.)

Architectural treatment on U-walls shown and noted.

Remove all water elevations, except for canal structures.

Show navigation lights, where required.

Show railing and label.

Show slopes of embankment.

Show track dimensions if railroad is involved.

Show stream section if stream is involved.

If clearance from ℄ track to face of pier is less than 20'-0", provide a crash wall (6'-0" above top of rail) in accordance with AREA specifications.

Show bottom of footing elevations on earth or piles.

Show piles, type and item, if required.

Show approximate existing ground line and assumed rock surface (Rock, if shown, should be indicated under borings only).

Show finished ground line.

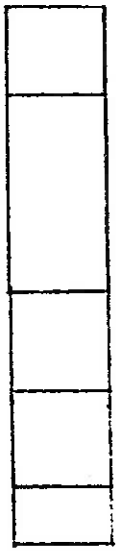
Show guide rail at mall piers and abutments, if required.

A longitudinal section (Scale 1"=10'-0" usually) shall be shown if it will clarify the plans. If a longitudinal section is shown, some of the items listed to be shown on the elevation view can be shown on the longitudinal section instead.

Show top of footing elevations on rock and minimum depth of footing.

Locate and indicate actual freeboard above design water elevation.

Show datum elevation line.



LAYOUT SHEET

(BRIDGE SECTION - Scale 1"=10'-0" usually)

Show railing or parapet and pay item.

Show curb type and pay item.

Show slab depth and item.

Show studs if required.

Show prestressed beams and item.

Show stringers and stringer spacing.

Show median width and railing or barrier.

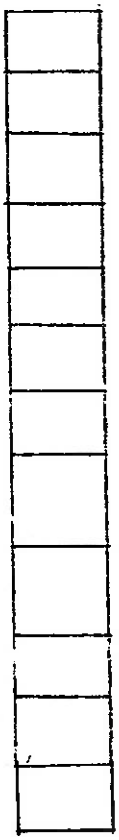
Show widths of pavement and sidewalks and show cross slopes.

Show dimension from ℄ fascia stringer to edge of slab.

Label T.G.L. and station line.

Show utilities and conduits.

Indicate configuration of top of pier.



LAYOUT SHEET

(APPROACH SECTION - Scale 1"=10'-0" usually)

Show pavement widths, sidewalks and cross slopes.

Show shoulder widths.

Show median widths and railing.

Show guide rail and dimensions.

Label T.G.L. and station line.

Show Appropriate ditch details.

Show embankment or cut slope.

LAYOUT SHEET

(PROFILES - Scale Horiz. 1"=20'-0" usually)
Vert. 1"=10'-0" usually)

Station ordinate line.

Length of vertical curves.

PVI Station, elevation, middle ordinate and sight distance, if required.

Show ordinate for ℄ of improvement and intersecting station.

Show grade lines and percentage of grades for under road, over road, track and stream, as required.

EXCAVATION AND EMBANKMENT SHEET

Show excavation and embankment details and payment lines.

Show stations of ℄ bearings of abutment in plan.

Embankment notes.

Indicate location and item of settlement platforms (included in highway estimate).

Show limits of temporary sheeting, designed sheeting and cofferdam items.

NOTE SHEET

General notes.

Substructure notes.

Superstructure notes.

Prestress concrete notes, if required.

Conservation notes, if required.

Foundation notes (refer to foundation design report).

Notes for special requirements.

Note for seeding of bridge embankments to be included in highway estimate.

Railroad maintenance note, if required.

Construction procedure for unusual conditions.

Note for removing existing substructure and superstructure and item number for their removal.

Maintenance table or description of maintenance responsibility (important on EGC and RR Law projects.)

ABUTMENT SHEET

GENERAL

Concrete pour and reinforcement breakdown.

Joint and keyway details, if not shown elsewhere.

Pile splice detail, if not shown elsewhere.

Detail of reinforced tip for steel bearing piles, if not shown elsewhere.

Pile reinforcement details, if not shown elsewhere.

Show plan of corners of abutment.

Show reinforcement corner plan.

No. 8 bars at 6" centers in bridge seat of high abutments.

Show backwall reinforcement plan.

Show pedestal reinforcement plan.

Plan of sidewalk overlays, showing reinforcement.

Check length of anchorage for bars in tension.

Cross-sections of walls and abutments, showing dimensions, reinforcement and piles, if required.

In abutment cross-section indicate point at which bridge begins and ends.

Label curb type and item.

Note concerning allowable bearing pressures, if required.

Allowable Load on piles.

Estimated length of test piles.

Information for piles.

If split faced block masonry is proposed for a structure, the colors and percentages should be indicated (colors and percentages can be obtained from R. Dillon).

ABUTMENT SHEET

(PLAN)

North Arrow

Station line and station at ℄ bearings.

Abutment properly dimensioned and tied down to ℄ bearings and station line.

Expansion, contraction or construction joints shown and tied down to working line.

Azimuth of ℄ bearings.

Azimuth of local tangent, if on curve.

Skew angle

Azimuths of girders or angle girders make with ℄ bearings.

If expansion joint in wall, there should be one in footing.

Anchor bolt location, description, dimensions, size and length of embedment and Item.

Show stringer spacing and tie down one to working line.

Label waterstops.

Show perforated pipe and outlets (pipe terminates 5'-0" from end of wall).

Show ℄ of railing anchorage and post location.

Label pours.

ABUTMENT SHEET

(ELEVATION)

Show perforated pipe (slope 1%) and elevation of outlet.

Show footing, pedestal, U-wall and backwall elevations.

Expansion, contraction or construction joints shown.

If expansion joint in wall, there should be one in footing.

Show sleeves for utilities and label item.

Label waterstops.

Label concrete pours and items.

Elevation of high point of backwall or header and tied down to working line.

ABUTMENT SHEET

PILE LAYOUT

North Arrow

Tie down to ℄ bearings and station line.

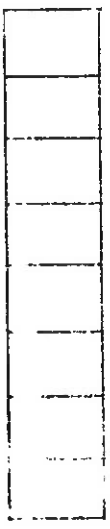
Show batter on piles.

Show location of test piles.

Number Piles.

Item Number.

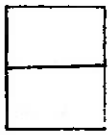
Pile load test.



ABUTMENT SHEET

FOOTING BAR PLAN

Show reinforcement top and bottom of footing.



Show covers to reinforcement or explain by note.
(Actual covers should be shown.)(Omit word "minimum".)

PIER SHEET

GENERAL

Show reinforcement of pedestal in plan and section (section should show depth of embedment of vertical bars).

Show wash on end elevation of pier cap.

Concrete pour and reinforcement breakdown.

Positive reinforcement in cap to be straight.

Footing bar reinforcement plans shown and actual covers shown or noted. (Omit word minimum)

Keyway details shown, if not elsewhere.

All ties should be continuous.

Show pier cap reinforcement detail and sections.

Show column reinforcement detail and sections.

Length of anchorage should be checked for bars in tension.

Pier nosing if required.

#8 bars at 6" centers in top of solid piers.

For simple spans provide #6 bars at 9" centers in the pedestal and placed perpendicular to the pier.

Note concerning allowable bearing pressures, if required.

Allowable load on piles.

Estimated length of piles.

Estimated length of test piles.

Information for piles.

PIER SHEET

PLAN

North Arrow

Station line and station at ℄ pier shown.

Pier properly dimensioned and tied down to ℄ bearings and station line.

Azimuth of ℄ pier.

Local tangent azimuth and station and angle between local tangent and ℄ pier.

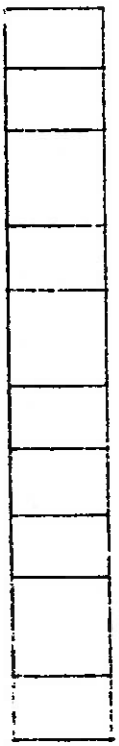
Azimuths of girders or angle made with ℄ pier.

Offset from local tangent to stringer.

Show stringer spacing along ℄ bearings.

Anchor bolt location, description, size, length and embedment into masonry and item number.

℄ bearings dimensioned from ℄ pier.



PIER SHEET

ELEVATION

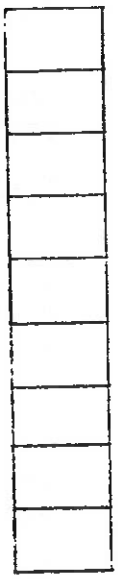
Show dimensions and elevations of cap, columns and footings.

The column reinforcement is usually shown on this detail.

Denote batter if applicable.

PIER SHEET

PILE LAYOUT



North Arrow

Tie down to ℄ pier and station line.

Show batter on piles.

Show location of test piles.

Number piles.

Item Number.

Pile load test.

SUPERSTRUCTURE SHEET

GENERAL

Show fascia detail.

Note, indicating substitution of welds for high strength bolts.

Table for bottom of slab elevations.

Show haunch detail, indicating distance from top of web of girders or top of flange of rolled beams to bottom of slab.

Details or notes showing how stiffener and connection plates are attached to girders.

Camber table shown(Include vertical curve if required).

Special steel notes for different types of steels.

Bearing details if not shown elsewhere.

With prestressed beams, Neoprene bearing top sole plate shall be beveled.

Railing layout in plan, if not shown elsewhere, and tied down.

Details showing taper of bottom flange to fit bearings.

Show slab reinforcement plan.

Size and type of welds shown.

Table of moments and shears given at tenth points for continuous girders.

Plan of typical sidewalk reinforcement.

Cross section of slab at pier and abutments.

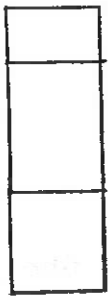
Detail of reinforcement in approach slab.

Breakdown of concrete and reinforcement in approach slabs.

Maximum moments and reactions for simple spans.

Check to see if fascias line up on structures of multiple spans. (Constant depth of fascia is required unless variable depth approved in preliminary.)

Breakdown of concrete and reinforcement in superstructure slab.



SUPERSTRUCTURE SHEET

TRANSVERSE SECTION

Show dimensions of widths of pavement, etc.

Show dimension from face of rail to edge of fascia.

Show stringers and stringer spacing.

Show dimension from ℄ fascia stringer to edge of slab.

Show diaphragms or cross frames and label.

Top of end diaphragm, follow slope of pavement and show distance from top of slab to diaphragm.

Top of solid intermediate diaphragms should be level.

Label type and item of curb unless shown elsewhere.

Show sketch of stay-in-place forms, showing one inch cover from bottom of reinforcement to top of corrugations of the form, where SIP forms are to be used.

Show bottom lateral gusset plate if required.

Show slopes of pavement cross section.

Tie down dimension of high point of pavement.

Show conduits and utilities.

Label T.G.L. and station line.

Show and label shear connectors.

Show reinforcement and label.

Label thickness and item of slab.

Show cover from top and bottom of slab.

SUPERSTRUCTURE SHEET

STEEL LAYOUT

Plan tied down to ℄ bearings at abutments, ℄ of pier and station line.

Skew angles at abutments and piers shown.

Station line shown.

Spacing of stringers along ℄ of bearings of abutments and ℄ of piers shown.

Stations of ℄ bearings at abutments and ℄ piers.

Diaphragms labelled and spacing shown.

Check to see if diaphragms are placed correctly (whether skewed or perpendicular).

Azimuth of girders shown.

If curved highway, azimuths of abutments and piers.

Spacing of stiffeners shown.

Check to see if bottom lateral system required.

Label fixed and expansion bearings.

1/2" minimum thickness of bent connection plates.

Indicate 1/2 stiffener spacing at ℄ bearings.

SUPERSTRUCTURE SHEET

GIRDER ELEVATION

Thicknesses, lengths and widths of flanges given with type of steel.

Size of web labelled and type of steel.

Shear connector spacing given.

Groove weld shown for spliced flanges.

On simple spans bottom of bearing stiffeners to be groove welded or milled to bear.

On curved girders bottom of bearing stiffeners to be groove welded.

Ratio of flange thicknesses at splices shall not exceed 2 to 1.

Termination of weld detail on rolled beam with cover plates.

Limits of flanges in tension under dead load on continuous girders.

SUPERSTRUCTURE SHEET

SLAB REINFORCEMENT

Indicate bars in slab, sidewalk, at scuppers and at light poles if required.

Tie down and dimension as needed.

Show detail at construction joint in slab.

MISCELLANEOUS SHEET

MISCELLANEOUS DETAILS THAT MAY BE REQUIRED IF NOT SHOWN ELSEWHERE

Scupper details.

Bearing details.

Abutment and pier joint details.

Pile reinforcement details.

End of stone fill details for stream bridges.

Stud shear connector details.

Conduit Expansion joint details.

Waterstop details.

Light pole anchor bolts.

Wingwall, approach and superstructure curb details.

Superstructure joint details.

Navigation light details.

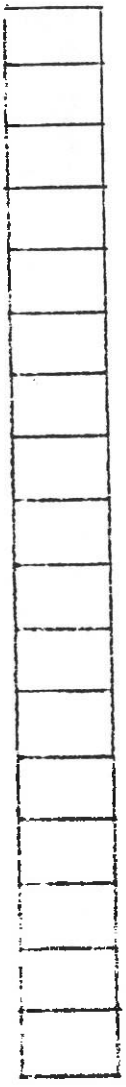
Pile tip detail.

Pile splice details.

Handrail detail.

Detail of tapered flange.

Stone masonry details.



PROPOSAL

When submitting a project for a P.S.& E., four sets of prints and five copies each of the special specifications, Engineer's Estimate and the special bridge notes should be forwarded with the original plans.

This material should be presented to the Plan Review Unit of the Structures Subdivision (Russ Parker) at the time for the P.S.& E.