Research Contents

1) Ultimate strength analysis of stainless steel members
   • Stainless steels are able to contribute to ease of maintenance and to reduce LCC in long-term due to superior corrosion resistance.
   • This study assesses the ultimate strength and develop the design method of stainless steel members, in order to develop the design standard for stainless steel infrastructures in Japan.
   • Compound Ramberg-Osgood curve was proposed as constitutive equation in this research to express stress-strain curve of stainless steels with high accuracy in numerical analysis.
   • This curve was incorporated to computer programs of elasto-plastic finite displacement analysis for frame and shell structures.
   • Existing test results of stainless steel structures have been utilized to validate computer programs.

2) Assessment of residual strength and redundancy against for collapse of existing steel structures
   • Strategic maintenance of existing steel structures needs to grasp members for which inspection shall be implemented intensively by clarification between damage of the member and collapse of structure.
   • This study developed the computer program which is able to predict collapse of steel structure due to damage of member arising from corrosion, fatigue, and so on.
   • Redundancy against for collapse of the steel truss bridge due to member rapture has been assessed in this study.

Available Facilities and Equipment

<table>
<thead>
<tr>
<th>Universal hydraulic testing machine (2000kN capacity)</th>
<th>Computer program of Elasto-plastic finite displacement analysis for shell structures (Original)</th>
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</thead>
<tbody>
<tr>
<td>Personal computer (HP Pavilion 500-040jp/CT Desktop PC)</td>
<td>Computer program of Elasto-plastic finite displacement analysis for 2D frame considering volume loss due to corrosion (Original)</td>
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<td>Fortran compiler (PGI)</td>
<td>Computer program of Elasto-plastic finite displacement analysis with solid finite element (Original)</td>
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<td>G fortran (free software)</td>
<td>Computer program of Elasto-plastic finite displacement analysis for spatial frame with closed cross-sections (Original)</td>
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