Project 0-1264, Corrosion Protection of Cable-Stay Systems [Presentation Slides]

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TxDOT Research Project 0-1264

"Corrosion Protection for Post-Tension Tendons and Cable Stay Systems"

Sponsoring Agency: Texas Department of Transportation

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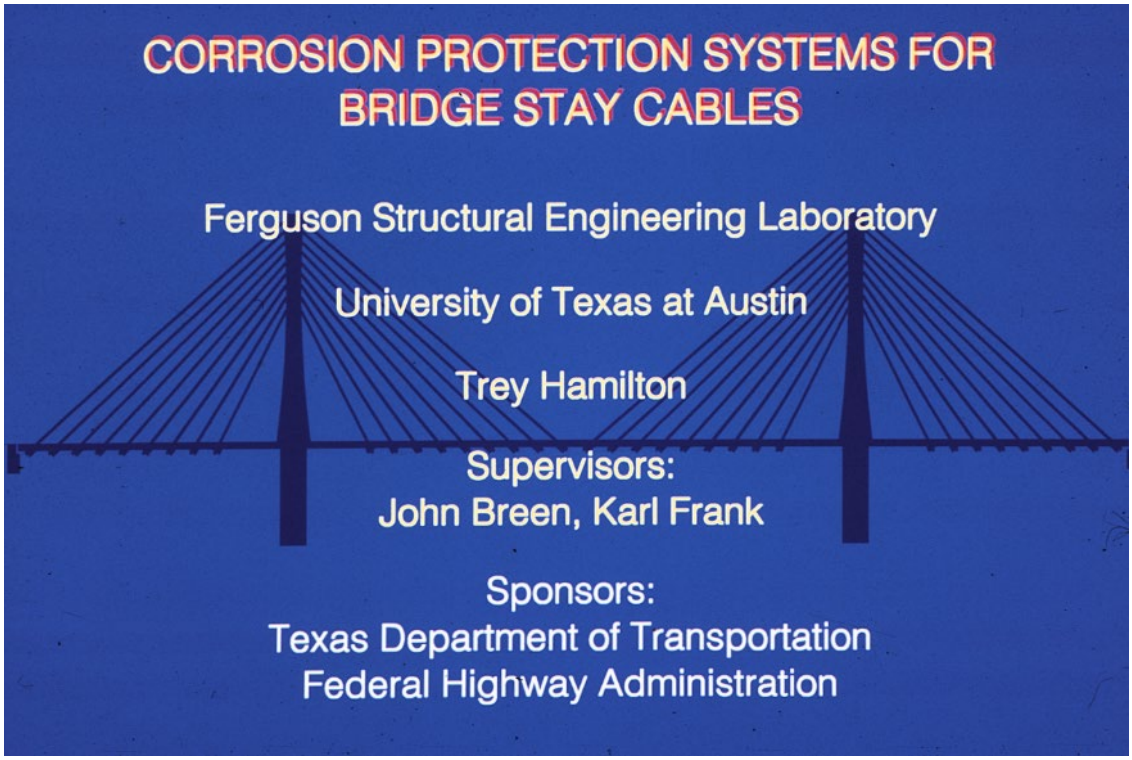

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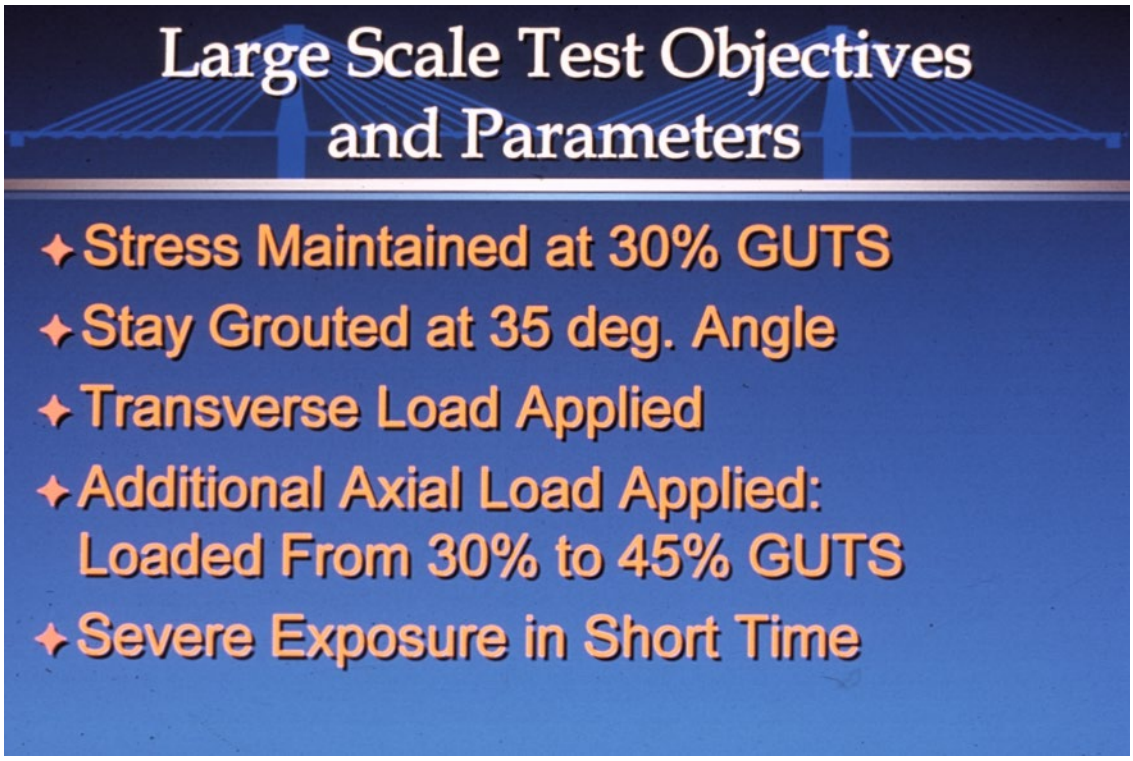

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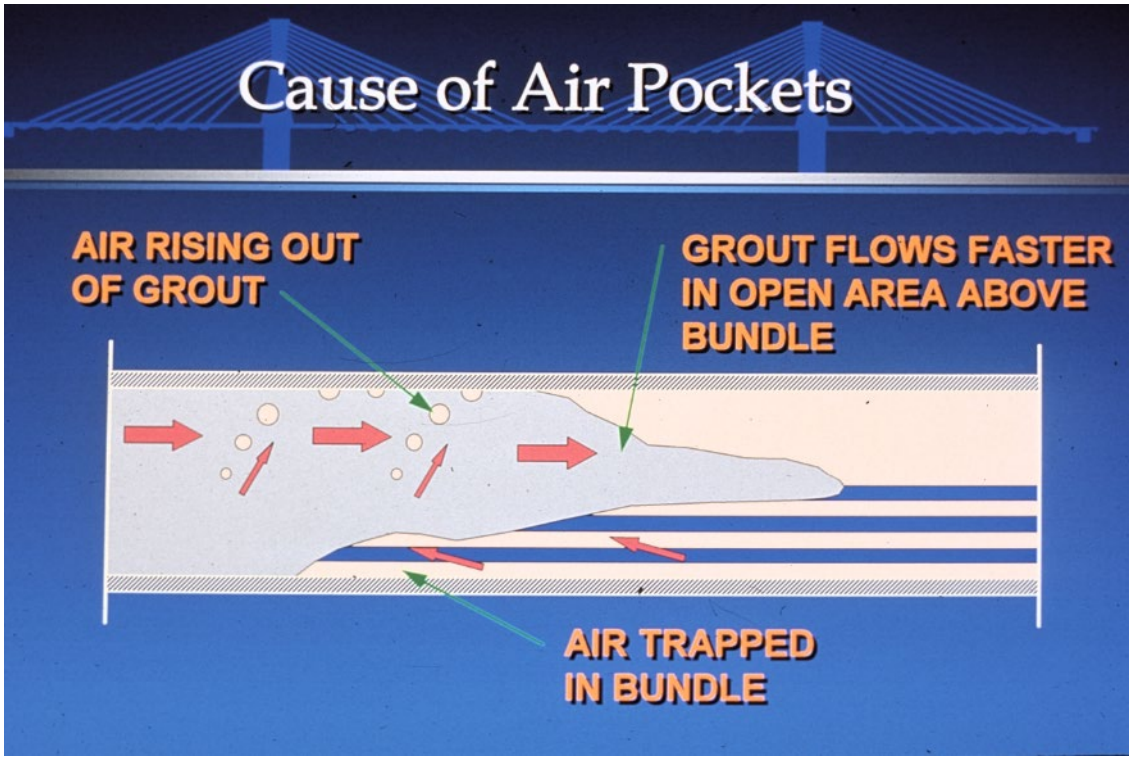

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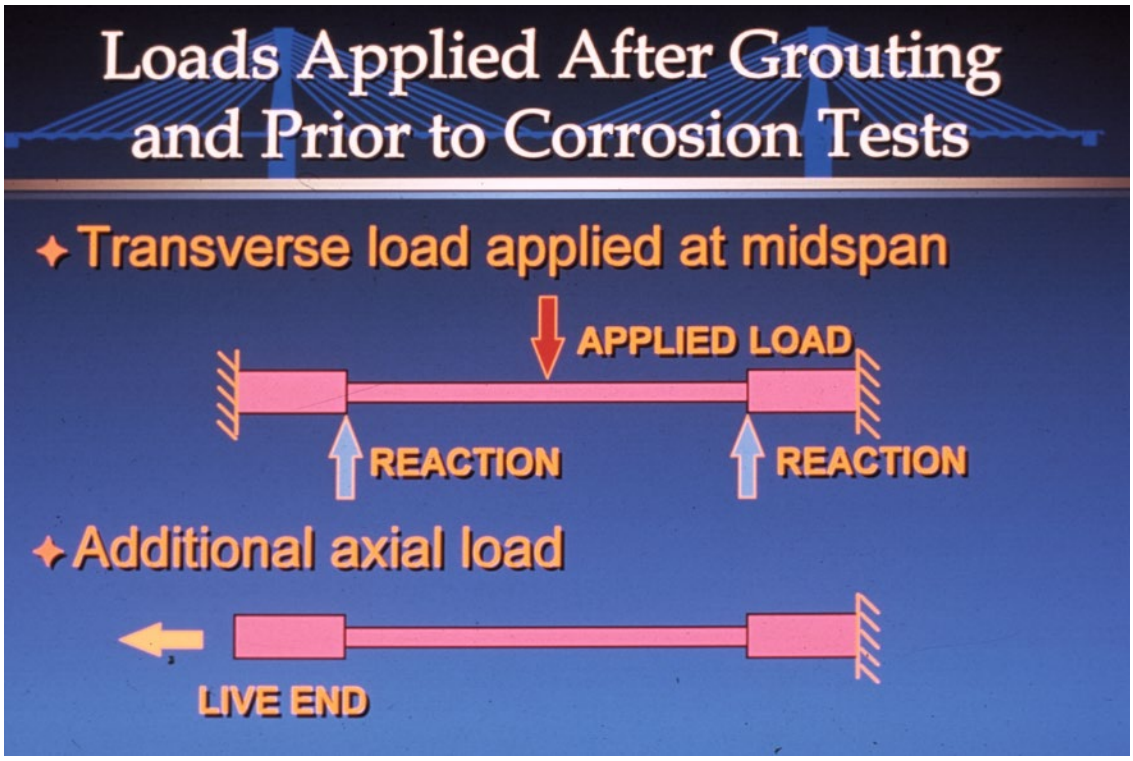

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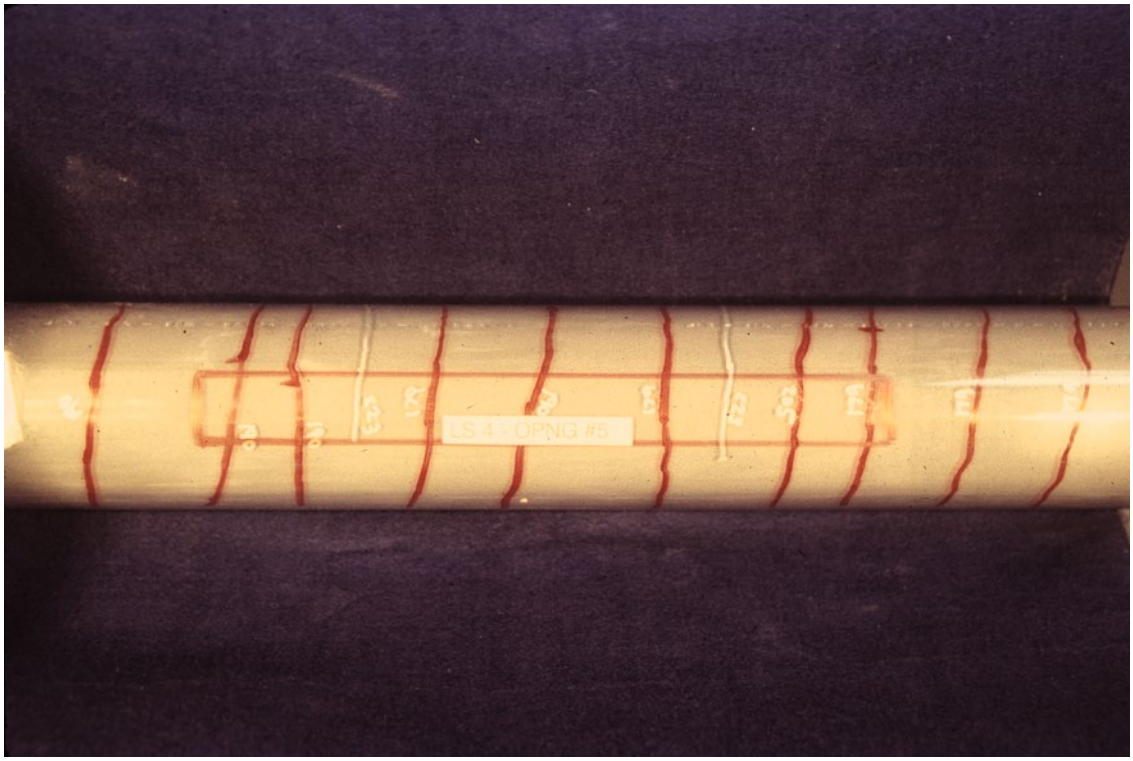

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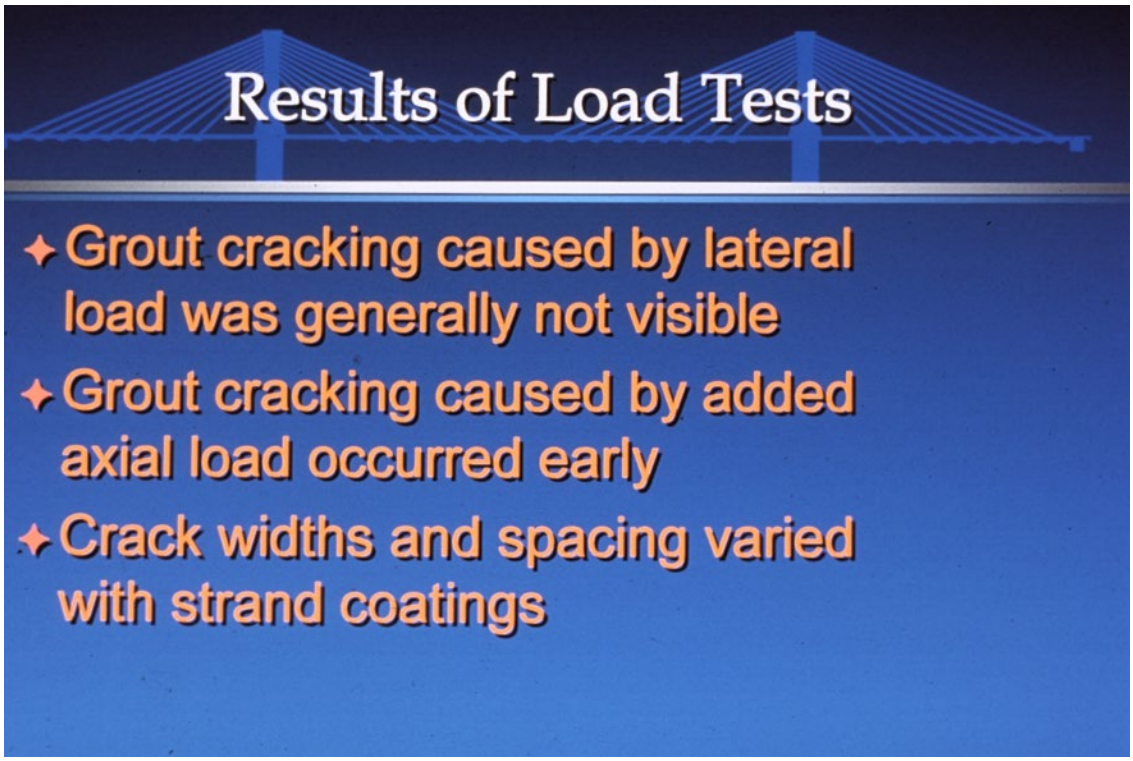

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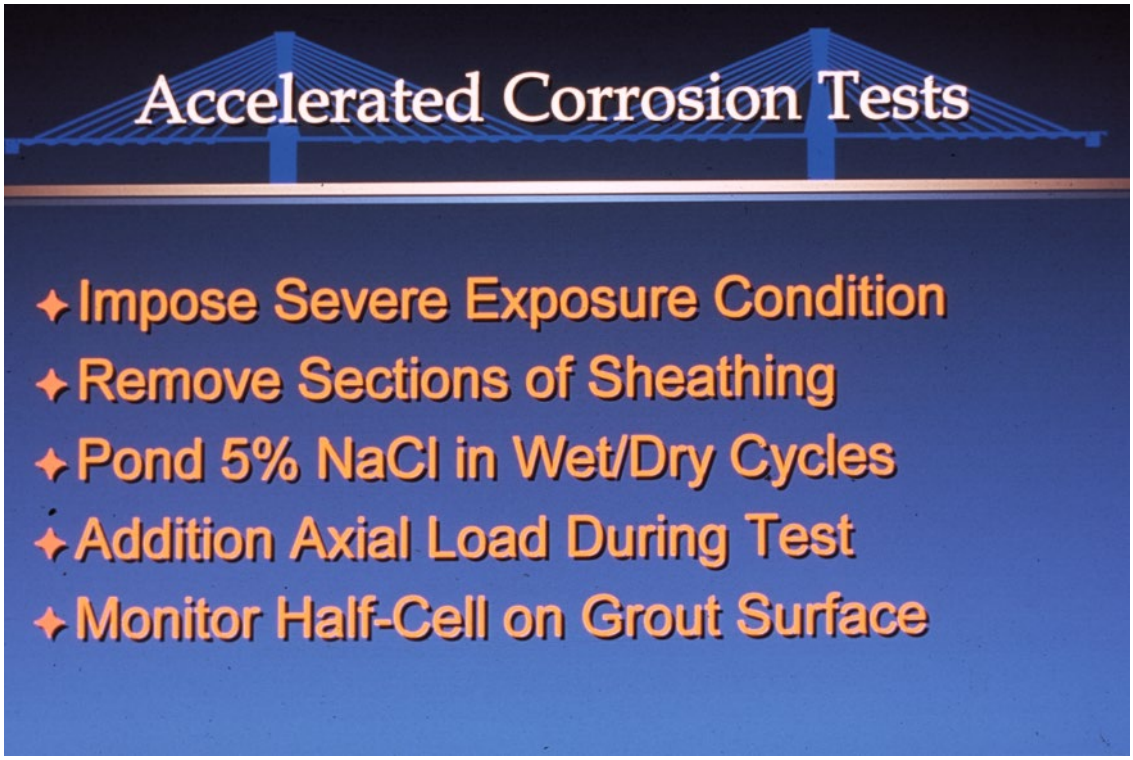

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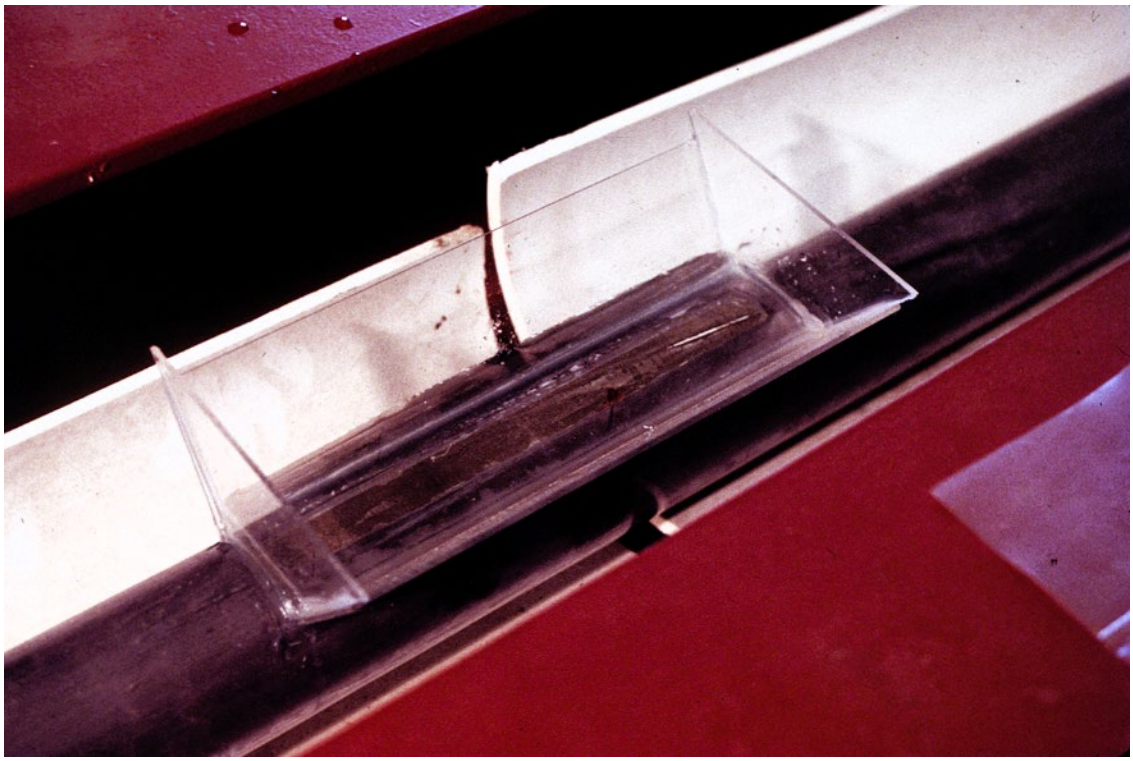

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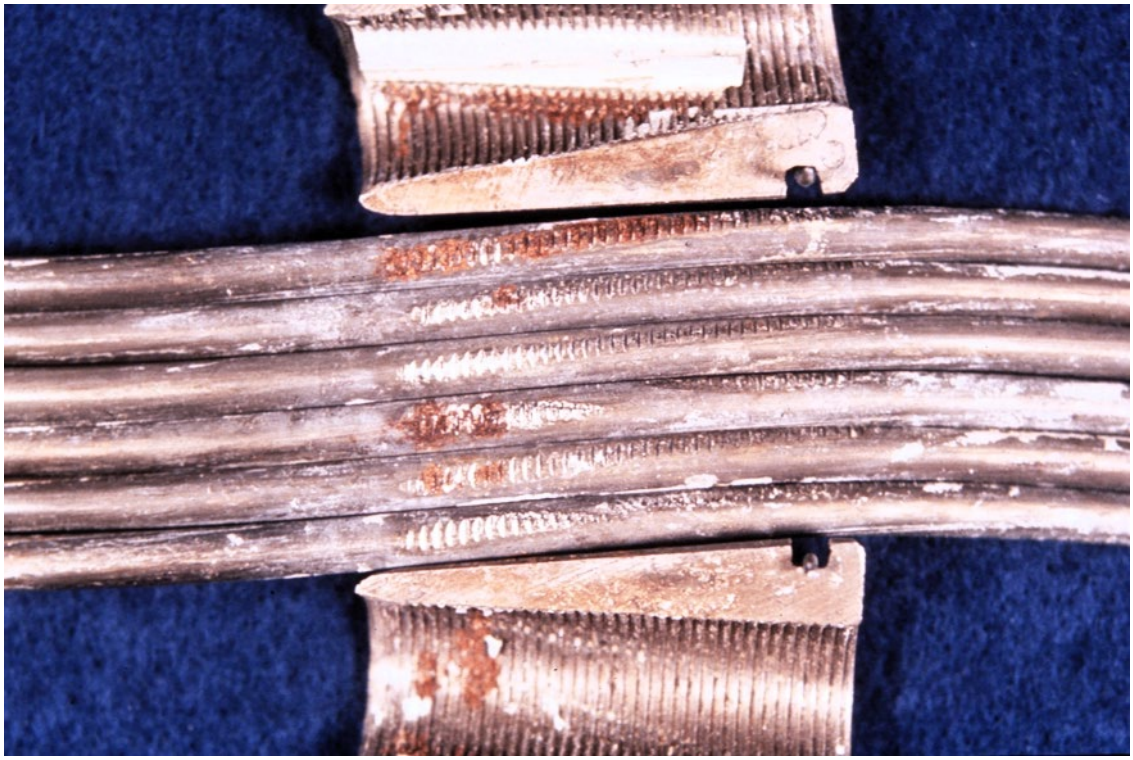

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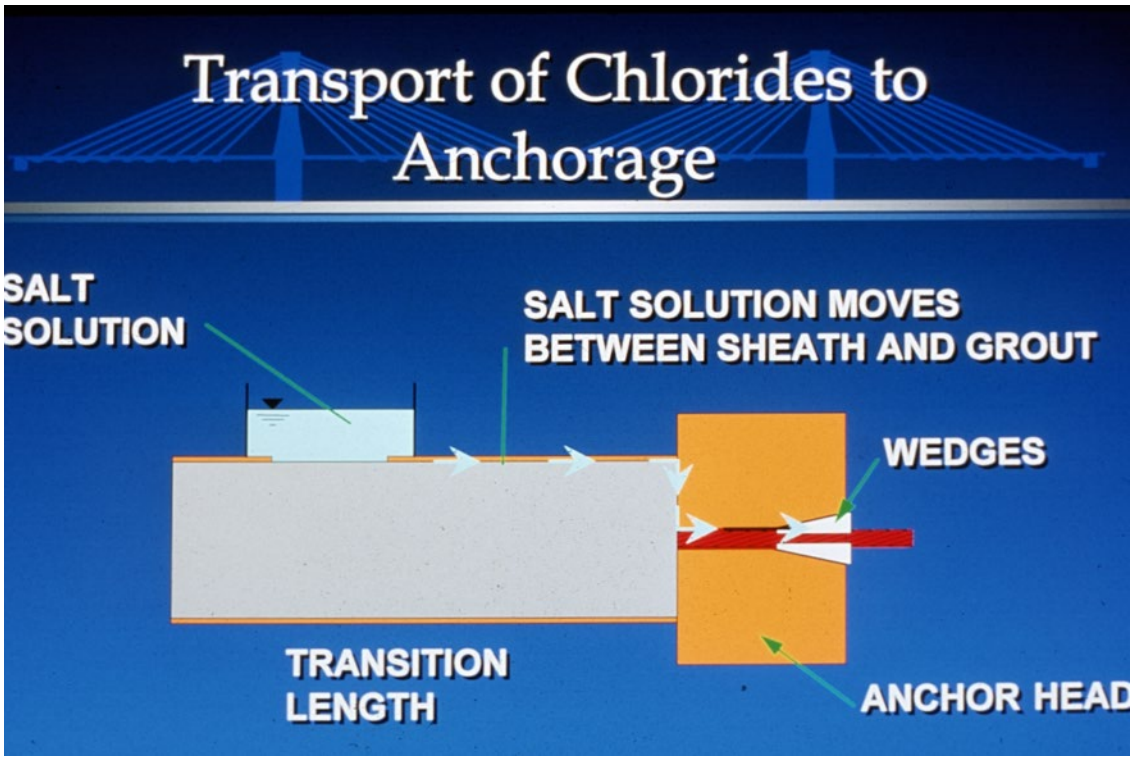

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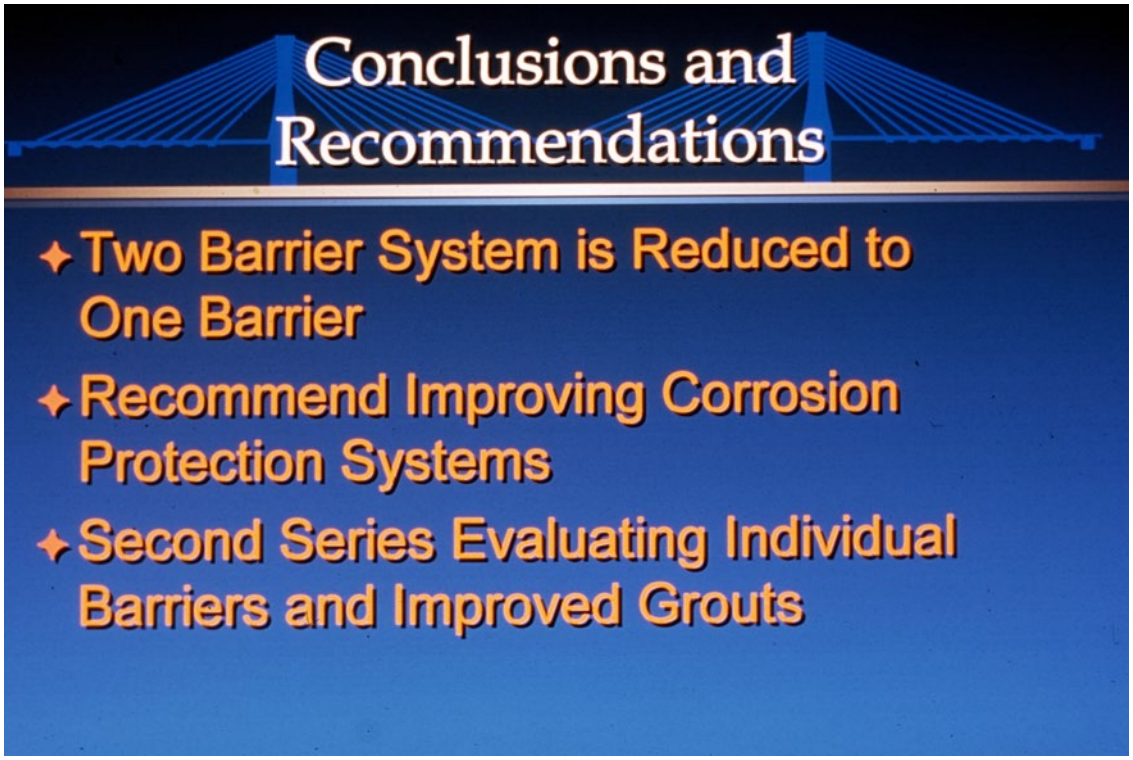

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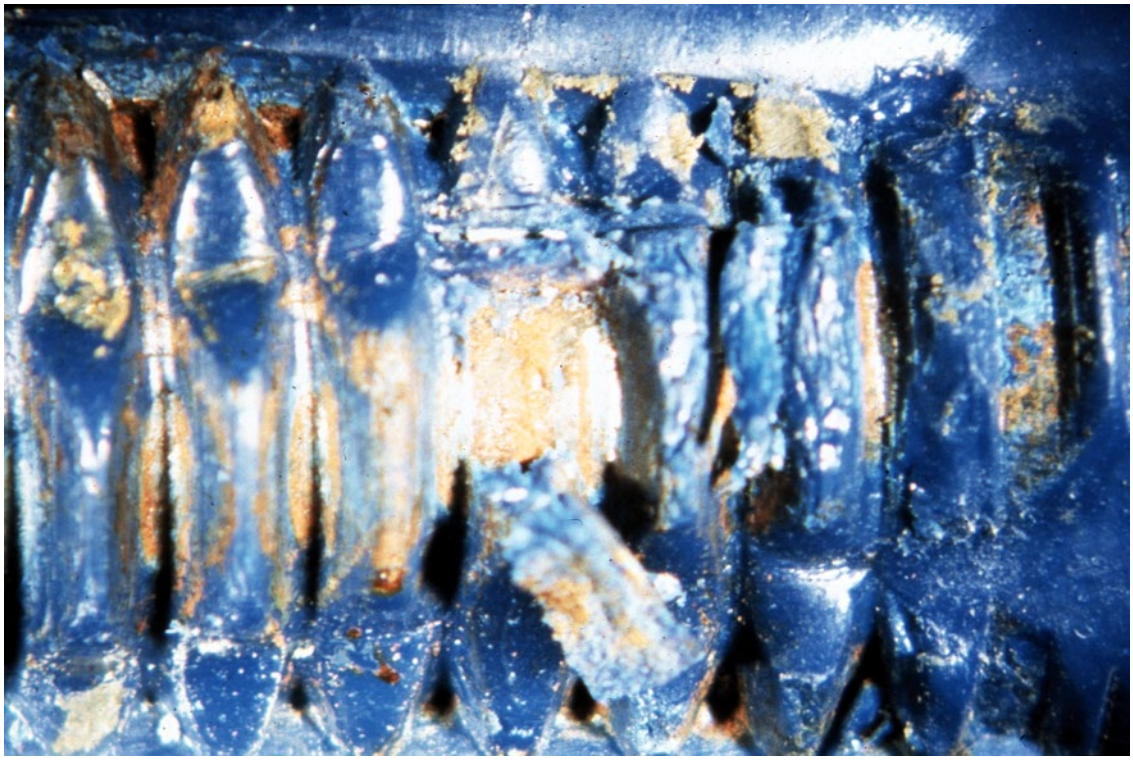

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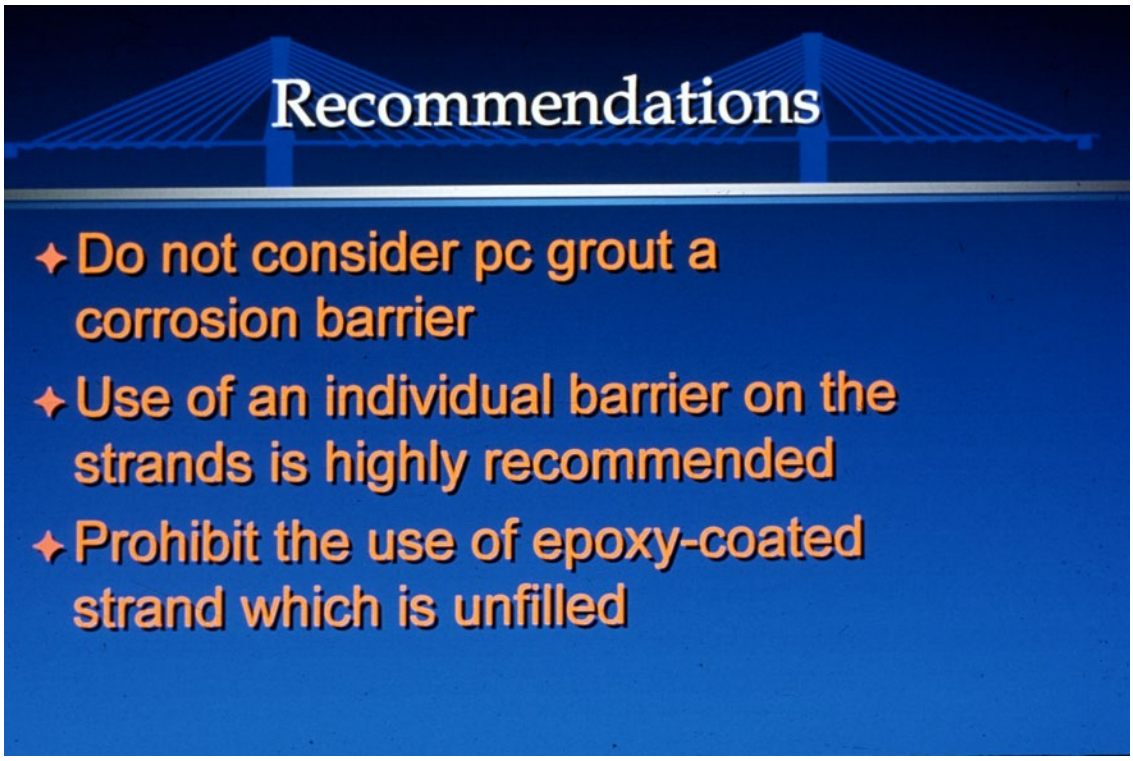

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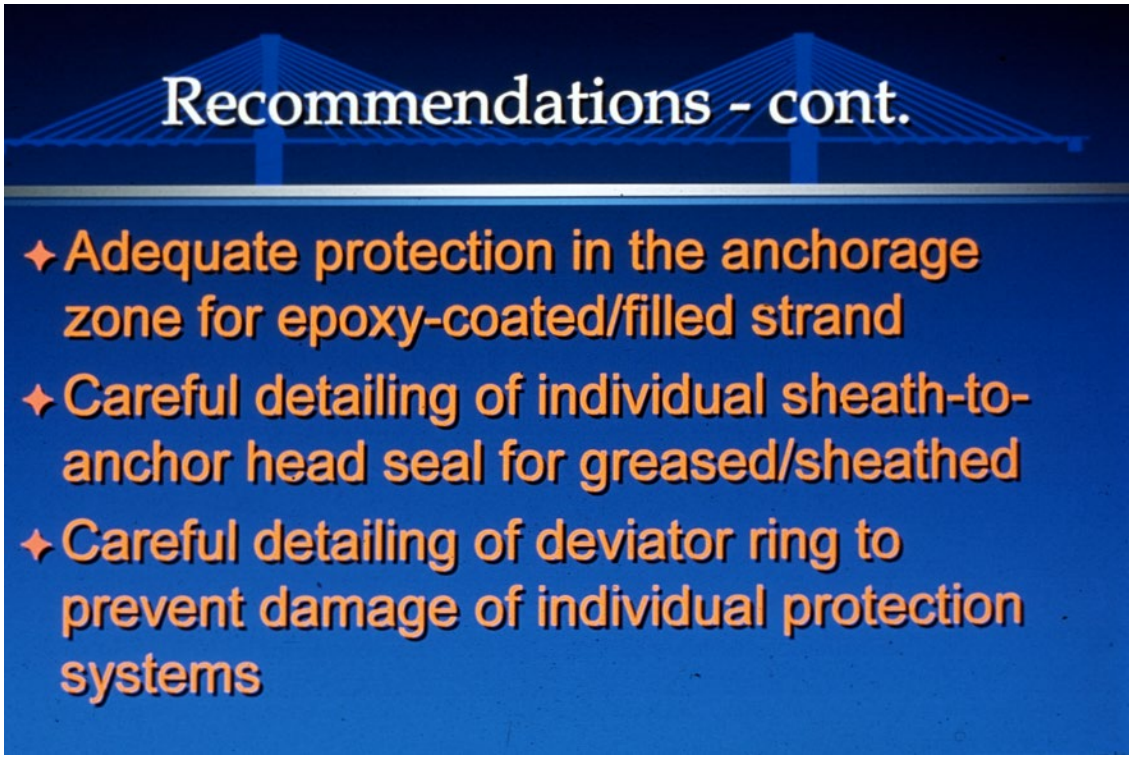

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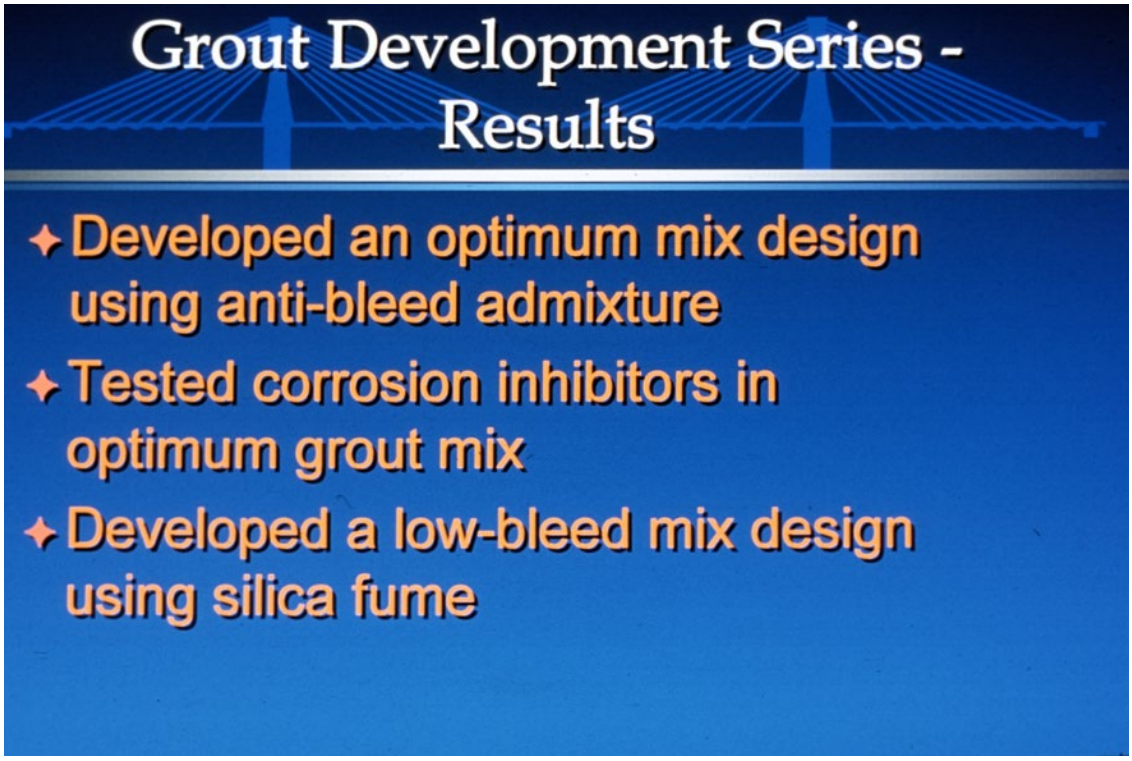

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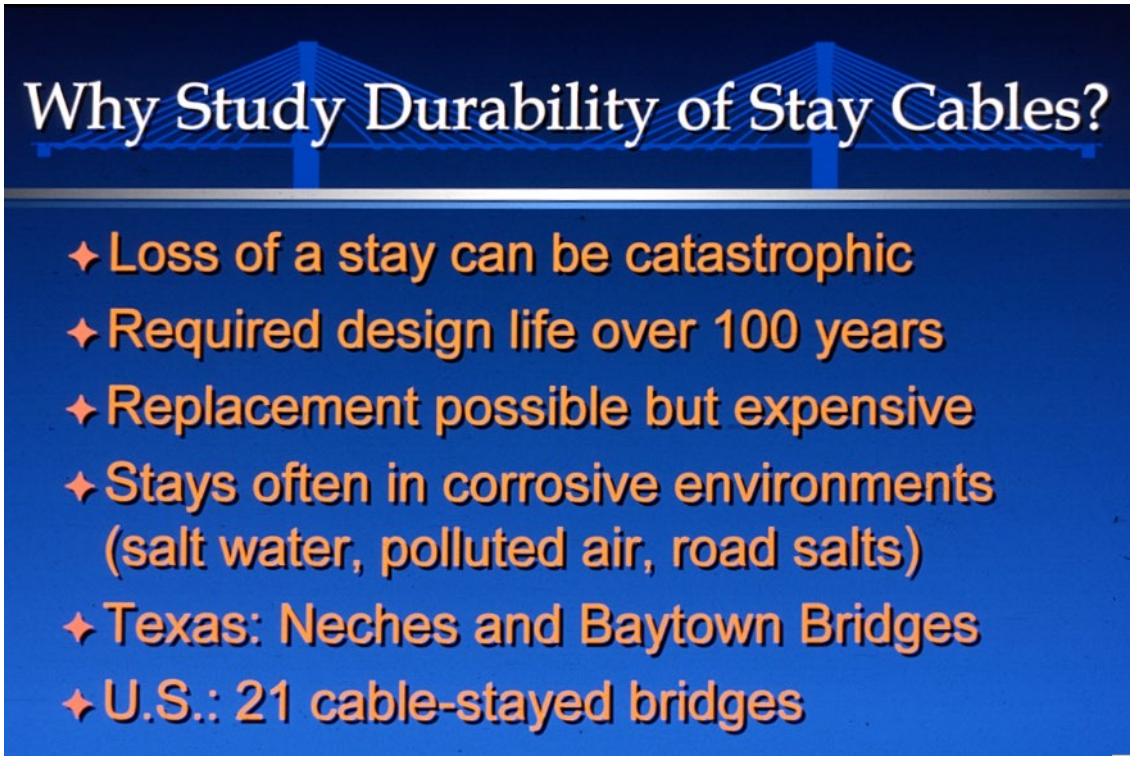

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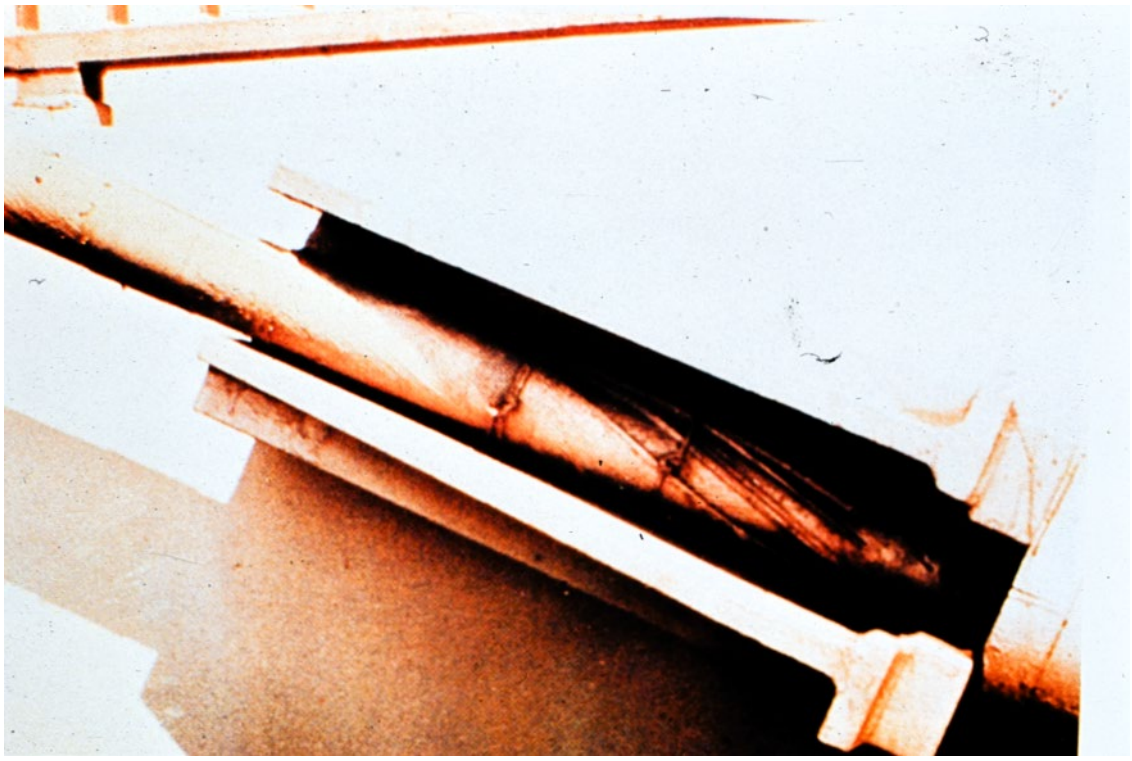

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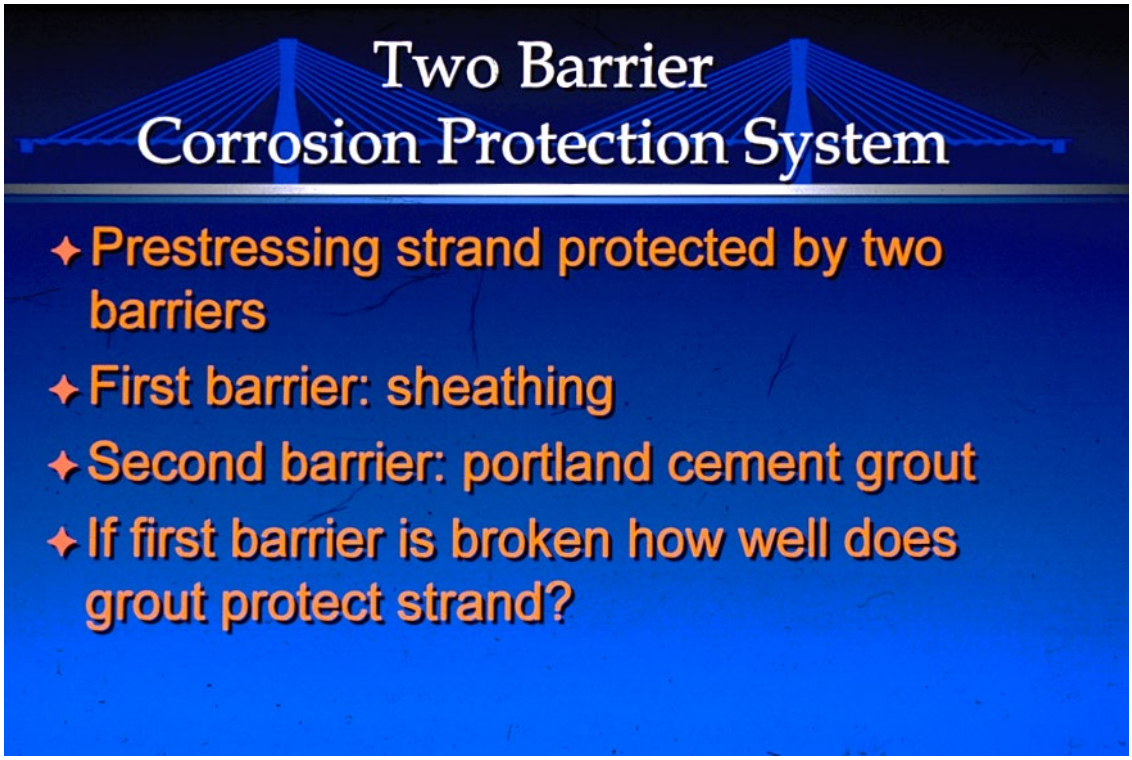

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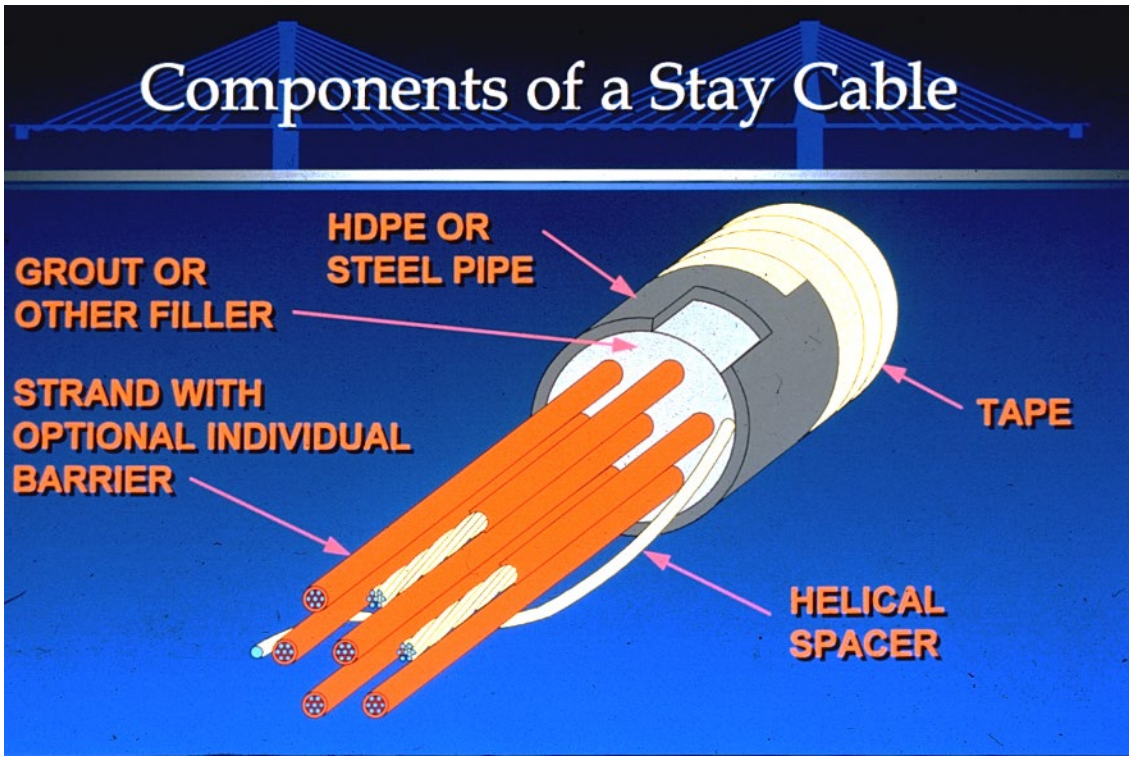

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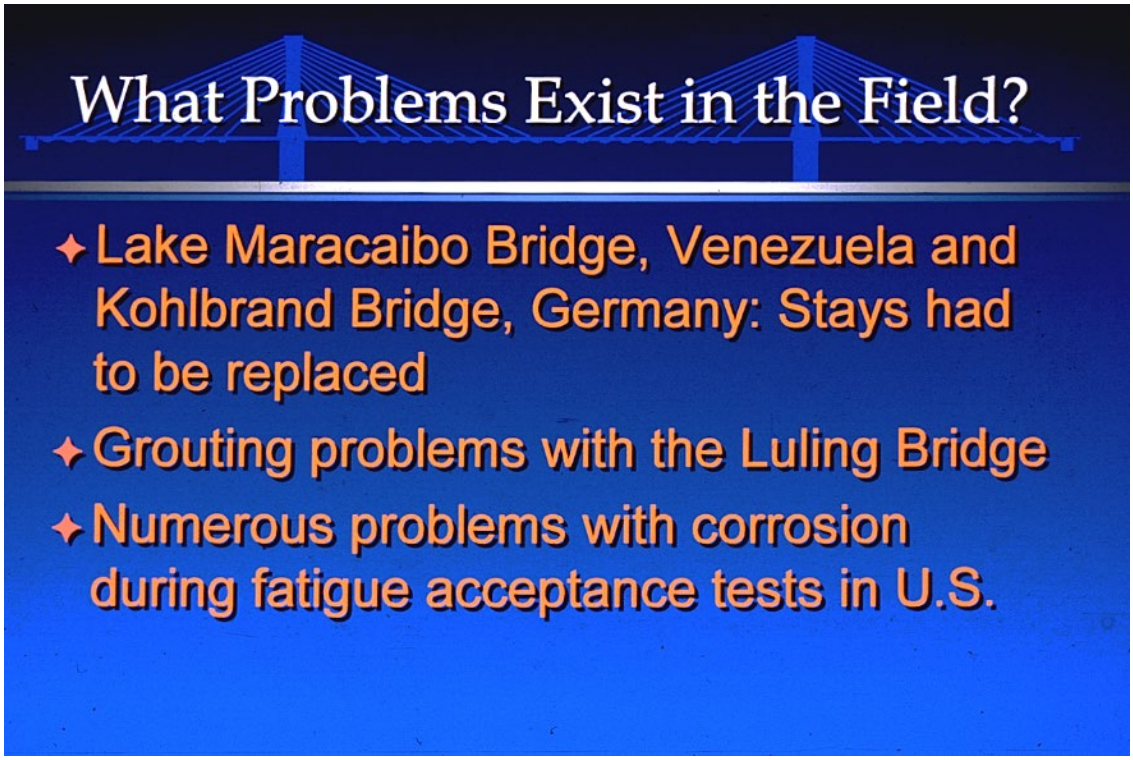

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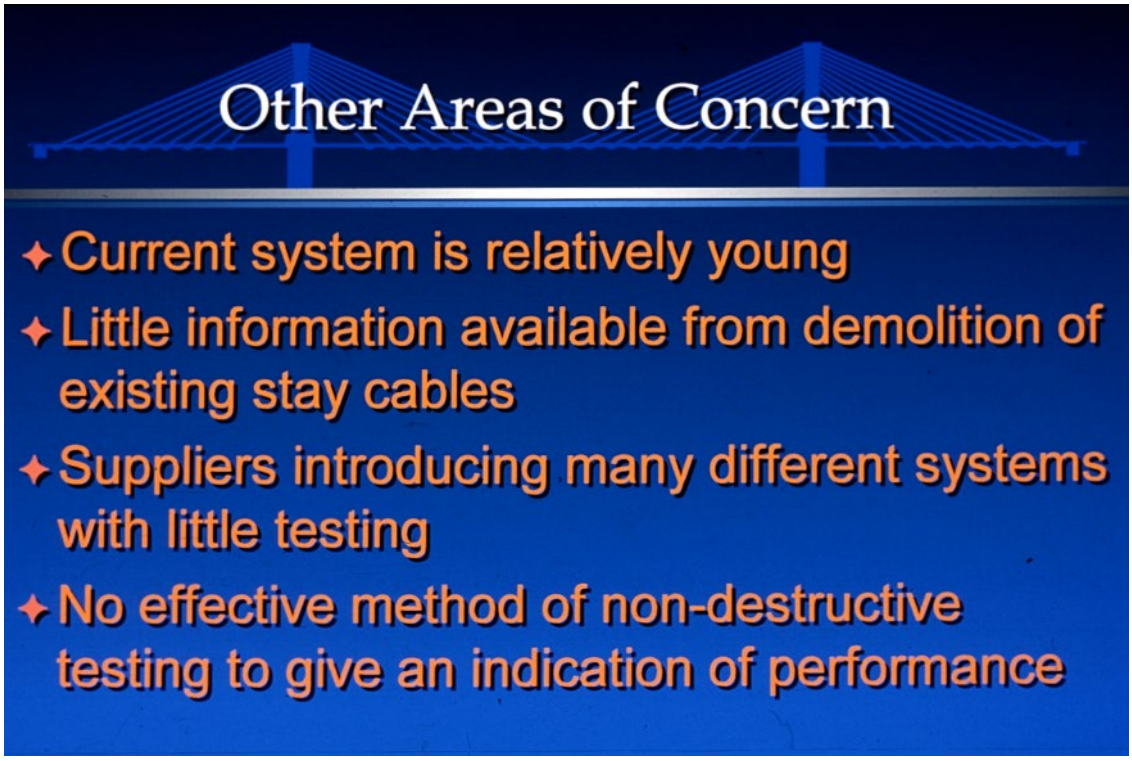

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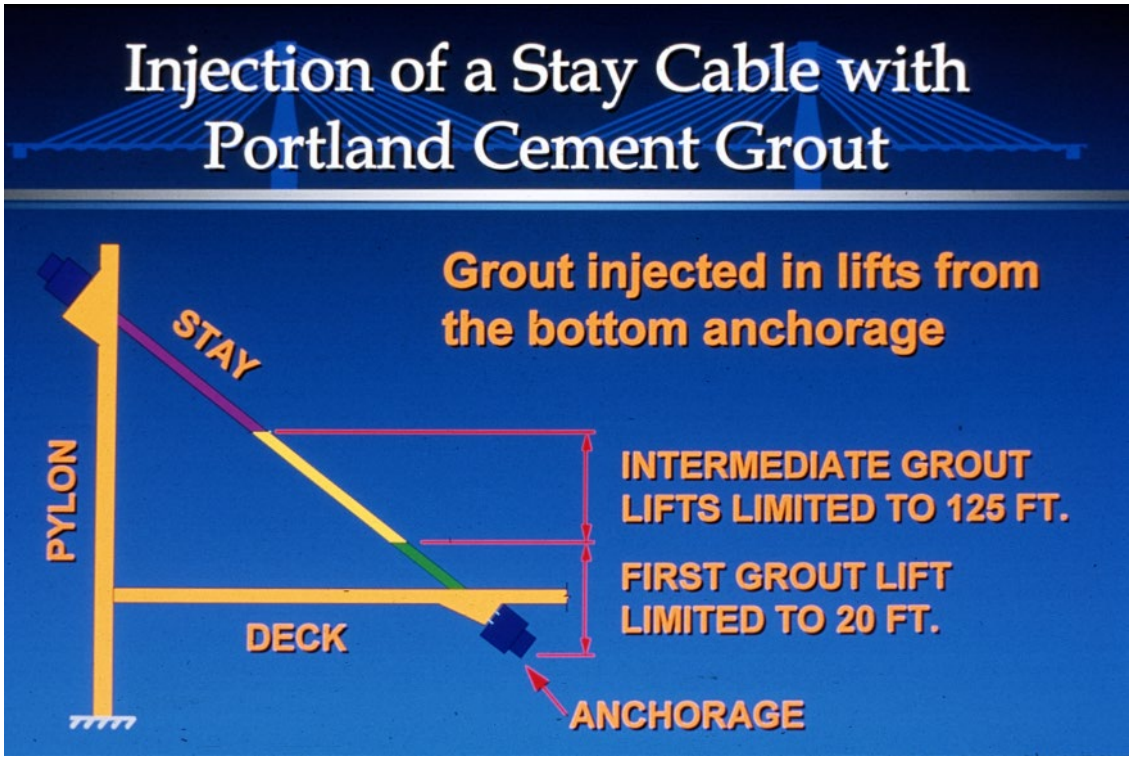

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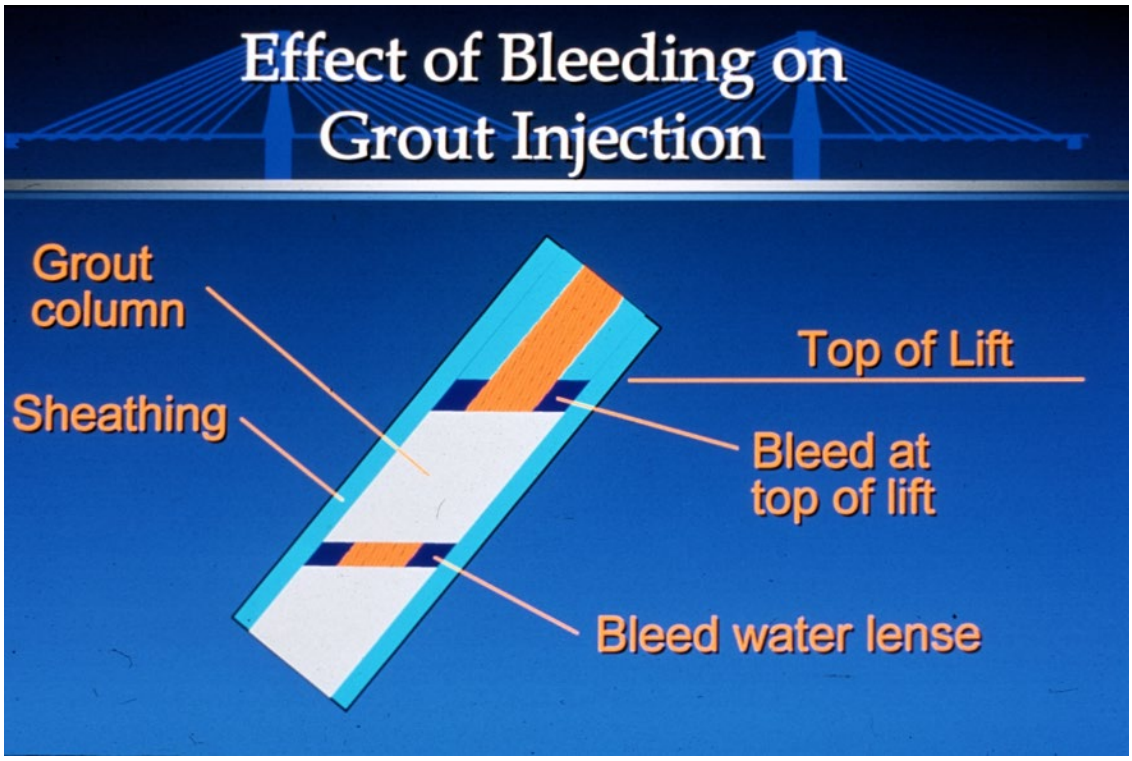

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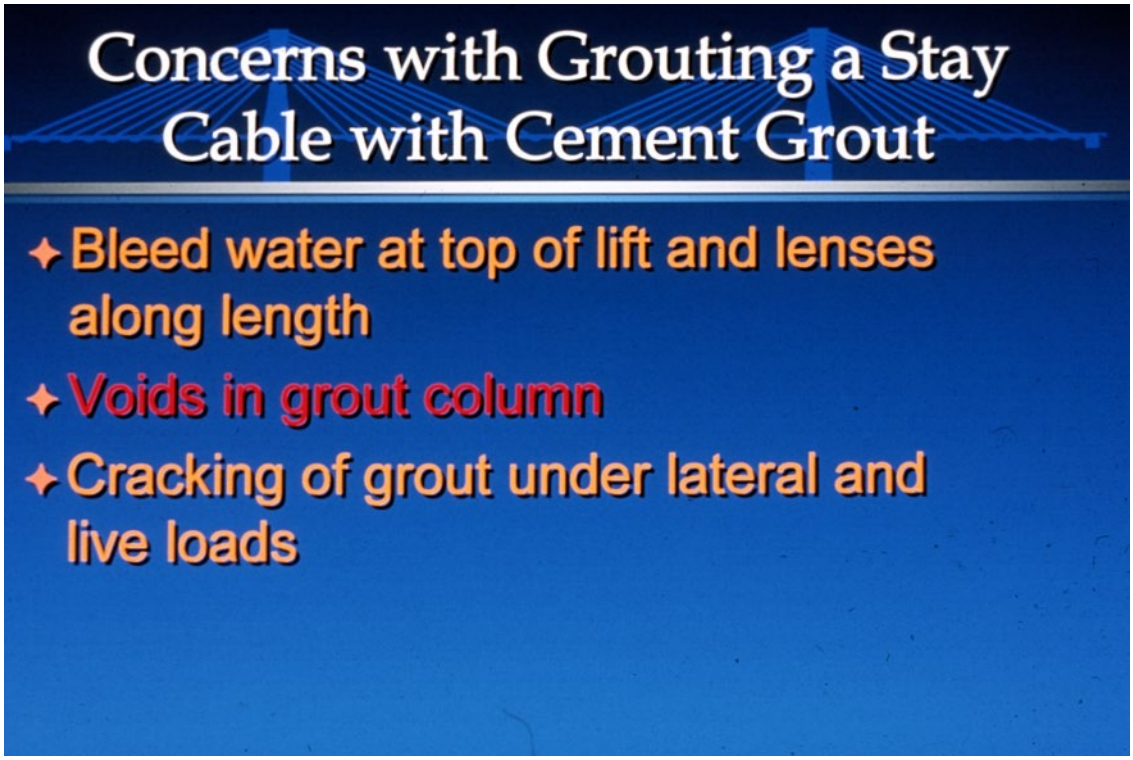

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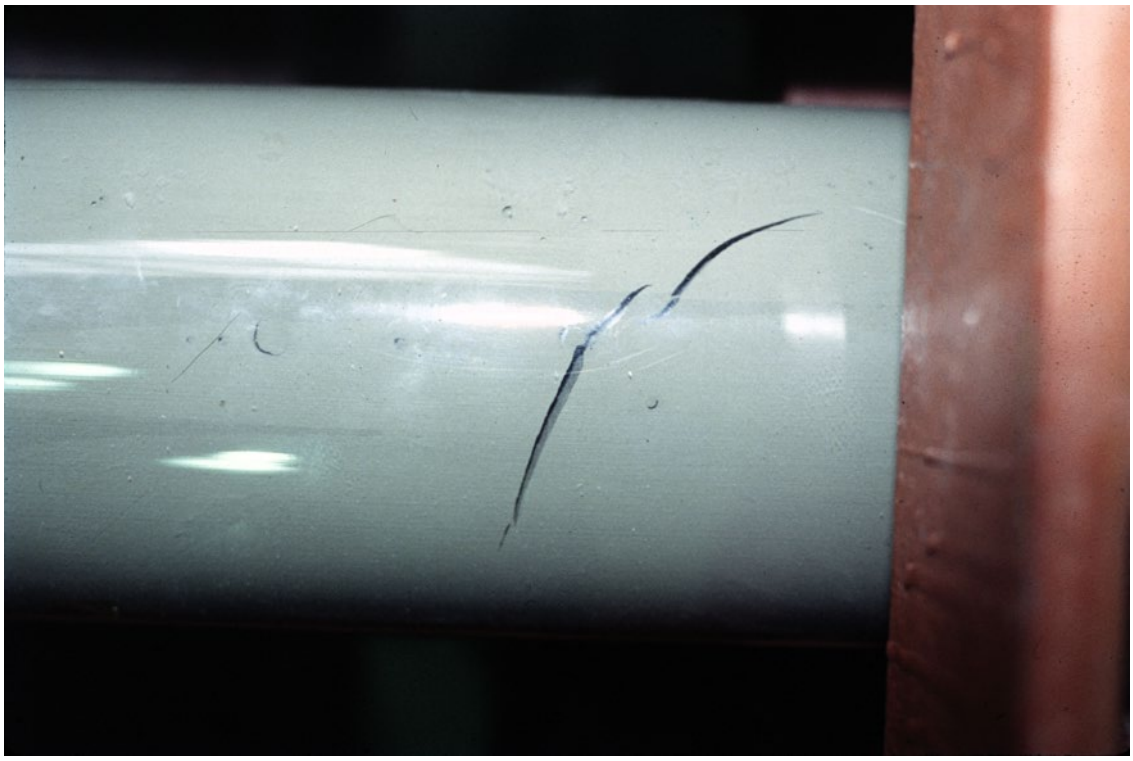

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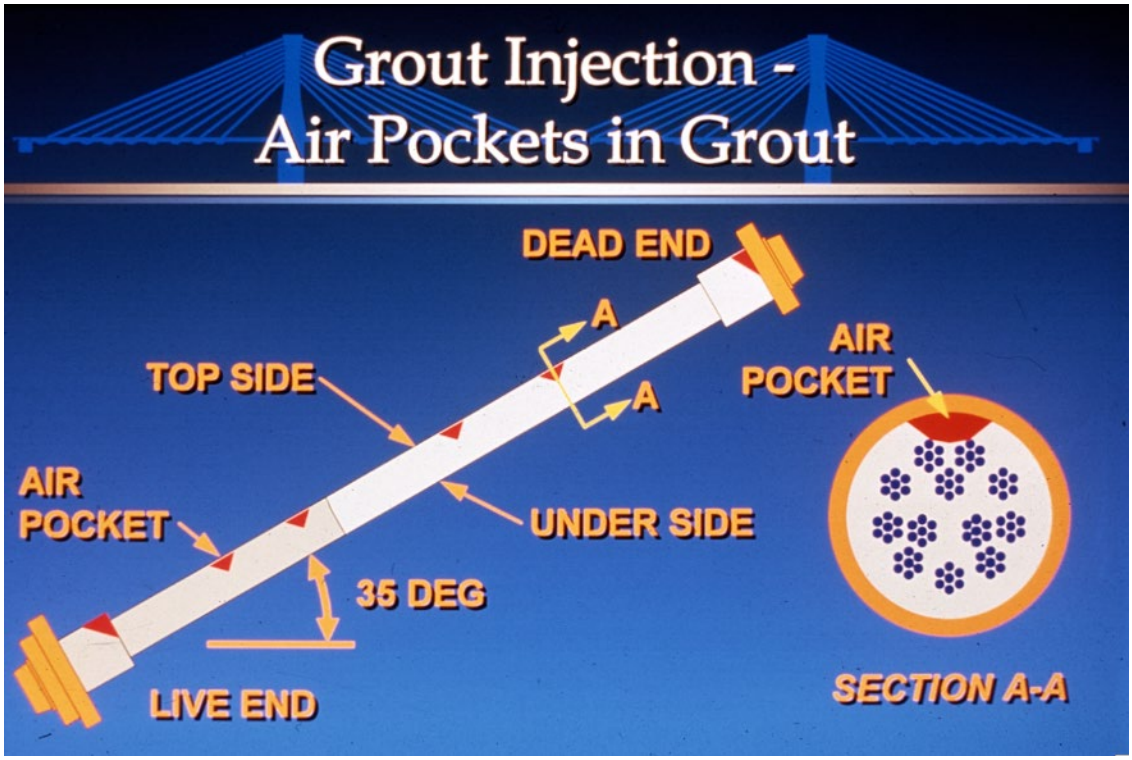

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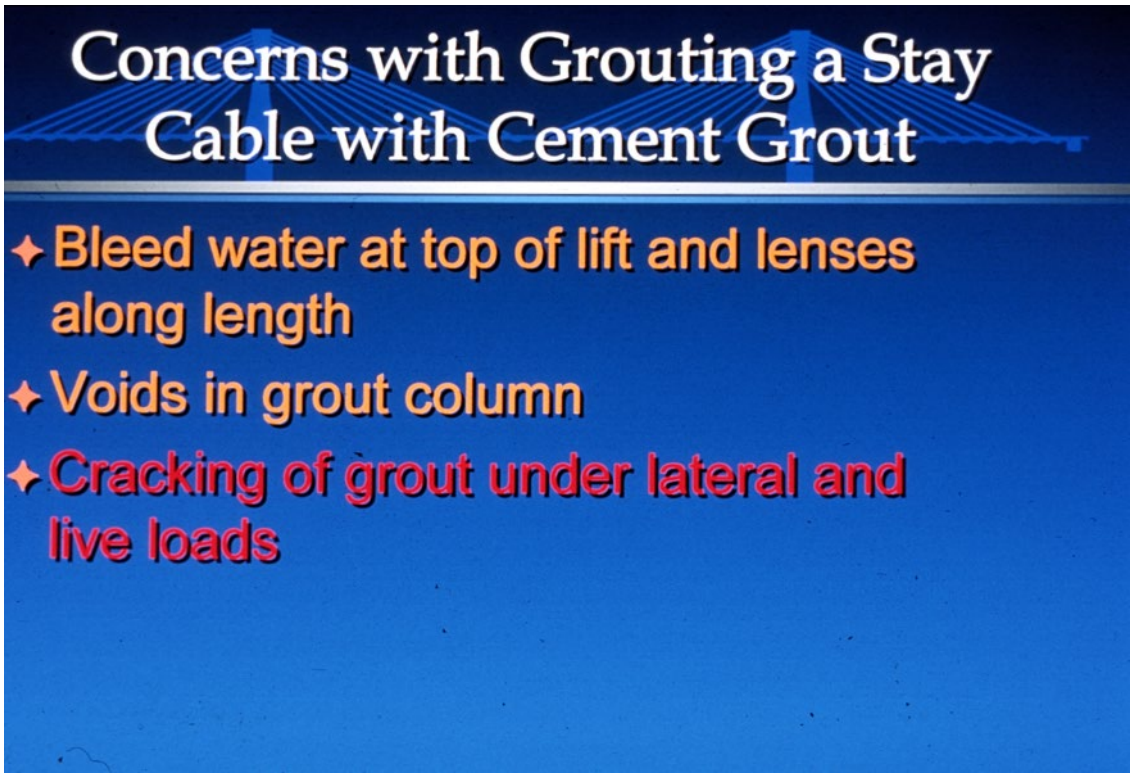

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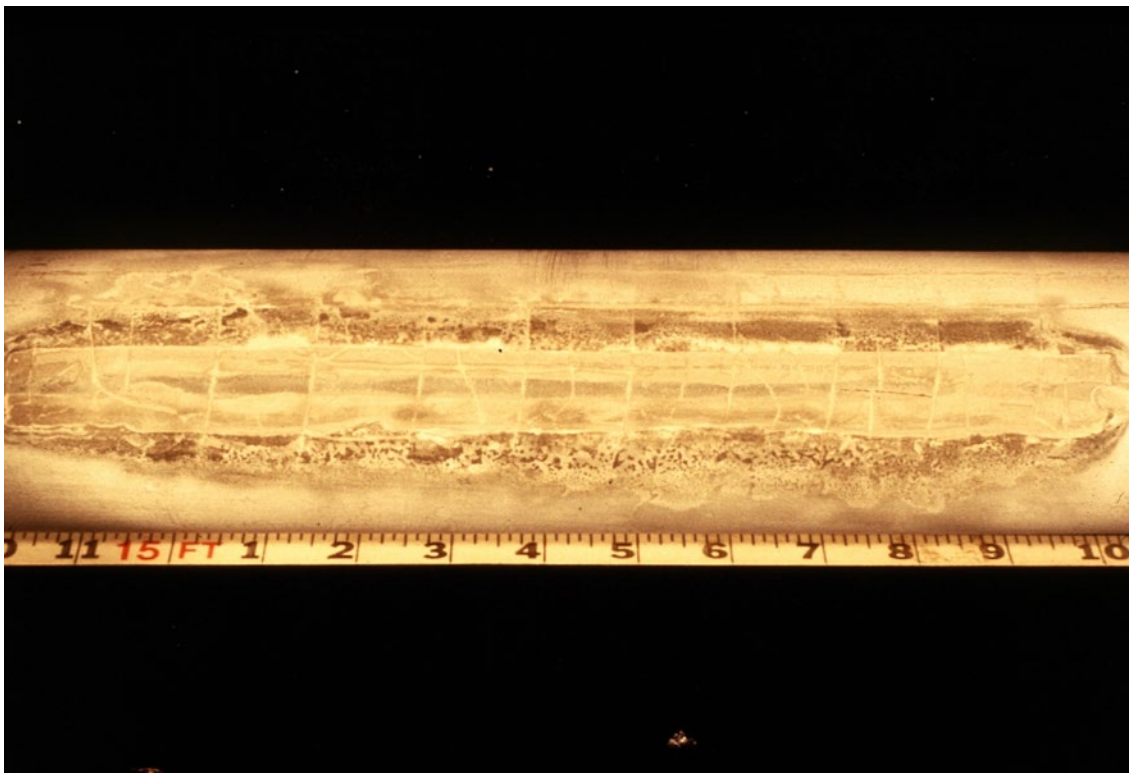

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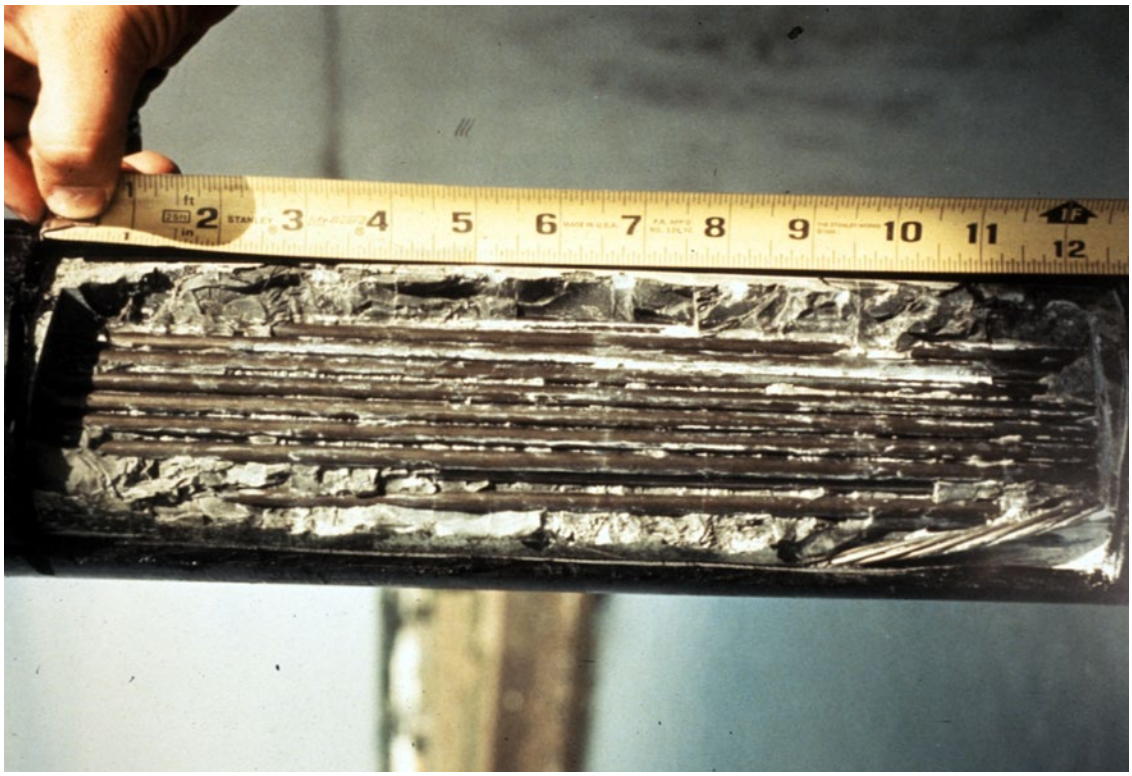

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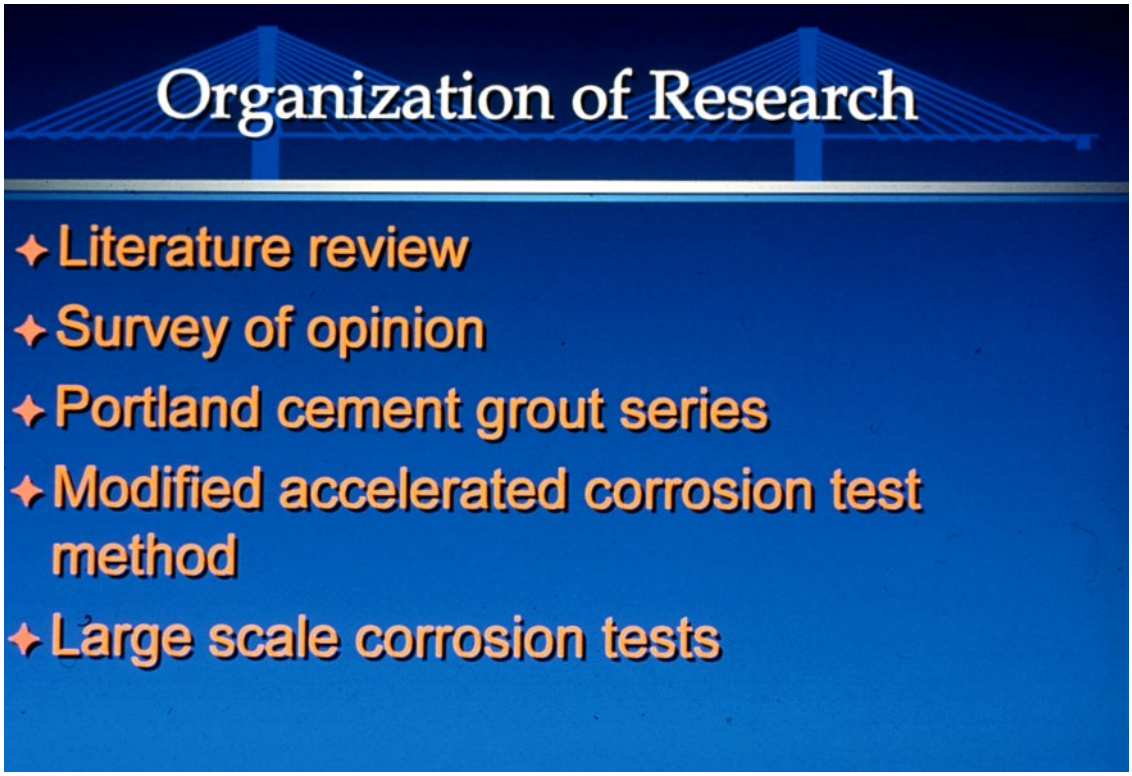

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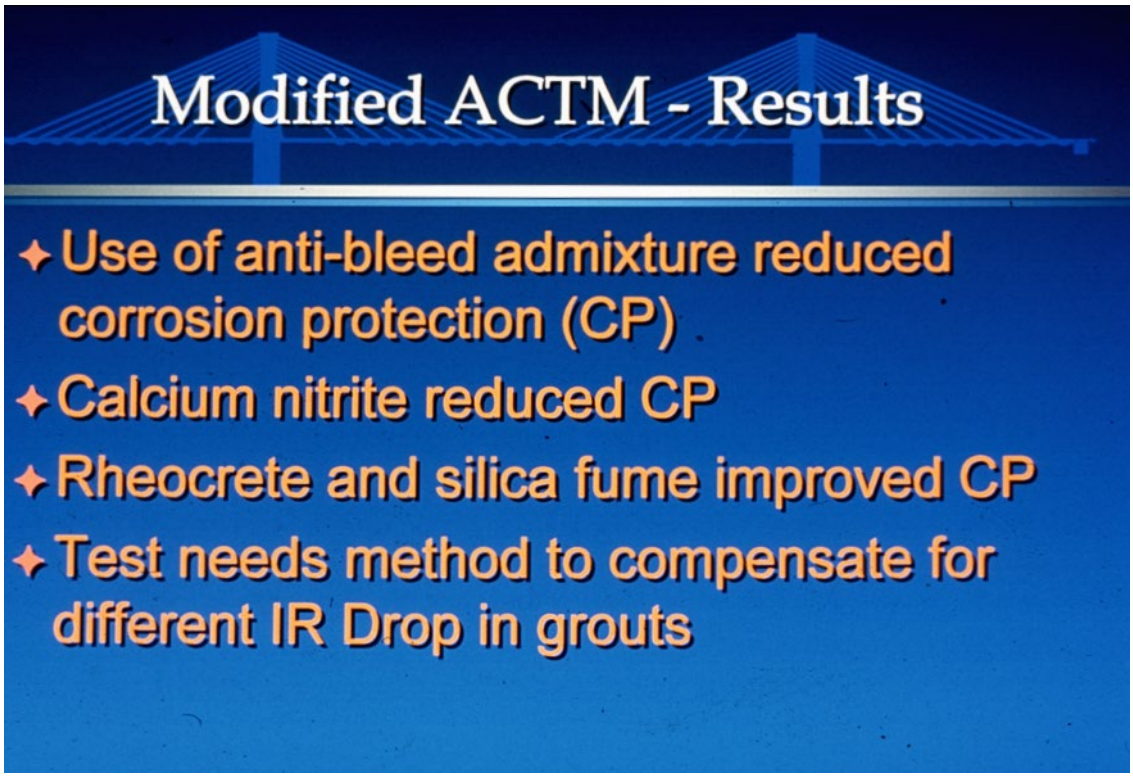

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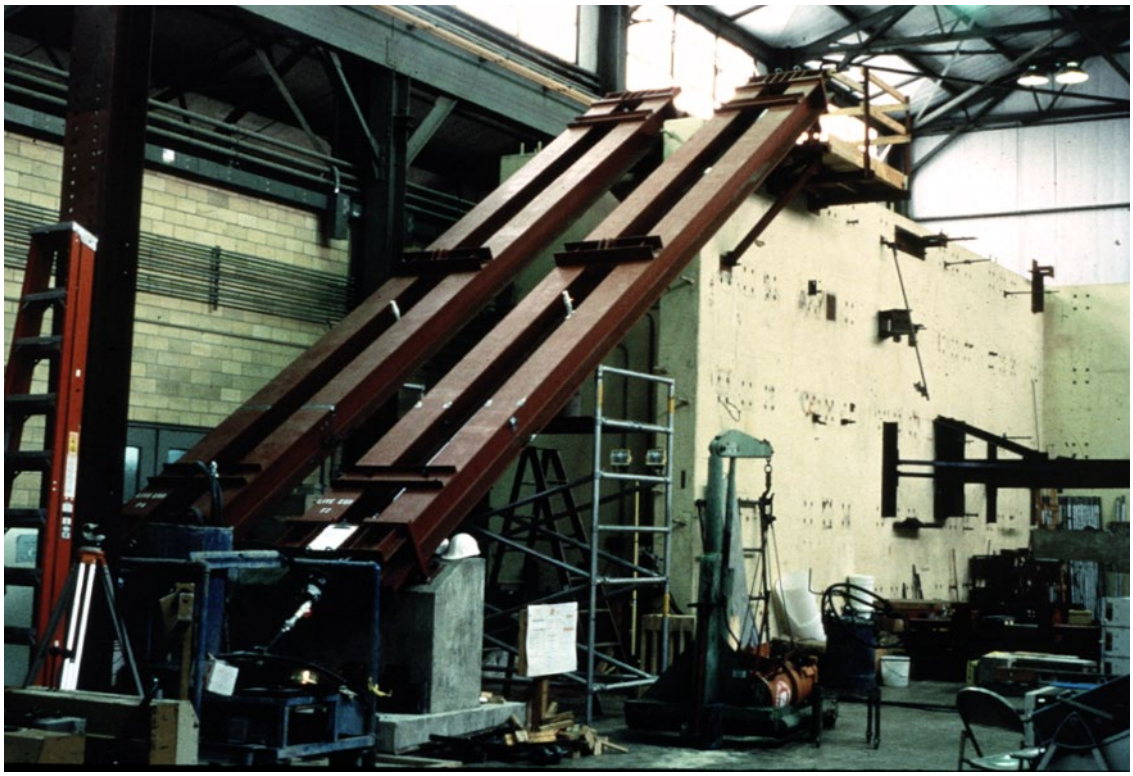

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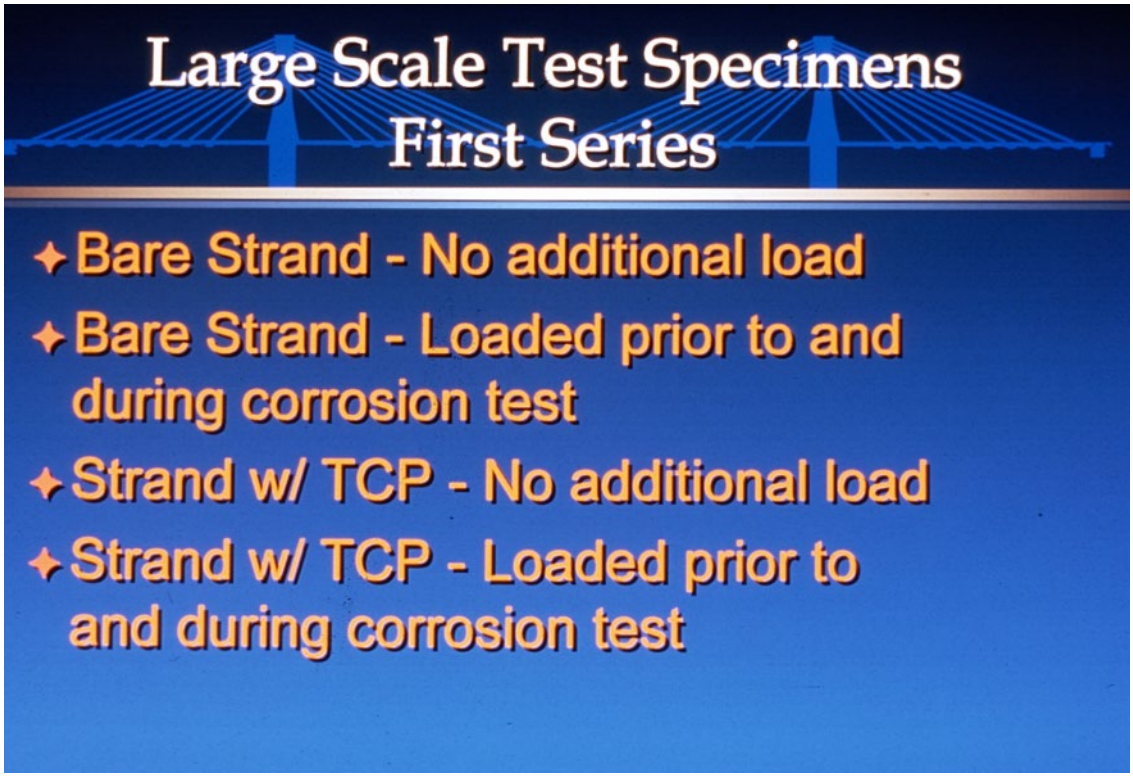

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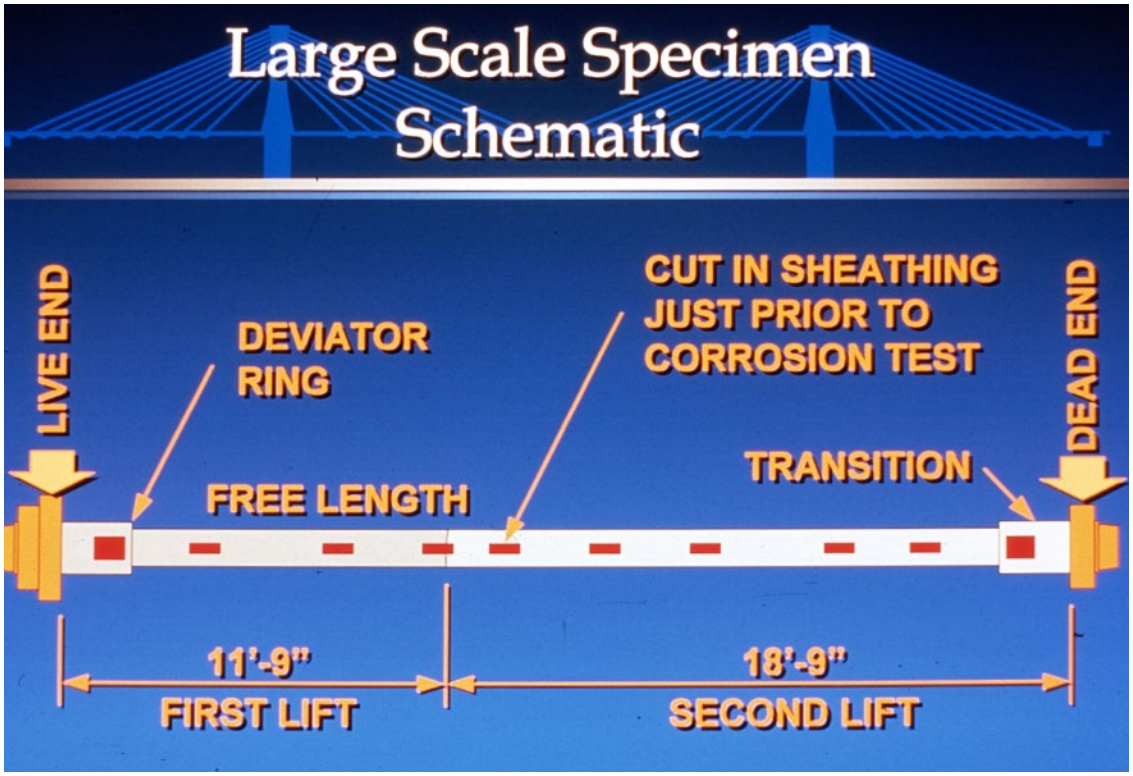

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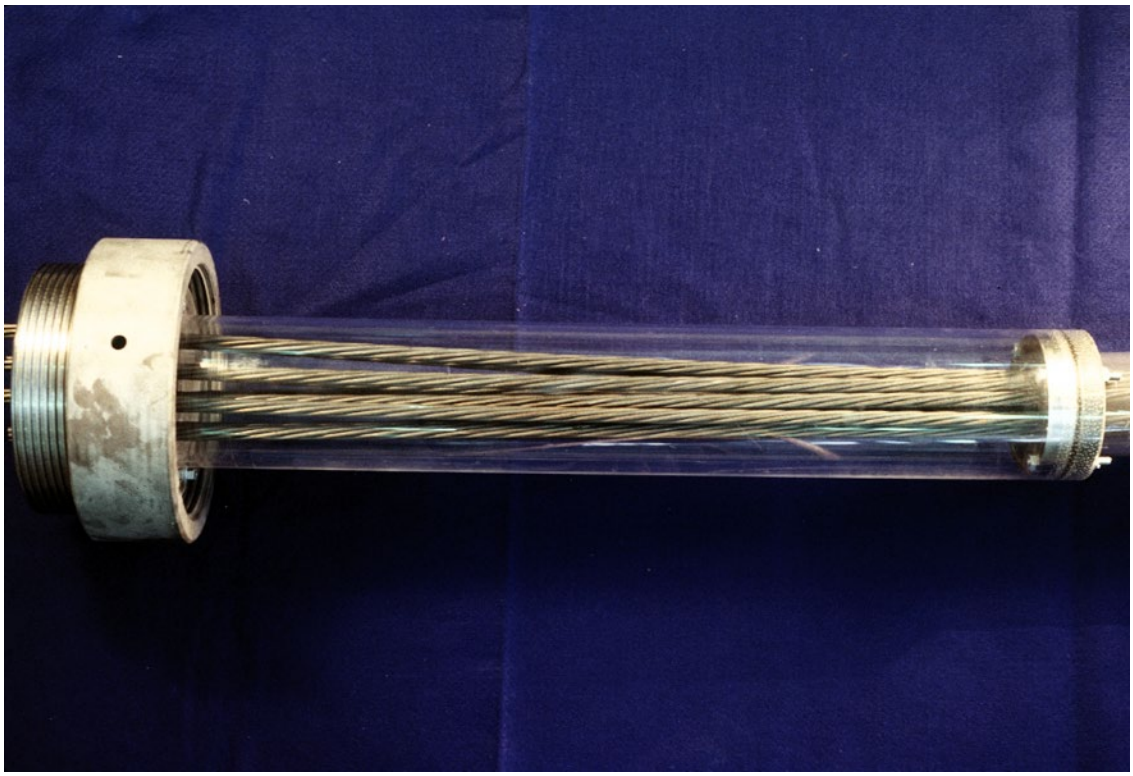

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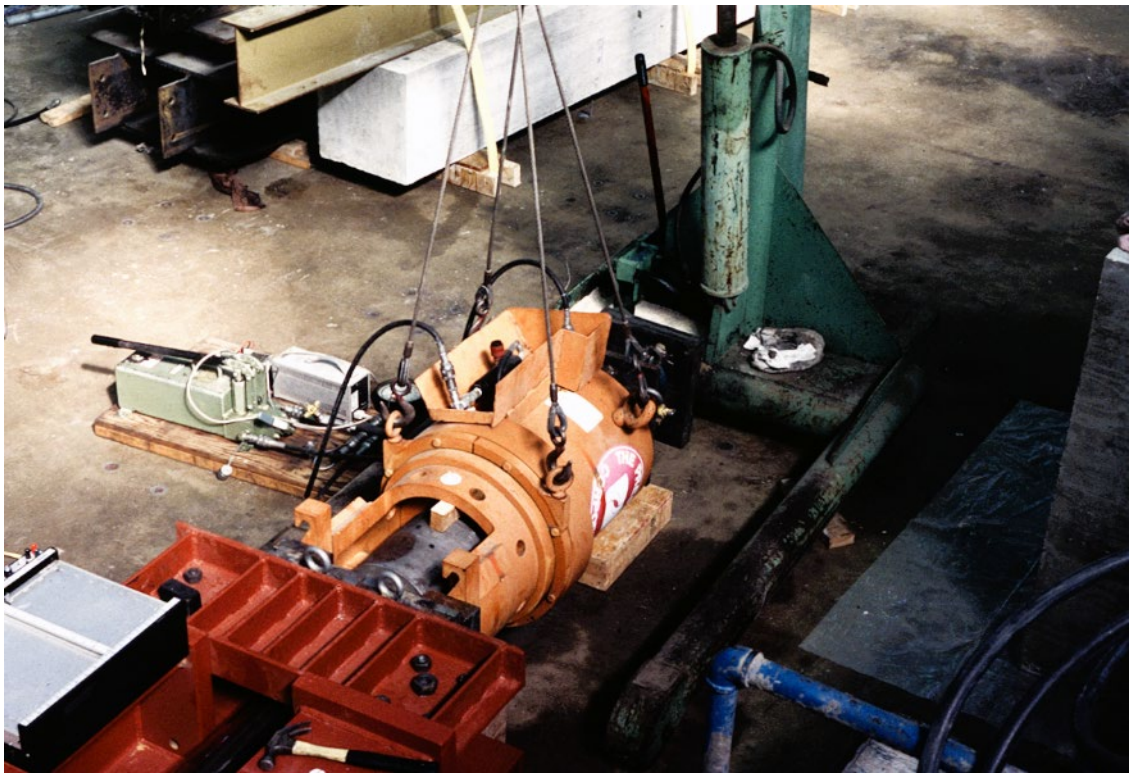

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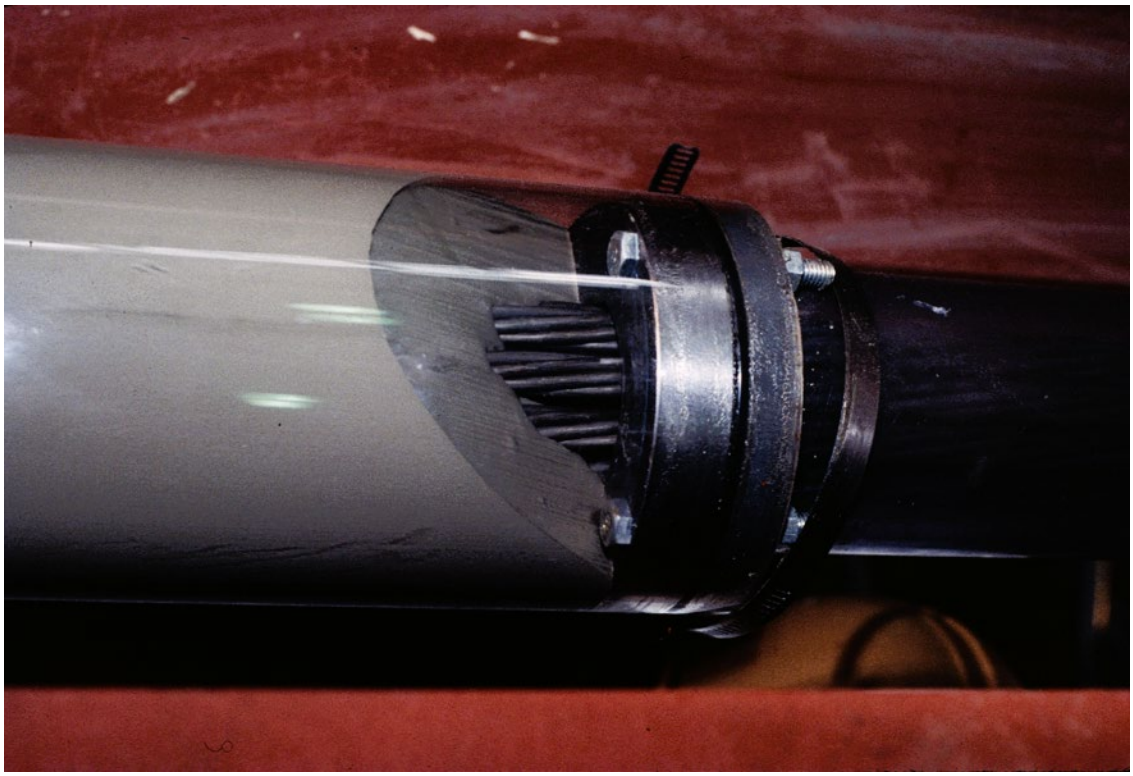

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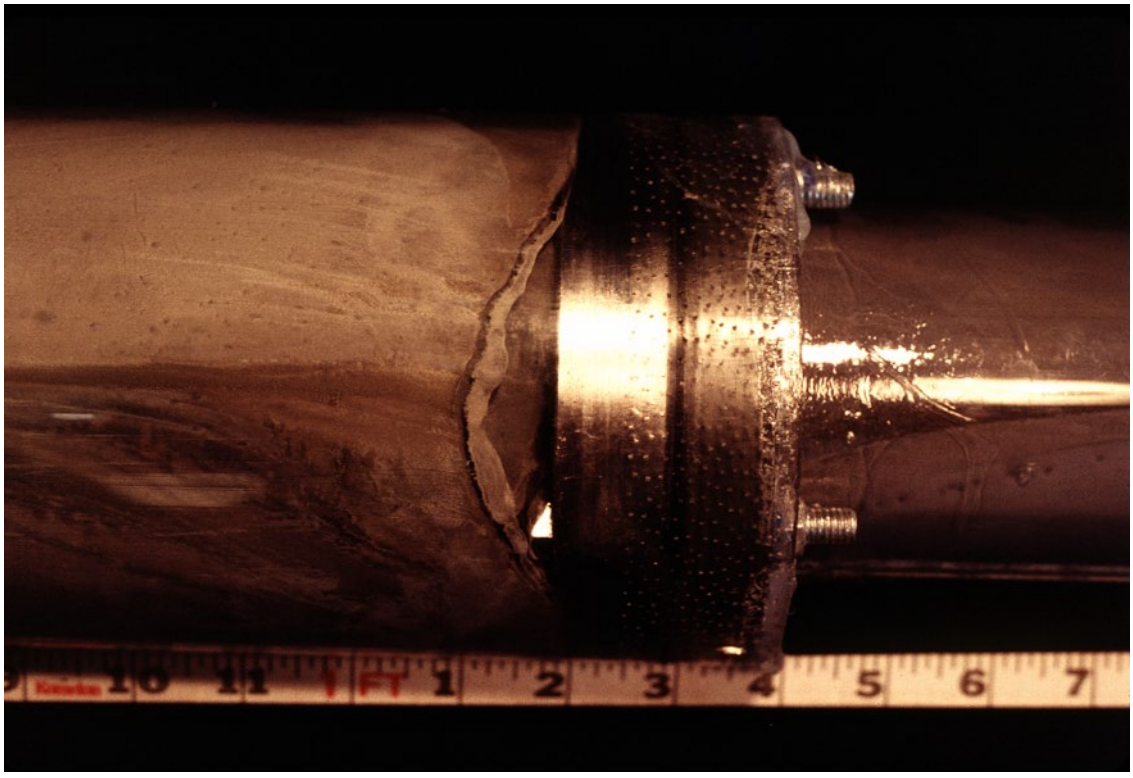

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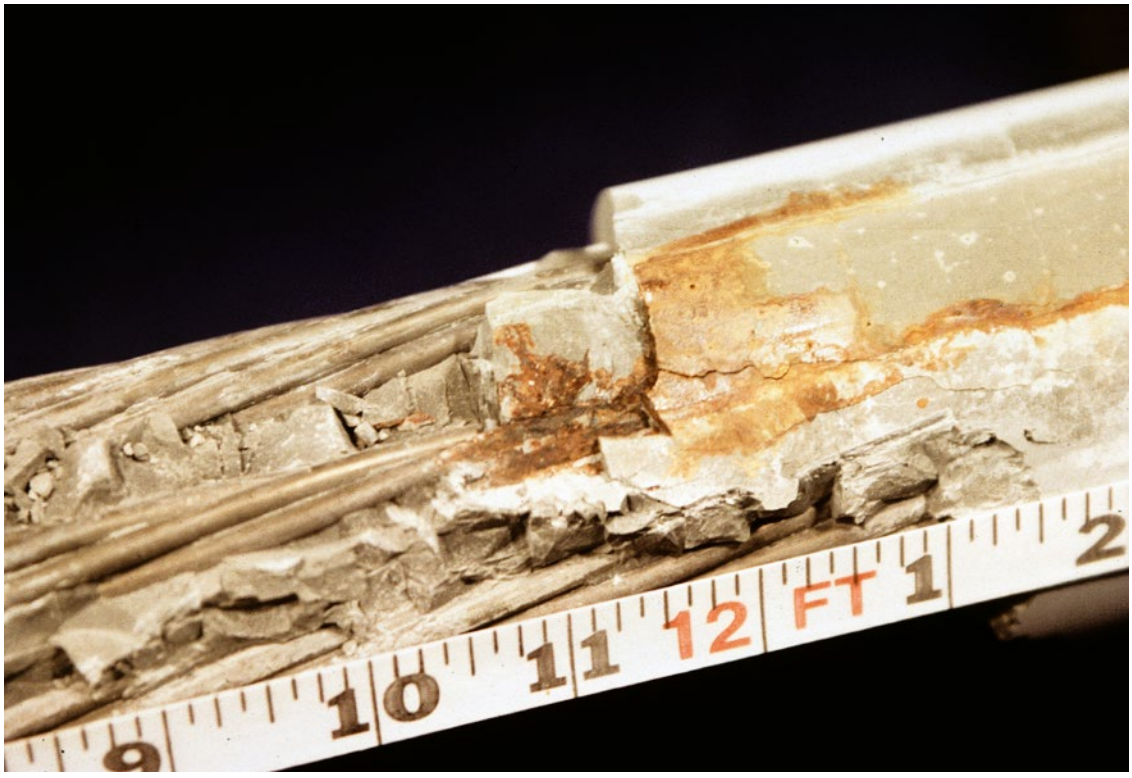

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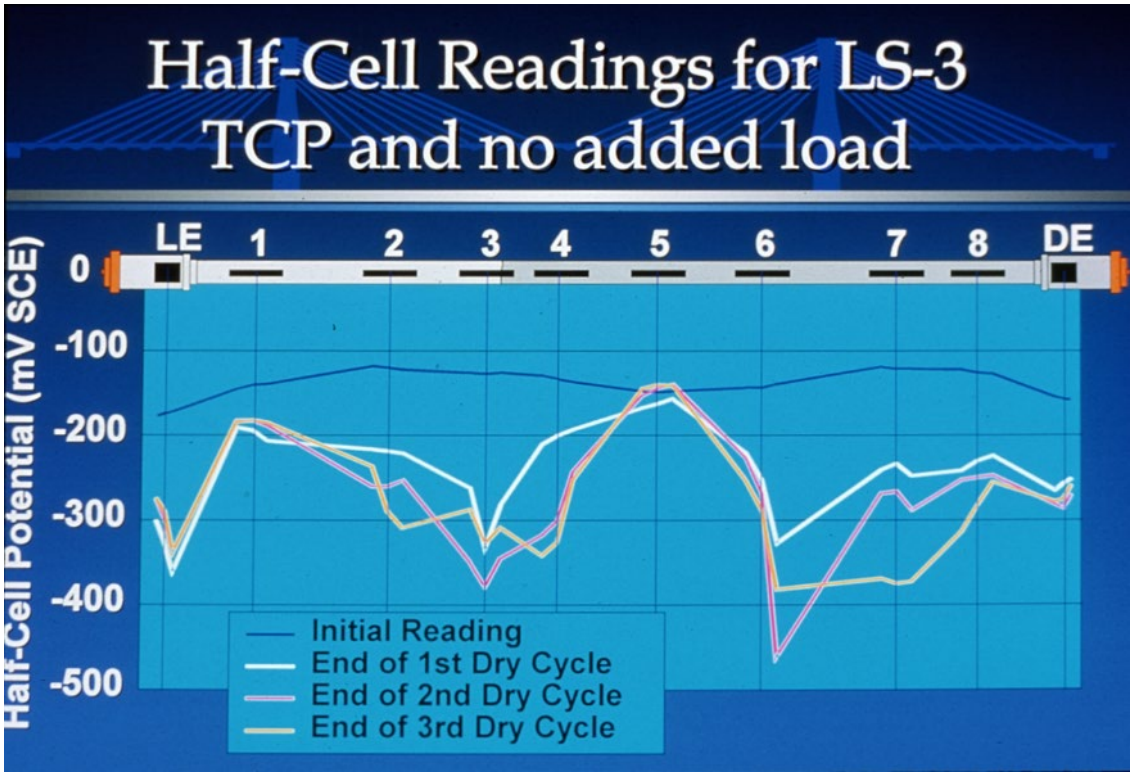

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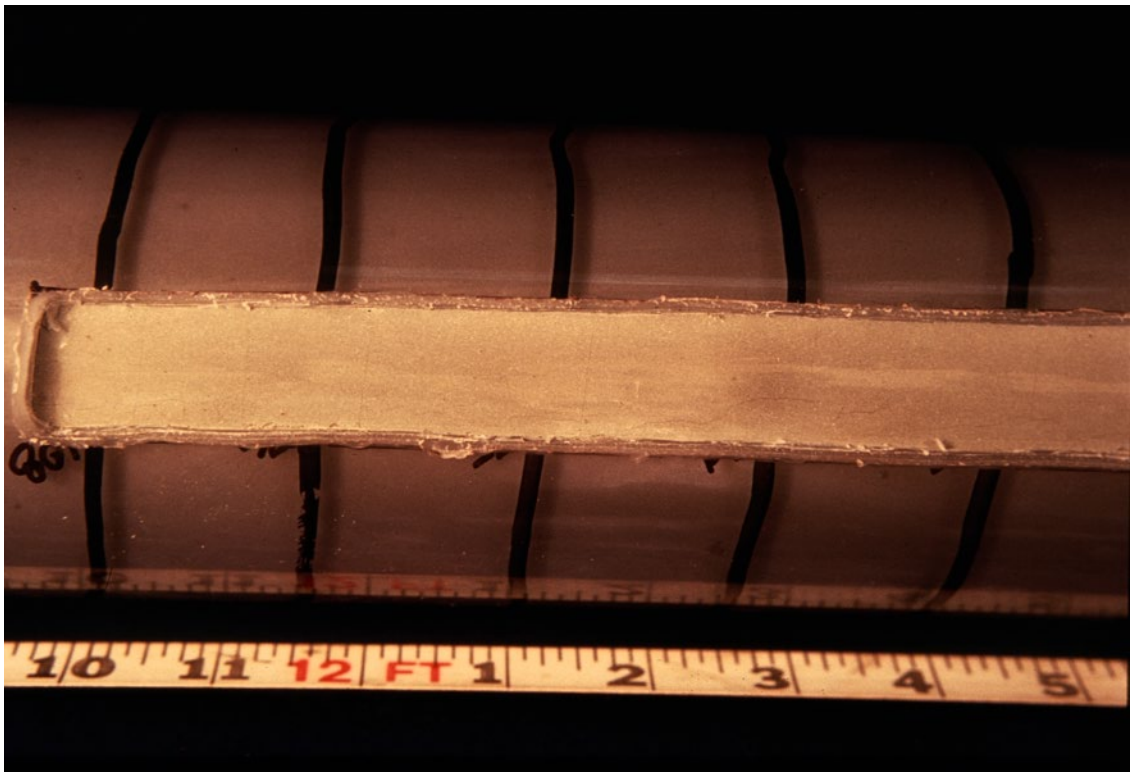

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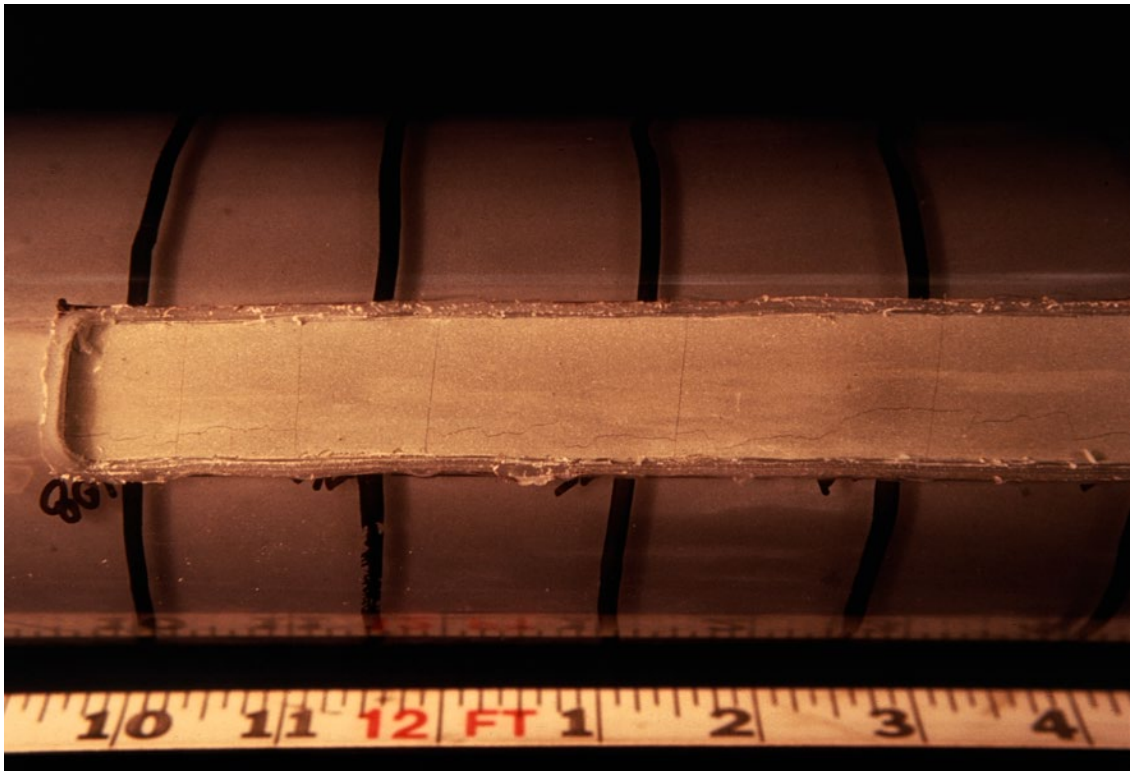

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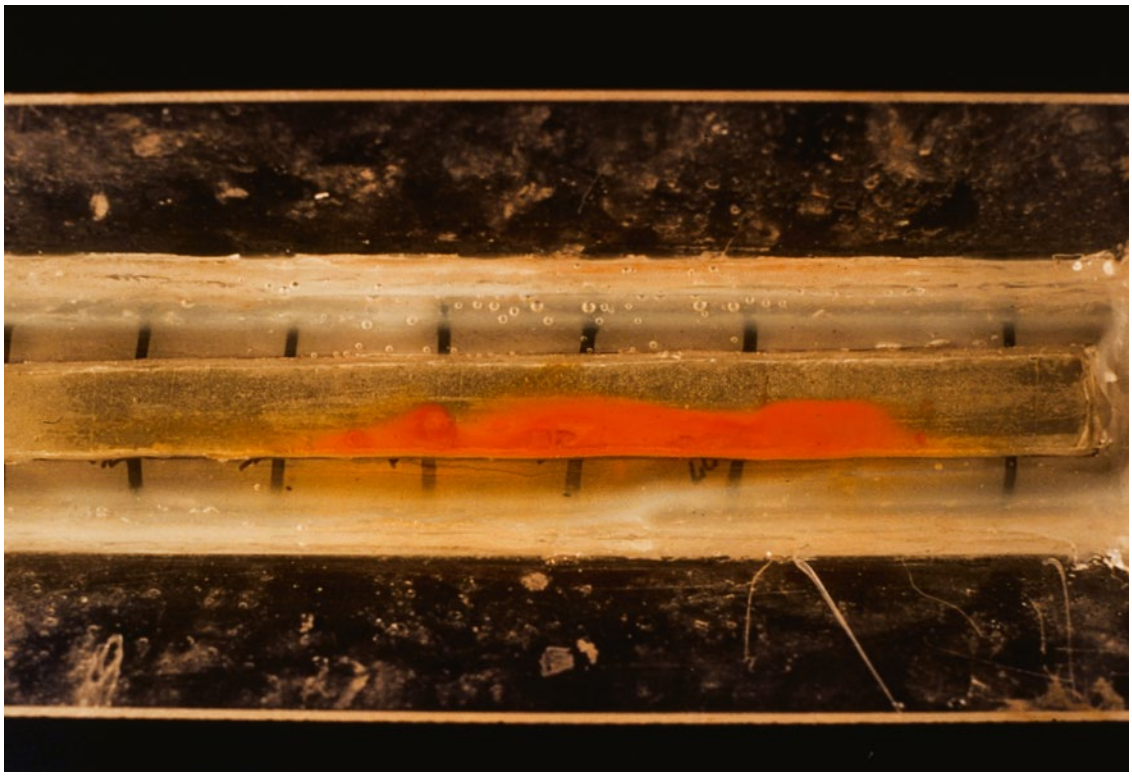

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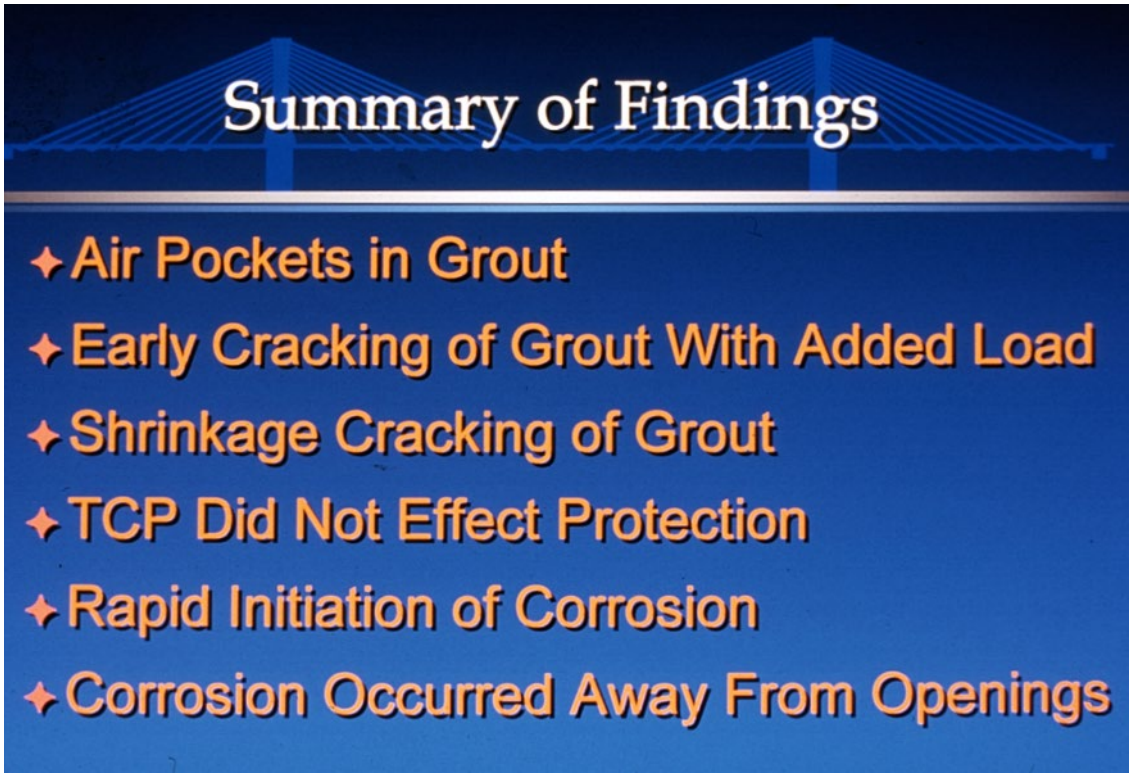

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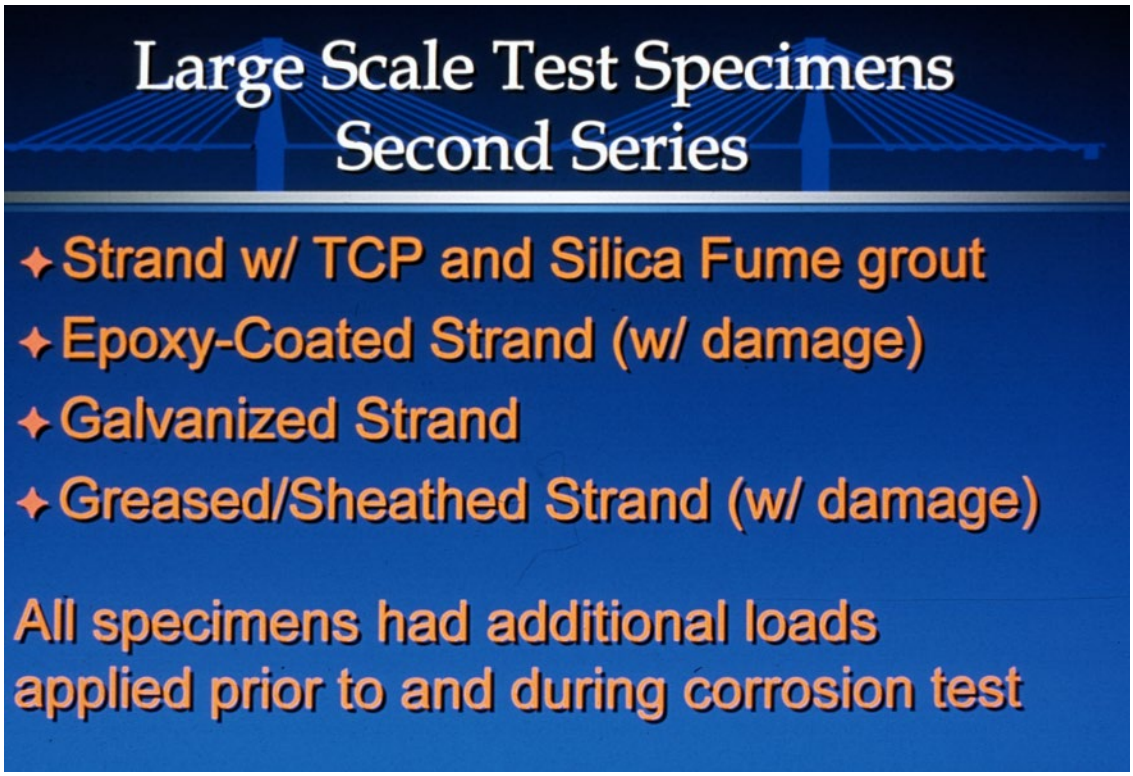

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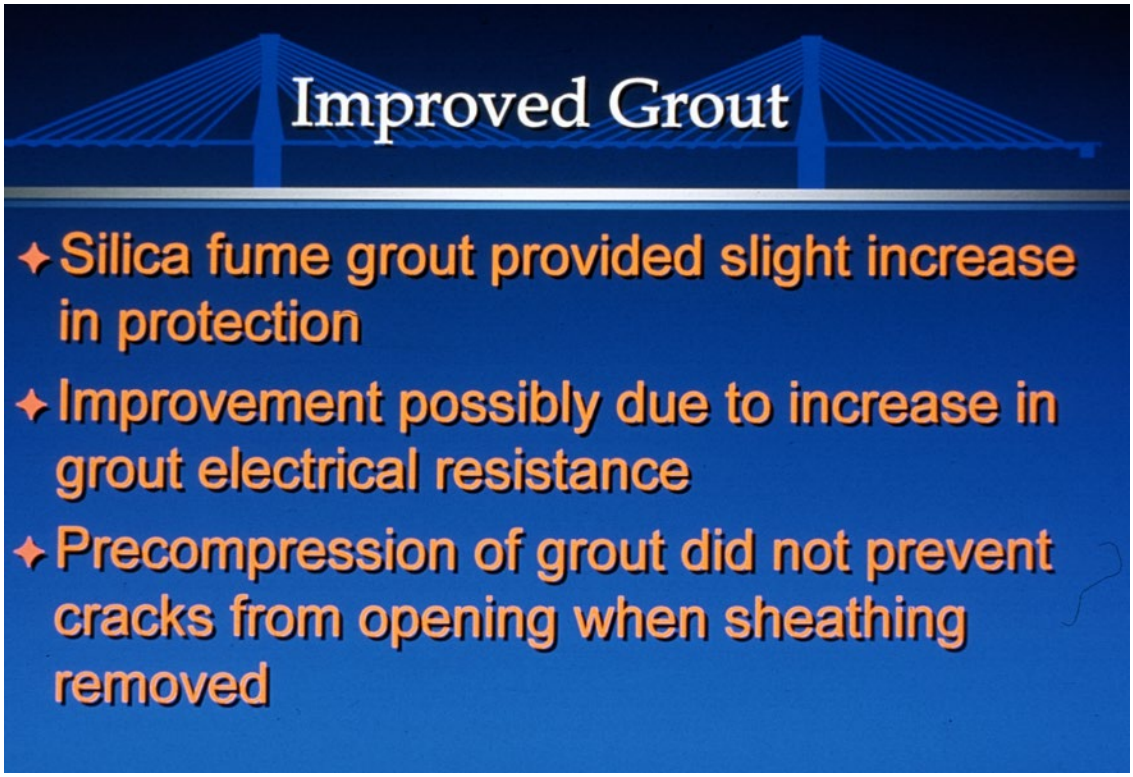

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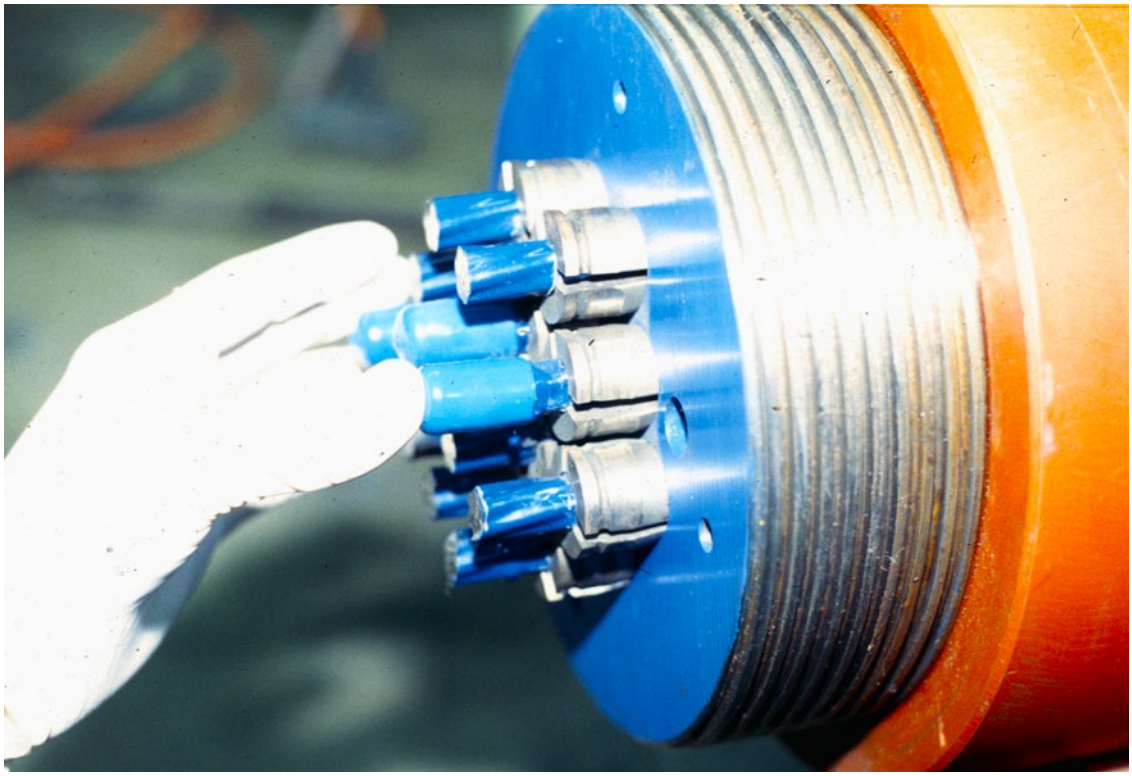

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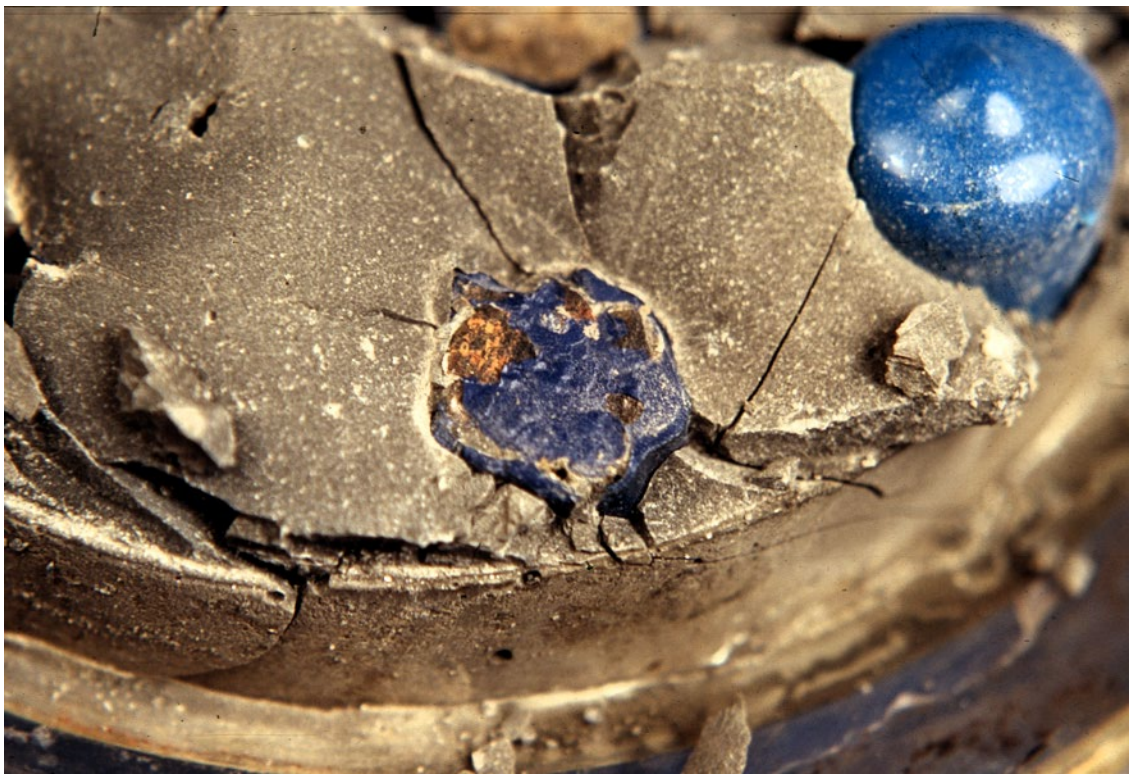

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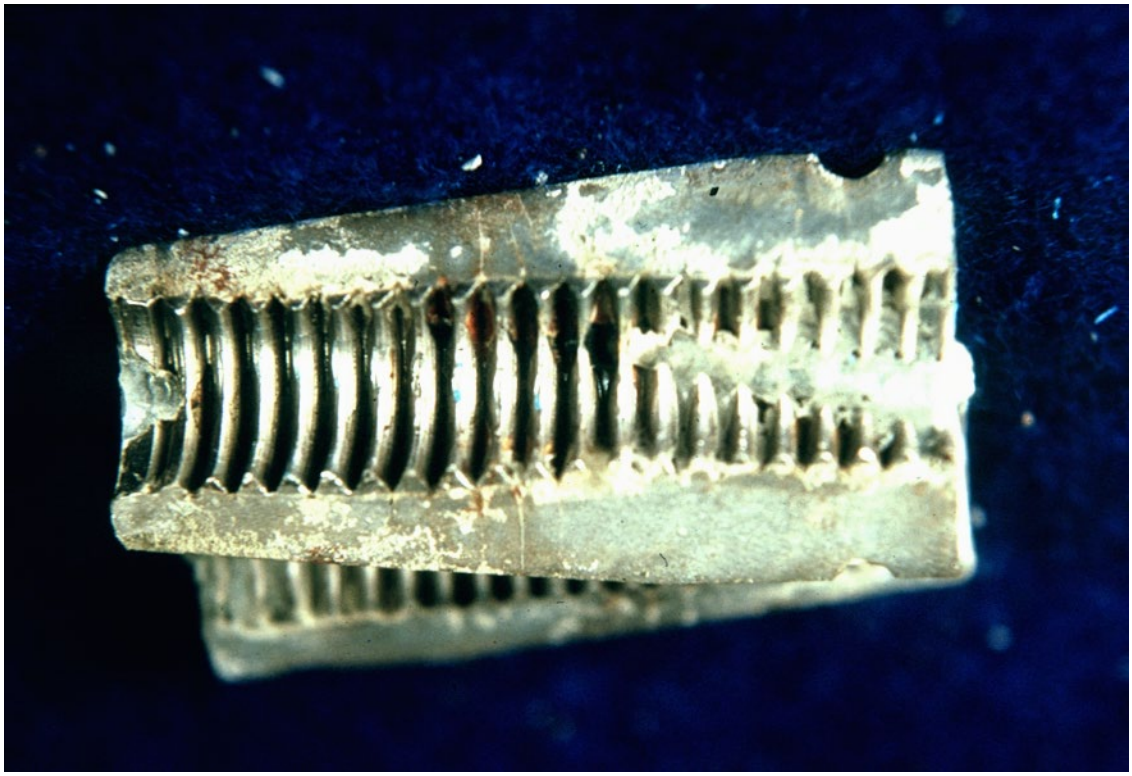

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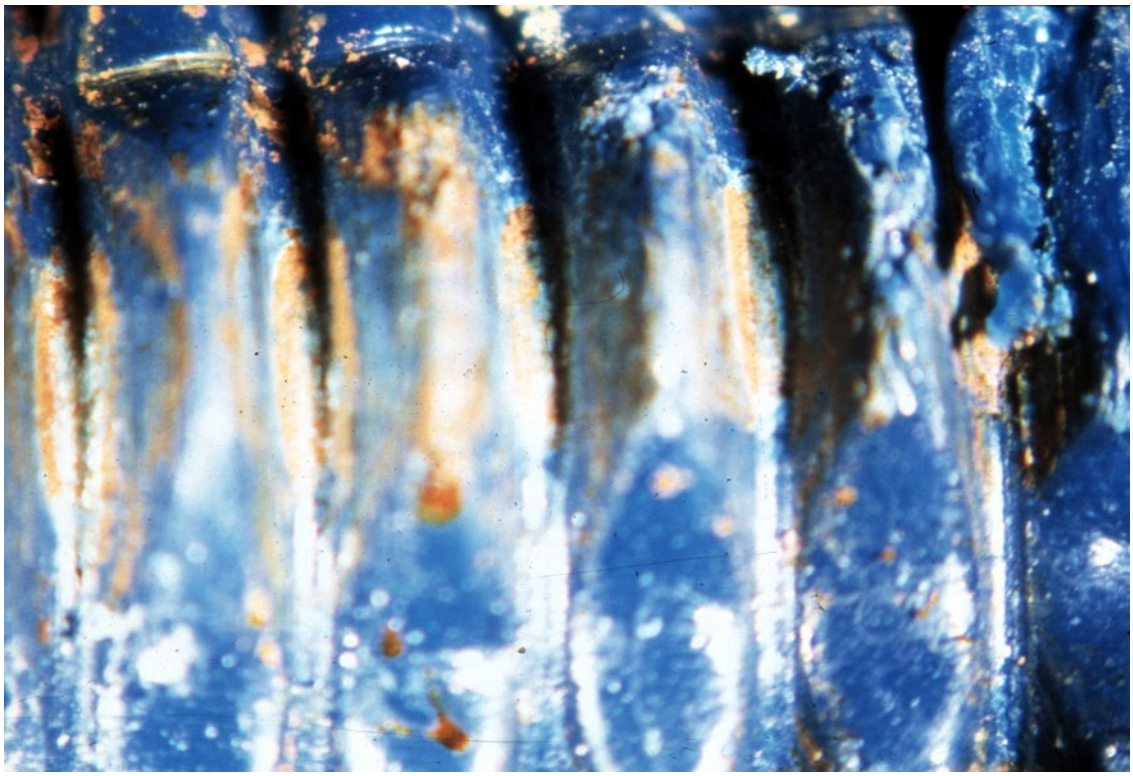

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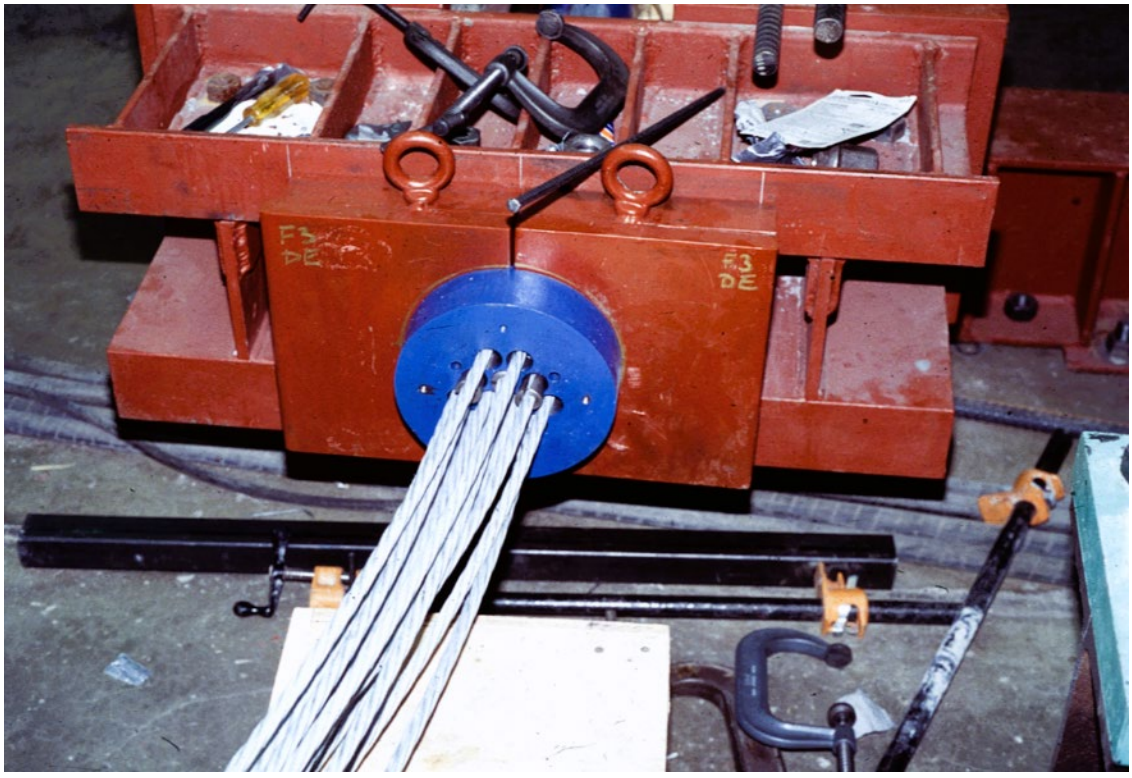

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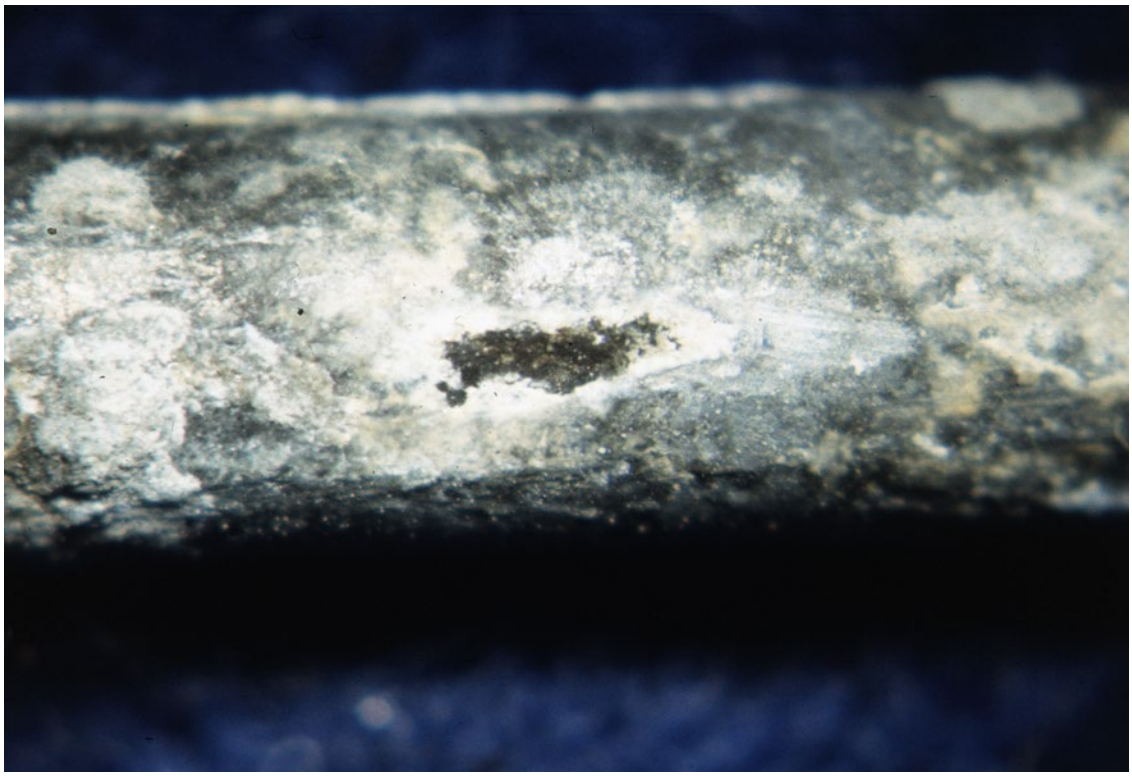

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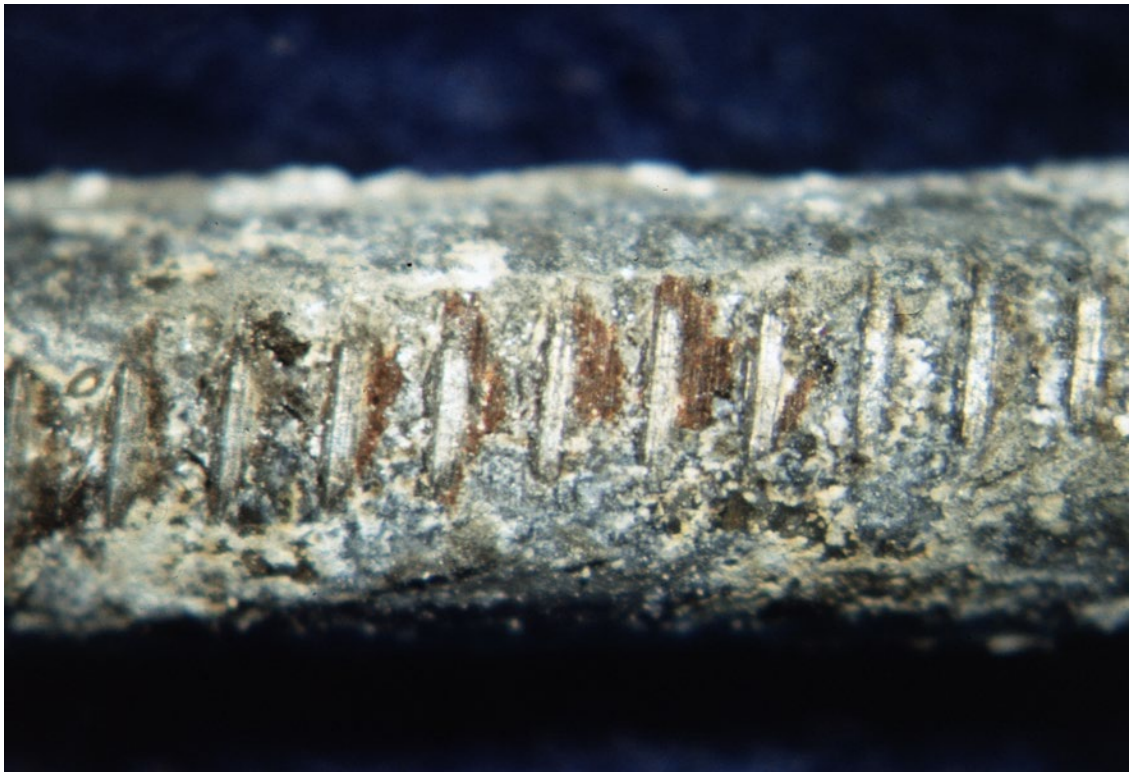
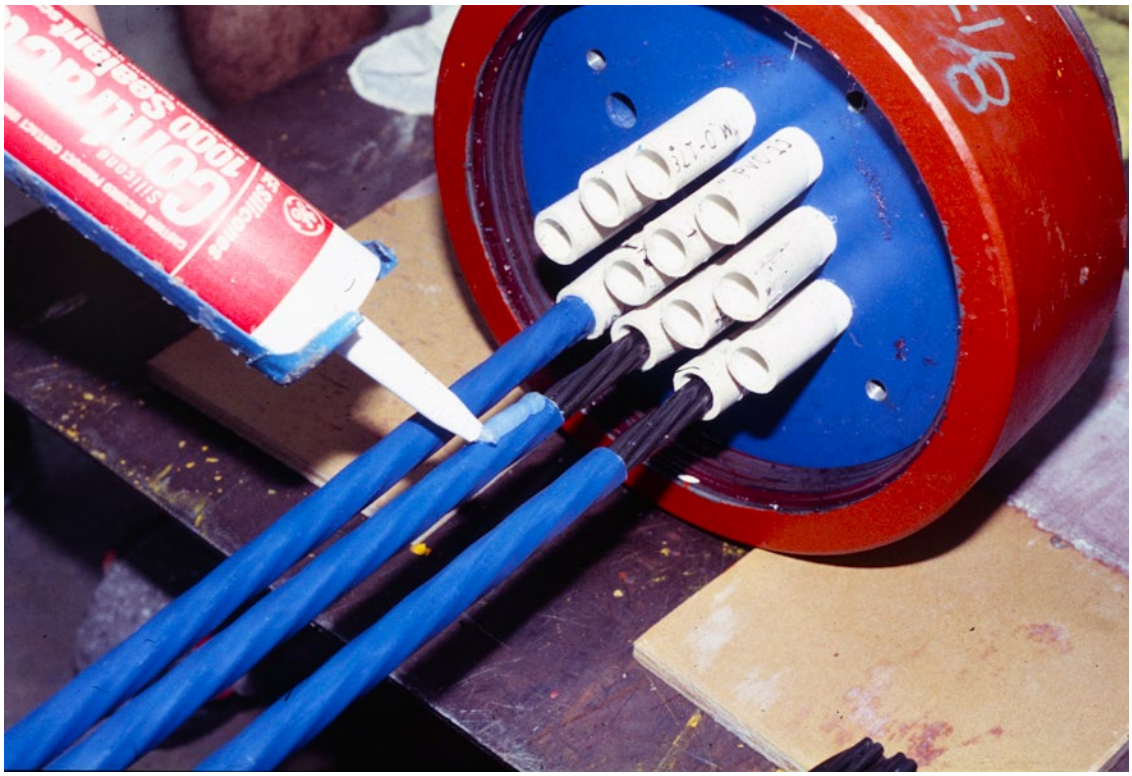
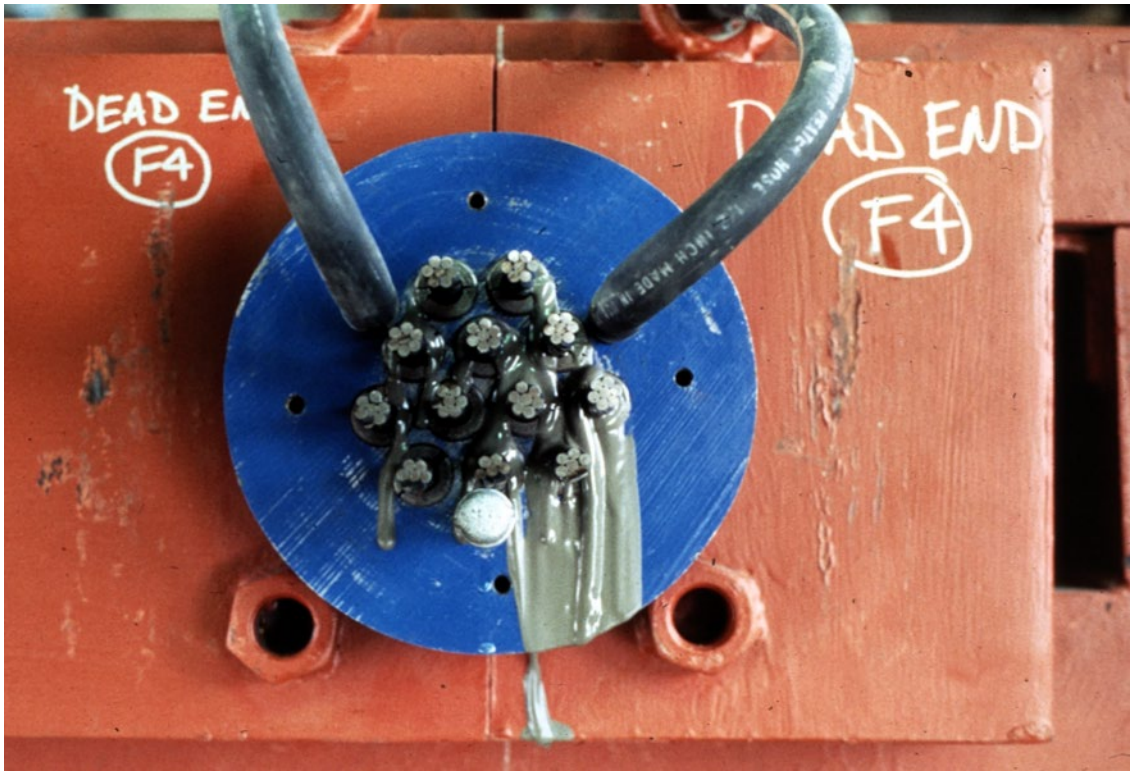


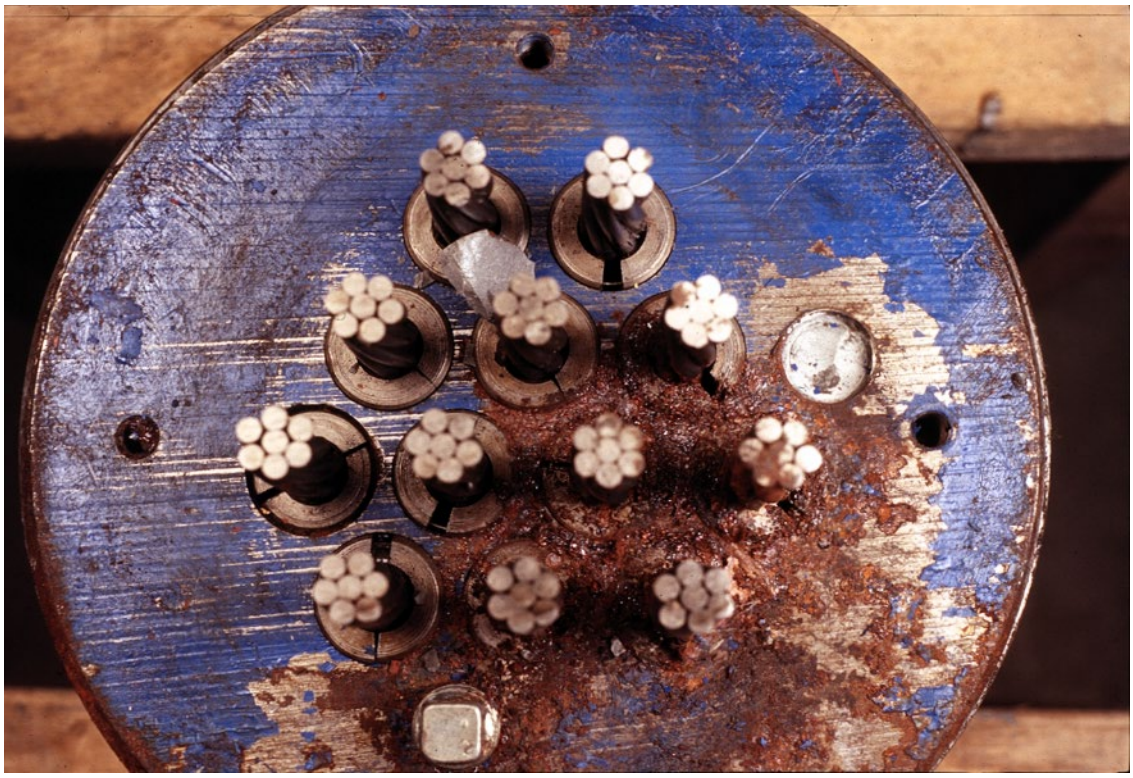
Slide 67. Large scale test seven (LS-7). April 7, 1995.



Slide 68. Large scale test eight (LS-8). Assembly. August 29, 1994.

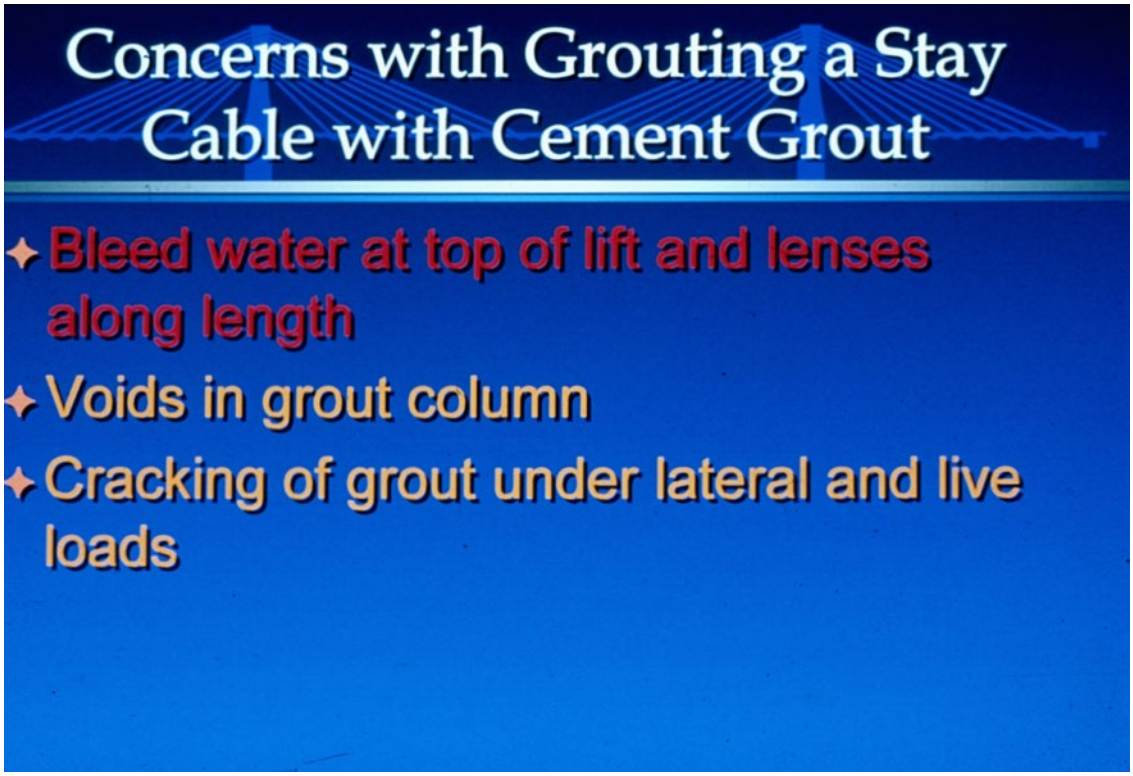


Slide 69. Specimen LS-8 grout leak through anchor head.

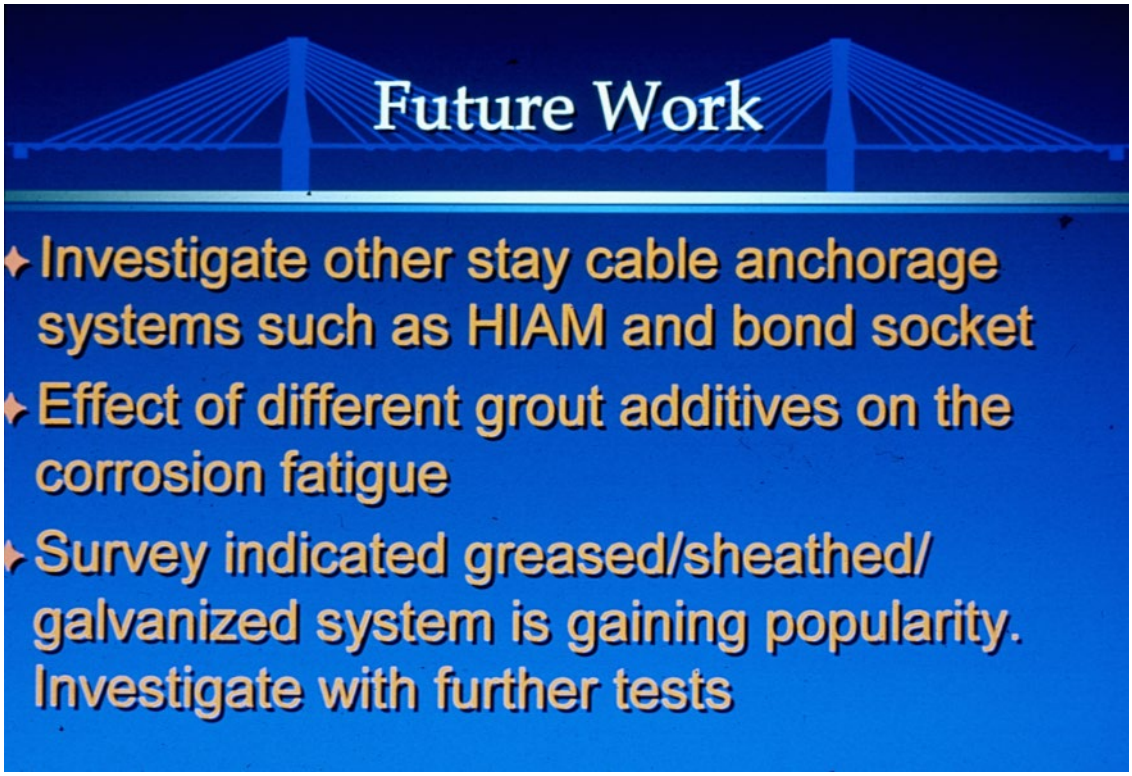


Slide 70. Large scale test eight (LS-8). March 30, 1995.

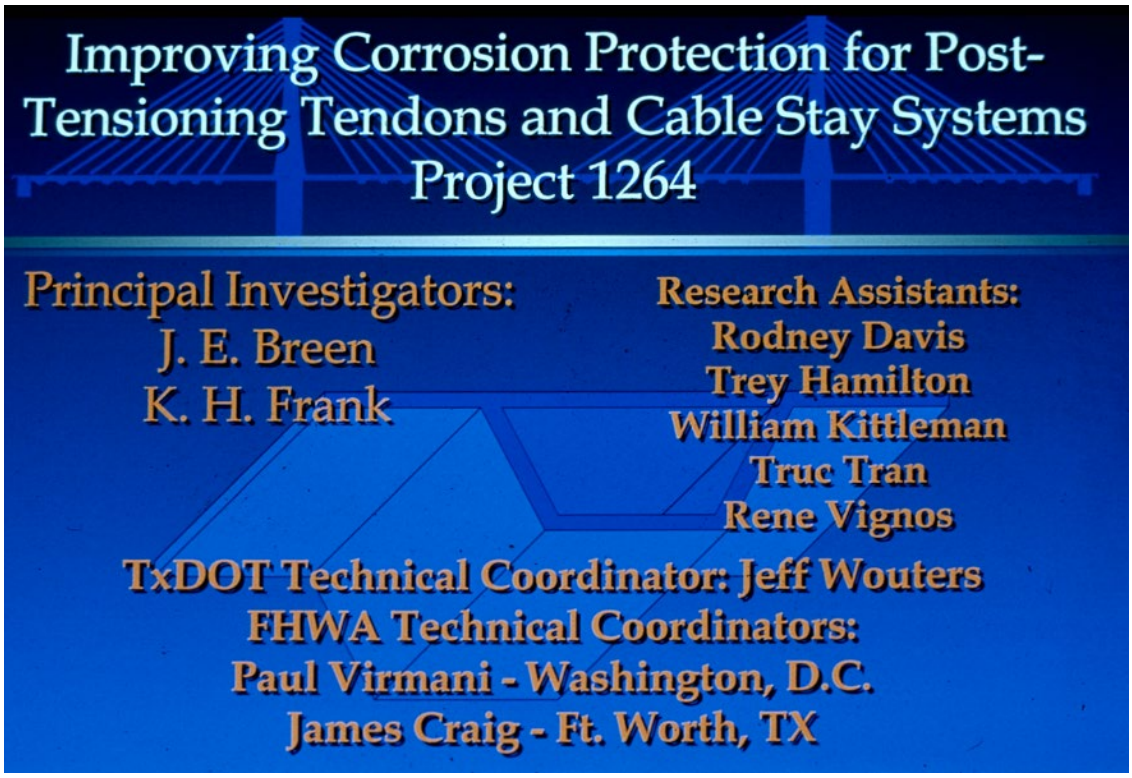
Slide 71. Large scale test eight (LS-8). March 30, 1995.



Slide 72. Concerns with Grouting a Stay Cable with Cement Grout



Slide 73. Future Work



Slide 74. Improving Corrosion Protection for Post-Tensioning Tendons and Cable Stay Systems; Project 1264

Section 2. Pasco-Kennewick

Slide 75. Breaking open stay cable.

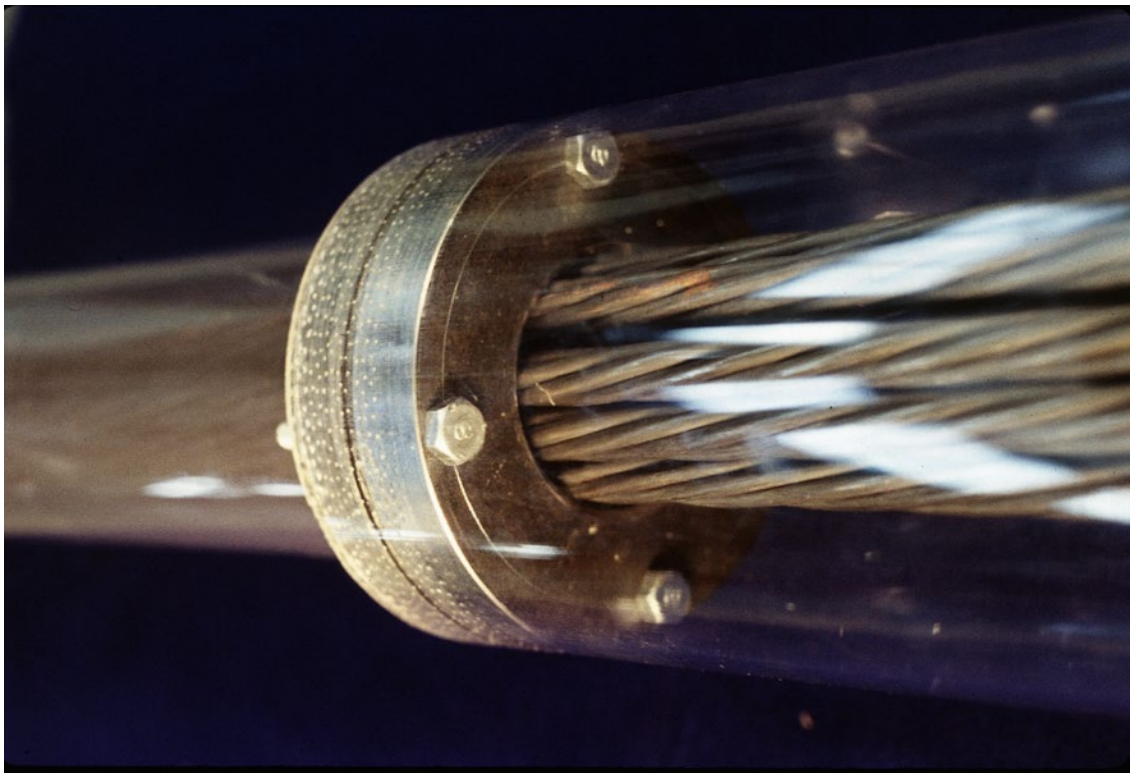
Slide 76. Stay cable.

Slide 77. Stay cable (interior view).

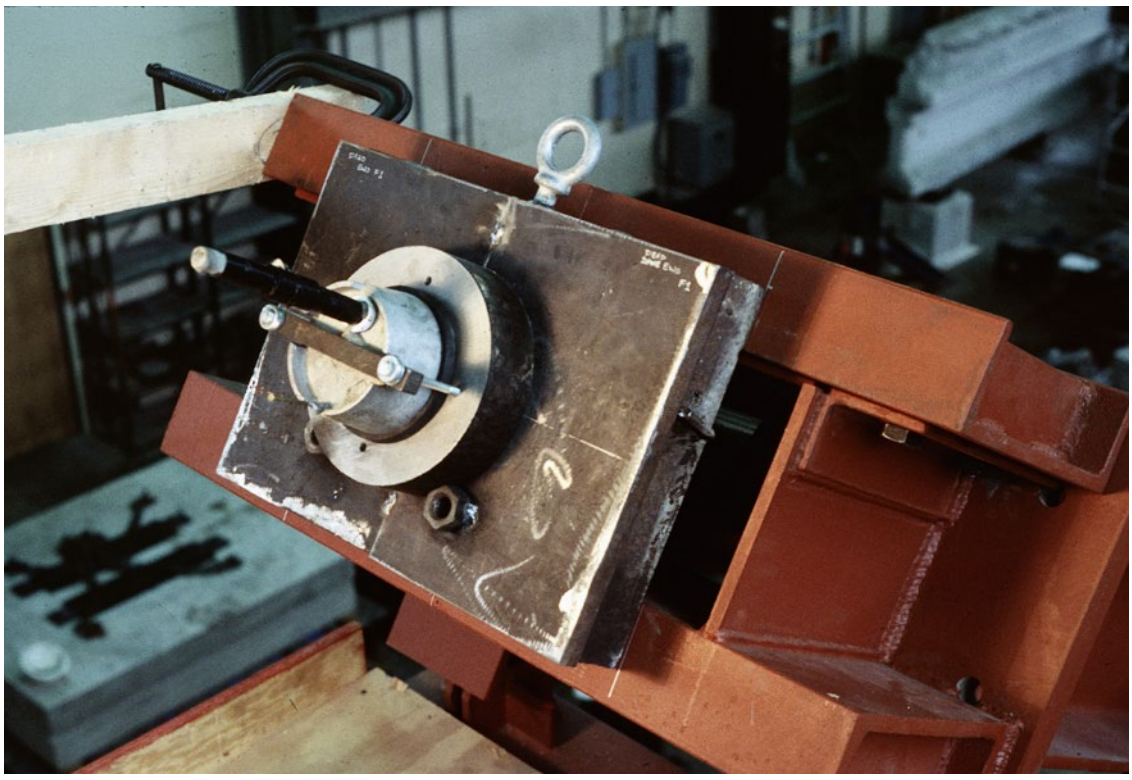
Section 3. Stay Cable Large-Scale Corrosion Tests

Part 1. Assembly and Grafting

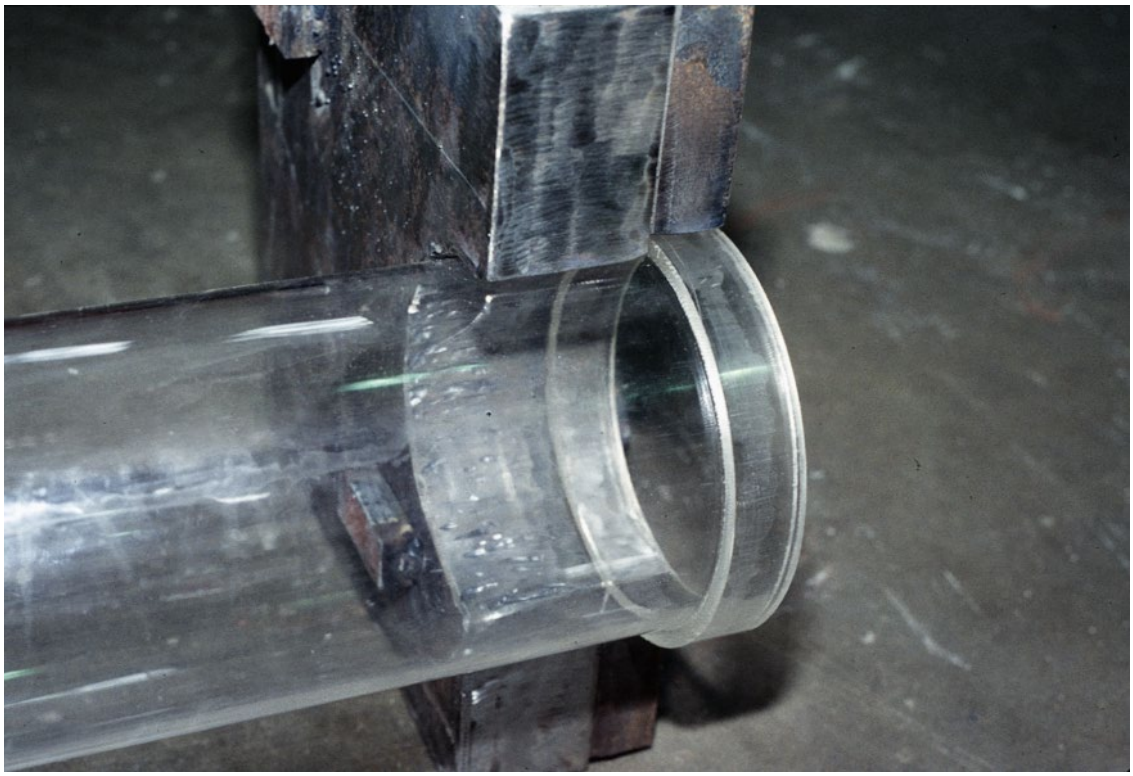
Slide 78. Large scale test three (LS-3). Assembly. Installation of live end anchor head.



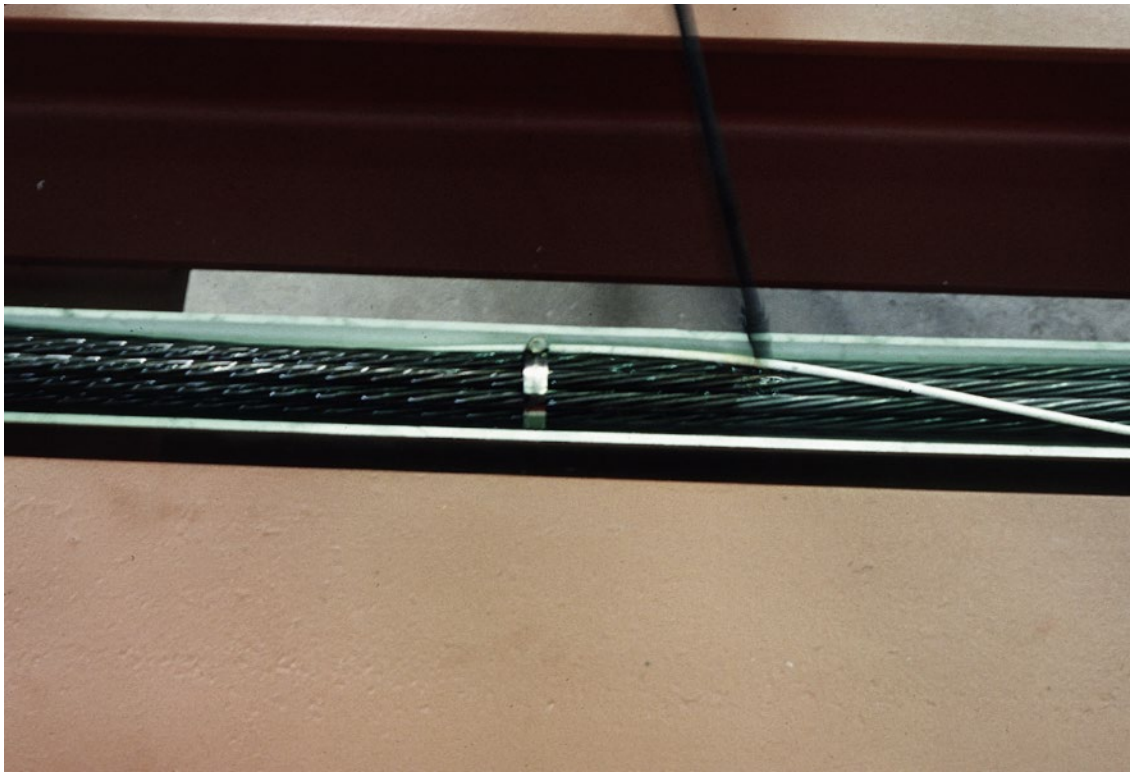
Slide 79. Large scale test three (LS-3). Parts. Transition assembly deviator ring.



Slide 80. Large scale test one (LS-1). Top anchor head.



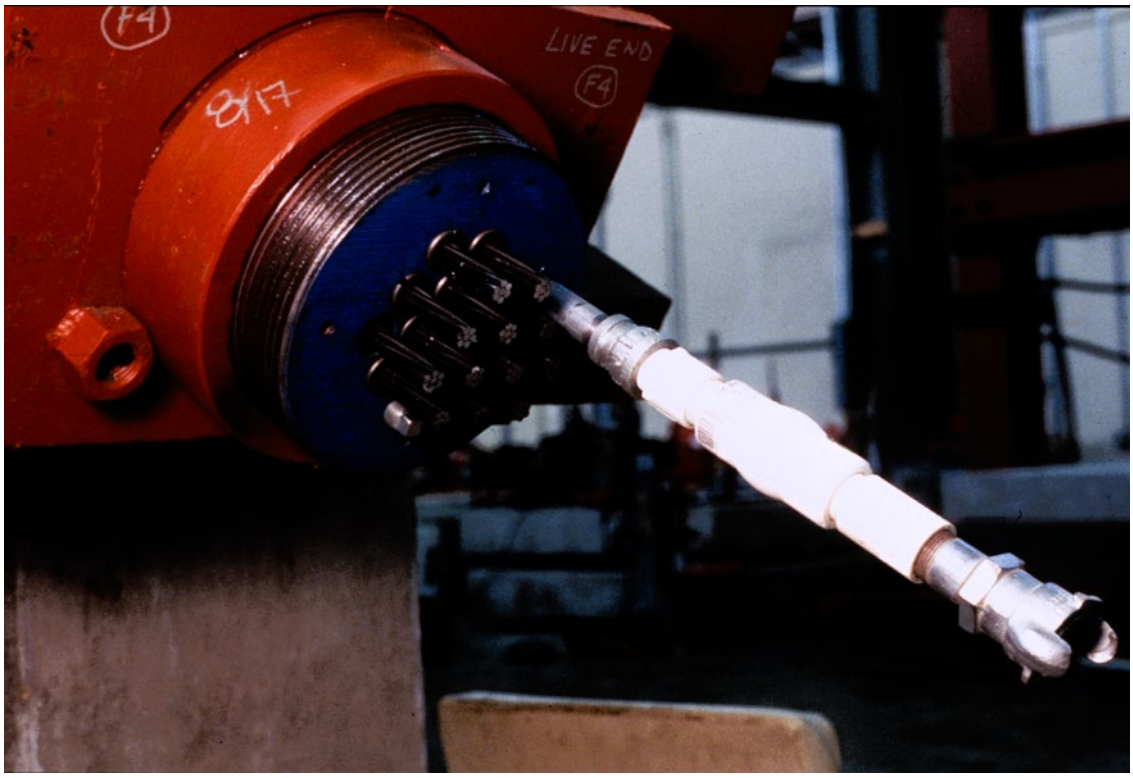
Slide 81. Large scale test three (LS-3). Assembly. Dead end transition pipe and plate.



Slide 82. Large scale test three (LS-3). Installation. Coating strand with oil.

Slide 83. Large scale test three (LS-3). Assembly. Dead end stressing assembly.

Slide 84. Specimen LS-8.



Slide 85. Anchor head.

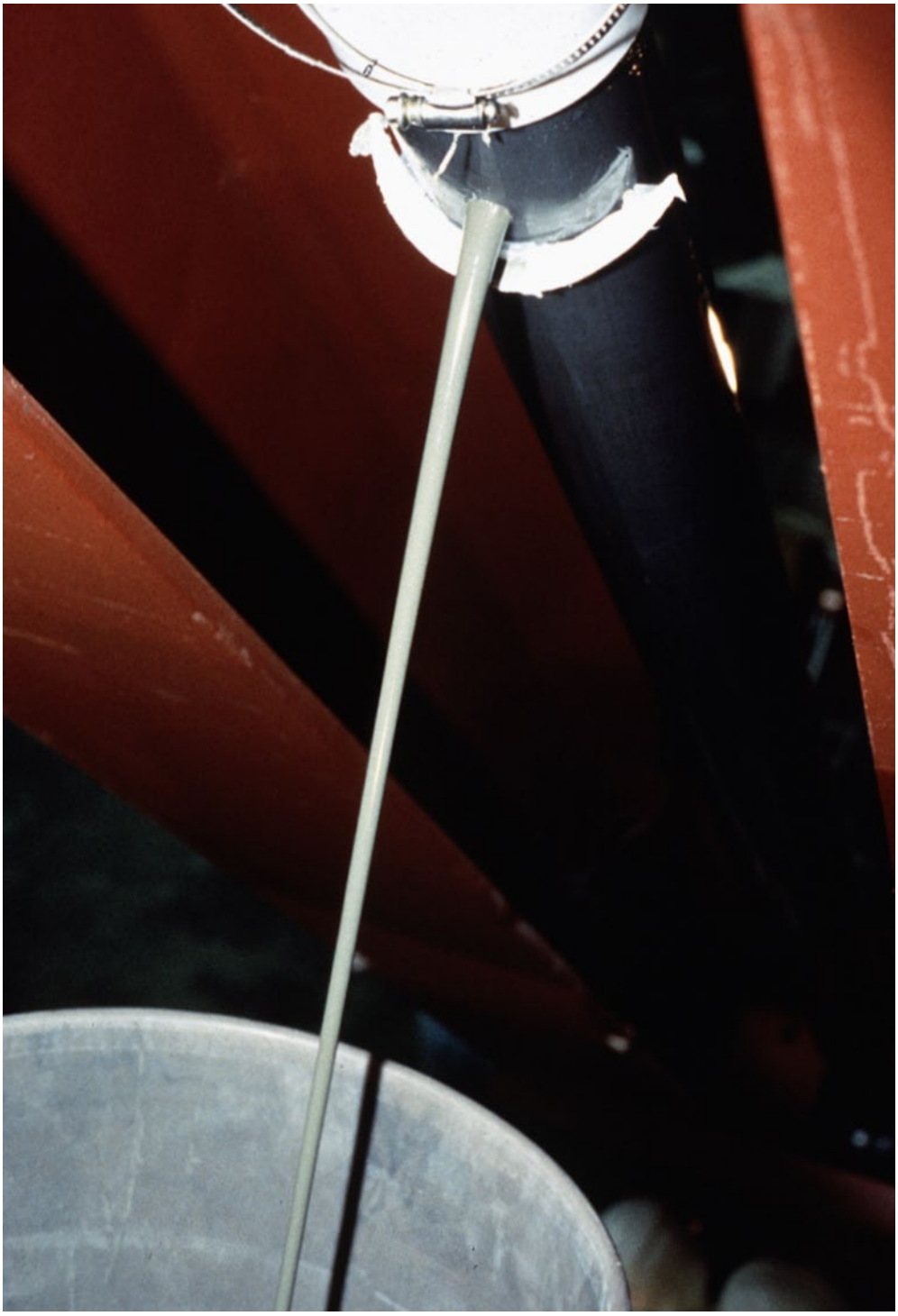
Slide 86. Mixing.

Slide 87. Agitating.

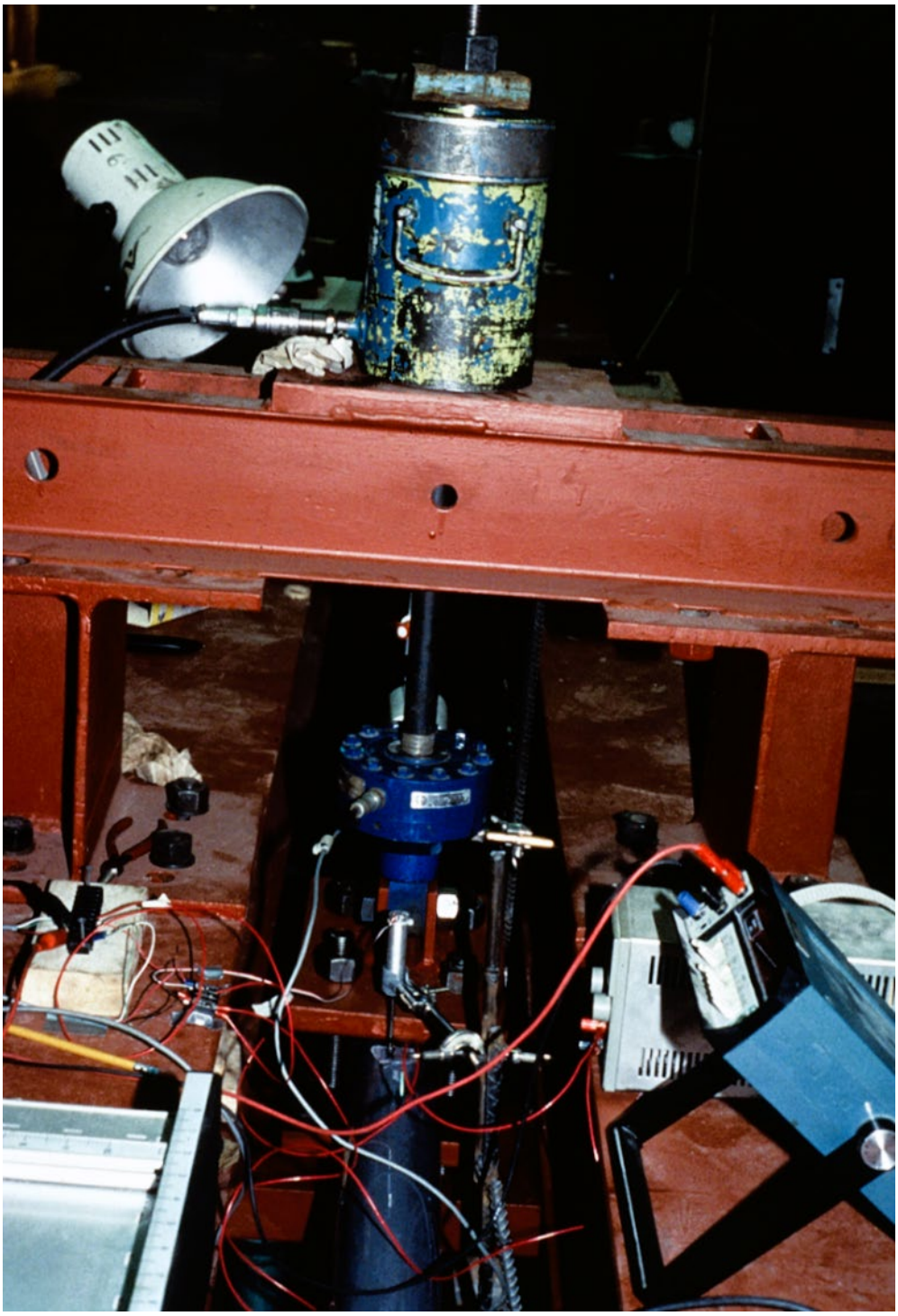
Slide 88. Straining grout.

Slide 89. Recirculating to remove air.

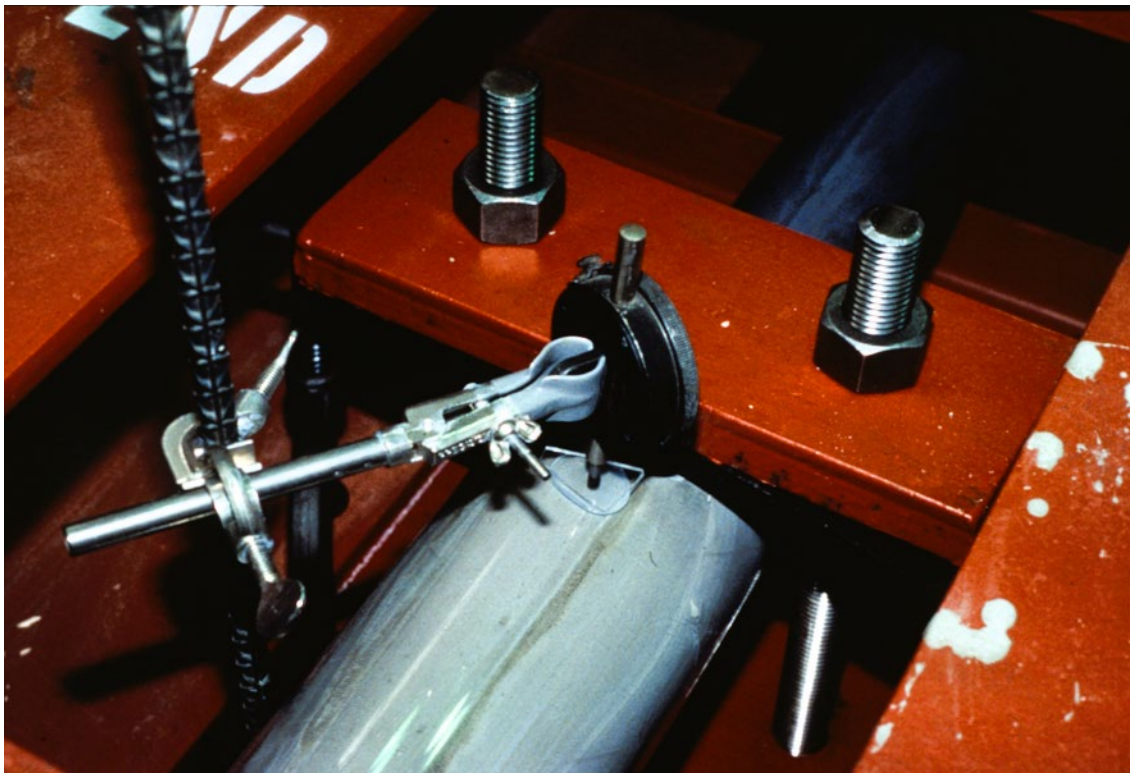
Slide 90. Removing attachment (?).



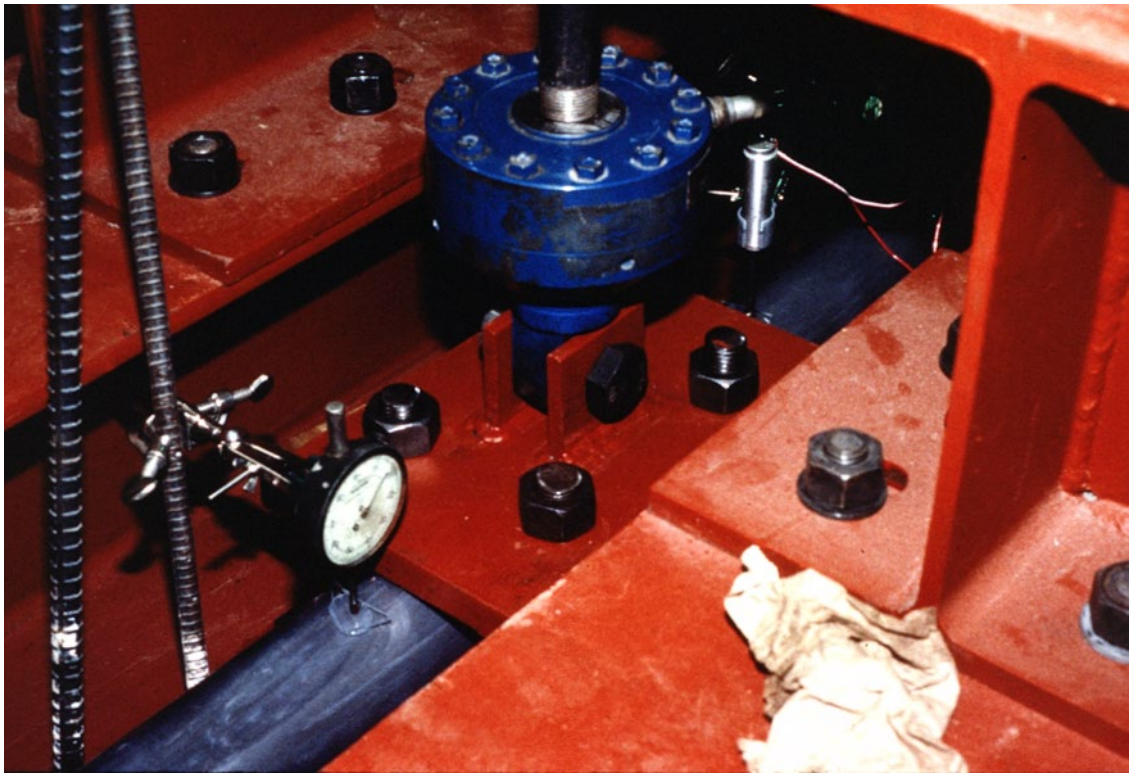
Slide 91. Discharge of first lift.



Slide 92. Test set-up.

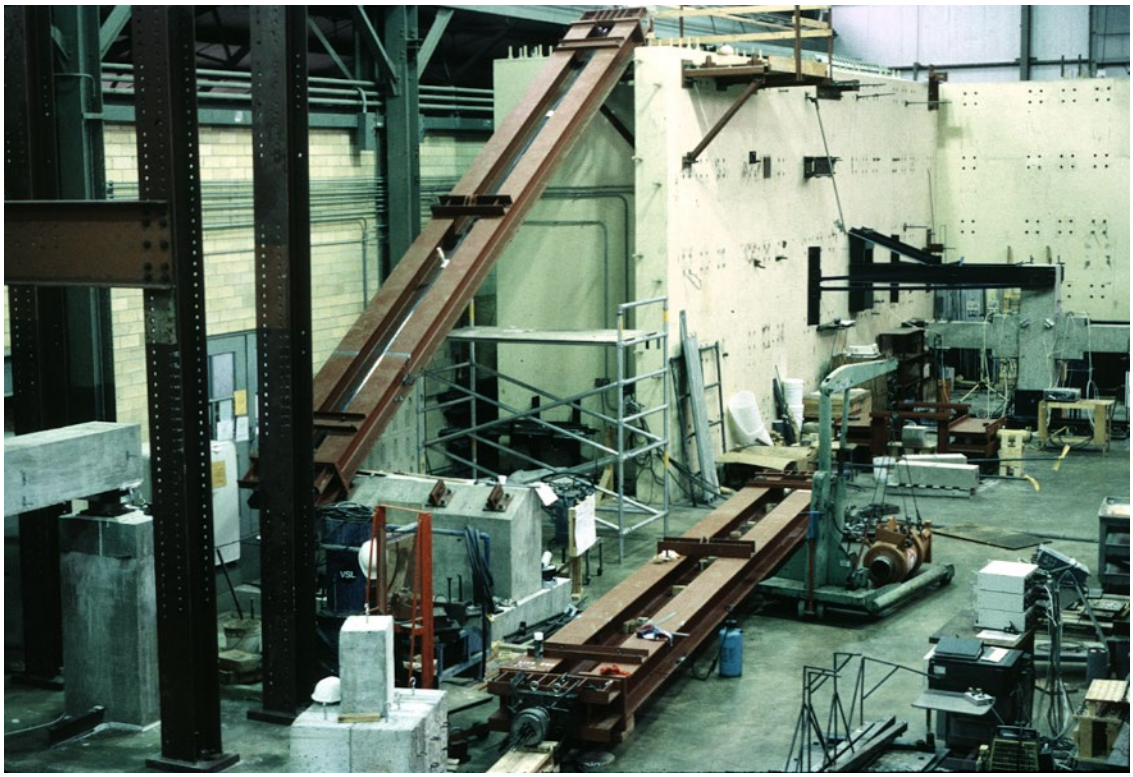


Slide 93. Test set-up (detail).



Slide 94. Test set-up (detail).

Part 2. Miscellaneous Pictures from Dissection of LS-1–LS-5

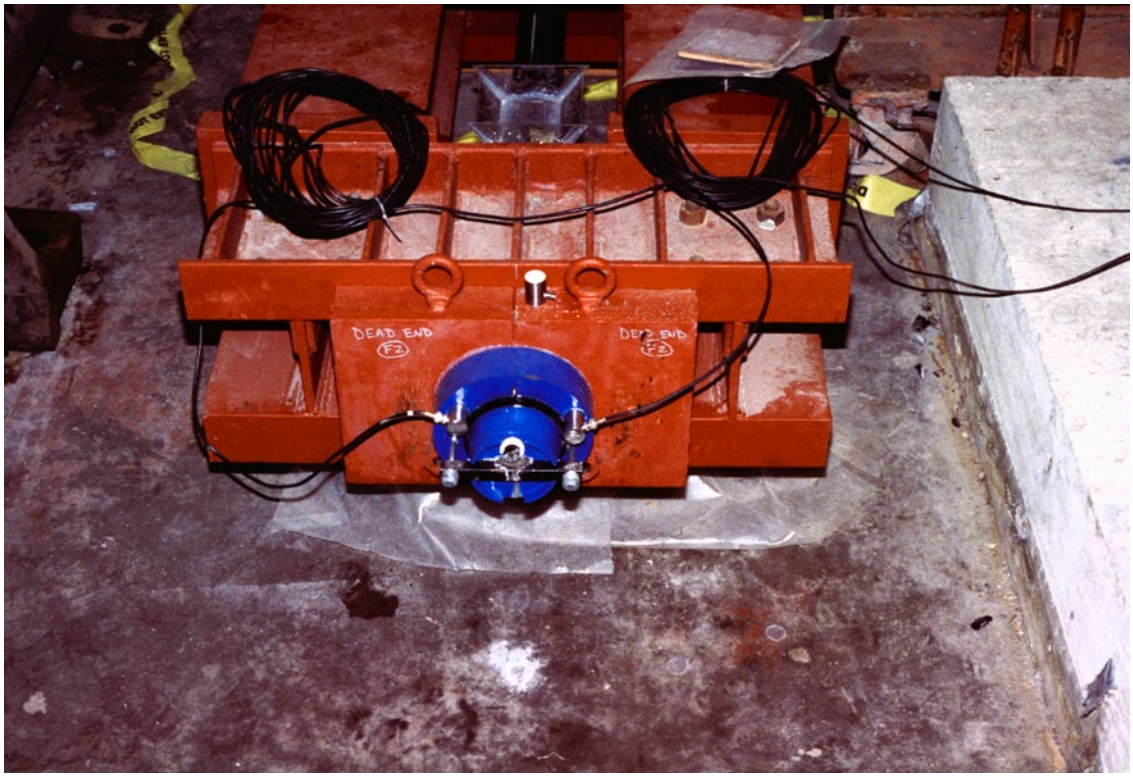


Slide 95. Large scale. Overall of grouting and assembly.

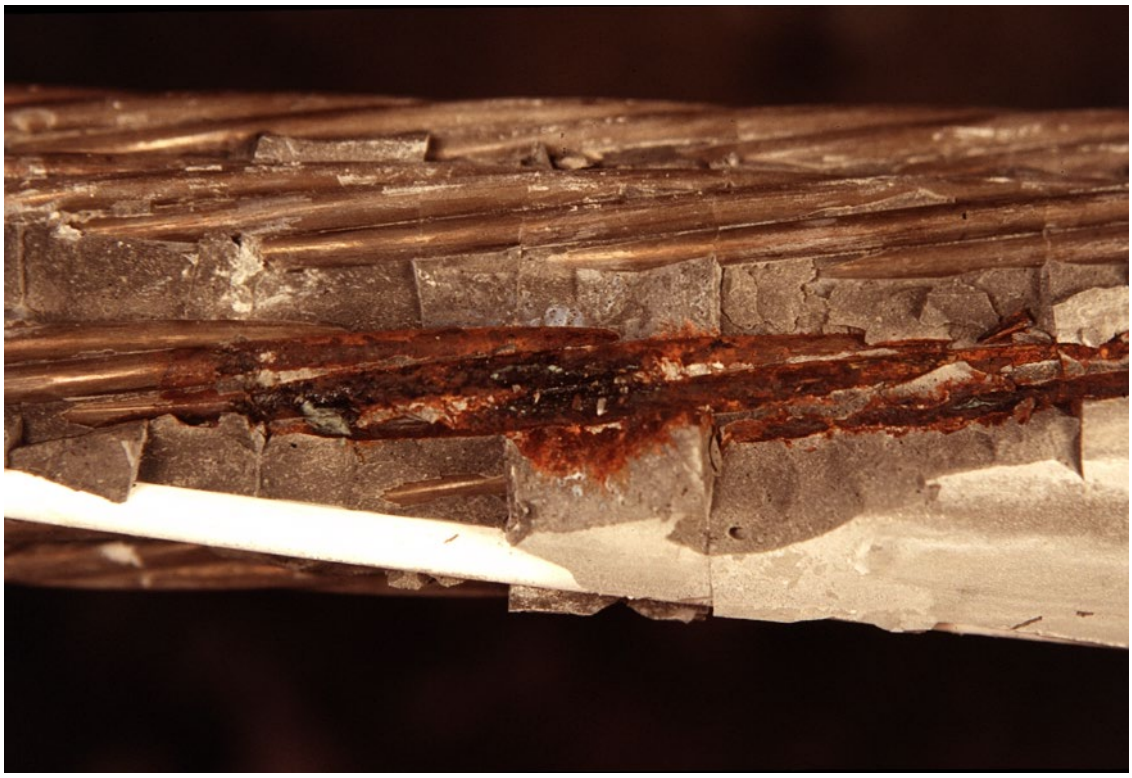
Slide 96. Large scale test five (LS-5).

Slide 97. Large scale test one (LS-1). Break in grout at bott [?] trans. in third after grout.

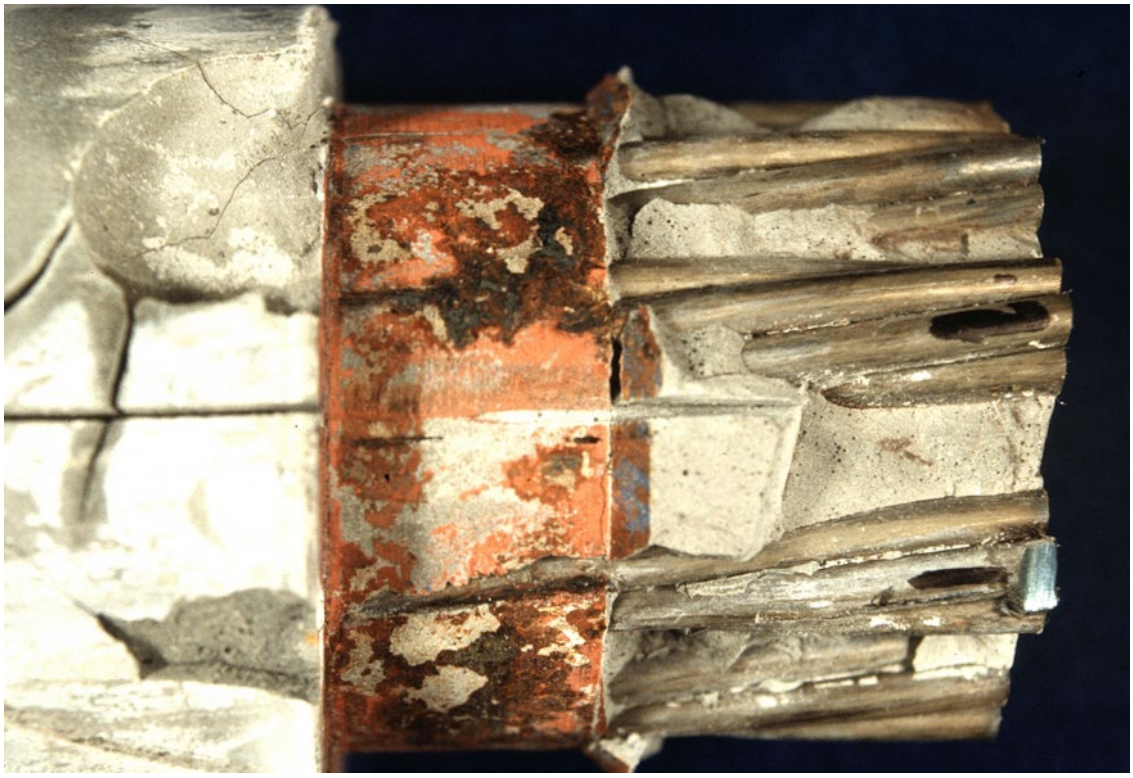
Slide 98. Large scale test five (LS-5). May 2, 1995.



Slide 99. Large scale test five (LS-5). D.E. leaking grout cap. February 22, 1995.

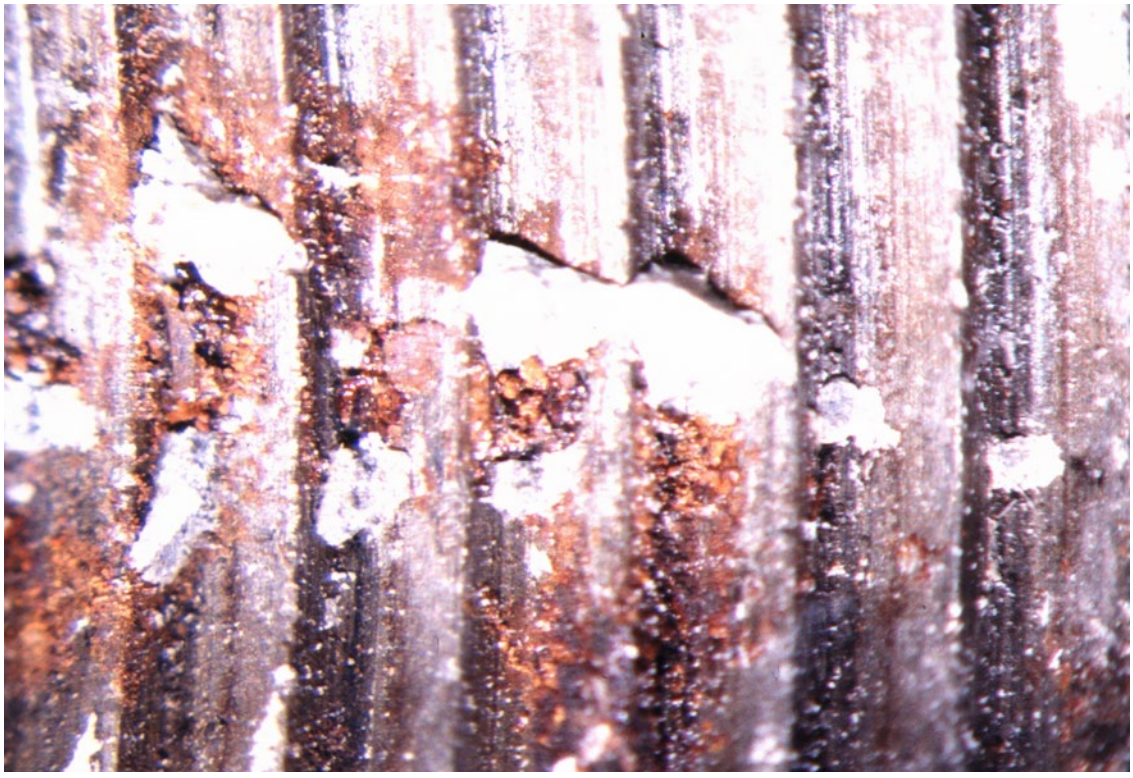


Slide 100. Large scale test five (LS-5). May 2, 1995.

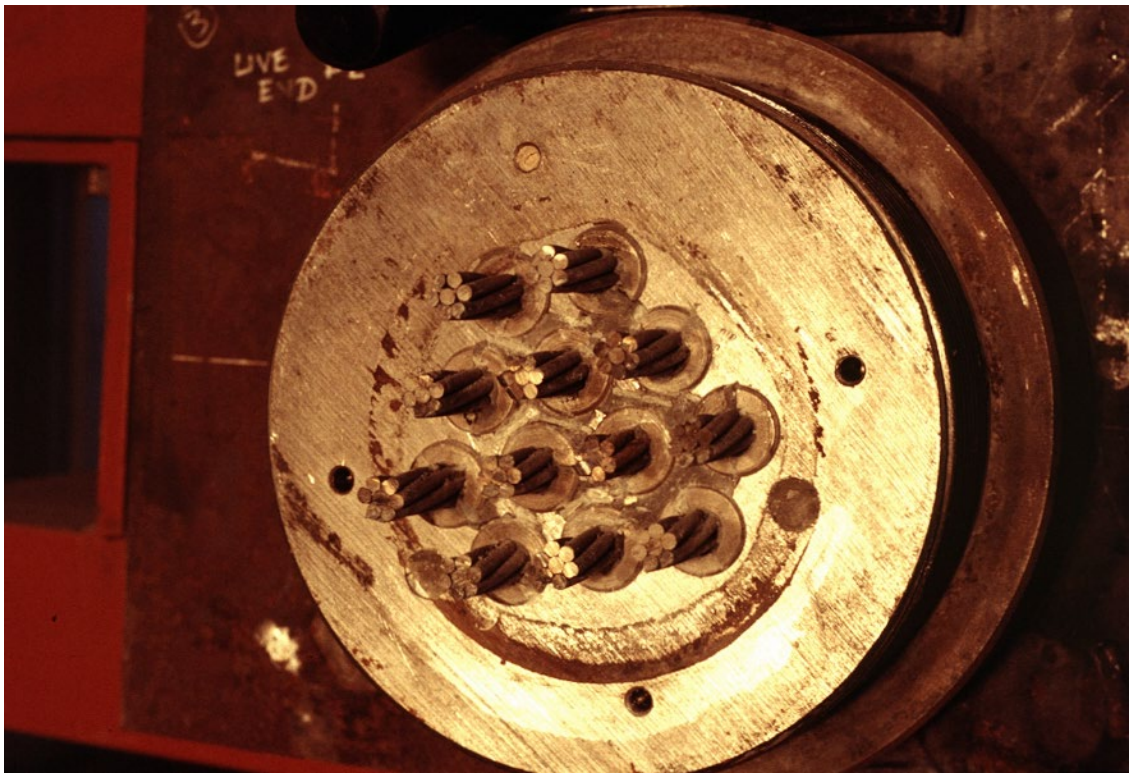


Slide 101. Large scale test five (LS-5). May 2, 1995.

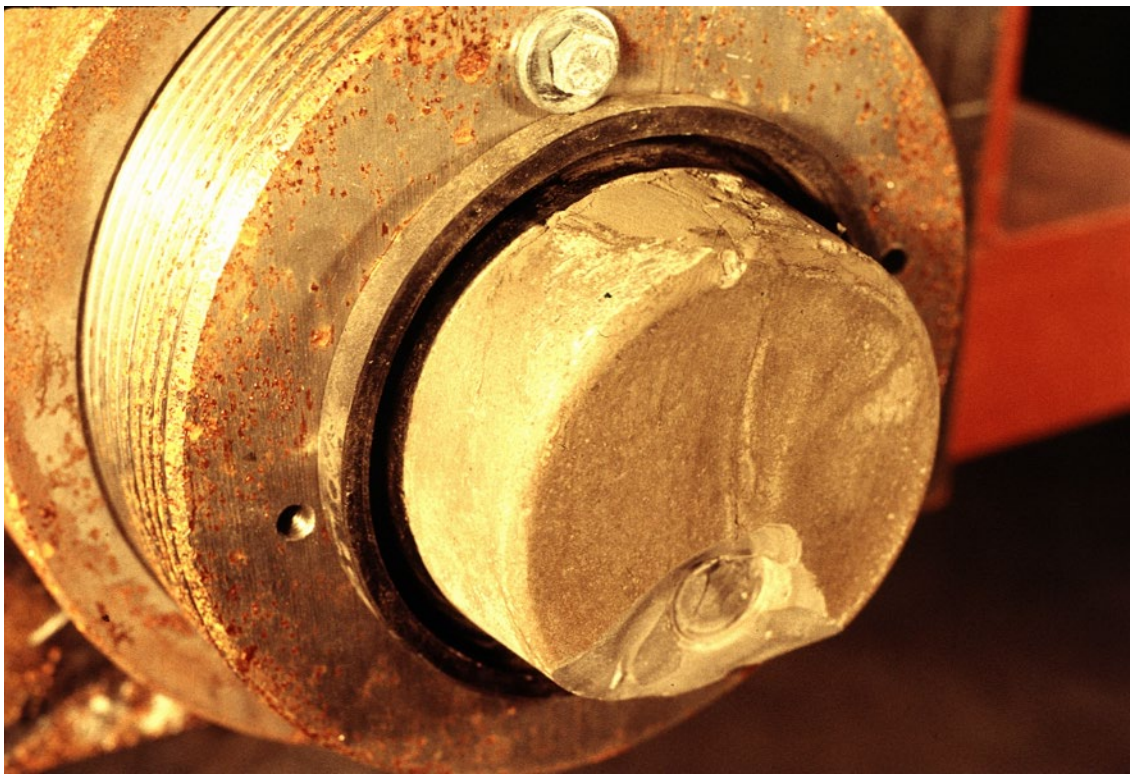
Slide 102. Large scale test four (LS-4). L.E. July 6, 1994.



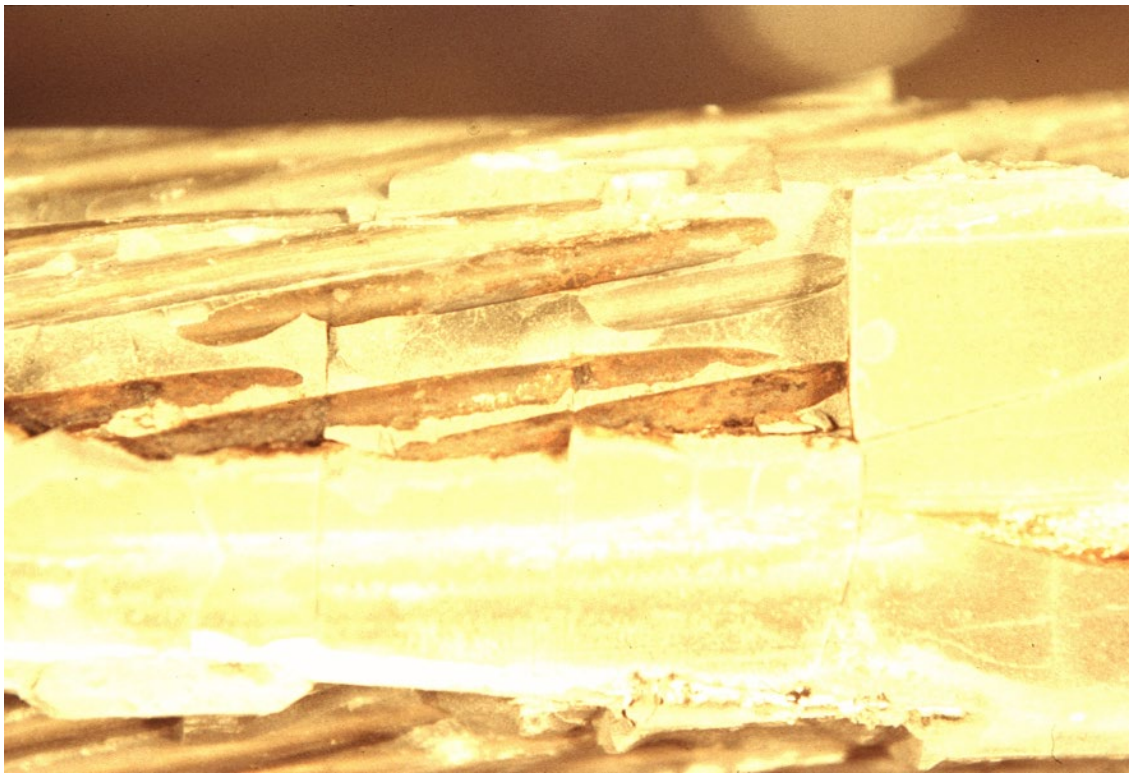
Slide 103. Large scale test two (LS-2)/4. Wedge. August 23, 1994.



Slide 104. Large scale test four (LS-4). L.E. Under grout cap. July 6, 1994.



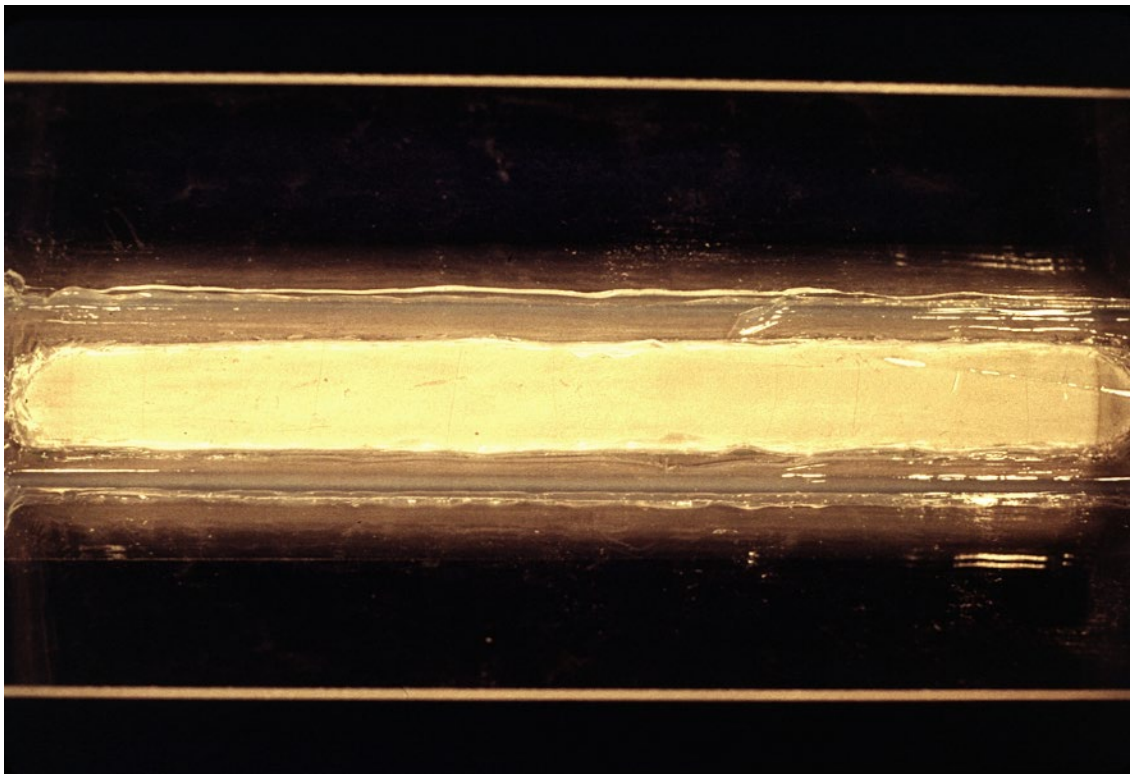
Slide 105. Large scale test three (LS-3). Diss. L.E. February 24, 1994.



Slide 106. Large scale test one (LS-1). Corrosion at crack. Copy #6. March 28, 1994.

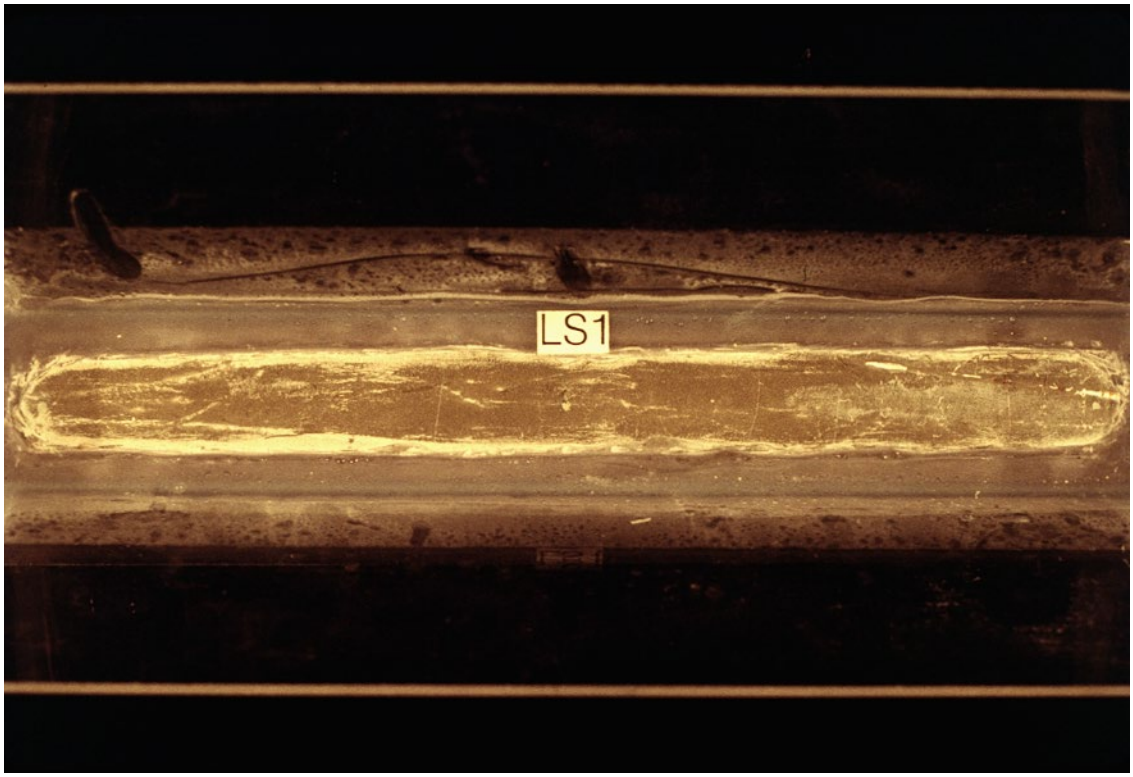
Slide 107. Large scale test two (LS-2). September 30, 1994.

Part 3. OPNG#2: LS-1 from Start to Finish [and LS-3]



Slide 108. Large scale test one (LS-1). Corrosion. L.E. 2nd copy. November 5, 1993.

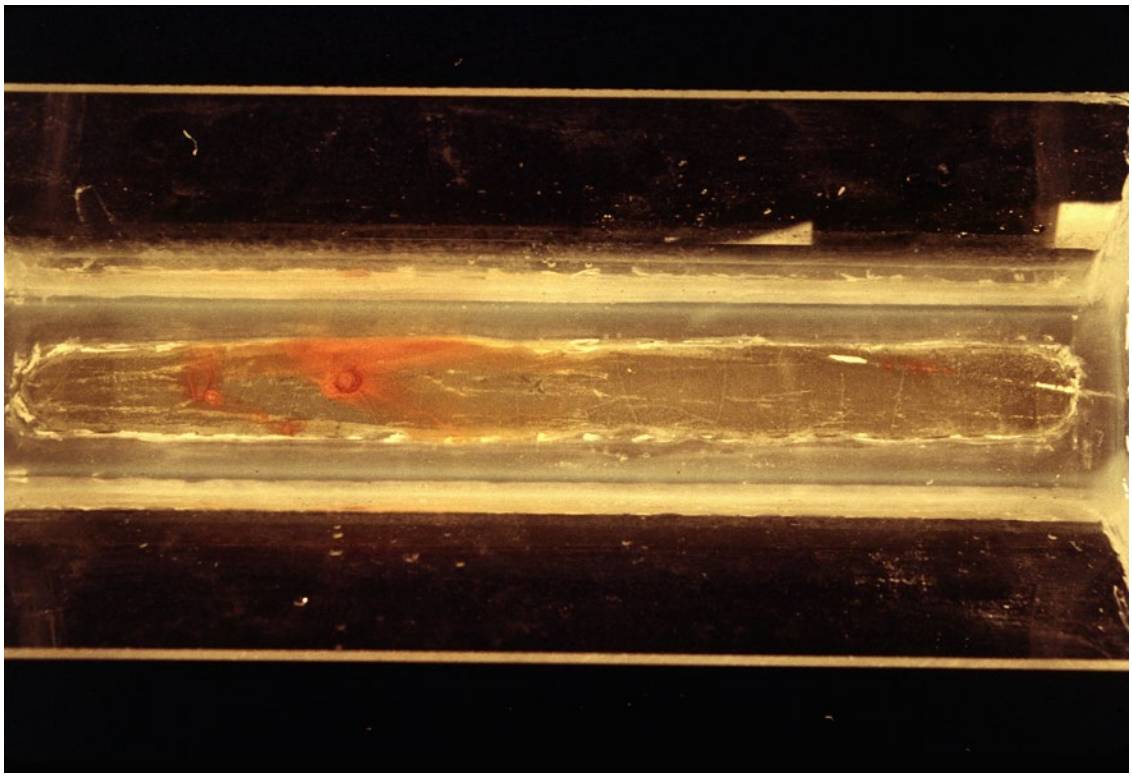
Slide 109. Large scale test one (LS-1). Corrosion. L.E. 2nd copy. November 19, 1993.



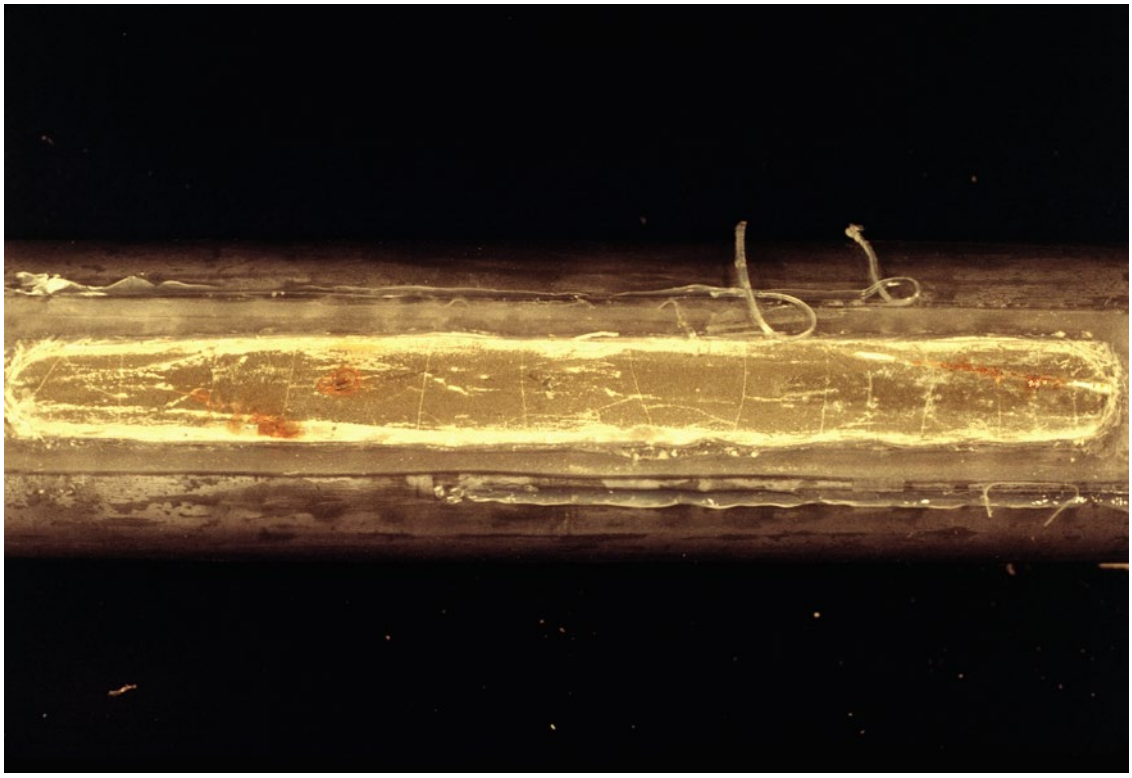
Slide 110. Large scale test one (LS-1). Corrosion. L.E. 2nd copy. December 3, 1993.

Slide 111. Large scale test one (LS-1). Corrosion. #2. December 17, 1993.

Slide 112. Large scale test one (LS-1) #2. December 31, 1993.



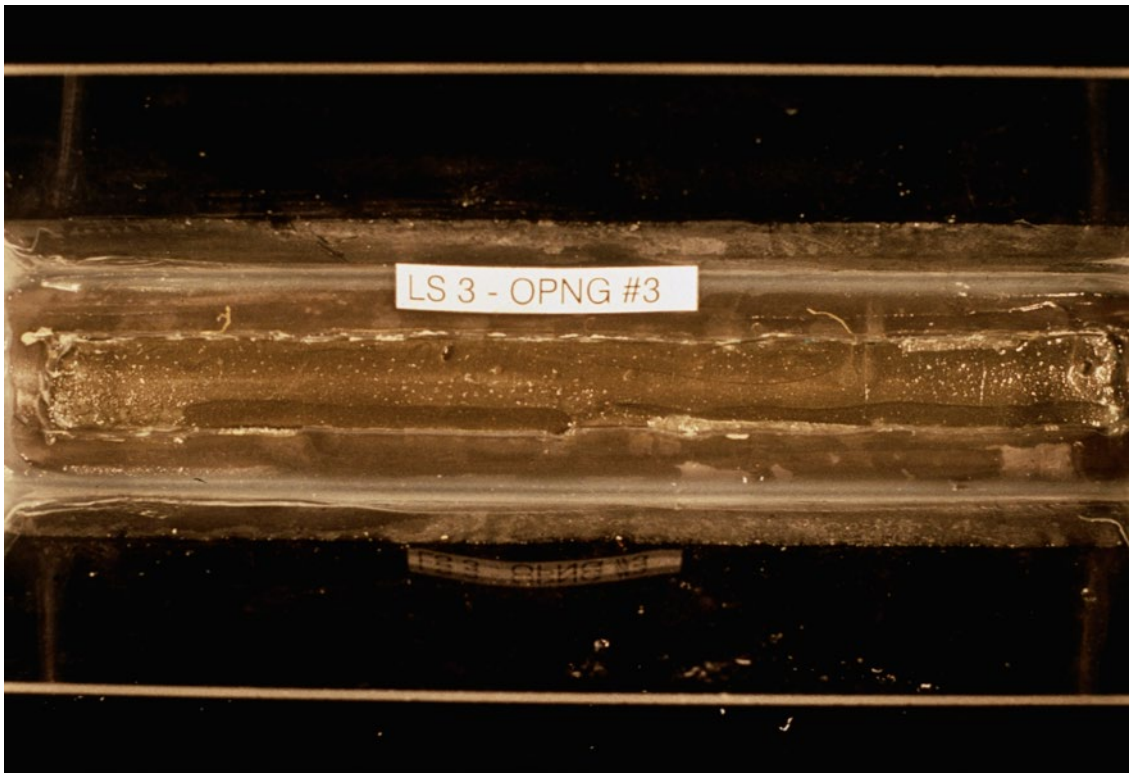
Slide 113. Large scale test one (LS-1) #2. January 12, 1994.



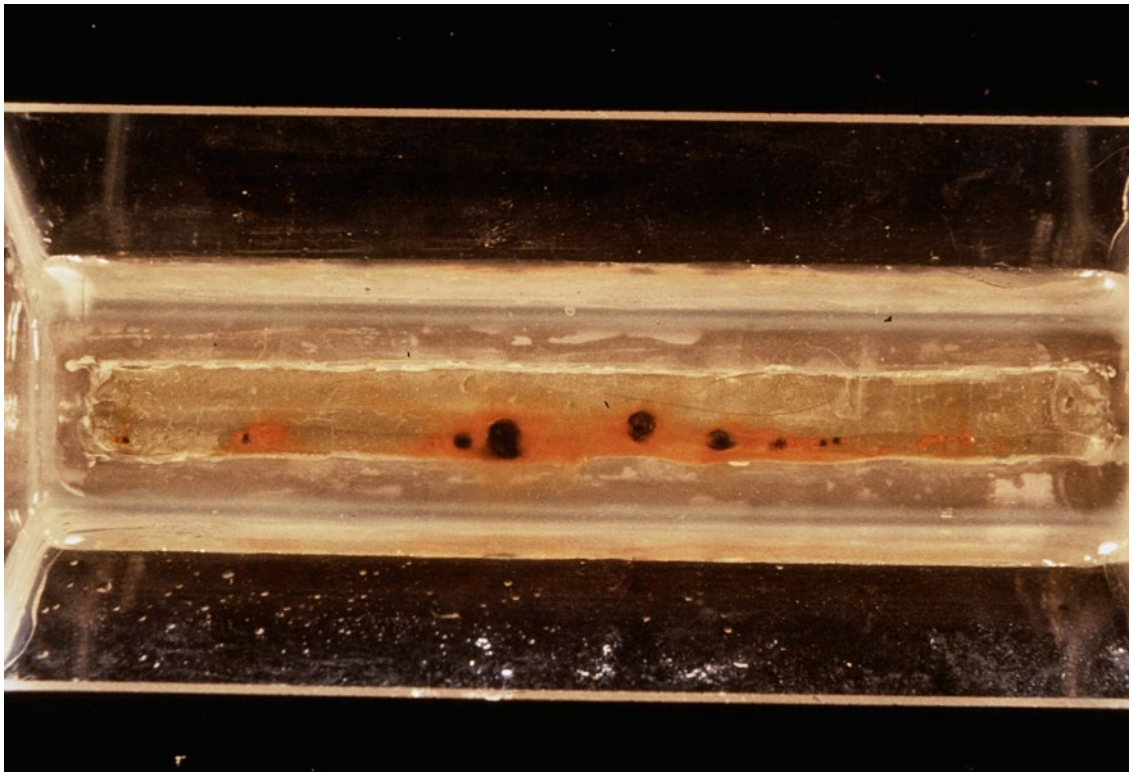
Slide 114. Large scale test one (LS-1) #2. January 31, 1994.

Slide 115. Large scale test one (LS-1). Corrosion. 2nd copy. March 28, 1994.

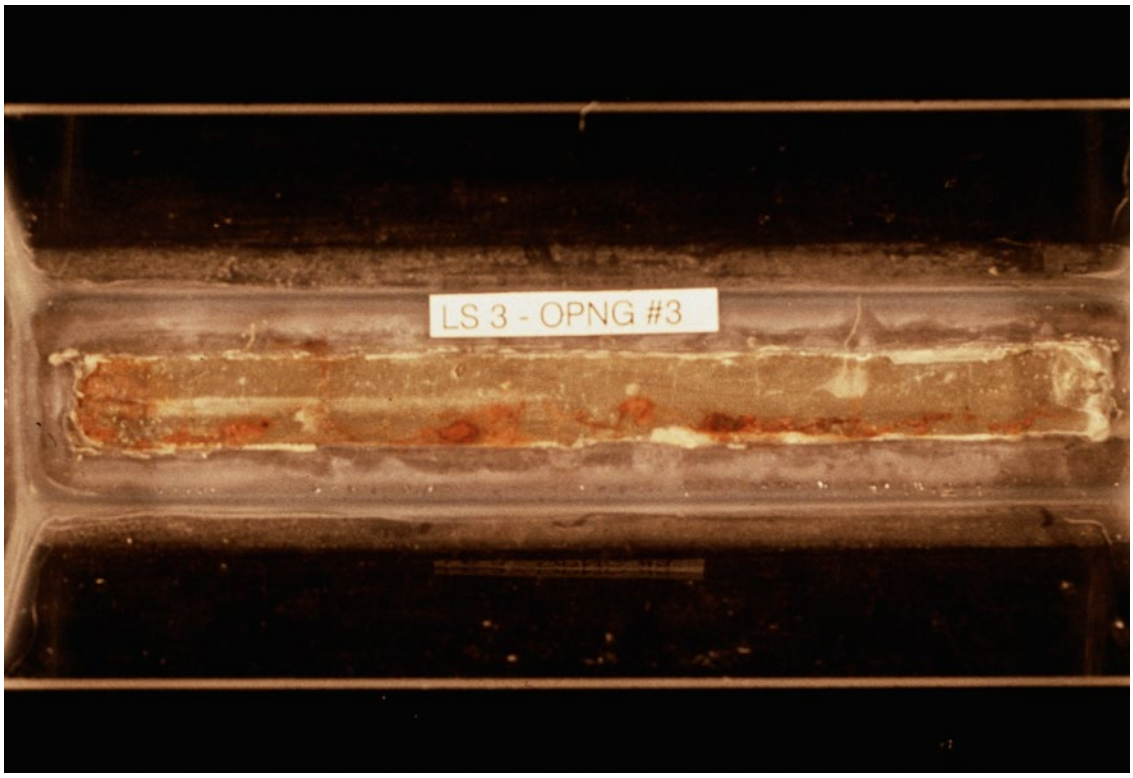
Slide 116. Large scale test one (LS-1). Corrosion. 2nd copy. March 28, 1994.



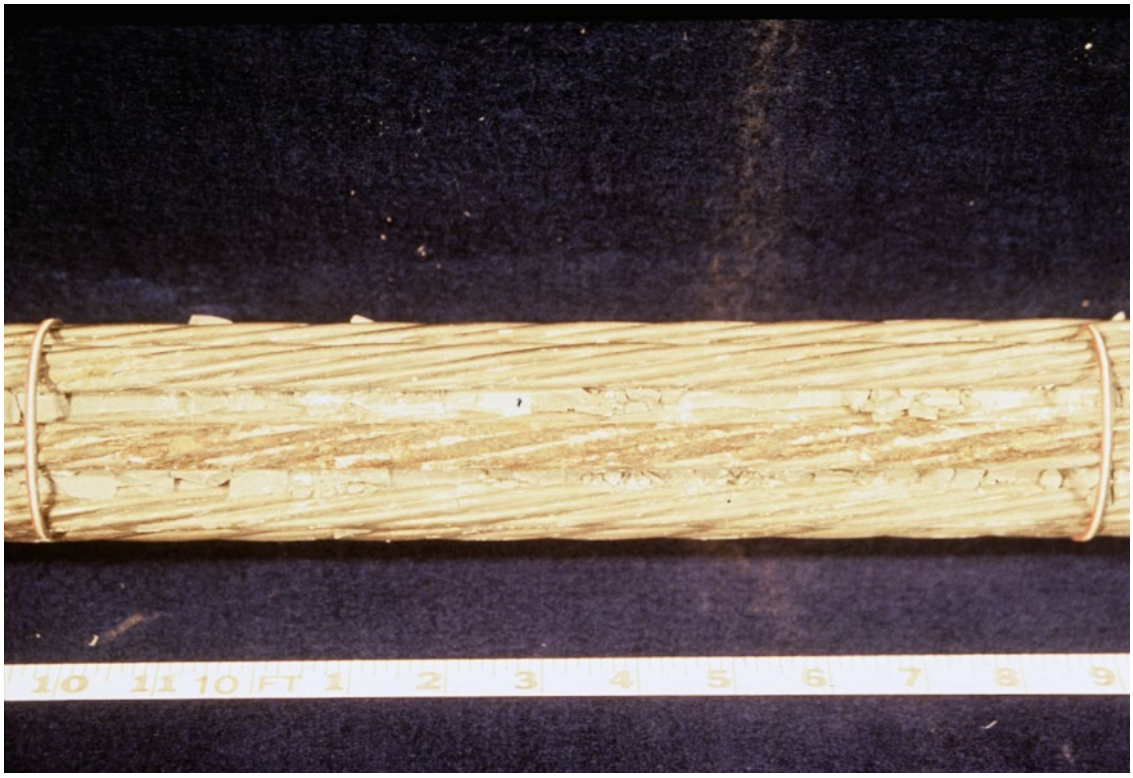
Slide 117. Large scale test three (LS-3). Copy 3.



Slide 118. Large scale test three (LS-3). Copy 3.

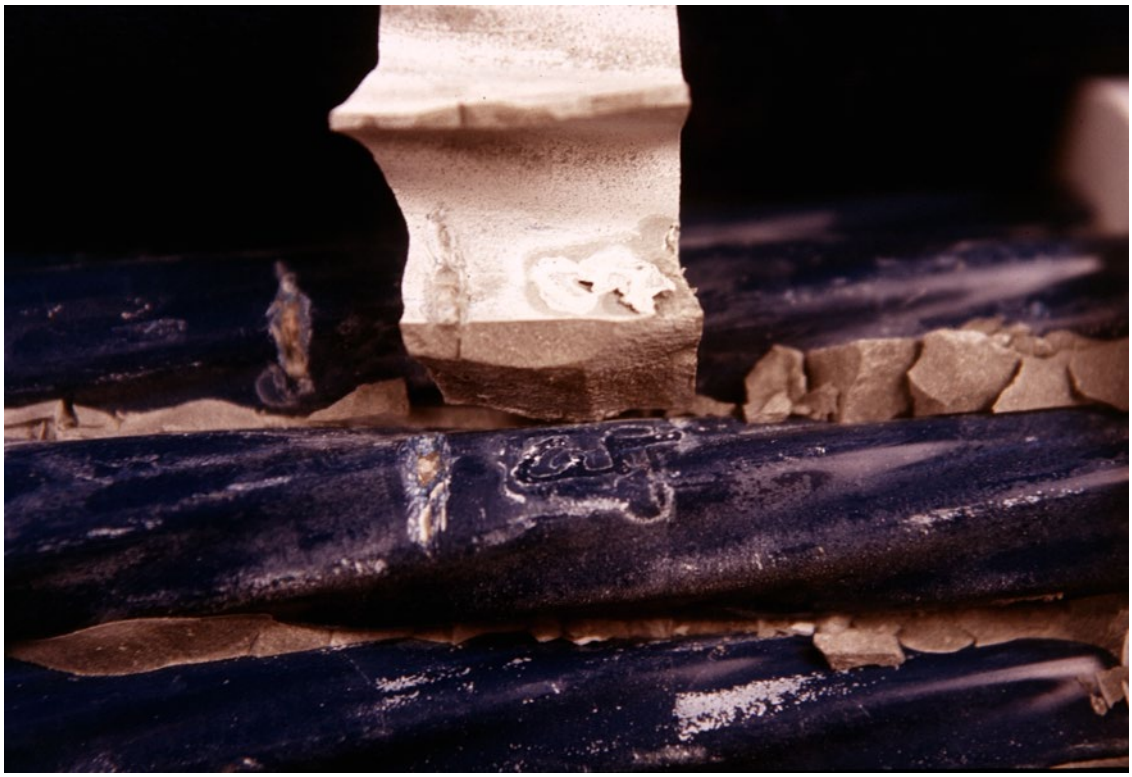


Slide 119. Large scale test three (LS-3). Copy 3.

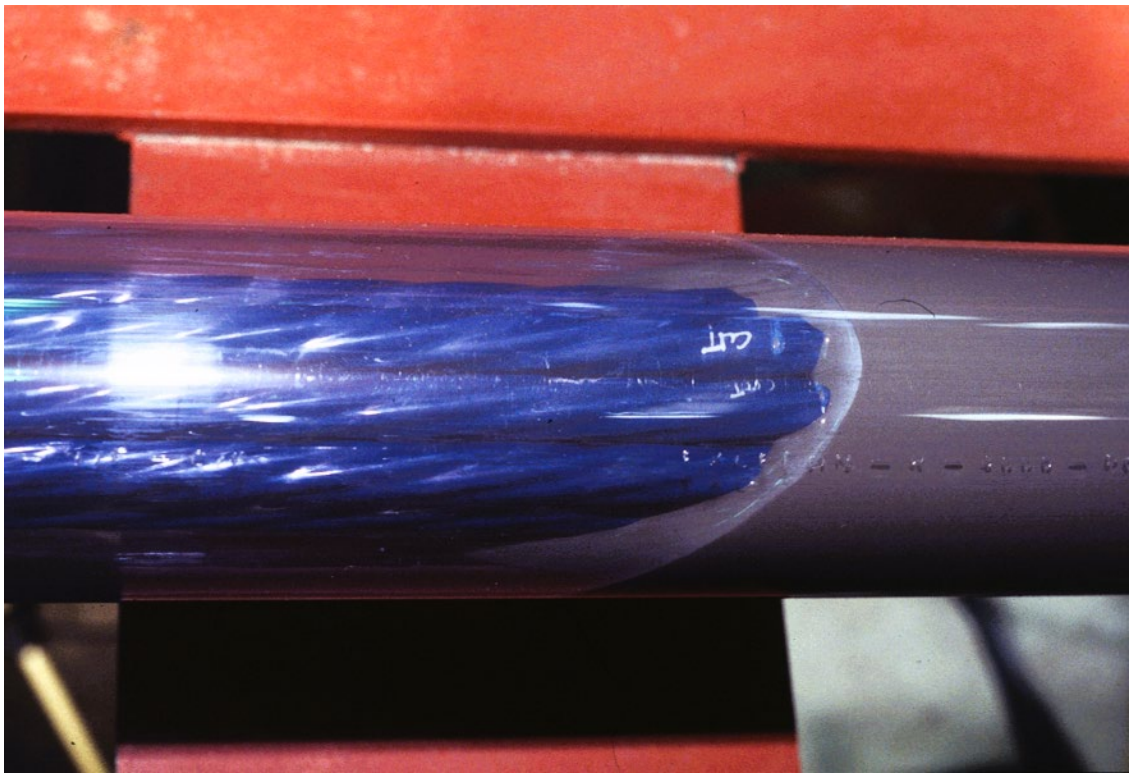


Slide 120. Large scale test three (LS-3). Copy 3.

Part 4. LS-6: Epoxy



Slide 121. Large scale test six (LS-6). December 13, 1994.

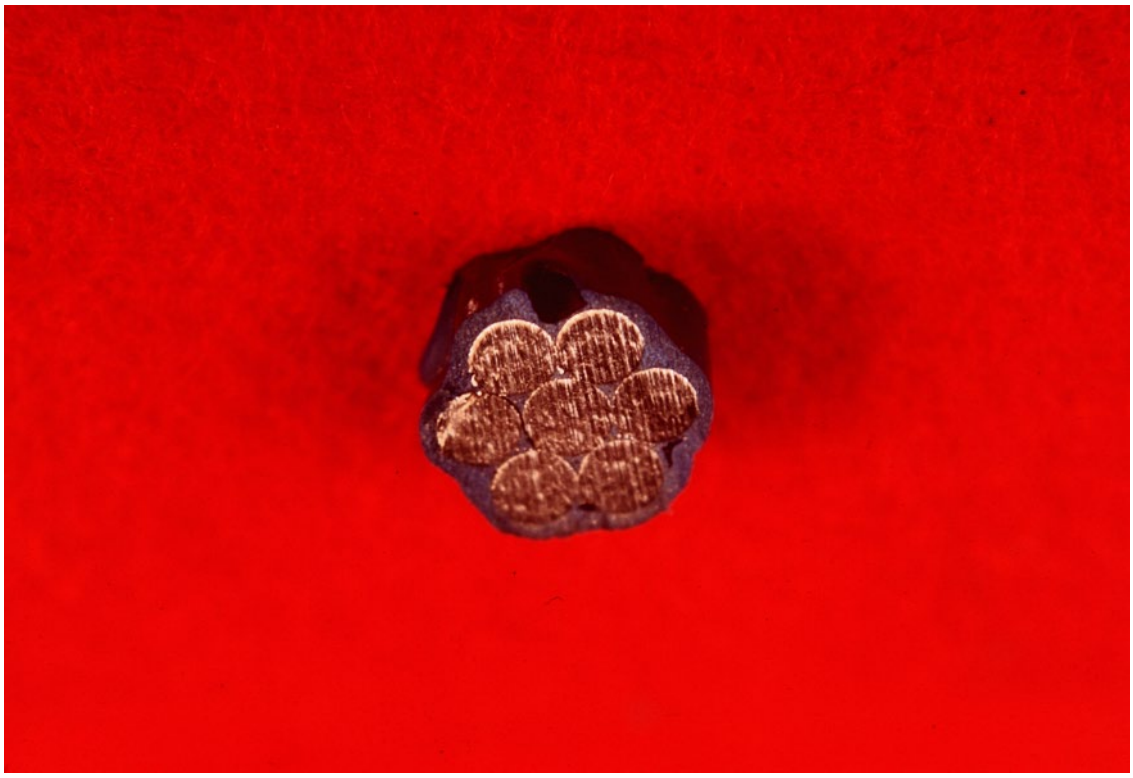


Slide 122. Large scale test six (LS-6). Grout in pipe. June 30, 1994.

Slide 123. Large scale test six (LS-6). December 13, 1994.

Slide 124. Large scale test six (LS-6). March 10, 1995.

Slide 125. Grout in epoxy repair cap. February 20, 1995.

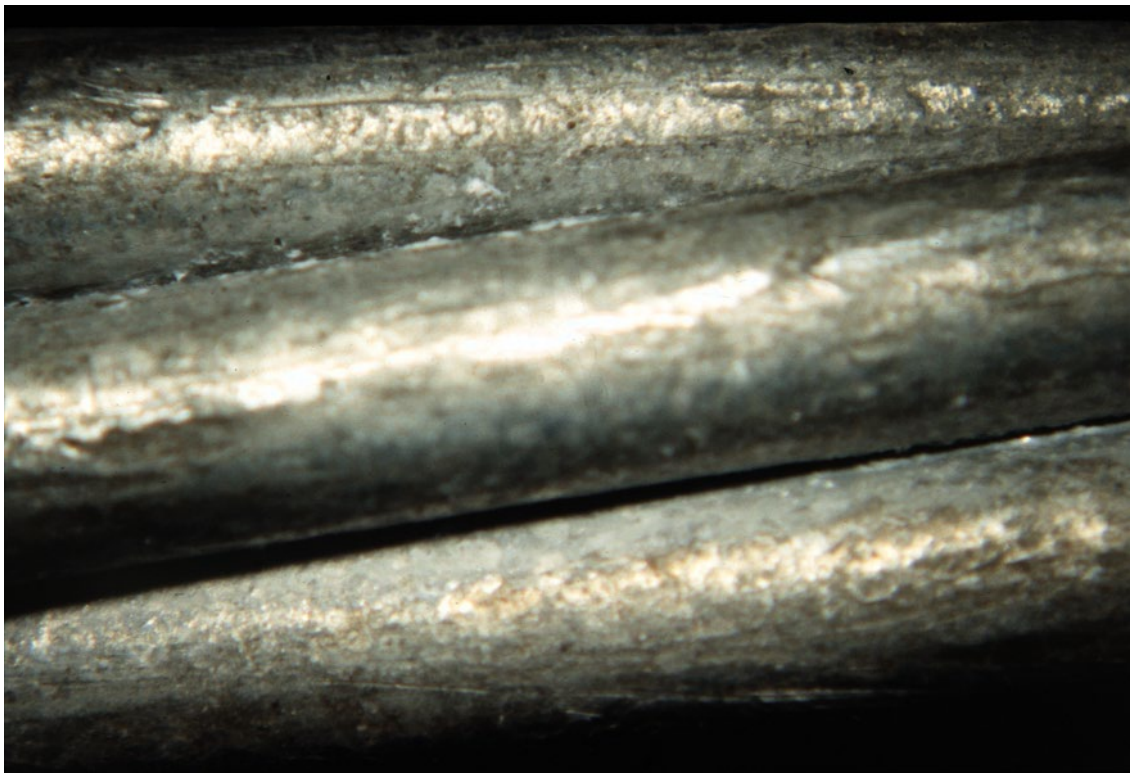


Slide 126. Large scale test six (LS-6). March 10, 1995.

Slide 127. Large scale test six (LS-6). March 10, 1995.

Slide 128. Large scale test six (LS-6). March 10, 1995.

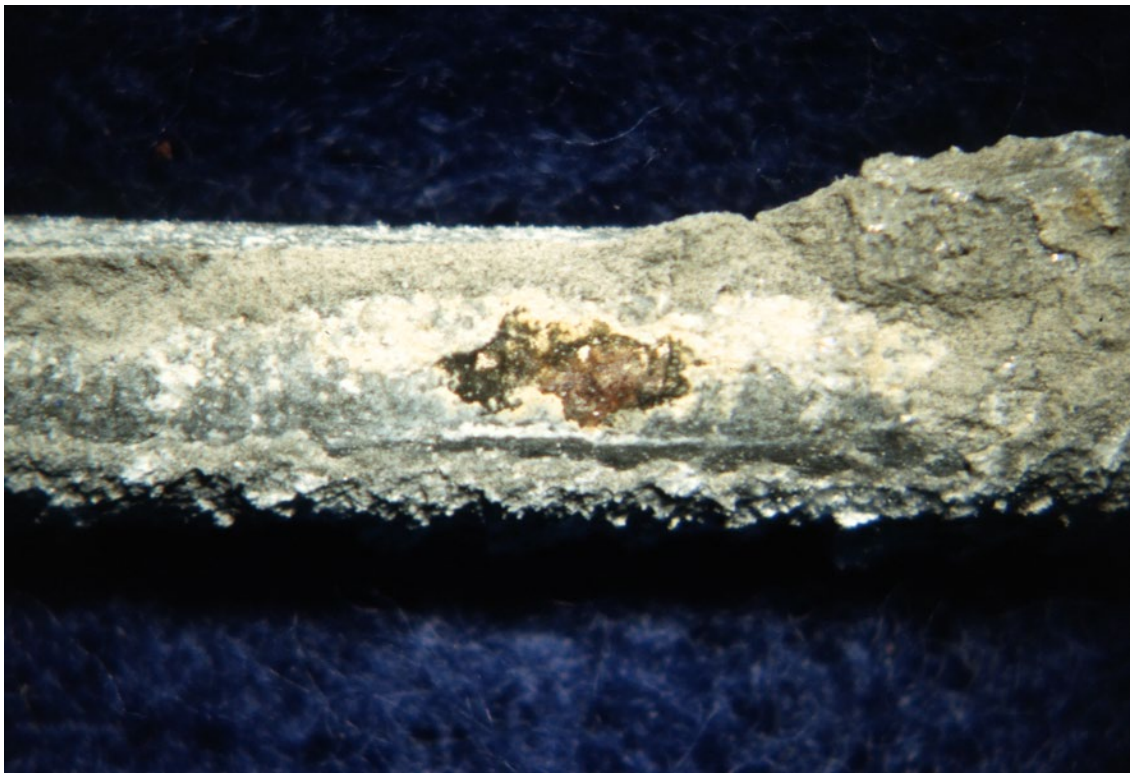
Part 5. LS-7: Galvanized



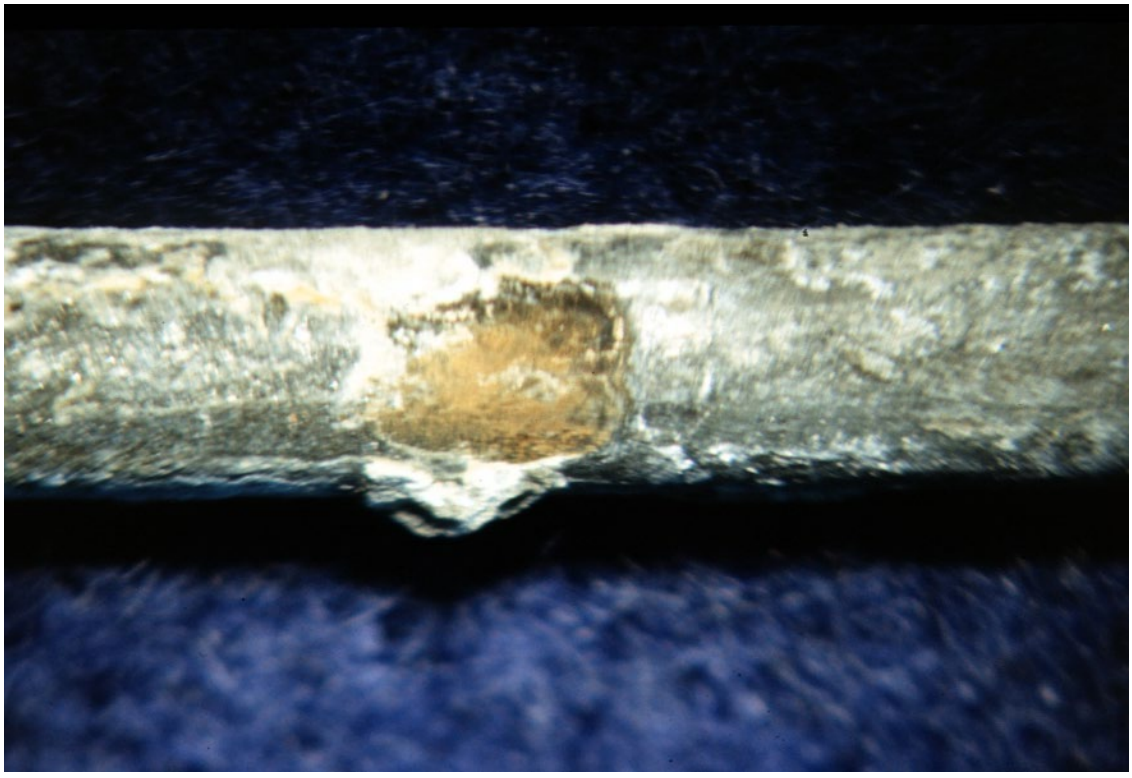
Slide 129. Large scale test seven (LS-7). April 7, 1995.

Slide 130. Large scale test seven (LS-7). March 23, 1995.

Slide 131. Large scale test seven (LS-7). March 30, 1995.



Slide 132. Large scale test seven (LS-7). April 7, 1995.



Slide 133. Large scale test seven (LS-7). April 7, 1995.

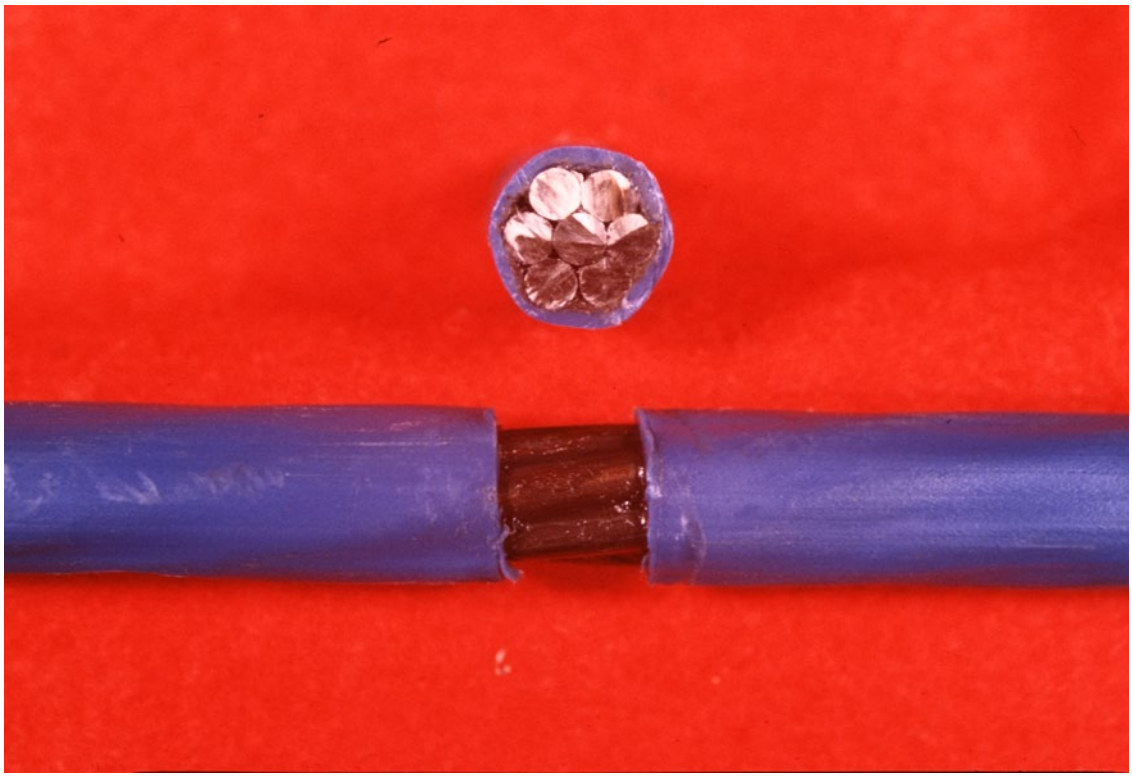
Slide 134. Large scale test seven (LS-7). March 23, 1995.

Slide 135. Large scale test seven (LS-7). March 17, 1995.

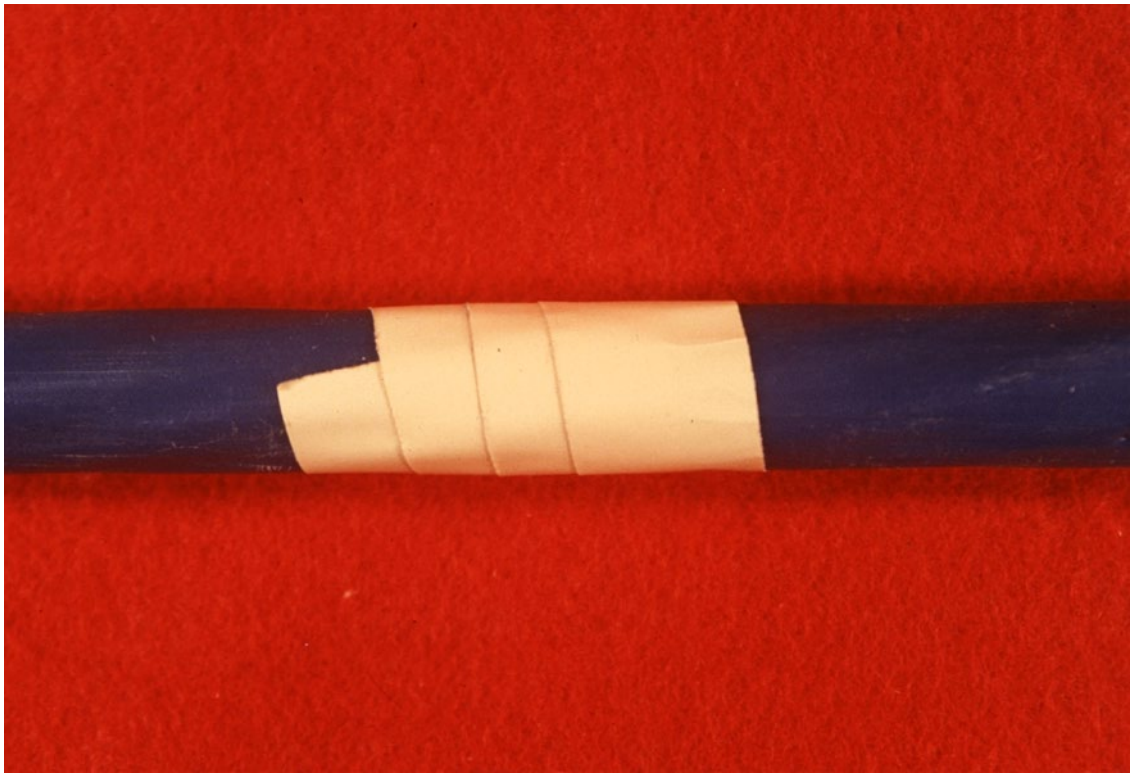
Slide 136. Large scale test seven (LS-7). March 17, 1995.

Part 6. LS-8: Greased/Sheathed

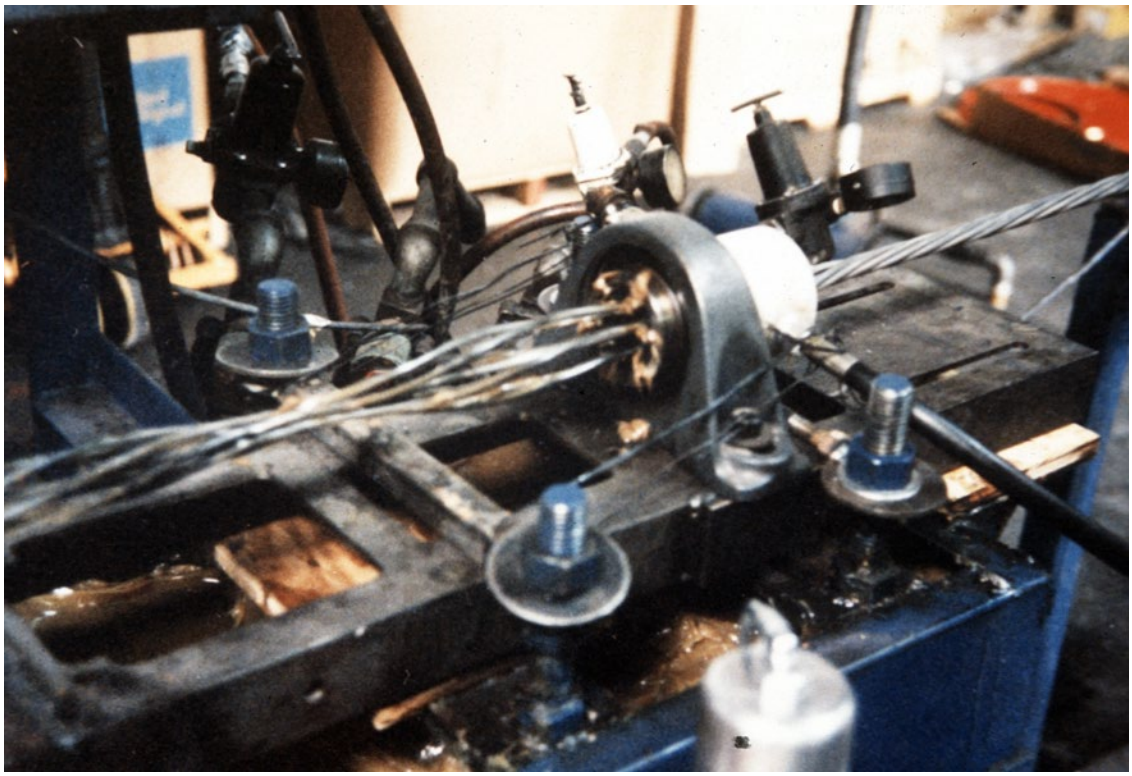
Slide 137. Large scale test eight (LS-8). Damage. August 23, 1994.



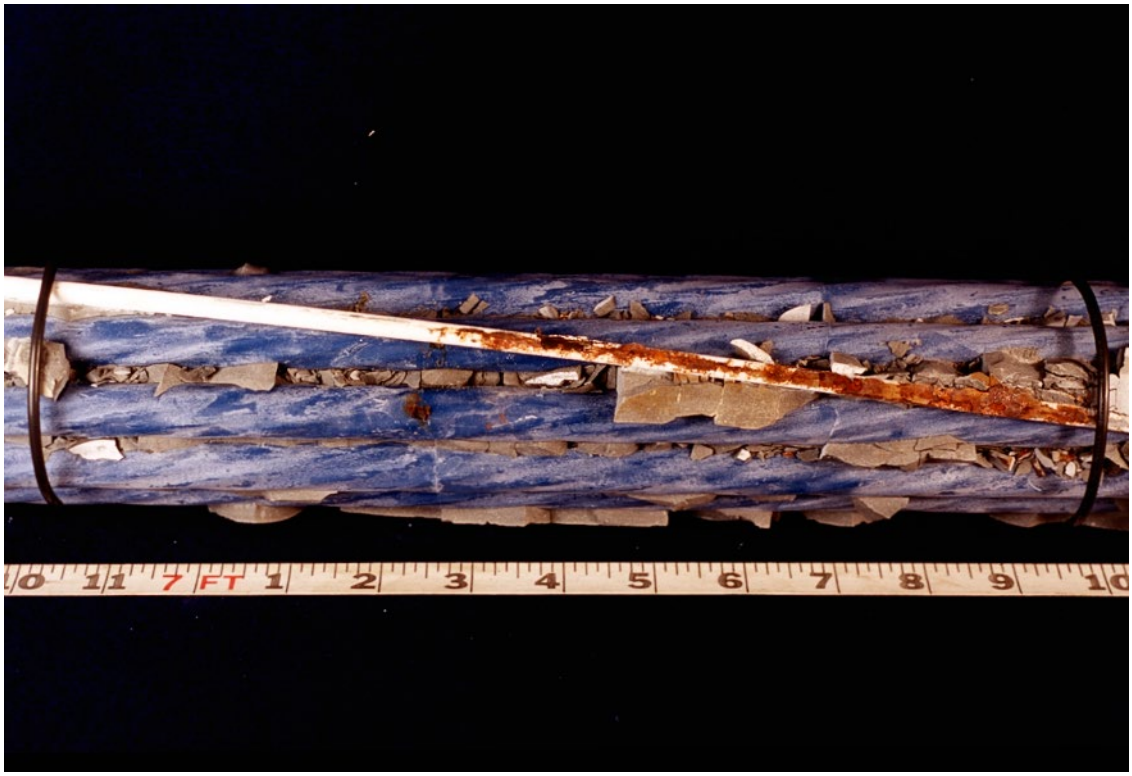
Slide 138. Large scale test eight (LS-8). Typical. August 23, 1994.



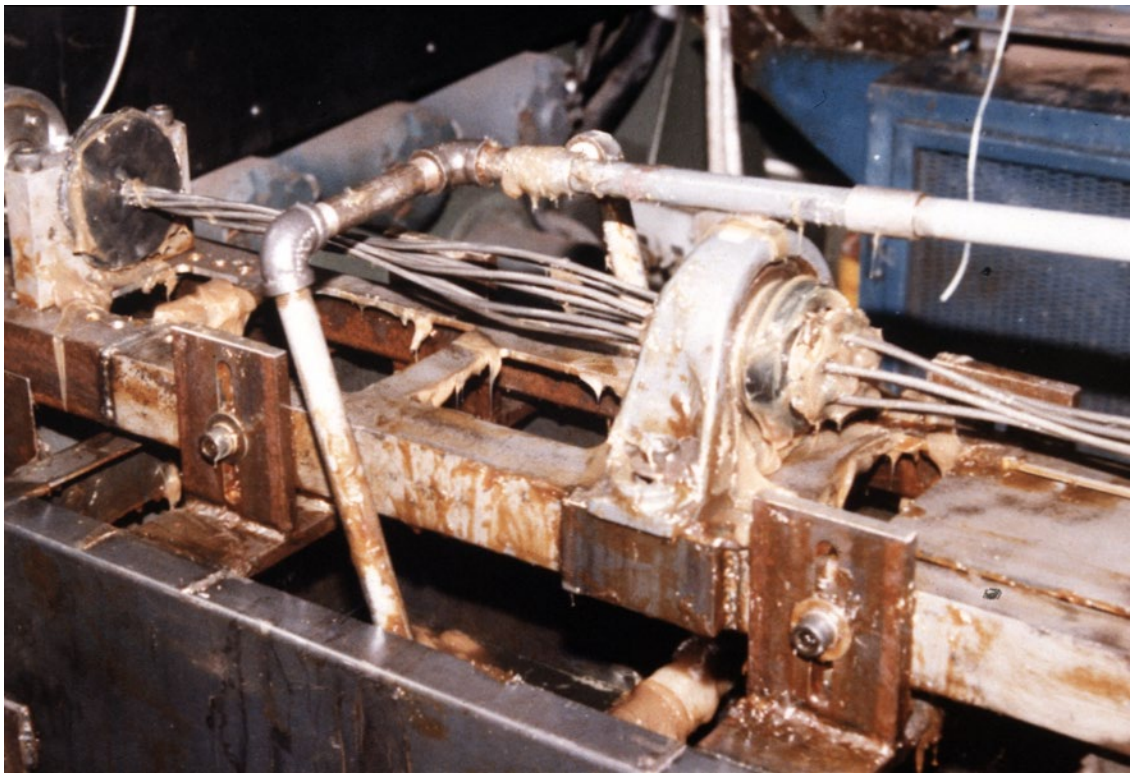
Slide 139. Large scale test eight (LS-8). Tape repair. February 20, 1995.



Slide 140. Picture from VSL.



Slide 141. Large scale test eight (LS-8). Copy 2. March 24, 1995.



Slide 142. De-stranding and application of grease to strand prior to extrusion of sheathing.

Slide 143. Large scale test eight (LS-8). March 30, 1995.

Slide 144. Large scale test eight (LS-8). March 24, 1995.

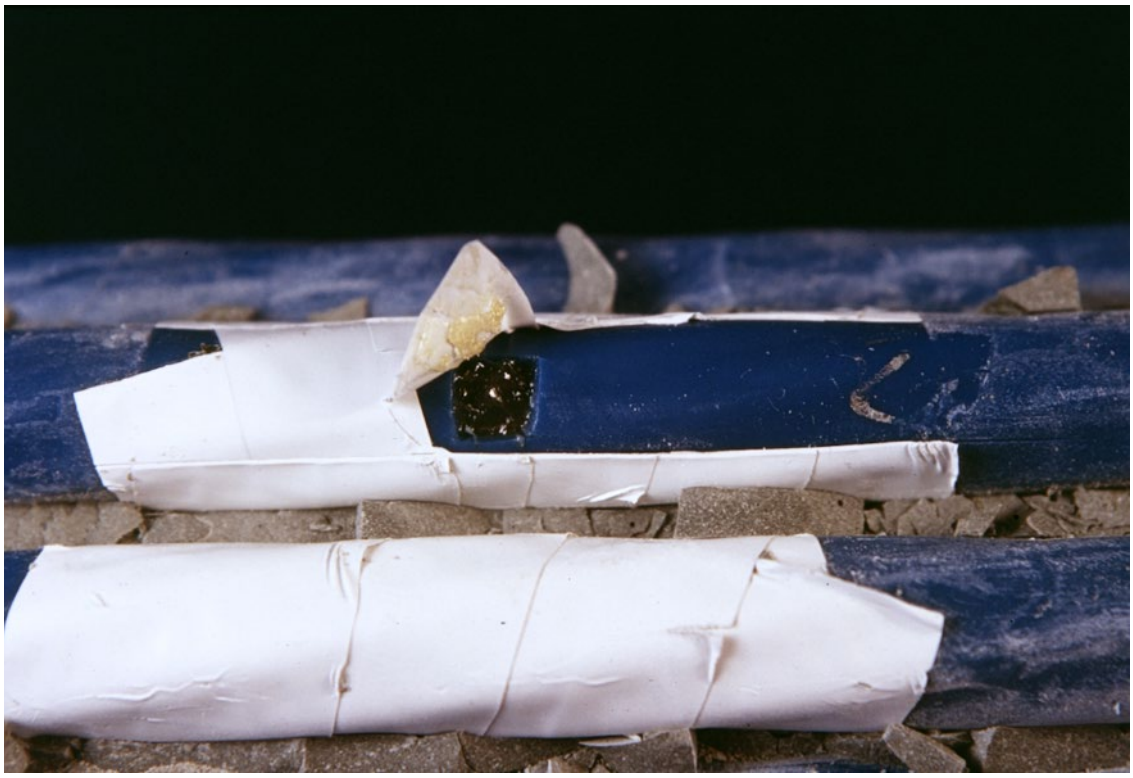
Slide 145. Large scale test eight (LS-8). March 24, 1995.

Slide 146. Large scale test eight (LS-8). March 24, 1995.

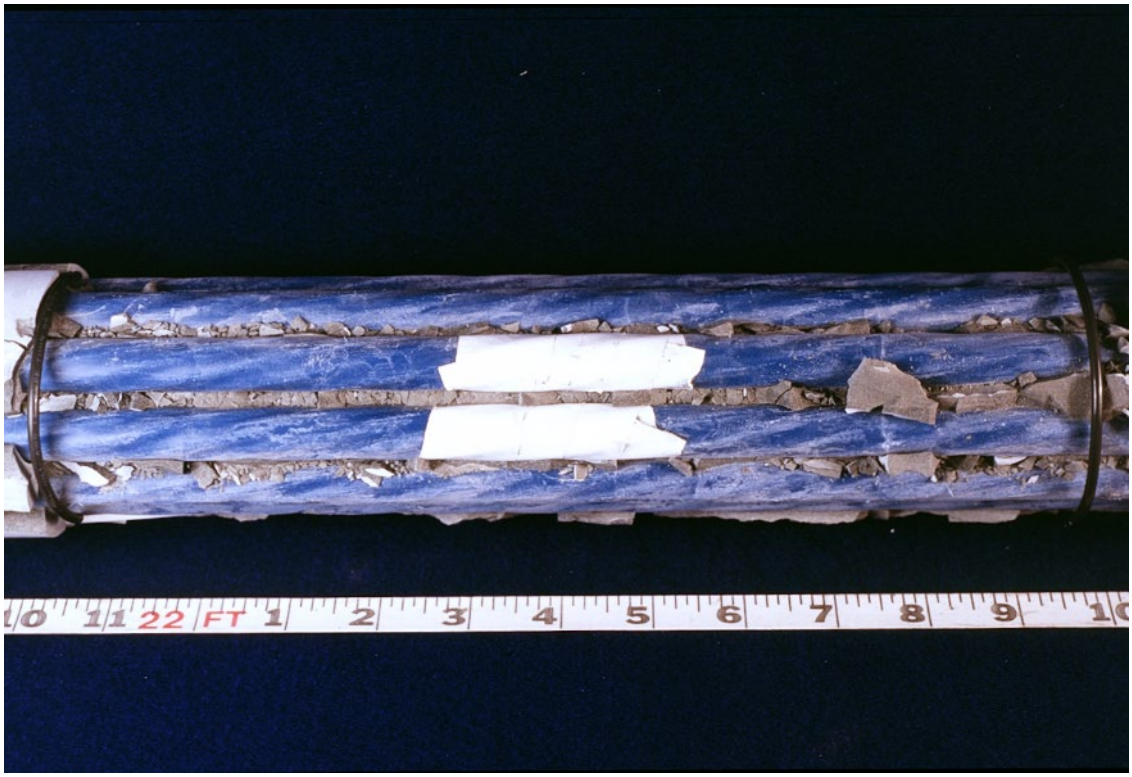
Slide 147. Large scale test eight (LS-8). April 7, 1995.

Slide 148. Large scale test eight (LS-8). March 24, 1995.

Slide 149. Large scale test eight (LS-8). March 24, 1995.



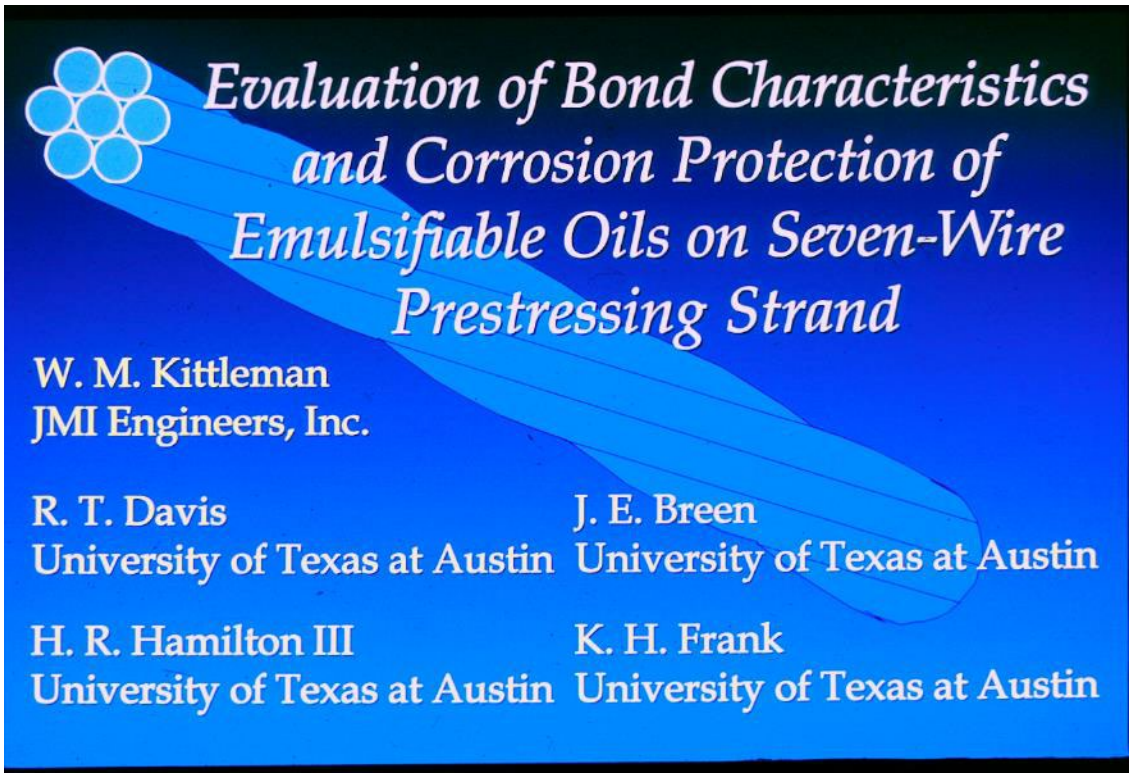
Slide 150. Large scale test eight (LS-8). March 24, 1995.



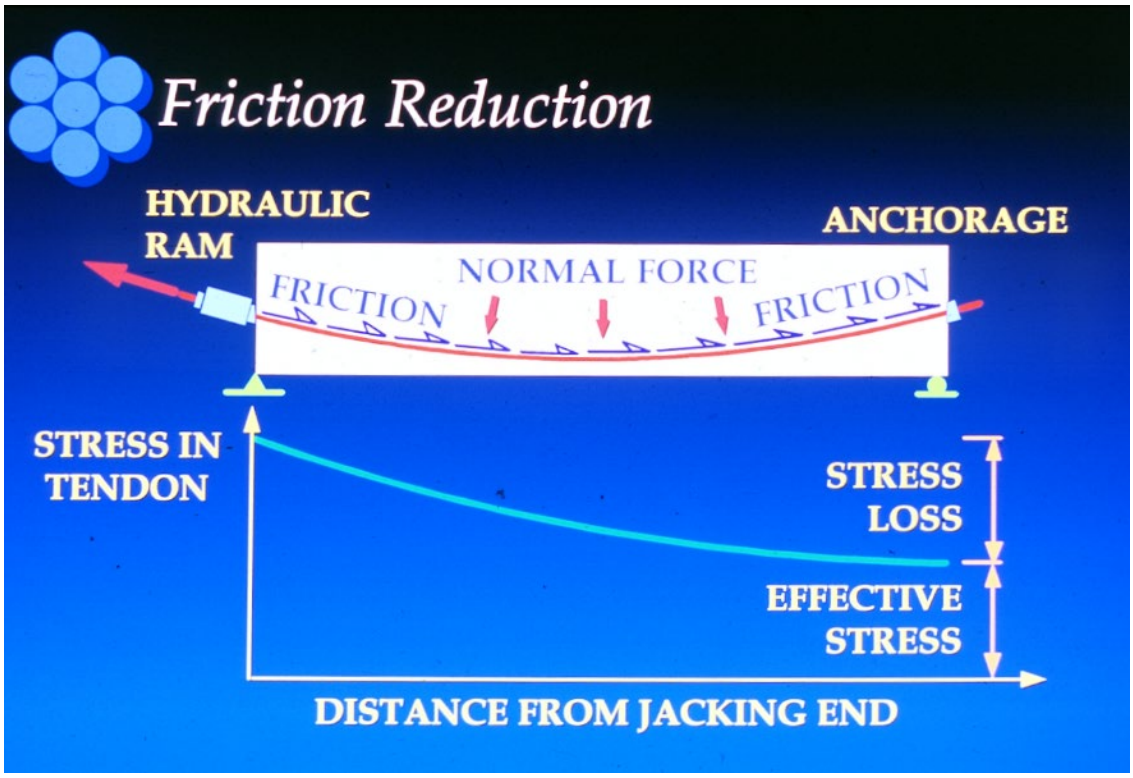
Slide 151. Large scale test eight (LS-8). March 24, 1995.

Slide 152. Large scale test eight (LS-8). March 30, 1995.

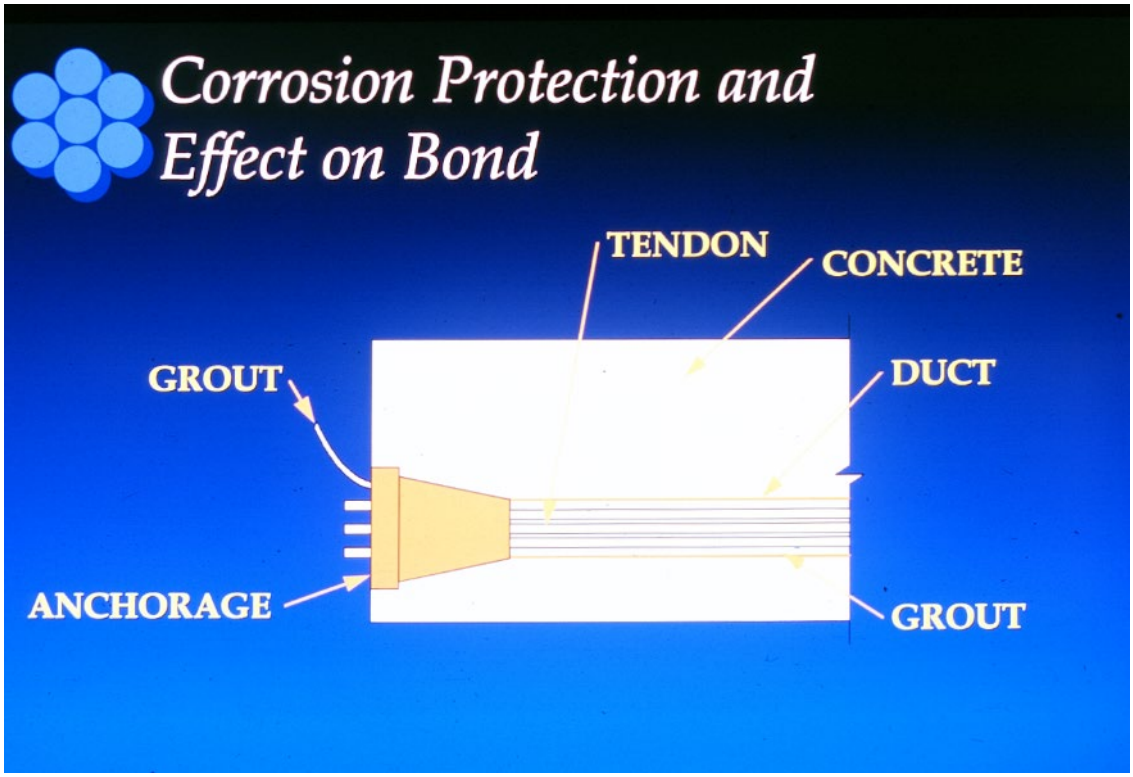
Section 4. Lubrication, Bond and Corrosion Protection of Emulsifiable Oils (Kittleman)



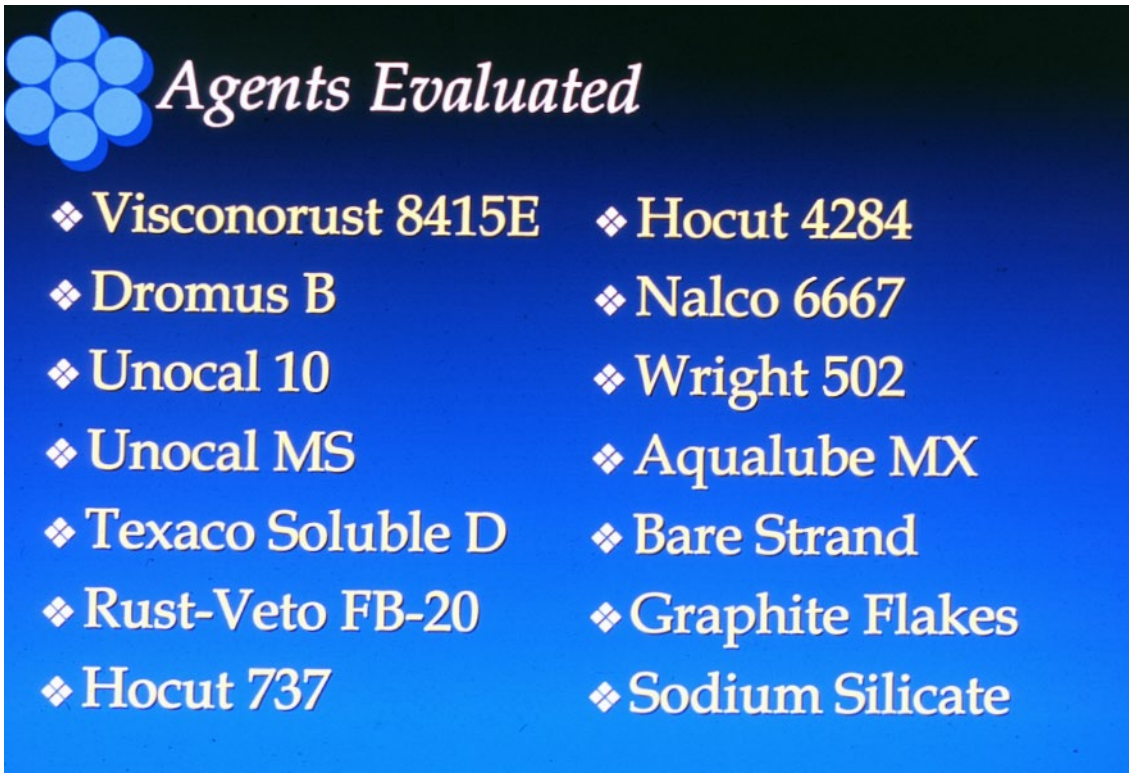
Slide 153. Evaluation of Bond Characteristics and Corrosion Protection of Emulsifiable Oils on Seven-Wire Prestressing Strand



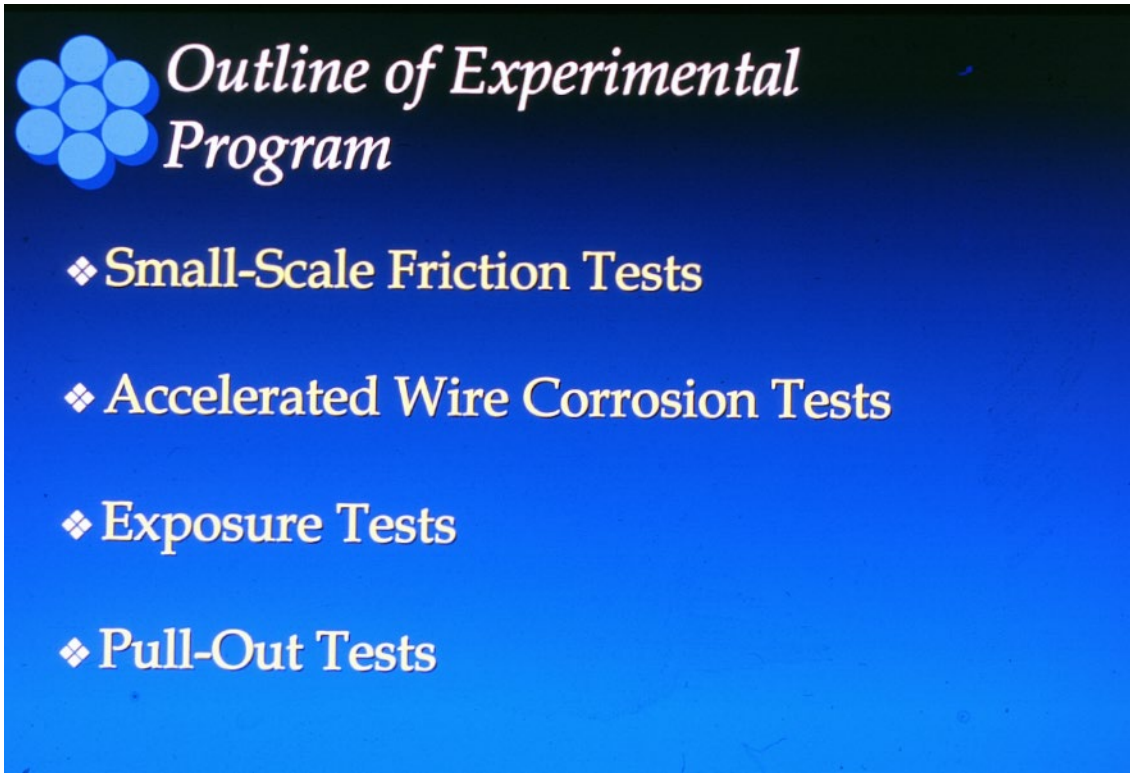
Slide 154. Friction Reduction



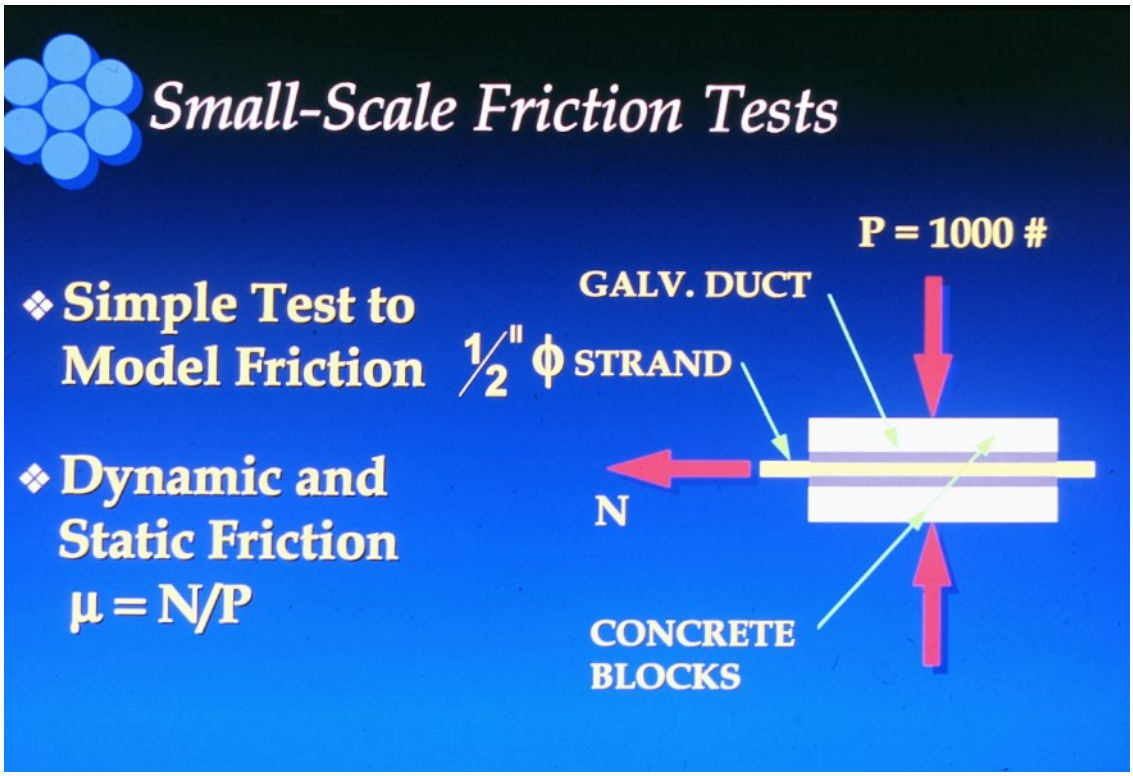
Slide 155. Corrosion Protection and Effect on Bond



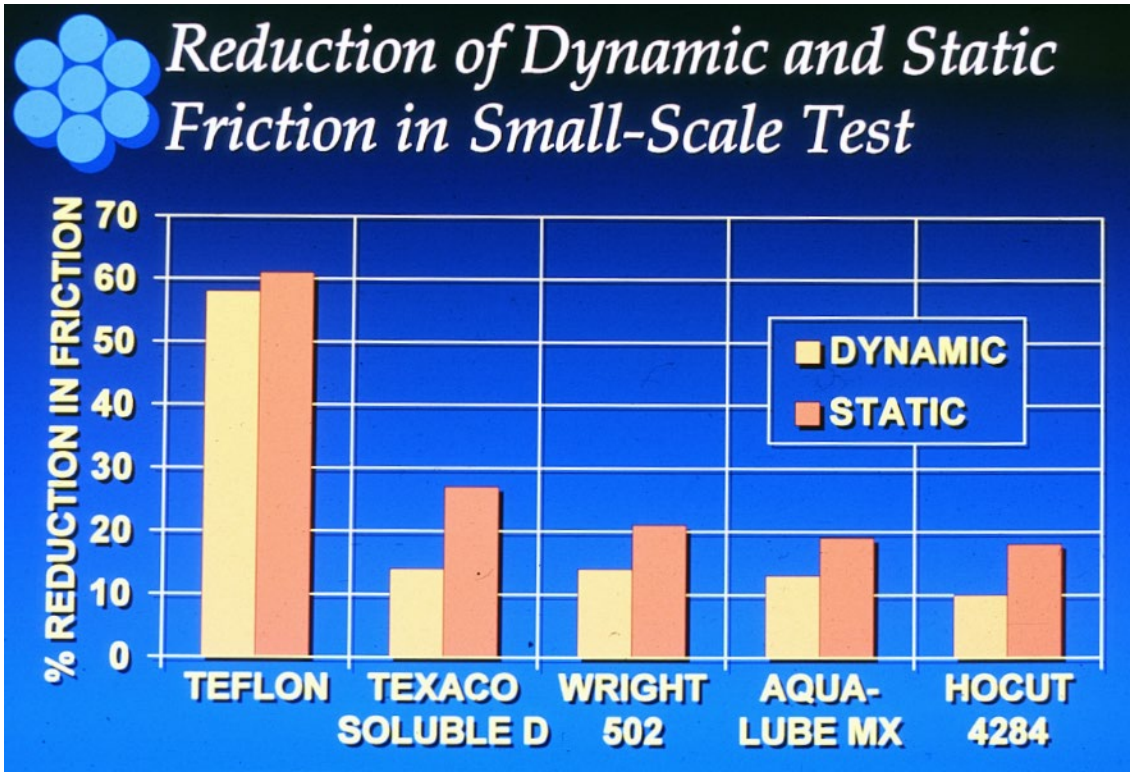
Slide 156. Agents Evaluated



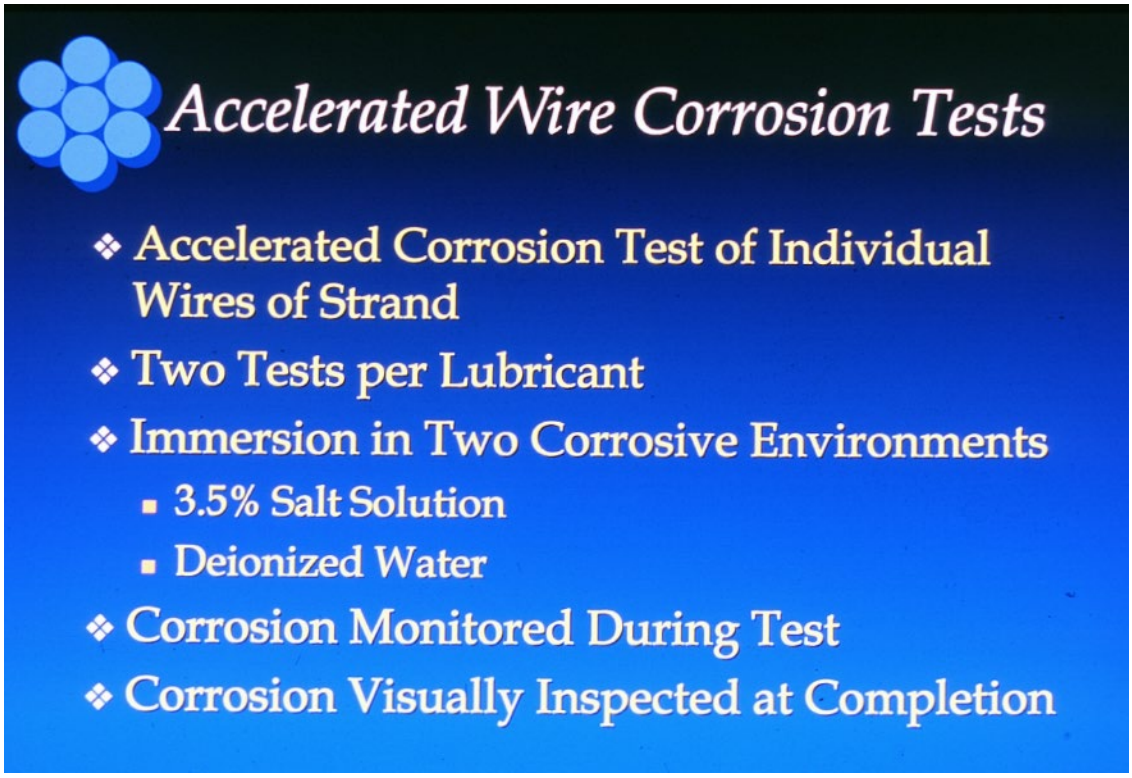
Slide 157. Outline of Experimental Program



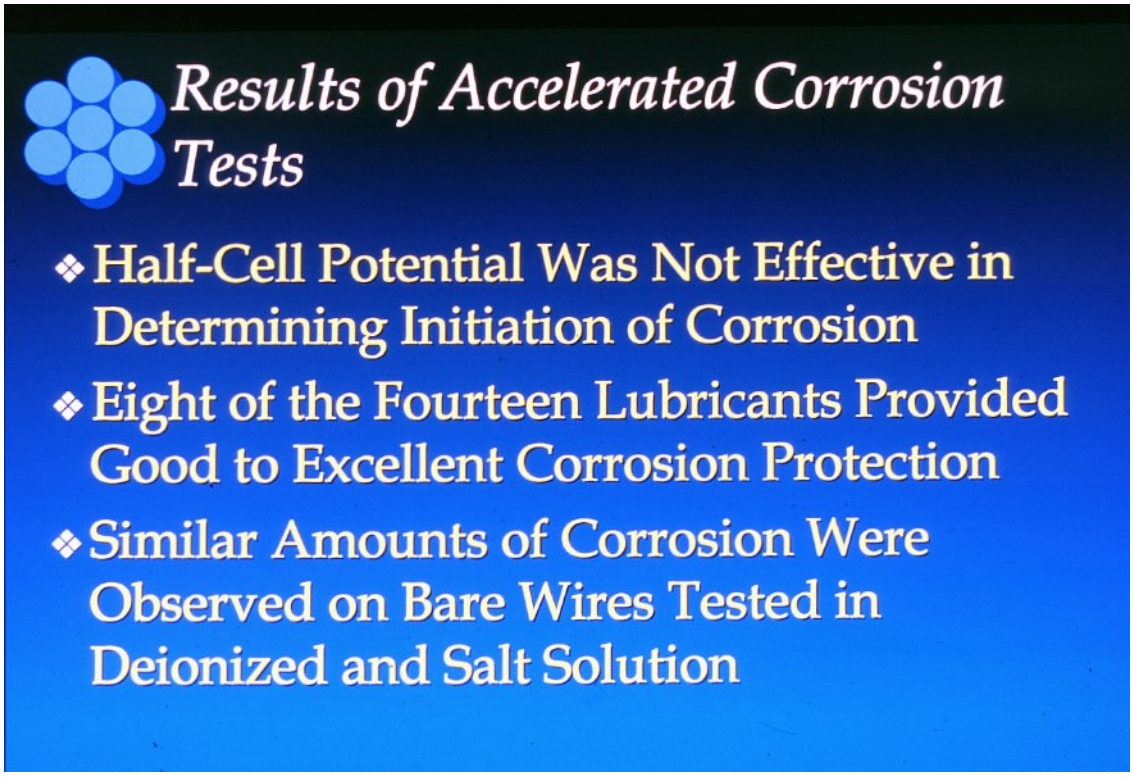
Slide 158. Small-Scale Friction Tests



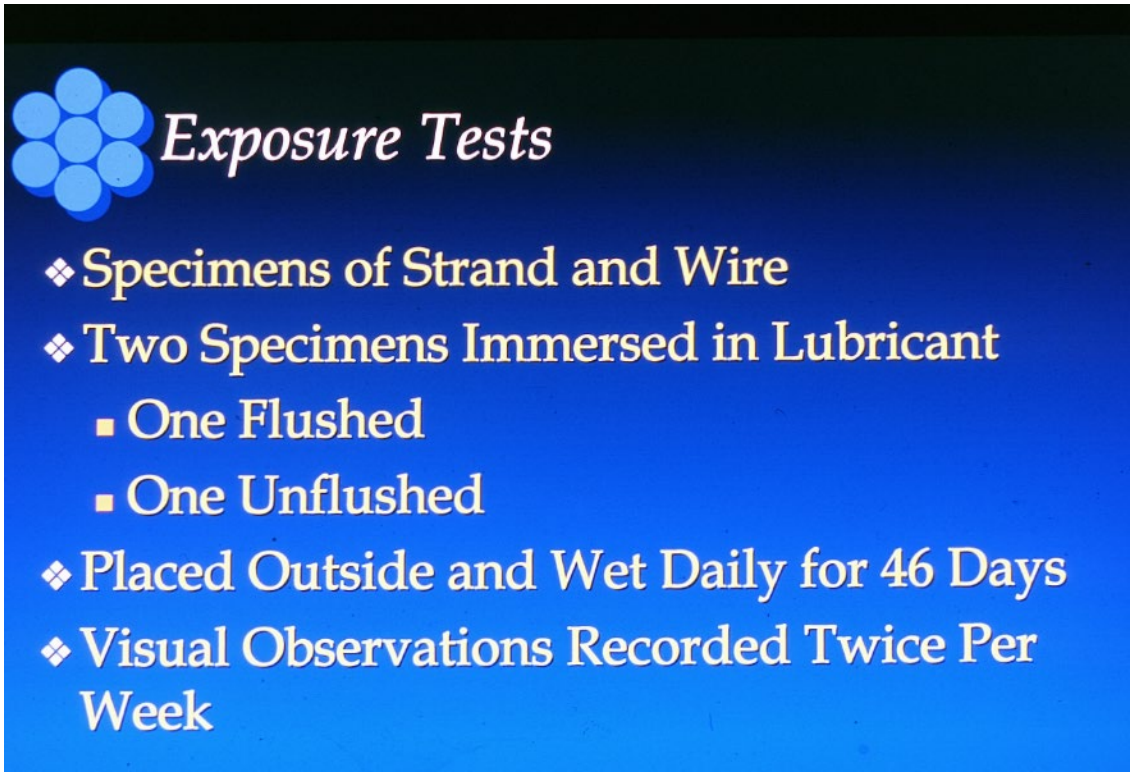
Slide 159. Reduction of Dynamic and Static Friction in Small-Scale Test



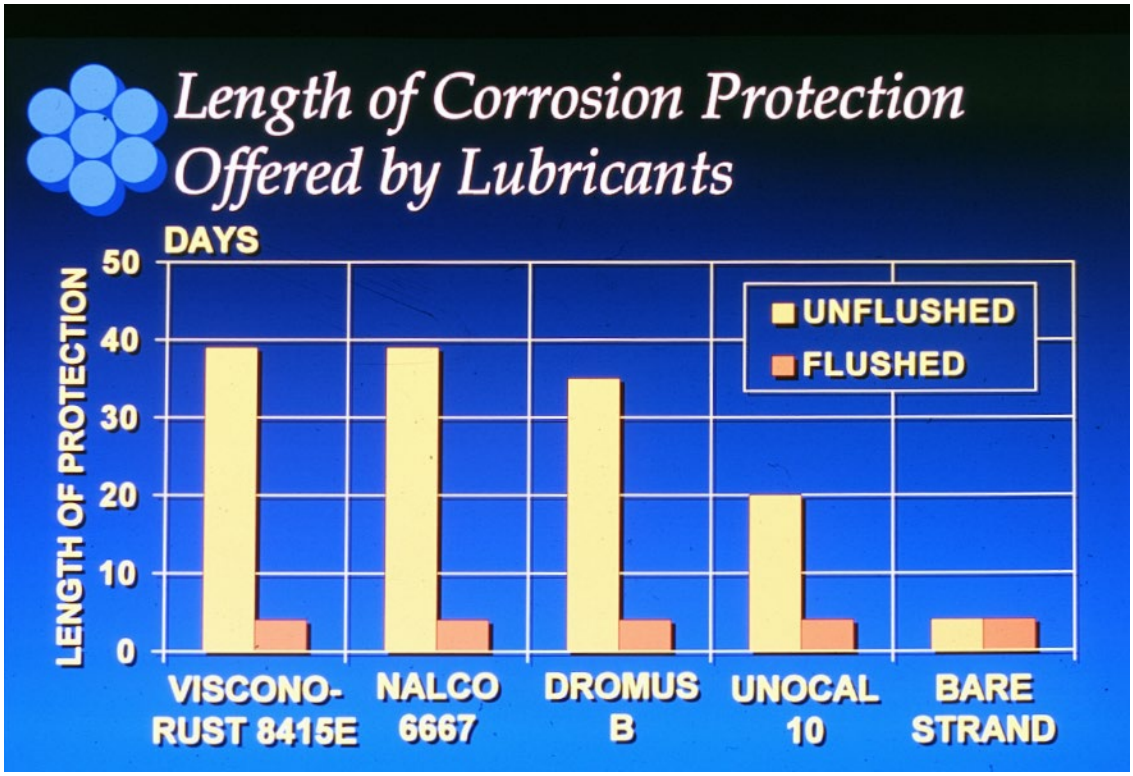
Slide 160. Accelerated Wire Corrosion Tests



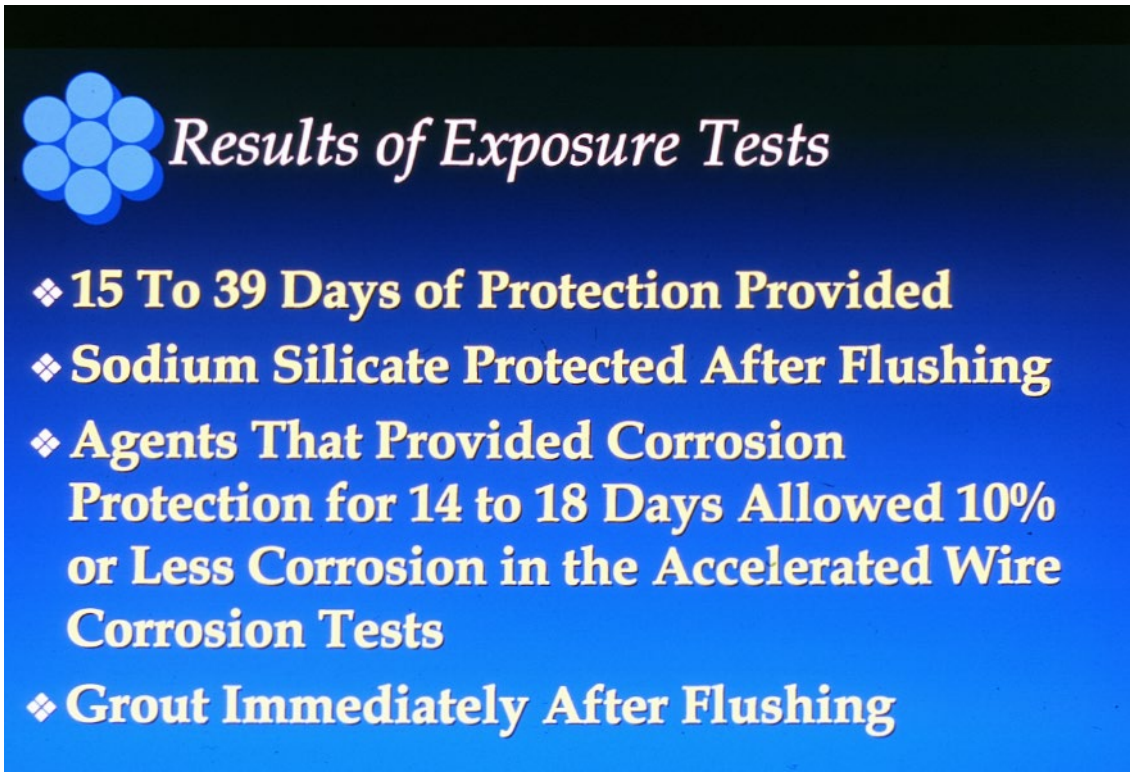
Slide 161. Results of Accelerated Corrosion Tests



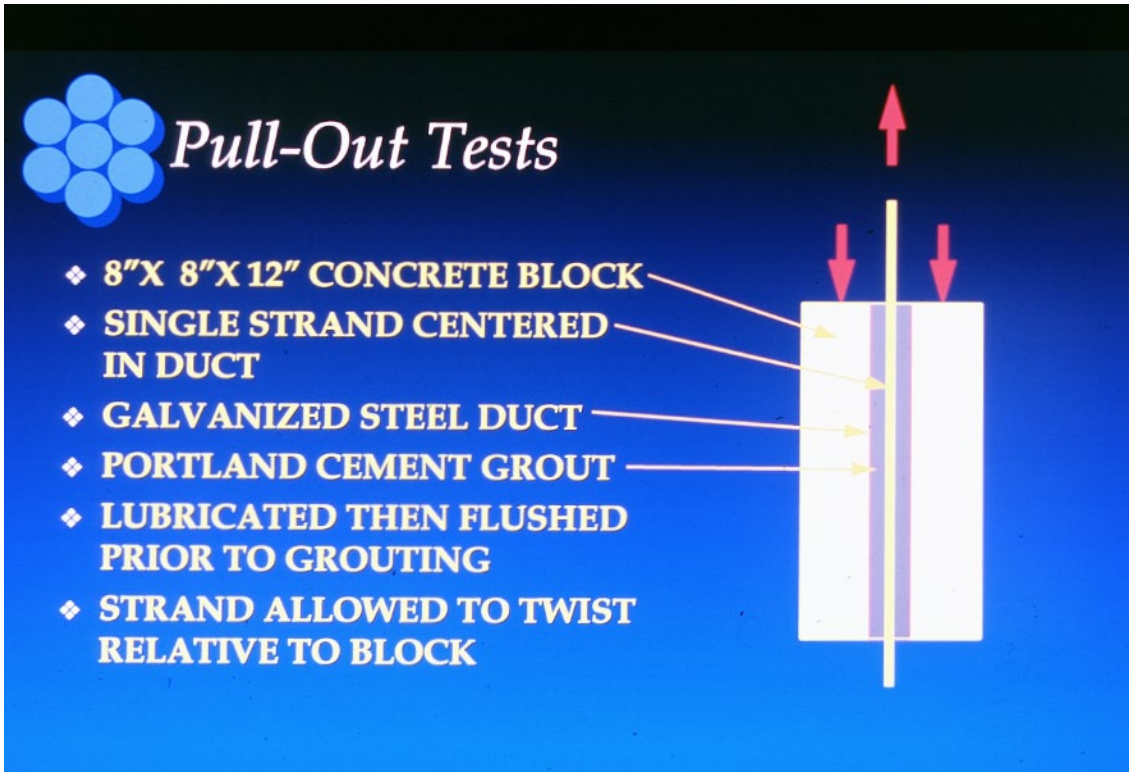
Slide 162. Exposure Tests



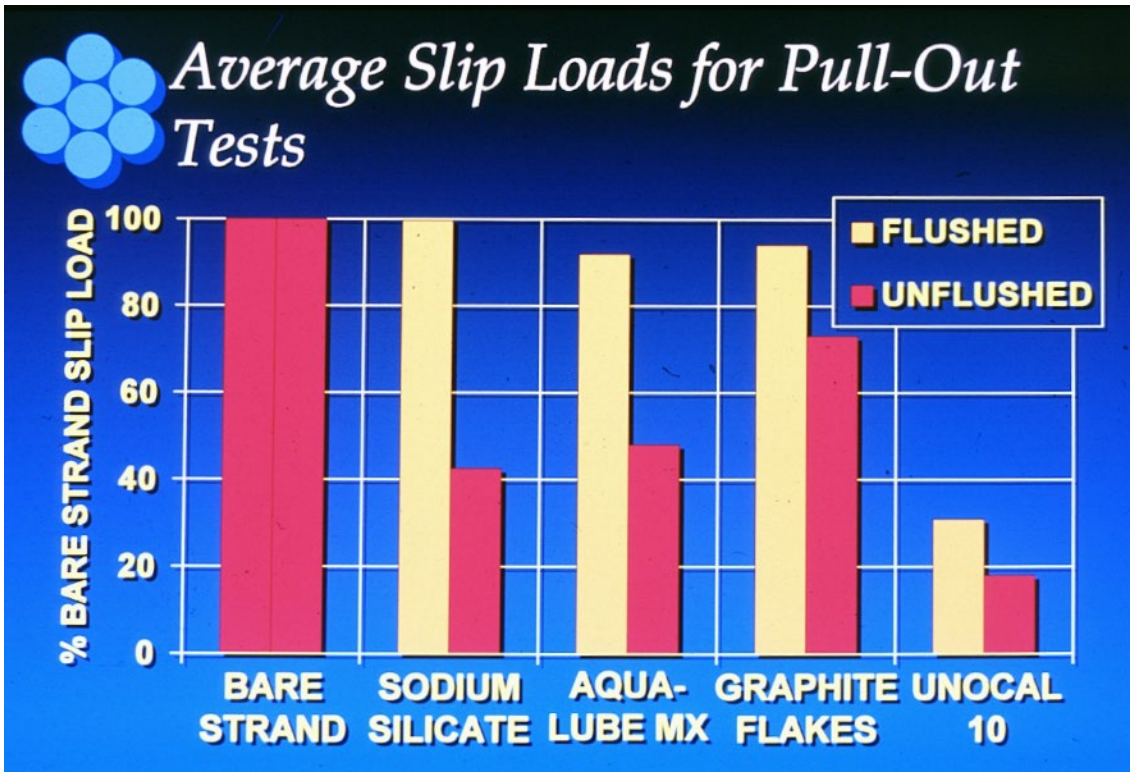
Slide 163. Length of Corrosion Protection Offered by Lubricants



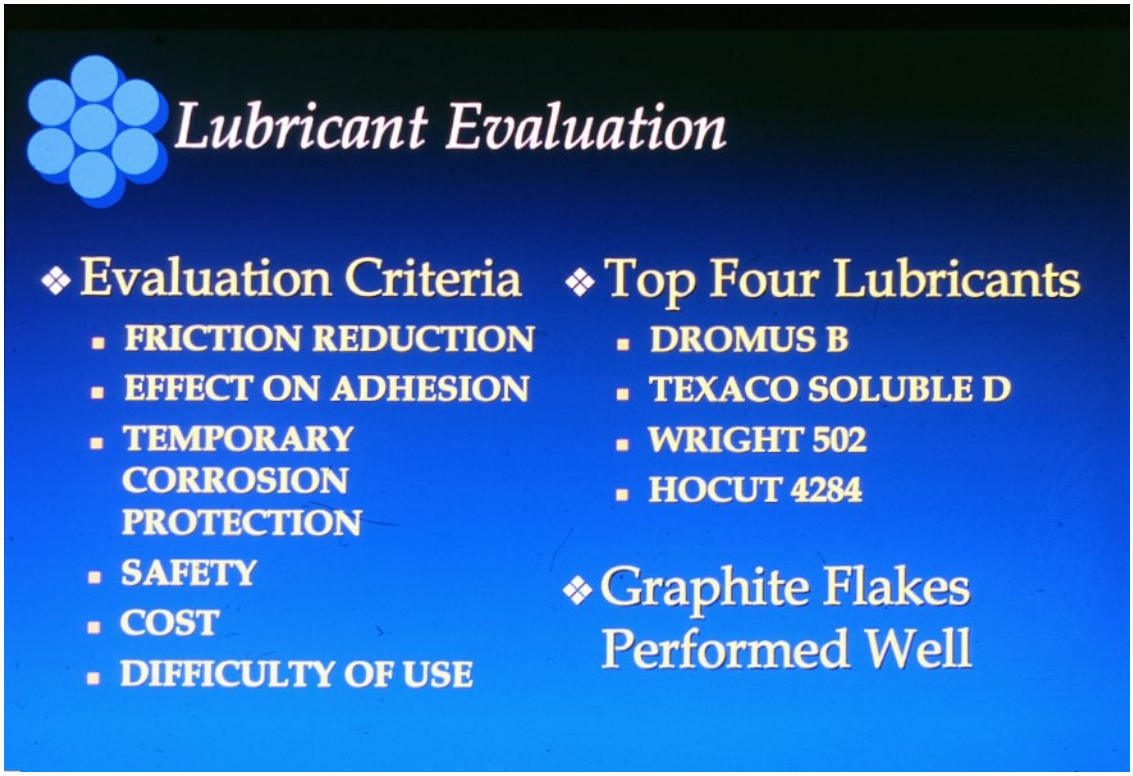
Slide 164. Results of Exposure Tests



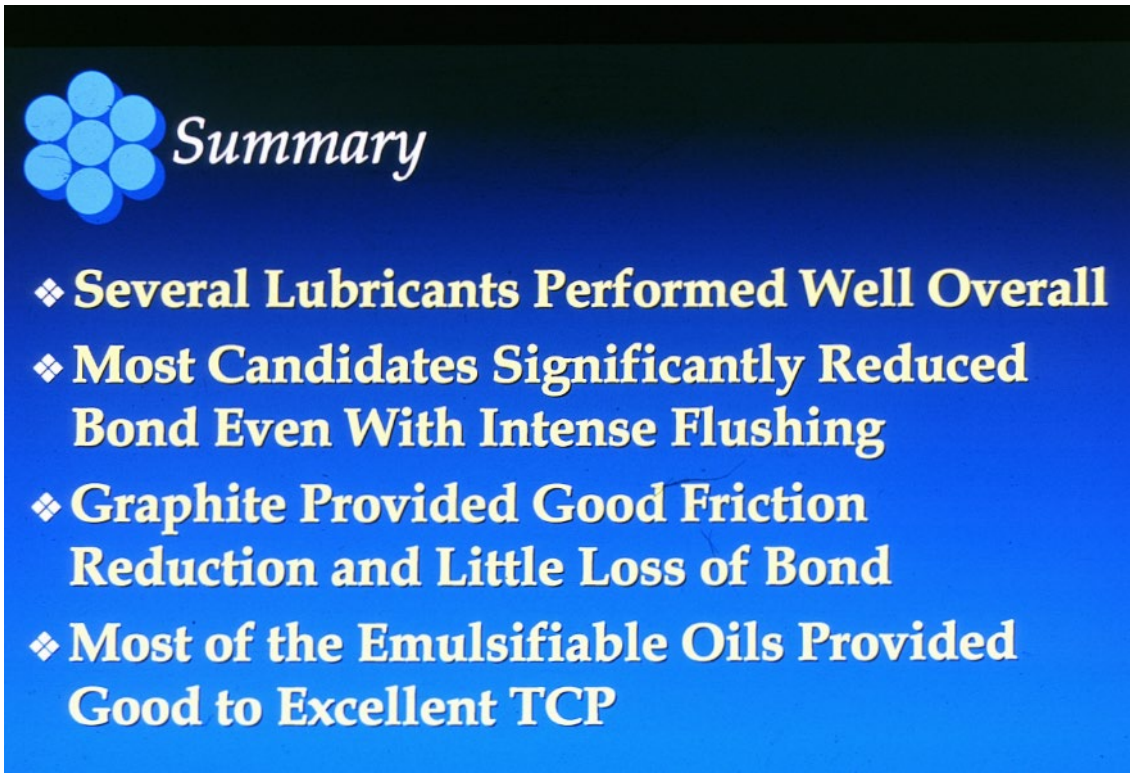
Slide 165. Pull-Out Tests



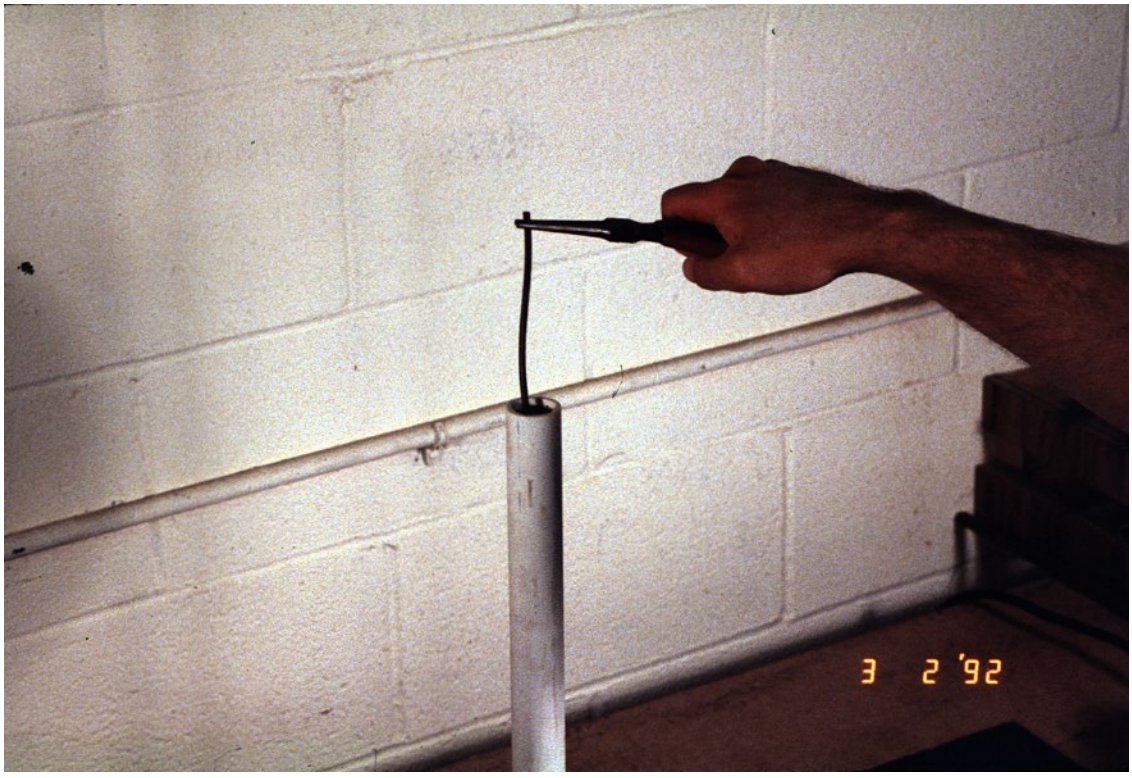
Slide 166. Average Slip Loads for Pull-Out Tests



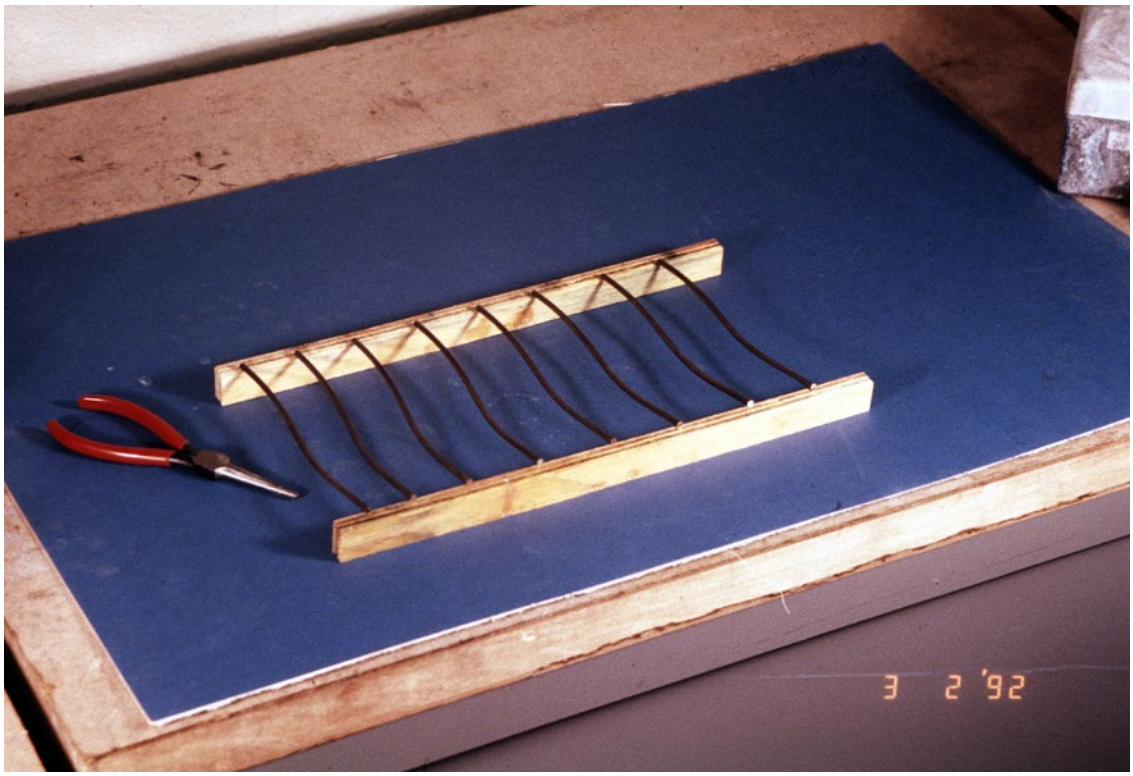
Slide 167. Lubricant Evaluation



Slide 168. Summary

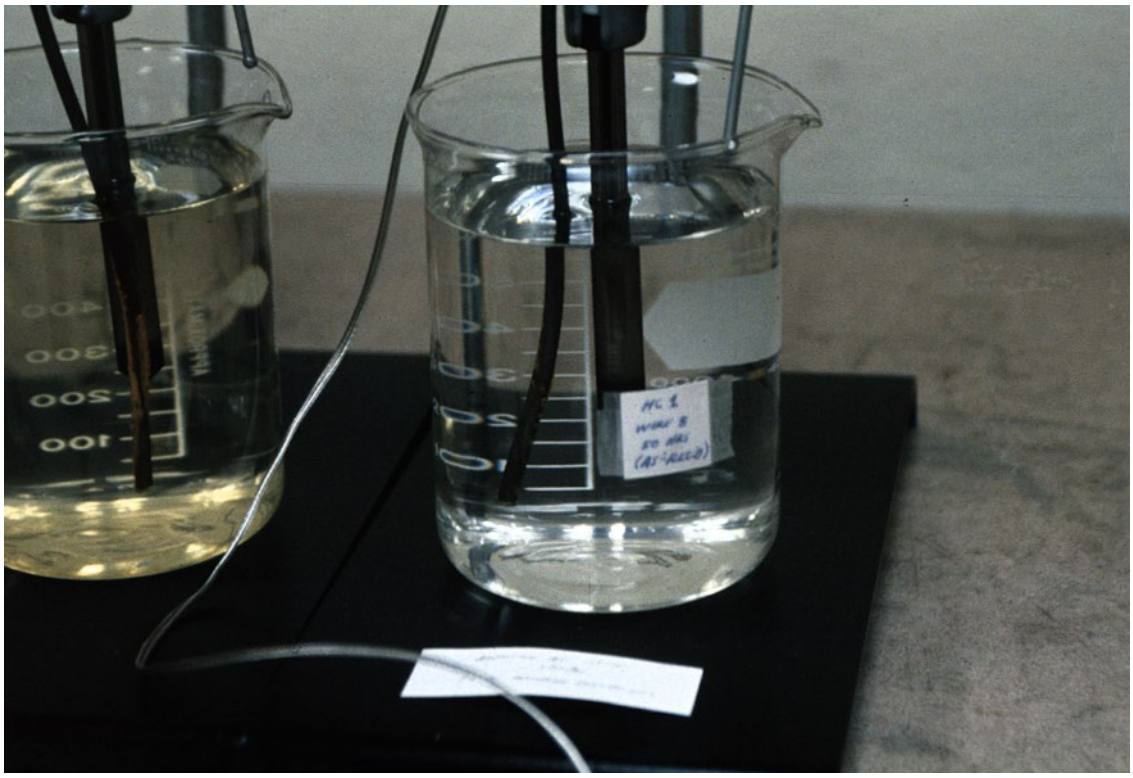


Slide 169. Dipping of wire. March 1992.



Slide 170. Drying rack for wires. March 1992.

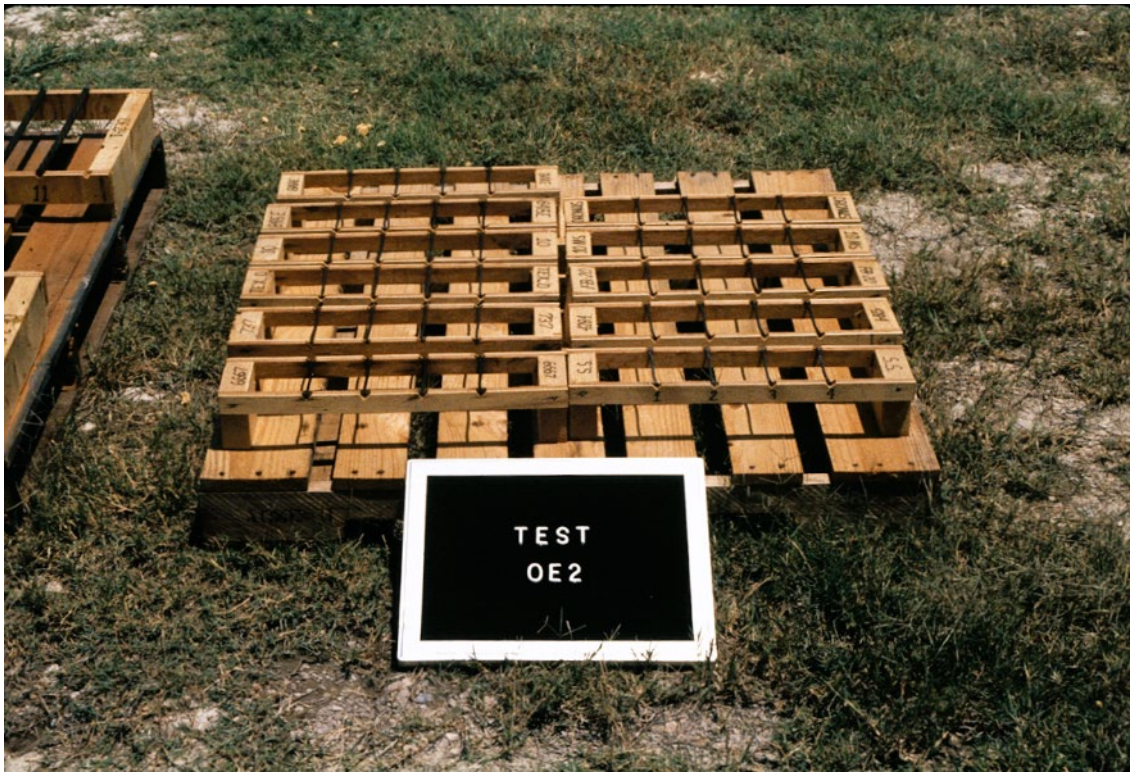
Slide 171. Half-coil test set-up. March 1992.



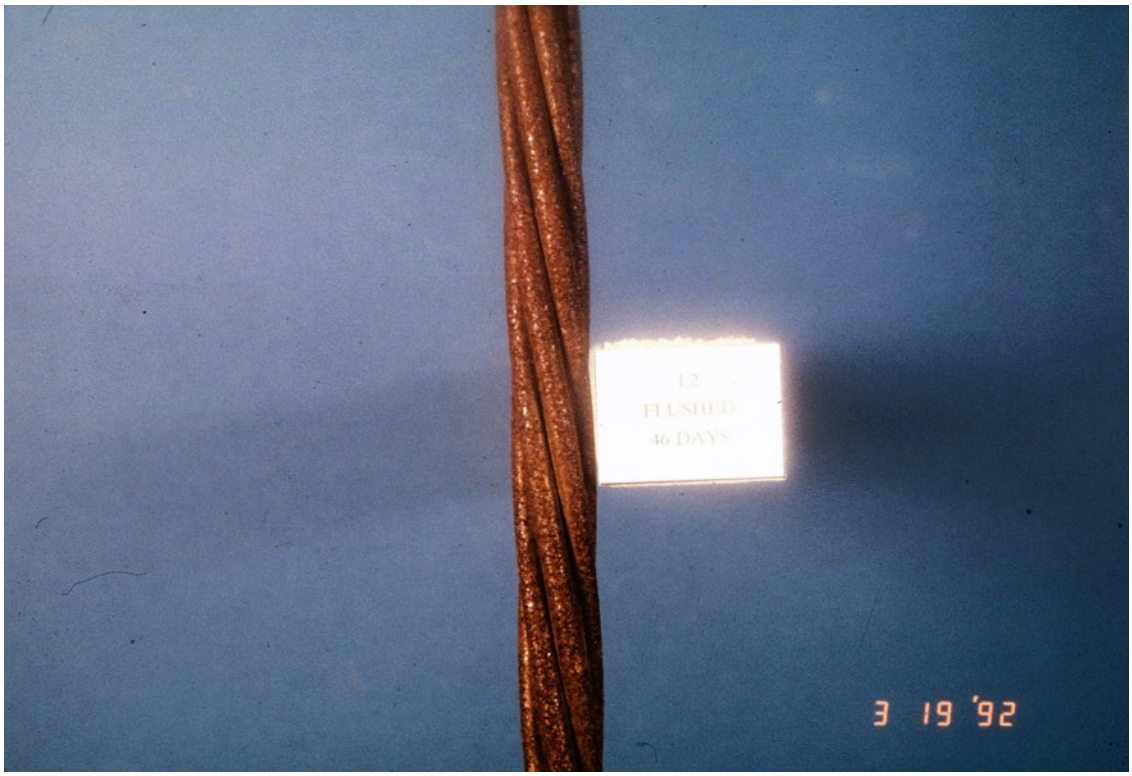
Slide 172. Miscellaneous. HCl, wire 8, 50 hours, As-R[?] ... H2O. July 1991.

Slide 173. Lubrication. March 1992.

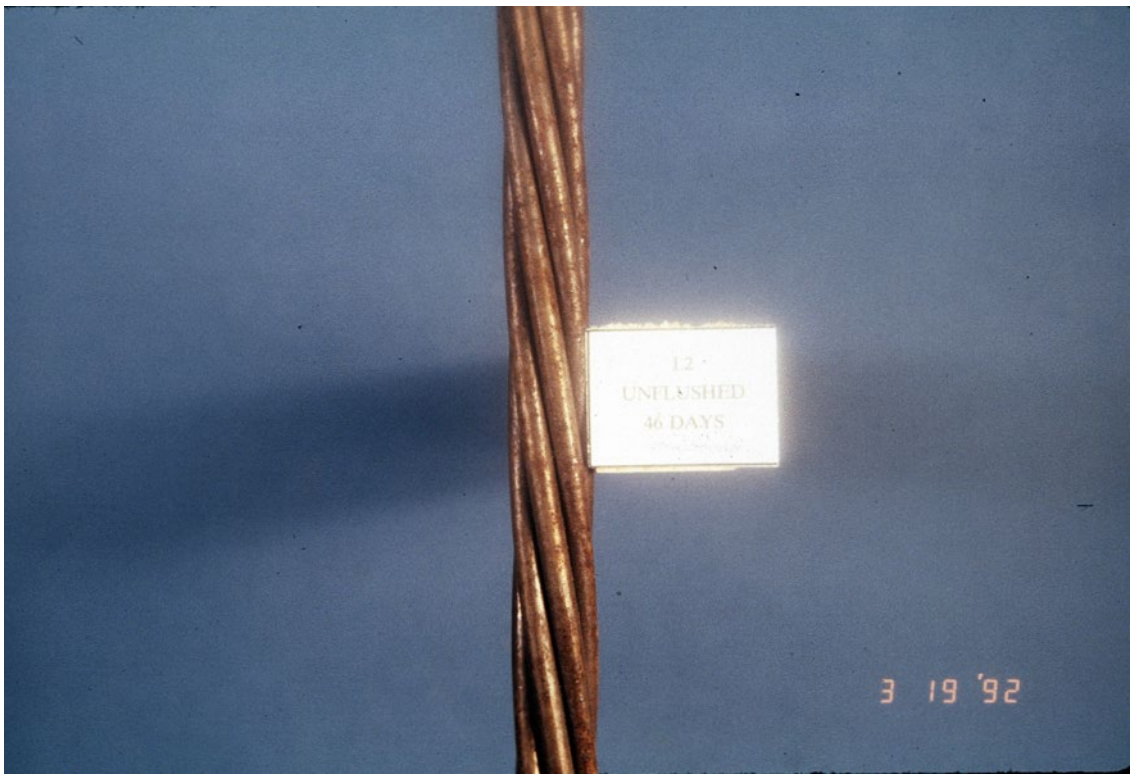
Slide 174. Flushing process. March 1992.



Slide 175. Test OE-2 set-up (unflushed wires). July 1991.



Slide 176. Lubricant two (L2). Flushed 46 days. March 1992.



Slide 177. Lubricant two (L2) . Unflushed 46 days. March 1992.

Slide 178. November 1991.

Slide 179. Mock grouting. D.O. 1 [?]. November 1991.