

## 20. Geotechnical and Corrosion Submittals.

### a. General.

- 1) This section lists the geotechnical and corrosion submittals that are required to be submitted with the contract drawings. The geotechnical information will not only be for the design, but will also assist the contractor to plan for his construction operation.

### b. First Submittal.

- 1) Plans showing the pipeline alignment and location of the proposed soil borings.
  - a) Follow the general requirements set forth in Appendix "E", (Subsurface Investigation Requirements for Water and Sewer Design and Construction) for the depth and location of the proposed soil borings.
  - b) Existing soil boring information can be used as part of the required soil borings, if it is in accordance with Appendix "E" and represents the existing ground conditions.
  - c) Soil borings are generally required for special thrust blocking design (for fittings, pipe, valves, etc.) and at structure locations (valves, manholes, etc.).
  - d) Follow the requirements presented in Part Three, Section 26, (Tunnel Design Criteria) and Appendix "F", (Soil Investigation Required for Soft Ground Tunnel Projects) for the depth and number of soil borings required for tunnel/casing crossings.
- 2) Thrust Restraint Schedule, Form "A". This form summarizes the thrust restraint requirements for the contract. Complete and submit the form for each project/design contract; a blank and example Form "A" are included in this section.
- 3) Corrosion Survey Checklist. This form is a preliminary survey to evaluate and determine if corrosion control measures are necessary, see Part Three, Section 28 (Corrosion Control), for the form and submittal requirements.

### c. Second Submittal.

- 1) Soil Data and Soil Report Requirements.
  - a) Pipelines less than 16-inch diameter. Submit the soil data in accordance with the requirements of Appendix "E" (Subsurface Investigation Requirements for Water and Sewer Design and Construction).
  - b) Pipelines 16-inch and larger diameter or when the site conditions show metastable, very loose, loose, very soft or soft soils; Petroleum Odor; Fill; Brick; Bituminous Concrete; Wood; Roots; Trace Organics; Oily Smell; Serpentine Rock; Organic Odors; Charcoal Pieces; or high groundwater. Submit a Soil Report bound in a suitable cover, which includes the soil data in accordance with Appendix "E" and discussion of the following issues: geologic setting; discussion and analysis of the data; evaluation of the design alternatives; design parameters such as friction angle; feasibility of deep cuts or excessive fills; discussion of potential construction problems; conclusions and recommendations for the pipeline construction; and limitations of the investigation.



- c) Tunnel crossings. For conditions and submittal requirements for the Tunnel Geotechnical Report, see Part Three, Section 26 (Tunnel Design Criteria).
- 2) Thrust Restraint Calculations. Following the completion of the soil borings, submit the completed Thrust Restraint Schedule, Form "A" and calculations for all special thrust blocking or restrained joint pipe according to the requirements and design examples in Part Three, Section 27 (Thrust Restraint Design for Buried Piping).
- 3) Corrosion Documentation, Form "B". This form is a follow-up to the Corrosion Survey Checklist, it summarizes the results of the field soil and groundwater testing, stray current testing, and identifies the method of corrosion control, see Part Three, Section 28 (Corrosion Control), for this form and requirements.



**FORM "A"**

SHEET \_\_\_\_ OF

**THRUST RESTRAINT SCHEDULE**

PROJECT NAME \_\_\_\_\_ CONTRACT NO. \_\_\_\_\_ DATE \_\_\_\_\_

| Location |             | Fitting   |      | Soil Parameters                    |                 |            | Restraint System Type |                                                                  |                                            | Block Design   |                            |
|----------|-------------|-----------|------|------------------------------------|-----------------|------------|-----------------------|------------------------------------------------------------------|--------------------------------------------|----------------|----------------------------|
| Station  | Street Name | Pipe Dia. | Type | $\gamma$<br>(lbs/ft <sup>3</sup> ) | $\phi$<br>(deg) | Depth<br>▼ | Thrust Block<br>(√)   | Restrained Joints<br>(Indicate Type and<br>WSSC Standard Detail) | Combined System<br>Block/Restrained<br>(√) | Special<br>(√) | WSSC<br>Standard<br>Detail |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |
|          |             |           |      |                                    |                 |            |                       |                                                                  |                                            |                |                            |

*Note: Submit all calculations for all special thrust blocking or restrained joint pipe.*



**SAMPLE FORM "A"**

SHEET 1 OF 1

**THRUST RESTRAINT SCHEDULE**

PROJECT NAME Kings Village CONTRACT NO. 95AW/AS0000A DATE 00/00/95

| Location |                  | Fitting   |                                        | Soil Parameters                    |                 |            | Restraint System Type |                                                                  |                                            | Block Design   |                               |
|----------|------------------|-----------|----------------------------------------|------------------------------------|-----------------|------------|-----------------------|------------------------------------------------------------------|--------------------------------------------|----------------|-------------------------------|
| Station  | Street Name      | Pipe Dia. | Type                                   | $\gamma$<br>(lbs/ft <sup>3</sup> ) | $\phi$<br>(deg) | Depth<br>▼ | Thrust Block<br>(√)   | Restrained Joints<br>(Indicate Type and<br>WSSC Standard Detail) | Combined System<br>Block/Restrained<br>(√) | Special<br>(√) | WSSC<br>Standard<br>Detail    |
| 0+00     | Crown Gate Road  | 8"        | 8"x 8" T                               | 120                                | 30              | Dry        | √                     |                                                                  |                                            |                | B/1.3                         |
| 2+16     | " "              | 8"        | 1/16 HB                                | 120                                | 30              | Dry        | √                     |                                                                  |                                            |                | B/1.0 &<br>B/1.0a             |
| 7+56     | " "              | 8"        | 1/16 HB                                | 120                                | 32              | 2'         | √                     |                                                                  |                                            |                | Modified<br>B/1.0 &<br>B/1.0a |
| 7+89     | " "              | 8"        | 1/16 HB                                | 120                                | 32              | Dry        | √                     |                                                                  |                                            |                | B/3.2                         |
| 8+36     | " "              | 8"        | 8"x 4" R                               | 120                                | 32              | Dry        |                       | Megalugs B/2.7                                                   |                                            |                |                               |
| 1+51     | Stone Gate Court | 6"        | 10"x 6" T                              | 120                                | 32              | Dry        |                       | Megalugs B/2.7                                                   | √                                          |                | B/3.1                         |
| 2+74     | " "              | 24"       | 1/8 HB                                 | 120                                | 32              | Dry        |                       |                                                                  |                                            | √              |                               |
| 0+00     | Kings Terrace    | 12"       | 1/16 LVB                               | 120                                | 30              | Dry        | √                     |                                                                  |                                            |                | B/1.8                         |
| 0+92     | " "              | 6"        | Cap                                    | 120                                | 32              | Dry        | √                     |                                                                  |                                            |                | B/1.4                         |
| 2+87     | " "              | 12"       | 1/8 HB w/12°34'17"<br>vert. defl. (up) | 120                                | 32              | Dry        |                       | Megalugs B/2.7                                                   | √                                          |                | B/3.3                         |
| 2+98     | " "              | 12"       | 1/8 HB w/12°34'17"<br>vert. defl. (dn) | 120                                | 32              | Dry        |                       | Megalugs B/2.7                                                   | √                                          |                | B/3.3                         |
| 3+50     | " "              | 12"       | 1/16 UVB                               | 120                                | 32              | 3'         | √                     |                                                                  |                                            | √              | Modified<br>B/1.7             |

