17. Evaluation of Existing Pipeline Structures.

a. General.

1) Evaluate the impact on existing structures of any alteration of existing loading or dimensions, the effect of relocation or upgrading of roads, and the strength and existing condition of the structure.

b. Analysis.

1) Review the affected structures using the as-built drawings and by researching the available contract documents and correspondence contained on microfilm or in original construction files, which are available through the WSSC. Check by analysis for surcharge loading, H20 traffic loading, and other appropriate structural loads applicable to the structure as indicated in Part Three, Section 16 (Design of Pipeline Structures). Also, provide analysis using the same criteria for any contemplated rehabilitation. If available, check Standard Details in effect at the time the structure was built (for example, manhole wall thickness for deep manholes).

c. Procedure.

1) Provide primary evaluation of the condition of the structure by visual inspection, if accessible. If existing structure appears to be structurally strained due to evidence of cracks, uneven settlement or corrosion of structural elements, evaluate each element separately for the proposed loading. Evaluate sewerage structures for infiltration, see Part Two, Section 11 (Design of Structures) and consult with WSSC.

d. Guidelines and References for Evaluating Existing Structures.

1) Abbreviations for References.

AASHTO	American Association of State Highway and Transportation Officials.
ACI	American Concrete Institute.
AREA	American Railway Engineering Association.
AWS	American Welding Society.

2) Concrete Structures.

a) ACI 318, Chapter 20, "Strength evaluation of existing structures."

b) ACI 201.1R-68 (revised 1984), "Guide for making a condition survey of concrete in service."

c) ACI 201.3R-86, "Guide for making a condition survey of concrete pavements."

d) ACI 210R-87, "Erosion of concrete in hydraulic structures."

e) ACI 207.3R-79 (revised 1985), "Practices for evaluation of concrete in existing massive structures for service conditions."

f) Secondary References.

(1) AREA, Chapter 8-21-85, "Inspection of concrete and masonry structures."

(2) Asphalt Institute, Technical Bulletins TB1, TB2, TB3 and TB4, "Asphalt overlays over concrete."

(3) Department of the Army, US Army Corps of Engineers, Engineering Manual No. 1110-2-2002, "Engineering and Design - Evaluation and Repair of Concrete Structures."

3) Steel and Metal Elements.

a) Evaluate existing structural members under actual field conditions.

b) Evaluate welded joints by visual inspection, unless other methods are necessary.

c) Strength evaluation in conformance with appropriate standards indicated in Part Three, Section 16 (Design of Pipeline Structures).

4) Plastics and Wood.

a) Replace deteriorated elements.

5) Other References.

a) ASCE, "Guidelines for structural condition assessment of existing buildings."

b) US Army Corps of Engineers, "The REMR (repair, evaluation, maintenance, rehabilitation) Notebook."

c) AWS Welding Handbook.

d) Federal Standards:

(1) TM-5-818-5, "Pavement evaluation for frost condition."

(2) BSS-58, "State of the art of structural test methods for walls, floors, roofs and complete buildings", November 1974.

(3) Technical Note 1247, "Review of non-destructive evaluation methods applicable construction materials and structures", June 1988.

e. Evaluation of Structural Components.

1) Structural evaluation for vaults to include, but not limited to the following: walls-concrete/masonry, bottom slab, top slab, structural beams and seating, ladder rungs, manhole covers and hatches, lifting hooks, and pipe supports.

2) Structural evaluation for manholes to include, but not limited to the following: walls, manhole frame and cover, ladder and manhole steps, pipe connections, benches, joints and brick mortar.

3) Structural evaluation for tunnels to include, but not limited to the following: bulkheads, access manholes, casing pipes (RCP and Steel) and liner plates.