GORD has come a long way since pioneering the Global Sustainability Assessment System (GSAS), formerly known as (QSAS), the Middle East’s first integrated and performance-based green building assessment rating system in 2009.

Our mission is to encourage the development and implementation of sustainability principles and imperatives stems from the sustainable goals outlined in Qatar National Vision 2030, which aims to achieve sustainable economic development and environmental leadership.

GSAS draws from top-tier global sustainability systems and adds new facets and dimensions to the current practices in assessing the sustainability of the built environment. Modeled on best practices from the most established global rating schemes including, but not limited to, BREEAM (United Kingdom), LEED (United States), GREEN GLOBES (Canada), CEPAS (Hong Kong), CASBEE (Japan), and the International SBTOOL, GSAS has grown into a pan-regional system offering a comprehensive framework, and equally flexible to incorporate the specific needs of the local context of different regions.

Primary goals of GSAS include creating a better living environment, minimizing resource consumption and reducing environmental degradation due to the fast pace of urbanization taking place in this era. Such objectives, coupled with the increasing evidence of climate change effects on a global level, have contributed strongly to the unprecedented pace of adaptation to sustainability practices not only in the developed countries, but also in developing countries.

GSAS has become one of the most comprehensive systems, to date, that addresses the built environment from a macro level to a micro level targeting a wide range of building typologies. The system manuals suite provides recommendations and guidelines for the effective implementation of the sustainability goals of each criterion. As more research is carried out on the rating system, the manuals will be further developed to keep users informed on updates within the constantly evolving GSAS rating systems.

I would like to acknowledge the efforts and contributions from the State of Qatar, all our members, and international partners—especially University of Pennsylvania and the associated consultants who helped establish the system and took it into new dimensions. Last but not least, the continuous support from Qatari Diar Real estate Investment Company is highly appreciated, and without its support, GSAS would not be able to achieve what it has achieved in such a short time.

Dr. Yousef Mohammed Alhorr
Founding Chairman
# TABLE OF CONTENT

## CHAPTER 1: GSAS Overview

1.1. Purpose of this Technical Guide ................................................................. 10  
1.2. GSAS Framework Development ................................................................. 10  
1.3. GSAS Categories ......................................................................................... 12  
1.4. GSAS Energy Standard ............................................................................... 13  
1.5. GSAS Measurement Principle ................................................................. 14  
1.6. GSAS Evaluation Procedure ................................................................... 14  
1.7. GSAS Submittal Requirements ................................................................. 15  
1.8. GSAS Scoring Mechanism ...................................................................... 15  
1.9. GSAS Scoring Sheets ............................................................................... 19  
1.10. GSAS Toolkits ......................................................................................... 20  
1.11. GSAS Calculators ..................................................................................... 22  
1.12. Types of GSAS Certifications .................................................................. 23

## CHAPTER 2: GSAS Certifications

2.1. Design & Build Certification ..................................................................... 28  
2.2. Construction Management Certification ............................................... 39  
2.3. Operations Certifications ........................................................................ 44  
2.4. Credentialing Requirements .................................................................... 45  
2.5. Guidelines / Policies ............................................................................. 47

## CHAPTER 3: GSAS Schemes

3.1. GSAS Assessment Schemes .................................................................... 50

## CHAPTER 4: GSAS Publication Series

4.1. GSAS Publications .................................................................................... 56
FIGURES

CHAPTER 1: Introduction to GSAS

Figure 1.1  GSAS Framework ................................................................................................................................. 11
Figure 1.2  GSAS Categories ................................................................................................................................... 12
Figure 1.3  Sample GSAS Criterion Score .............................................................................................................. 16
Figure 1.4  GSAS Commercial Scoring Weights ...................................................................................................... 17
Figure 1.5  Sample GSAS Commercial - Project Achieved Score ........................................................................ 18
Figure 1.6  Sample GSAS Design & Build Scoring Sheet ........................................................................................ 19
Figure 1.7  GSAS Toolkits ................................................................................................................................... 20
Figure 1.8  Sample GSAS Calculator .................................................................................................................... 22
Figure 1.9  GSAS Certifications & Project Life Cycle ........................................................................................... 23
Figure 1.10 GSAS Certifications Flowcharts ......................................................................................................... 24

CHAPTER 2: GSAS Certifications

Figure 2.1  Provisional Design & Build Certification Flowchart ............................................................................ 29
Figure 2.2  GSAS Star Rating Table for Design & Build Certification ........................................................................ 30
Figure 2.3  GSAS Cumulative Scoring Chart for Design & Build Certification ....................................................... 31
Figure 2.4  Final Design & Build Certification Flowchart ...................................................................................... 33
Figure 2.5  Sample Letter of Appointment ............................................................................................................. 37
Figure 2.6  Construction Management Certification Flowchart ........................................................................... 41
Figure 2.7  Table of GSAS Service Providers and CGPs ....................................................................................... 46
CHAPTER: 1

GSAS Overview
1.1. Purpose of this Technical Guide

1.1.1. This technical guide is intended to provide a brief introductory overview of the Global Sustainability Assessment System (GSAS) for those unfamiliar with the GSAS certifications for design, construction, and operations of the built environment. For a more detailed technical discussions, the reader is directed to refer to other relevant GSAS Publications listed at the end of this technical guide.

1.2. GSAS Framework Development

1.2.1. In the entirety of this text, GSAS shall mean Global Sustainability Assessment System, the first of its kind performance-based sustainability rating system for the construction industry in the middle east region developed by GORD in collaboration with University of Pennsylvania and Georgia Institute of Technology, USA.

1.2.2. The primary objective of GSAS is to create a sustainable built environment that minimizes ecological impact while addressing the specific needs and environment of the region.

1.2.3. The development of GSAS took advantage of a comprehensive review of combined best practices employed by a mix of established international and regional rating systems.

1.2.4. The development of GSAS, works on ground-up approach, developing from scratch to allow for seamless integration between the country’s specific requirements and sustainable goals.

1.2.5. It started in 2007 from the review of the existing 140+ building rating systems, tools, and guidelines around the globe and narrowed down to the 40 whole building rating systems, see Fig. 1.1.
1.2. GSAS Framework Development

1.2.6. Based on the findings of the initial review process, out of the 40, the methods of the 6 most established rating systems were further investigated, including BREEAM from UK, the LEED from USA, the GREEN GLOBES from Canada, the CEPAS from Hong Kong, the CASBEE from Japan, and the International SBTOOL.

1.2.7. Together with the review of the existing energy standards from other countries, the GSAS Energy Standard looked deeper into ASHRAE Energy Standard from US and the CEN-ISO Energy Standards from the European Union.
1.3. GSAS Categories

1.3.1. The system’s goals are identified to lower the environmental impacts pertinent to the region.

1.3.2. These goals were translated to what is known as the GSAS 8 Categories that are key aspects affecting the overall building/development sustainability.

1.3.3. Each GSAS Category is associated with a direct impact on environmental stress mitigation. Each category measures a different aspect of the project’s environmental impact, see Fig. 1.2.

1.3.4. These categories are then broken down into specific criteria that measure and define these individual issues. These issues range from a thorough review, for instance of water consumption to an assessment of light quality.

Figure 1.2. GSAS Categories
### 1.3. GSAS Categories

**1.3.5.** Each criterion specifies a process for measuring individual aspects of the criterion’s environmental impact and supporting it with the required documentation. A score is then awarded to each criterion based on the level of achievement.

**1.3.6.** Measurements are further defined through three components – measurement principles, measurement methods, and demonstration requirements.

**1.3.7.** Categories, criteria, and measurements are defined to be performance-based and quantifiable, where possible.

**1.3.8.** Prescriptive measurements are provided as recommendations in the Design Guidelines manuals.

**1.3.9.** Aggregation method of the scoring weights is applied from ground up and is used in the system at the criterion, sub-category, and category levels, which allow for the flexibility of modifying an individual component without interfering with the entire system.

### 1.4. GSAS Energy Standard

**1.4.1.** The energy assessment methodology is composed of performance-based normative calculations that follow the framework of the CEN-ISO standards, and NEN standards.

**1.4.2.** Based on CEN-ISO framework, energy is assessed from four perspectives namely, Energy Demand, Energy Delivery, Primary Energy and Emissions.

**1.4.3.** The normative calculation procedure introduced in GSAS has distinctive advantages: easiness, transparency, robustness, and reproducibility.
<table>
<thead>
<tr>
<th><strong>1.4.</strong> GSAS Energy Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.4.4.</strong></td>
</tr>
<tr>
<td><strong>1.4.5.</strong></td>
</tr>
<tr>
<td><strong>1.4.6.</strong></td>
</tr>
<tr>
<td><strong>1.4.7.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>1.5.</strong> GSAS Measurement Principle</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.5.1.</strong></td>
</tr>
<tr>
<td><strong>1.5.2.</strong></td>
</tr>
<tr>
<td><strong>1.5.3.</strong></td>
</tr>
</tbody>
</table>
## 1.7. GSAS Submittal Requirements

1.7.1. Each criterion in GSAS is provided with explanations of the submittal requirements that can be found in the assessment and training manuals.

1.7.2. The project shall submit the documentations required for each criterion to demonstrate compliance.

1.7.3. Submittal requirements are generally design documents and plans supporting the input values in the GSAS calculators and toolkits.

1.7.4. Submittals for drawings, schematics, sketches, design reports, simulation reports, and vendor’s data shall be saved in appropriate format.

1.7.5. All submittals shall highlight the information supporting the input values in the GSAS calculators and toolkits.

1.7.6. All submittals shall be saved in clear and readable copies.

1.7.7. Submittals for calculations shall be saved in appropriate format.

## 1.8. GSAS Scoring Mechanism

1.8.1. GSAS scoring is quantifiable on the scale of -1 to 3 (-1, 0, 1, 2, 3). Using negative scale allows criteria with greater impact to be emphasized and to trade off that negative impact by creating higher level of building performance in the remaining criteria. Except for the criteria in the Urban Connectivity and Management & Operations wherein scoring does not allow for a negative value and the scale is from 0 to 3.

In GSAS, -1 is a negative measure of “not acceptable” for criteria falling under categories Site, Energy, Water, Materials, Indoor/Outdoor Environment and Cultural & Economic Value. Also, for categories Urban Connectivity and Management & Operation the 0 in criterion measured from scale of 0 to 3 is the lowest score given for “non-conformance” to the criterion requirements.
1.8. GSAS Scoring Mechanism

1.8.2. Criterion Score lists the range of possible compliance levels and the measurement range associated with each level, see Fig. 1.3 for a sample criterion score.

In the example E.1 criterion, the score is determined by first calculating the EPC value achieved by the project for energy demand performance. Then from the scoring table, a score is given corresponding to the achieved EPC value.

For example, assuming the project complied with the required documentations in support of the EPC calculator and the calculated EPC resulted to 0.90. Therefore, the project complied with Level 0 performance for E.1, hence a score of 0 is given.

<table>
<thead>
<tr>
<th>[E.1] Energy Demand Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criterion Score</td>
</tr>
<tr>
<td>-1</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
</tbody>
</table>

Where: EPC = Energy Performance Coefficient

Figure 1.3. Sample GSAS Criterion Score
## 1.8. GSAS Scoring Mechanism

1.8.3. Each criterion shall have its corresponding scoring weight and the total of all criteria shall be 100%, see Fig. 1.4. Extra bonus are allocated for specific criteria to emphasize their impact. Such bonus are given to encourage developers to pursue these criteria. As an example, the given score obtained from 1.8.2 will have to be multiplied by the scoring weight to get the equivalent scoring points for that criterion. For example, the scoring points for E.1 shall be $0 \times \frac{7.00\%}{100\%} = 0.00$ points based on level 0 criterion score achieved from 1.8.2 and 7.00% weights from Fig. 1.4. for criterion E.1 of the Scoring Weights for GSAS Commercial.

### GSAS Commercial Scoring Weights

<table>
<thead>
<tr>
<th>Elements</th>
<th>%</th>
<th>Elements</th>
<th>%</th>
<th>Elements</th>
<th>%</th>
<th>Elements</th>
<th>%</th>
<th>Elements</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>UC.1</td>
<td>1.22</td>
<td>S.5</td>
<td>1.27</td>
<td>E.1</td>
<td>7.00</td>
<td>M.6</td>
<td>1.60</td>
<td>CE.1</td>
<td>3.12</td>
</tr>
<tr>
<td>UC.2</td>
<td>1.48</td>
<td>S.6</td>
<td>0.62</td>
<td>E.2</td>
<td>6.87</td>
<td>M.7*</td>
<td>2.00</td>
<td>CE.2</td>
<td>3.88</td>
</tr>
<tr>
<td>UC.3</td>
<td>1.15</td>
<td>S.7</td>
<td>0.78</td>
<td>E.3</td>
<td>3.04</td>
<td>IE.1</td>
<td>1.57</td>
<td>MO.1</td>
<td>1.20</td>
</tr>
<tr>
<td>UC.4</td>
<td>0.38</td>
<td>S.8</td>
<td>0.67</td>
<td>E.4</td>
<td>5.04</td>
<td>IE.2</td>
<td>1.13</td>
<td>MO.2</td>
<td>1.05</td>
</tr>
<tr>
<td>UC.5</td>
<td>0.94</td>
<td>S.9</td>
<td>0.58</td>
<td>E.5</td>
<td>2.05</td>
<td>IE.3</td>
<td>2.33</td>
<td>MO.3</td>
<td>1.21</td>
</tr>
<tr>
<td>UC.6</td>
<td>0.26</td>
<td>S.10</td>
<td>0.83</td>
<td>W.1</td>
<td>6.00</td>
<td>IE.4</td>
<td>1.37</td>
<td>MO.4</td>
<td>1.07</td>
</tr>
<tr>
<td>UC.7</td>
<td>0.68</td>
<td>S.11*</td>
<td>2.65</td>
<td>W.2</td>
<td>10.00</td>
<td>IE.5</td>
<td>1.83</td>
<td>MO.5*</td>
<td>2.17</td>
</tr>
<tr>
<td>UC.8</td>
<td>0.89</td>
<td>S.12</td>
<td>0.87</td>
<td>M.1</td>
<td>2.05</td>
<td>IE.6</td>
<td>1.37</td>
<td>MO.6</td>
<td>1.30</td>
</tr>
<tr>
<td>S.1</td>
<td>1.10</td>
<td>S.13</td>
<td>0.84</td>
<td>M.2</td>
<td>0.95</td>
<td>IE.7</td>
<td>1.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.2</td>
<td>1.04</td>
<td>S.14</td>
<td>0.72</td>
<td>M.3</td>
<td>2.70</td>
<td>IE.8</td>
<td>1.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.3</td>
<td>0.65</td>
<td>S.15</td>
<td>0.72</td>
<td>M.4</td>
<td>1.75</td>
<td>IE.9</td>
<td>1.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.4</td>
<td>1.03</td>
<td>S.16</td>
<td>0.63</td>
<td>M.5</td>
<td>0.95</td>
<td>IE.10</td>
<td>1.83</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Incentive Weights

Figure 1.4. GSAS Commercial Scoring Weights

TOTAL 100.00

BONUS 5.00
### 1.8. GSAS Scoring Mechanism

1.8.4. All scoring points accumulated for each criterion shall be summed up to obtain the cumulative or aggregated score of the project. The project cumulative score shall always fall within the range of -1.00 points to 3.00 points. For example, after completing the assessments for each criterion, the scoring points are already obtained and then tabulated, see Fig. 1.5. The cumulative score shall determine the star rating of the project. In this case the project’s cumulative score of 0.96 points will receive a 2-star rating based from the project scoring table in Fig. 1.7. The user must use the GSAS Toolkit to assign the initial scores to individual criteria and also to perform the summation to obtain the final score for the project, hence the corresponding star rating will be demonstrated.

#### Sample GSAS Commercial - Project Achieved Score (rounded-off to 2 decimal places)

<table>
<thead>
<tr>
<th>Elements</th>
<th>%</th>
<th>Elements</th>
<th>%</th>
<th>Elements</th>
<th>%</th>
<th>Elements</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>UC.1</td>
<td>0.00</td>
<td>S.5</td>
<td>0.03</td>
<td>E.1</td>
<td>0.00</td>
<td>M.6</td>
<td>0.00</td>
</tr>
<tr>
<td>UC.2</td>
<td>0.00</td>
<td>S.6</td>
<td>0.03</td>
<td>E.2</td>
<td>0.00</td>
<td>M.7*</td>
<td>0.02</td>
</tr>
<tr>
<td>UC.3</td>
<td>0.01</td>
<td>S.7</td>
<td>0.00</td>
<td>E.3</td>
<td>0.00</td>
<td>IE.1</td>
<td>0.01</td>
</tr>
<tr>
<td>UC.4</td>
<td>0.00</td>
<td>S.8</td>
<td>0.00</td>
<td>E.4</td>
<td>0.00</td>
<td>IE.2</td>
<td>-0.01</td>
</tr>
<tr>
<td>UC.5</td>
<td>0.03</td>
<td>S.9</td>
<td>0.00</td>
<td>E.5</td>
<td>0.00</td>
<td>IE.3</td>
<td>0.05</td>
</tr>
<tr>
<td>UC.6</td>
<td>0.00</td>
<td>S.10</td>
<td>0.03</td>
<td>W.1</td>
<td>0.12</td>
<td>IE.4</td>
<td>0.04</td>
</tr>
<tr>
<td>UC.7</td>
<td>0.01</td>
<td>S.11*</td>
<td>0.02</td>
<td>W.2</td>
<td>0.20</td>
<td>IE.5</td>
<td>-0.02</td>
</tr>
<tr>
<td>UC.8</td>
<td>0.01</td>
<td>S.12</td>
<td>0.02</td>
<td>M.1</td>
<td>0.02</td>
<td>IE.6</td>
<td>-0.01</td>
</tr>
<tr>
<td>S.1</td>
<td>0.01</td>
<td>S.13</td>
<td>0.00</td>
<td>M.2</td>
<td>0.00</td>
<td>IE.7</td>
<td>0.00</td>
</tr>
<tr>
<td>S.2</td>
<td>-0.01</td>
<td>S.14</td>
<td>0.01</td>
<td>M.3</td>
<td>0.00</td>
<td>IE.8</td>
<td>-0.01</td>
</tr>
<tr>
<td>S.3</td>
<td>-0.01</td>
<td>S.15</td>
<td>0.02</td>
<td>M.4</td>
<td>0.00</td>
<td>IE.9</td>
<td>0.00</td>
</tr>
<tr>
<td>S.4</td>
<td>-0.01</td>
<td>S.16</td>
<td>0.00</td>
<td>M.5</td>
<td>-0.01</td>
<td>IE.10</td>
<td>0.06</td>
</tr>
</tbody>
</table>

* Incentive Weights

**Figure 1.5. Sample GSAS Commercial - Project Achieved Score**
1.9. GSAS Scoring Sheets

1.9.1. Scoring sheets are simple tools which can be used to quickly generate case scenarios for a project to assess the viability of various design options in meeting the targeted GSAS star rating. Criteria levels can be adjusted allowing the user to conduct sensitivity analysis based on individual criterion score. Fig.1.6 shows a sample sheet which can be generated to compare design options of scenario (SC) one and scenario two for conformance with the criteria related to Urban Connectivity (UC). All criteria levels in the GSAS Categories must be inputted in the scoring sheet to determine the overall star rating of the project. This scoring sheet is to be used for Design & Build assessment only and not for Construction Management and Operations assessments.

### Design & Build Scoring Sheet

<table>
<thead>
<tr>
<th>Criteria</th>
<th>&quot;Weight %&quot;</th>
<th>Score Range</th>
<th>SC 1 Score Level</th>
<th>SC 2 Score Level</th>
<th>SC 1 Criterion Scores</th>
<th>SC 2 Criterion Scores</th>
<th>Total Points - SC 1</th>
<th>Total Points - SC 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>UC.1 Proximity to Infrastructure</td>
<td>1.22%</td>
<td>(0,1,2,3)</td>
<td>0</td>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UC.2 Load on Local Traffic Conditions</td>
<td>1.48%</td>
<td>(0,1,2,3)</td>
<td>0</td>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UC.3 Public Transportation</td>
<td>1.15%</td>
<td>(0,1,2,3)</td>
<td>1</td>
<td></td>
<td>0.012</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UC.4 Private Transportation</td>
<td>0.38%</td>
<td>(0,1,2,3)</td>
<td>0</td>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UC.5 Sewer &amp; Waterway Contamination</td>
<td>0.94%</td>
<td>(0,1,2,3)</td>
<td>3</td>
<td></td>
<td>0.028</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UC.6 Acoustic Conditions</td>
<td>0.26%</td>
<td>(0,1,2,3)</td>
<td>0</td>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td>0.962</td>
<td></td>
</tr>
<tr>
<td>UC.7 Proximity to Amenities</td>
<td>0.68%</td>
<td>(0,1,2,3)</td>
<td>2</td>
<td></td>
<td>0.014</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UC.8 Accessibility</td>
<td>0.89%</td>
<td>(0,3), (0,1,2,3)</td>
<td>1</td>
<td></td>
<td>0.009</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total</th>
<th>SC 1</th>
<th>7.00%</th>
<th>0.062</th>
<th>2 Stars</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SC 2</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SC 1*: Scenario one

Figure 1.6. Sample GSAS Design & Build Scoring Sheet
### GSAS TECHNICAL GUIDE

#### 1.10. GSAS Toolkits

1.10.1. The toolkits compute the final project score and certification level for the project using each criterion score entered by the user, see Fig. 1.7. This toolkit is to be used for Design & Build assessment only and not for Construction Management and Operations assessments.

### GLOBAL SUSTAINABILITY ASSESSMENT SYSTEM (GSAS)

#### DESIGN STAGE

**Project Information**

<table>
<thead>
<tr>
<th>Project ID:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Name:</td>
<td></td>
</tr>
<tr>
<td>Project Location:</td>
<td></td>
</tr>
<tr>
<td>Gross Area (m²):</td>
<td></td>
</tr>
<tr>
<td>Typology</td>
<td>COMMERCIAL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No</th>
<th>Category</th>
<th>Point 0.962</th>
</tr>
</thead>
<tbody>
<tr>
<td>UC</td>
<td>Urban Connectivity</td>
<td>0.062</td>
</tr>
<tr>
<td>S</td>
<td>Site</td>
<td>0.140</td>
</tr>
<tr>
<td>E</td>
<td>Energy</td>
<td>0.000</td>
</tr>
<tr>
<td>W</td>
<td>Water</td>
<td>0.320</td>
</tr>
<tr>
<td>M</td>
<td>Materials</td>
<td>0.030</td>
</tr>
<tr>
<td>IE</td>
<td>Indoor Environment</td>
<td>0.110</td>
</tr>
<tr>
<td>CE</td>
<td>Cultural &amp; Economic Value</td>
<td>0.210</td>
</tr>
<tr>
<td>MO</td>
<td>Management &amp; Operations</td>
<td>0.090</td>
</tr>
</tbody>
</table>

**Level Achieved**: 2 Stars

*Figure 1.7. GSAS Toolkits Part I*
Categories Achieved Point vs. Points Attainable

<table>
<thead>
<tr>
<th>Category</th>
<th>Level Range</th>
<th>Points Attainable</th>
<th>Points Achieved</th>
<th>Points Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Connectivity</td>
<td>X&lt;0</td>
<td>0.062</td>
<td>0.310</td>
<td>0.248</td>
</tr>
<tr>
<td>Site</td>
<td>0.0&lt;=X&lt;=0.5</td>
<td>0.123</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy</td>
<td>0.5&lt;X&lt;=1.0</td>
<td>0.000</td>
<td>0.220</td>
<td>0.480</td>
</tr>
<tr>
<td>Water</td>
<td>1.0&lt;X&lt;=1.5</td>
<td>0.005</td>
<td>0.100</td>
<td>0.480</td>
</tr>
<tr>
<td>Materials</td>
<td>1.5&lt;X&lt;=2.0</td>
<td>0.005</td>
<td>0.100</td>
<td>0.480</td>
</tr>
<tr>
<td>Indoor Environment</td>
<td>2.0&lt;X&lt;=2.5</td>
<td>0.010</td>
<td>0.210</td>
<td>0.480</td>
</tr>
<tr>
<td>Cultural &amp; Economic Value</td>
<td>2.5&lt;X&lt;=3.0</td>
<td>0.010</td>
<td>0.210</td>
<td>0.480</td>
</tr>
<tr>
<td>Management &amp; Operations</td>
<td></td>
<td>0.010</td>
<td>0.210</td>
<td>0.480</td>
</tr>
</tbody>
</table>

Legend

<table>
<thead>
<tr>
<th>Level</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>X&lt;0</td>
</tr>
<tr>
<td>★</td>
<td>0.0&lt;=X&lt;=0.5</td>
</tr>
<tr>
<td>★★</td>
<td>0.5&lt;X&lt;=1.0</td>
</tr>
<tr>
<td>★★★</td>
<td>1.0&lt;X&lt;=1.5</td>
</tr>
<tr>
<td>★★★★</td>
<td>1.5&lt;X&lt;=2.0</td>
</tr>
<tr>
<td>★★★★★</td>
<td>2.0&lt;X&lt;=2.5</td>
</tr>
<tr>
<td>★★★★★★</td>
<td>2.5&lt;X&lt;=3.0</td>
</tr>
</tbody>
</table>

Level Achieved: 2 Star

Figure 1.7. GSAS Toolkits Part II
### 1.11 GSAS Calculators

Calculators are computational systems based on normative measures provided for many criteria to evaluate the project’s performance under its appropriate schemes. An example of one of GSAS Calculators is shown below, see Fig. 1.8.

<table>
<thead>
<tr>
<th>Building General</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Terrain class</strong></td>
<td><strong>Urban / City</strong></td>
</tr>
<tr>
<td>Total gross floor area: internal dimension1 [m²]</td>
<td>21686.00</td>
</tr>
<tr>
<td>Building volume [m³]</td>
<td>65058.00</td>
</tr>
<tr>
<td>Height [m]</td>
<td>60.00</td>
</tr>
<tr>
<td>Occupancy schedule [days / week]</td>
<td>5.00</td>
</tr>
<tr>
<td>Equivalent full-load occupancy hours [hours / day]</td>
<td>10.00</td>
</tr>
<tr>
<td>Occupancy: area per person [m²/person]</td>
<td>10.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Internal Temperature Set Point</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupied internal set point for cooling [°C]</td>
<td>23.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Material</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roof</strong></td>
<td></td>
</tr>
<tr>
<td>Roof: U-value [W/(m²K)]</td>
<td>0.255</td>
</tr>
<tr>
<td><strong>Opaque Exposed Wall</strong></td>
<td></td>
</tr>
<tr>
<td>Opaque Wall U-value [W/(m²K)]</td>
<td>0.418</td>
</tr>
<tr>
<td>Door material U-value [W/(m²K)]</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Window Type 1</strong></td>
<td></td>
</tr>
<tr>
<td>Window Type 1 U-value [W/(m²K)]</td>
<td>1.82</td>
</tr>
<tr>
<td>Window Type 1 Solar Transmittance</td>
<td>0.430</td>
</tr>
<tr>
<td>Window Type 1 Frame Fraction</td>
<td>0.25</td>
</tr>
<tr>
<td><strong>Window Type 2</strong></td>
<td></td>
</tr>
<tr>
<td>Window Type 2 U-value [W/(m²K)]</td>
<td>1.7</td>
</tr>
<tr>
<td>Window Type 2 Solar Transmittance</td>
<td>0.16</td>
</tr>
<tr>
<td>Window Type 2 Frame Fraction</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Figure 1.8. Sample GSAS Calculator
1.12. Types of GSAS Certifications

1.12.1 Overview. There are three types of certification that GSAS Trust offers to the construction industry to assess the elements of sustainability throughout the entirety of the Project/Development life cycle (i.e. Design, Construction & Operations stages).

These are:

- Design & Build Certification
- Construction Management Certification
- Operations Certification

These certifications are administered by GSAS Trust, the certifying body that evaluates and qualifies the level of certificate granted to the assessed project, see Fig. 1.9.

**Figure 1.9. GSAS Certifications & Project Life Cycle**
1.12. Types of GSAS Certifications

1.12.2 Design & Build Certification. This is a type of GSAS certification with the purpose of assessing and qualifying the project design that complies with GSAS design assessment in order to obtain the GSAS Star Rating and GSAS Design & Build Certificate.

The overall Design & Build Certification process is shown in Fig. 1.10. Refer to section 2.1. for more details.

Figure 1.10. GSAS Certifications Flowcharts
1.12. **Types of GSAS Certifications**

1.12.3 **Construction Management Certification.** This is a type of GSAS certification with the purpose of assessing and qualifying the Contractor’s construction process and practices that complies with Construction Management assessment in order to obtain the GSAS Star Rating and GSAS Construction Management Certificate. This certification is not related to building design as it assesses the practices of contractors performing the construction activities.

The overall Construction Management Certification process is shown in Fig. 1.10. Refer to section 2.2. for more details.

1.12.4 **Operations Certification.** This is a type of GSAS certification with the purpose of assessing and labeling the facility/tenant’s performance in energy, water, and indoor environment that complies with GSAS operations assessment. The awarded certificates are GSAS Energy Certificate, GSAS Water Certificate and GSAS Indoor Environment Certificate. Such certificates demonstrate performance compliance within the validity period granted for recognition.

The overall Operations Certification process is shown in Fig. 1.10. Refer to section 2.3. for more details.
CHAPTER: 2

GSAS Certifications
2.1. Design & Build Certification

2.1.1. Registering the Project

Registering the project at GSASgate is the starting point for all projects being designed to obtain the GSAS Design & Build Certificate, see Fig. 2.1., All projects obtaining certification for its design must register at GSASgate and pay the associated fees for the gateway registration and project certification in order to activate the project account.
Figure 2.1. Provisional Design & Build Certification Flowchart
2.1. Design & Build Certification

2.1.2. Assessing the Project Design

Upon activation of the project account, the project may start using the facility of GSASgate to support the sustainability assessment of the project’s design deliverables, see Fig. 2.1.

The Design & Build Certification assesses the project’s design deliverables from design stage up to post-construction stage.

Design & Build Certification provides six levels to measure the project’s impact.

Each level of certification corresponds to a star rating from a minimum of 1-star up to maximum of 6-stars, see Fig. 2.2.

Each level of certification or star rating achieved by the project has a corresponding range of cumulative scores, see Fig. 2.3.

A project that obtains a cumulative score below 0 shall mean that it does not meet the baseline and therefore shall not receive the certificate for failing the GSAS Design & Build assessment.

<table>
<thead>
<tr>
<th>Cumulative or Aggregated Score ($x$)</th>
<th>GSAS Star Rating (★)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x \leq 0$</td>
<td>Failed (No Certificate)</td>
</tr>
<tr>
<td>$0.00 &lt; x \leq 0.50$</td>
<td>★</td>
</tr>
<tr>
<td>$0.50 &lt; x \leq 1.00$</td>
<td>★★</td>
</tr>
<tr>
<td>$1.00 &lt; x \leq 1.50$</td>
<td>★★★</td>
</tr>
<tr>
<td>$1.50 &lt; x \leq 2.00$</td>
<td>★★★★</td>
</tr>
<tr>
<td>$2.00 &lt; x \leq 2.50$</td>
<td>★★★★★</td>
</tr>
<tr>
<td>$2.50 &lt; x \leq 3.00$</td>
<td>★★★★★★</td>
</tr>
</tbody>
</table>

Figure 2.2. GSAS Star Rating Table for Design & Build Certification
Figure 2.3. GSAS Cumulative Scoring Chart for Design & Build Certification
2.1.3. Obtaining Provisional GSAS Design & Build Certificate - Letter of conformance (LOC)

Project shall receive **Provisional GSAS Design & Build Certificate** in the form of **Letter of Conformance (LOC)** by the end of the design stage and upon approval of submission indicating the achieved GSAS star rating of the completed design documents that are ready for construction, see Fig.2.1.

2.1.4. Registering Project at GSASgate for Final Certification

Upon receiving the Letter of Conformance (LOC) from GSAS Trust, the Owner (or Client) should nominate a representative with a valid Service Provider license to be responsible for managing final Design & Build Certification process during construction. See Fig.2.4.

The appointed client representative (Project GSAS-CGP) will have to register the project at GSASgate to activate the project account for LOC Compliance Audits.
(I) Audits Plan:
The required number of routine and random audits for a project as outlined in Form - 08 shall be implemented during the following phases:

<table>
<thead>
<tr>
<th>Phase (A)</th>
<th>Phase (B)</th>
<th>Phase (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Envelop Construction Works</td>
<td>Systems Installation</td>
<td>Commissioning Stage/Pre-occupancy</td>
</tr>
<tr>
<td>(Walls, Windows, Claddings, etc.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(II) Audit Process

**Project Registration**
- Registration on GSASgate
- Payment of GSASgate Registration Fees
- Payment of Conformance to Design Audit (CDA) Fees
- Activation of Project on GSASgate

**Conformance to Design Audit**
- Checking Criteria Status Based on LOC?
- CASE (1)
  - Failed Criteria in LOC and Targeted During Construction
  - Apply for New Criteria Assessment and Pay Fees (QR 2,000/Criterion)
  - Submission for GSAS Review (Calculators/Submitts/Evidences for New Criteria)
- CASE (2)
  - Criteria Targeted in LOC & Pursued in Construction
  - Facilitation of Audit Visits
  - Submission for GSAS Reviews (Submitts/Evidences)
- CASE (3)
  - Criteria Targeted in LOC But Not Pursued in Construction

**Certification Completion**
- Confirmation of Level for New Criteria Submitted
- Confirmation of Level for Pursued Criteria (Maintain-Upgrade-Downgrade)
- Assignment of Minimum Level for Not Pursued Criteria
- Update of Project Toolkit Score
- Issuance of CDA Report
- Obtaining GSAS Design & Build Certificate

Figure 2.4. Final Design & Build Certification Flowchart
2.1.5 Pursuing Conformance to Design Audit (CDA)

During construction and commissioning, GSAS Trust shall conduct a number of routine and random audits which shall be facilitated by the Client Representative.

The goal of these audits is to verify the validity of information provided during the design stages as well as to ensure that the sustainability performance objective of the project is adequately met as per the initial design assessment.

Audit visits shall be conducted by GSAS Trust or its “Authorized Representative” on a “Routine” or “Random” bases. In the “Routine” audit the time and scope is agreed before hand, while in the “Random” audit, a short notice is given to the Client Representative.

Audit visits shall serve as GSAS Trust audit protocol where the compliance requirements submitted during the design development are validated during construction.

Audit visits shall be conducted for sampling purposes, as part of GSAS Trust quality assurance process.

For number of visits refer to GSAS Trust published schedule of visits.

For projects with multiple phases of constructions, site visits will be conducted depending on the project schedule and will be treated on a case-to-case basis.

During the CDA, the pursued criteria levels will be verified against appropriate submittals and evidences, consequently the level can be maintained, upgraded or downgraded.
# 2.1. Design & Build Certification

Assessed criteria in the LOC if not pursued during construction will be assigned minimum level as indicated in the applicable GSAS scheme.

Project may opt to target failed (not acceptable or non-conformance) criteria as indicated by the LOC to improve their levels during the construction stage. For such case, project shall apply for required number of criteria and pay applicable assessment fees as per GSAS Trust published rates.

Following successful completion of the audit visits and review of relevant submittals & evidences a Conformance to Design Audit (CDA) Report will be issued indicating the as-built updated criteria levels and star rating.

**Roles and Responsibilities**

**Project GSAS-CGP** may come from the design consultancy firm, contractor, program/project management firm, construction management firm, construction supervision firm or an independent sustainability advisor firm holding a valid GSAS Service Provider corporate license type.
2.1. Design & Build Certification

The roles and responsibilities of the project GSAS-CGP include but not limited to:

- Leading the overall planning, scheduling, and coordinating of the required LOC Compliance Audit.

- Ensuring seamless audits by extending the required assistance and necessary support to the Client Representative for the successful implementation of audits and collection of data.

- Preparing and signing-off all submittals and evidences relevant to the design parameters of the issued Provisional Certificate (LOC) for the project.

- Sufficiently demonstrating that evidences, such as reports, photographs, bill of materials, data sheets and other construction documents, are supporting the measurement principles of the GSAS criterion before submitting to GSAS Trust for final review.

GSAS Trust is the certifying body that evaluates and qualifies the level of certificate granted to the participant. The roles and responsibilities of GSAS Trust includes but not limited to:

- Conducting random and routine audit visits at various stages of the construction.

- Reviewing of the submitted data and evidences by Client Representative as mentioned above.

Contractor must hold a valid GSAS Design & Build Service Provider license.
2.1. Design & Build Certification

Sample Appointment Letter of Client Representative

See Fig. 2.5. for the sample letter of appointment for the LOC Compliance Audit works.

ON PROJECT OWNER’S LETTERHEAD

Date: 
Ref: 

Client Representative Appointment Letter

Att. GSAS Trust,
Gulf Organisation for Research & Development,
QSTP,
Doha-Qatar.

Dear Sirs;
We are pleased to appoint ___________ (name of appointed Firm), holding a valid Service Provider license (SP no.xxxx), as our representative for GSAS Conformance to Design Audit (CDA) for the ___________ (project name) which issued the GSAS Design & Build Provisional Certificate (LOC) Ref. No. (____________) on the following terms and conditions:

1. The appointee will carry out the duties and responsibilities as outlined by GSAS Trust.
2. The delegation of the authority however, does not relieve us from the responsibility and accountability for this project.
3. Should the appointee-unable to deliver within GSAS Trust expectations, we are hereby responsible to find a suitable replacement within (4-6) weeks upon the receipt of a written notice from GSAS Trust.

By: ____________________ Signature:________________
(Name of the Owner/Client Authorized Signatory)

Title: _____________________ Date: ____________
(Title or Position of the signatory)

Owner/Client Stamp: _______________________

Figure 2.5. Sample Letter of Appointment
2.1.6. Obtaining GSAS Design & Build Certificate.

Upon successful completion of the Conformance to Design Audit (CDA), the final GSAS Design & Build Certificate will be issued to the project, for having conformed to the performance set forth in the GSAS Design Assessment manual and the final GSAS star rating achieved by the project.

GSAS Design & Build Certificate will only be issued after completing the CDA visits and receiving CDA Report indicating the final GSAS star rating.
2.2.1 Registering Contractor’s Project at GSASgate.

All projects obtaining certification for the construction management must register at GSASgate and pay the associated fees for the gateway registration and Construction Management Certification in order to activate the account for the Contractor’s project, see Fig.2.6.

The Contractor registering for its project must be an authorized GSAS Service Provider with valid corporate license type and shall nominate a representative with valid CGP-CM certificate to be qualified for managing the Construction Management Certification process during construction of the entire project site.

A Kick-off meeting should take place between GSAS Trust and project team after project registration to discuss the assessment process requirements.

2.2.2 Assessing Contractor’s Project Submittals.

Upon activation of the project account, the Contractor may start using the facility of GSASgate to support the sustainability assessment of the project’s construction submittals, see Fig.2.6.

The Construction Management Scheme evaluates the environmental impact for the project over the course of the construction process. It is based on the evaluation of the categories and their associated criteria throughout the three main stages of the project construction based on the targeted star rating:

a. Enabling stage/foundation stage,
b. Substructure & superstructure, and
c. Finishing stage.
2.2. Auditing Contractor’s Construction Practices at Site.

Audit Visits shall be conducted by GSAS Trust or its “Authorized Representative” on a “Routine” basis wherein time and scope is agreed beforehand with the Contractor.

For number of visits refer to GSAS Trust published schedule of visits.

For projects with multiple phases of constructions, site visits will be conducted depending on the project schedule and will be treated on a case-to-case basis.

Obtaining Audit Advisory Notices (AAN)

After completing the submittals’ review and site audit(s) for each construction stage, see Fig.2.6., the Contractor shall receive an interim Audit Advisory Notice indicating the evaluation scores for each criterion submitted at the appropriate construction stage.

In the second and third stages, the scores could be maintained, upgraded or downgraded.

Scores from the three stages will be equally weighted and shall be aggregated in the GSAS Construction Management Certificate. The indicated Star Rating achievement of the Contractor’s project will be based on the resulting average of these three evaluation stages.
Figure 2.6. Construction Management Certification Flowchart
2.2.4. Obtaining GSAS Construction Management Certificate.

Upon successful completion of the construction activities of the entire project site, GSAS Construction Management Certificate will be issued to the Contractor, for having conformed to the performance set forth in the GSAS Construction Management Assessment manual and the final GSAS star rating achieved by the Contractor’s project.

GSAS Construction Management Certificate will only be issued after completing all the construction activities in the entire site development and upon successful completion of the assessment and auditing requirements in Sections 2.2.2. and 2.2.3, respectively.
2.2. Construction Management Certification

Roles and Responsibilities

GSAS Trust is the certifying body that evaluates and qualifies the level of certificate granted to the participant. The roles and responsibilities of GSAS Trust includes but not limited to:

- Conducting “Routine” visits at different stages of the construction. See Fig. 2.6.
- Reviewing and verifying the submitted data and evidences by the Contractor’s CGP.

Contractor must be a valid GSAS Service Provider for GSAS Construction Management assessments and shall appoint a certified professional with valid GSAS-CM certificate who shall be the focal person for registering and assessing the construction practices applied to the project. The roles and responsibilities of the Contractor includes but not limited to:

- Facilitating site audit and collecting of data to validate the claimed scores.
- Sufficiently demonstrating that evidences, such as reports, photographs, surveys, site measurements, and other construction documents, are supporting the measurement principles of the GSAS criterion before submitting to GSAS Trust for final review.
2.3. Operations Certifications

2.3.1. Registering Facility/Tenant’s Project at GSASgate. The Operations certifications assess the environmental impact of an existing building which might have or might have not possessed GSAS Design & Build Certificate. The starting point of Operations Certification is to register the facility/tenant’s project for GSAS Operations assessment at GSASgate and pay the associated fees for the gateway registration and project certification in order to activate the project account, see Fig.1.10.

2.3.2. Auditing the Operating Performances of the Facility/Tenant’s Project. Upon activation of the project account, the project may start using the facility of GSASgate to support the Operations assessment of the project’s energy, water, and indoor environment performances, see Fig.1.10. There are three auditing activities conducted to assess the Operations performance of the facility/tenant’s project. These audits shall assess the project’s compliance with the requirements of:

- GSAS Water Performance Assessment
- GSAS Energy Performance Assessment
- GSAS Indoor Environment Performance Assessment

2.3.3. Obtaining GSAS Operations Certificate. Having demonstrated full compliance to the auditing requirements of the Operations performances, the project will be granted with the appropriate labeling certificates for conforming to the Operations performance assessments for Energy, Water, and Indoor Environment. The obtained certificates will indicate the achieved performance of buildings on a normalized scale for a new and existing buildings. It is, however, expected that existing building performance will achieve lower values and be labeled as such, than a comparable new building designed sustainably.
2.4. Credentialing Requirements

2.4.1. Managing GSAS Certifications for a project requires acquiring appropriate GSAS Service Provider license types, Fig.2.7.

2.4.2. For Design & Build Certifications there are different license types for Service Providers as follows, see also Fig.2.7:

- Building Typologies
- Districts & Infrastructure
- Healthcare
- Railways
- Sports

2.4.3. Client or the project developer or owner who wishes to obtain Design & Build Certification shall appoint an authorized GSAS Service Provider who shall register the project for design assessment.

2.4.4. Contractor who shall perform the construction of a project that has already obtained Provisional Certificate (LOC) needs to acquire the appropriate Design & Build Service Provider License type, Fig.2.7, in order to perform the LOC Compliance Audit requirements.

2.4.5. Contractor who wishes to apply for Construction Management certification must be an authorized GSAS Service Provider for Construction Management. The GSAS Service Provider for Construction Management must have at least one professional (GSAS-CM) certified to perform the GSAS Construction Management assessment, Fig.2.7.

2.4.6. Client or the project developer or owner who wishes to obtain Operations certifications shall appoint an authorized GSAS Service Provider for Operations who shall register the project for Operations assessment. The GSAS Service Provider for Operations must have at least one professional (GSAS-OP) certified to perform the GSAS Operations assessment, Fig.2.7.
<table>
<thead>
<tr>
<th>GSAS Service Providers</th>
<th>Qualifying Applicants</th>
<th>Corporate License Types</th>
<th>Assessing Privileges</th>
<th>License Prerequisites</th>
<th>Extra Credential Requirements (effective by 2nd Quarter of 2016)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Design &amp; Build Certification</td>
<td>• Design Consultants • Design &amp; Build Contractors</td>
<td>Building Typologies</td>
<td>All Building Typologies Scheme</td>
<td>GSAS-CGP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Project Managers • Construction Supervision Consultants</td>
<td>Districts &amp; Infrastructure</td>
<td>Districts &amp; Infrastructure Scheme</td>
<td>GSAS-CGP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Program Managers • Owners/Clients/Developers • Main Contractors • Sustainability Consultant</td>
<td>Healthcare</td>
<td>Health Care Scheme</td>
<td>GSAS-CGP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>Railways</td>
<td>Railways Scheme</td>
<td>GSAS-CGP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>•</td>
<td>Sports</td>
<td>Sports Scheme</td>
<td>GSAS-CGP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For Construction Management Certification</td>
<td>• Main Contractors • Sub-Contractors • Specialist Contractors • Builders • Sustainability Consultant</td>
<td>Construction Management</td>
<td>Construction Management Scheme</td>
<td>GSAS-CM (Certified to perform the Construction Management assessment)</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>For Operations Certification</td>
<td>• Facility Managers/Operators • Building Tenants • Building Owners/Clients/Developers • Sustainability Consultant</td>
<td>Operations</td>
<td>• Energy Performance • Water Performance • Indoor Environment Performance</td>
<td>GSAS-OP (Certified to perform the Operations assessment)</td>
<td></td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Figure 2.7. Table of GSAS Service Providers and CGPs
2.5. Mandatory compliance to the following GSAS policies for project certifications is a Prerequisite for certification:

The assessed average energy performance (Energy Category) of the project shall not receive a negative score.

The assessed water performance (Water Category) of the project shall not receive a negative score.

2.5.2. For Districts & Infrastructure Assessment, at least eighty percent (80%) of the built-up area shall be certified.

2.5.3. For Neighborhood assessment, auxiliary and utility buildings of built-up area less than 500m² can be excluded from GSAS assessment.

2.5.4. For projects undergoing major renovation, the GSAS Design & Build Certification can be pursued using the assessment scheme for Existing Buildings.

2.5.5. For energy centers or central plants within a development/project, the performance of the cooling system will be assessed and verified according to EN 14825 standard. The project shall be registered for assessment and certification based on Building Typologies fees schedule. The project shall submit all relevant calculations and supporting documents and receive the Compliance Report which shall be used to support the claimed SEER in the Energy Category in GSAS relevant scheme.
CHAPTER: 3

GSAS Schemes
3.1.1. **GSAS Assessment Schemes for Design & Build Certifications.** GSAS Assessment Schemes for Design & Build Certification are available for the following typologies with each typology supported by GSAS manuals for design assessments and design guidelines. See also Section 4 for the latest published GSAS Design Assessment and GSAS Design Guidelines.

### Districts & Infrastructure

Districts & Infrastructure scheme is used for evaluating the planning and design of urban developments that work to improve the welfare of people and their communities by creating more convenient, equitable, healthful, efficient, and attractive places for present and future generations.

In developing the plan for a community a wide array of issues to be considered such as use and protection of land, outdoor environment, sustainable energy production, materials and water consumption. In addition, the infrastructure components consisting of interrelated systems & services such as roads, bridges, tunnels, water supply, sewers, electrical grids, telecommunications, and so forth are investigated.

The scheme consists of a set of criteria and measurements used to assess the individual aspects of environmental impact and documenting the degree to which the requirements of (GSAS) have been met.

### Commercial

Commercial scheme is used for the assessment of commercial building types include spaces that serve various functions such as offices, conference rooms, foyers, retail spaces, and ancillary areas.

### Mosques

Mosques scheme building types include the building containing the congregational worship areas.
3.1. GSAS Assessment Schemes

**Neighborhood**

Neighborhood scheme is used to assess a zone within a district. It may comprise of different building typologies designed for a specific functionality or use. The assessment of UC, S, CE and MO categories for the main building will be based on the scheme relevant to the main use, i.e. commercial, educational, hotel or industrial and all other buildings will inherit the scores achieved by the main building. The assessment of the other categories will be conducted for each building within the neighborhood and aggregated score for all buildings will be issued for the project.

**Parks**

Parks scheme is used for rating the ecological impacts of new and existing parks, including its on-site amenities, such as landscape areas, walkways, and picnic spaces, as well as any minor service facilities including restrooms, storage sheds, or small information centers.

It is used for the design assessment of different types of parks including mini park, community Park, district park, large urban and zoos.

**Residential / Group Residential**

Residential scheme building types include spaces used primarily for housing. This includes single-family housing units as well as multi-unit dwellings. Also low-rise and high-rise residential complexes are covered.

**Education**

Education scheme buildings include educational facilities for students in kindergarten through 12th grade as well as college and university facilities. This includes classrooms, libraries, auditoriums, cafeterias, kitchens, offices, research laboratories and other spaces that are part of academic buildings.
<table>
<thead>
<tr>
<th>3.1. GSAS Assessment Schemes</th>
<th>Hotels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotels scheme building types include a variety of spaces including guest-rooms, lobbies, banquet halls, offices, conference rooms, dining areas and kitchens, fitness centers, retail spaces, and ancillary areas. Also service apartments, resorts and other associated facilities are included.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Light Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Industry scheme building types include both operational such as warehouses, workshops, Production facilities and office areas as well as the general building as a whole.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sports scheme include any buildings or venues that are designed to host a sporting event that support activities for athletes/competitors, support staff, and spectators. Uniquely, the scheme can be used to assess air-conditioned open stadium.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Railways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Railways scheme is used for rating the sustainability and ecological impacts of new main station buildings including spaces that serve various functions of a railway station such as but not necessarily limited to platform/concourse, offices, station control room, ticketing, retail, food/beverage areas, and ancillary areas.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Healthcare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare scheme is used for rating the ecological impacts of new healthcare buildings, including specialist hospitals, general hospitals, out-patient hospitals, and primary care health centers. The scheme can also be used to assess research laboratories conducting biomedical activities.</td>
</tr>
</tbody>
</table>
3.1. GSAS Assessment Schemes

Workers’ Accommodation

The Workers Accommodation scheme is developed based on the international labor standards and best practices employed in different parts of the world. The objective should be to ensure “adequate and decent housing accommodation and a suitable living environment for workers”. This scheme defines the relevant criteria to meet the sustainability objectives of GSAS when designing workers accommodation.

Existing Buildings

Existing Building scheme is used to assess the environmental impact of any type of buildings under going major renovations. The scheme provisions takes into consideration the constraints that an existing building is subject to in terms of location, site, form and structure.

Bespoke schemes

Please contact GSAS Trust for further information.

3.1.2 GSAS Assessment Scheme for Construction Management Certification

GSAS Assessment Scheme for Construction Management is used to provide assessment on the aspects of construction process that has a lasting environmental impact. It will perform measurements related to normative standards and accepted practices, and considers what impacts the project can mitigate. The issues covered are related to five main categories namely Site, Energy, Water, Materials and Management & Operation.

It will require a thorough review of the Contractor’s practices during the entire stage of the project’s construction to ensure its adherence to responsible construction practices. All types of projects/developments can be certified for its Construction Management using the assessment scheme for Construction Management.
3.1.3 GSAS Assessment Scheme for Operations Certifications

GSAS Assessment Scheme for Operations is used to provide information for the evaluation of the environmental impact of building operations.

Its purpose is to provide the process and evaluation procedures for auditing the facility or tenants operations in order to assess its energy, water, and indoor environment performances within the entire period of assessment. Where applicable, it details the steps and requirements, the project must take in order to take measurements on site during the facility or tenants operations.

It provides information on computation or documentation requirements that the project needs to submit in order to demonstrate compliance. It can evaluate the facility or tenant's operations over the course of its lifetime. Evaluation is conducted on data collected for the whole year cycle. The assessment scheme for operations is to be read in conjunction with the GSAS Operations Guidelines.
4.1 GSAS Districts & Infrastructure Design Assessment 2015

Provide information for evaluating the planning and design of urban development projects, including several components such as infrastructure networks, transportation networks and public or open spaces.

Guide design and construction professionals through design assessment for both new and existing districts.

The manual consists of a set of criteria and measurements used to assess the individual aspects of environmental impact and documenting the degree to which the requirements of Global Sustainability Assessment System (GSAS) have been met.

Provide information for the design assessment of each criterion in the following categories: Urban Connectivity, Site, Energy, Water, Materials, Outdoor Environment, Cultural & Economic Values, Management & Operations.
4.1.2 GSAS Districts & Infrastructure Design Guidelines 2015

Documents that continuously evolve to include timely and relevant sustainable strategies that could help mitigate the negative effects of the project.

Intended to be used as a practical resource to supplement the design assessment manual.

Contains descriptive information for consideration to help attain the specific credit for each criterion in the GSAS categories. These suggestions are in the form of recommended methods, strategies, and technologies.

Projects shall consider and assess the potential advantages and benefits of the recommended design guidelines in relationship to the specific goals, requirements and conditions of the project.
4.1.3. GSAS Parks Design Assessment 2015

Provide information for rating the ecological impacts of new and existing parks, including its on-site amenities, such as landscape areas, walkways, and picnic spaces, as well as any minor service facilities including restrooms, storage sheds, or small information centers.

Provide information for the design assessment of the following types of park:

- Mini Park that includes small public plots, serving a residential cluster with limited facilities and services. While community Park that serves two or more neighborhoods and serves broader purpose for recreational needs, open space preservation, and cultural events.

- District Park that includes large open spaces with increased public facilities and services and usually used for recreational and social focus.

- Large Urban Park that preserves a unique landscape in an urban environment and provides large open spaces to a diverse community. It also provides many public facilities and services.

- Regional Park that preserves large tracts of open space, generally well outside of city limits. It also provides many public facilities and services, though at a lower density than large urban parks. It has also more natural, open space than developed park facilities and public spaces.

- Zoological Park that includes facility in which animals are confined within enclosures and displayed to the public. It could include some gardens, water features, small public facilities for visitors, and galleries for souvenirs, displays and exhibitions.
4.1.4. GSAS Parks Design Guidelines 2015

Documents that continuously evolve to include timely and relevant sustainable strategies that could help mitigate the negative effects of the project.

Intended to be used as a practical resource to supplement the design assessment manual.

Contains descriptive information for consideration to help attain the specific credit for each criterion in the GSAS categories. These suggestions are in the form of recommended methods, strategies, and technologies.

Projects shall consider and assess the potential advantages and benefits of the recommended design guidelines in relationship to the specific goals, requirements and conditions of the project.
4.1.5. GSAS Building Typologies
Design Assessment 2015

Provides information for the design assessment of each of the following typologies:

- **Commercial** - It is used for the assessment of commercial building types include spaces that serve various functions such as offices, conference rooms, foyers, retail spaces, and ancillary areas.

- **Core + Shell** - Core + Shell buildings consist wholly or partly undersigned infill, and the owner/developer may not have control over the fit-out of the spaces. Building of these types include shopping malls and centres.

- **Residential / Group Residential** - Residential building types include spaces used primarily for housing. This includes single-family housing units as well as multi-unit dwellings.

- **Education** - Education buildings include educational facilities for students in kindergarten through 12th grade as well as college and university facilities. This includes classrooms, libraries, auditoriums, cafeterias, kitchens, offices, and other spaces that are part of academic buildings, such as research laboratories.

- **Mosques** - Mosques building types include the building containing the congregational worship areas.

- **Hotels Scheme** - Hotels building types include a variety of spaces including guest-rooms, lobbies, banquet halls, offices, conference rooms, dining areas and kitchens, fitness centers, retail spaces, and ancillary areas. Resorts & service apartments are also included.

- **Light Industry** - Light Industry building types include both operational and office areas as well as the general building as a whole. Warehouses and workshops are also included.
4.1 GSAS Publications

4.1.6 GSAS Building Typologies
Design Guidelines 2015

Provides relevant sustainable strategies that could help mitigate the negative effects of the project.

It contains descriptive information for consideration to help attain the specific credit for each criterion in the GSAS categories. These suggestions are in the form of recommended methods, strategies, and technologies.

Projects shall consider and assess the potential advantages and benefits of the recommended design guidelines in relationship to the specific goals, requirements and conditions of the project.

The manual is intended to be used as a practical resource to supplement the design assessment manual.
4.1.7. GSAS Sports Design Assessment 2015

Sports facilities include any buildings or venues that are designed to host a sporting event that support activities for athletes/competitors, support staff, and spectators, whether its indoor or outdoor air-conditioned spaces.
4.1 GSAS Publications

4.1.8. GSAS Sports Design Guidelines 2015

Documents that continuously evolve to include timely and relevant sustainable strategies that could help mitigate the negative effects of the project.

Intended to be used as a practical resource to supplement the design assessment manual.

Contains descriptive information for consideration to help attain the specific credit for each criterion in the GSAS categories. These suggestions are in the form of recommended methods, strategies, and technologies.

Projects shall consider and assess the potential advantages and benefits of the recommended design guidelines in relationship to the specific goals, requirements and conditions of the project.
4.1.9. GSAS Railways Design Assessment 2015

Provide information for rating the sustainability and ecological impacts of new main station buildings including spaces that serve various functions of a railway station such as but not necessarily limited to platform/concourse, offices, station control room, ticketing, retail, food/beverage areas, and ancillary areas. Stations types include underground, at-grade and elevated stations.
4.1.10. GSAS Railways Design Guidelines 2015

Documents that continuously evolve to include timely and relevant sustainable strategies that could help mitigate the negative effects of the project.

Intended to be used as a practical resource to supplement the design assessment manual.

Contains descriptive information for consideration to help attain the specific credit for each criterion in the GSAS categories. These suggestions are in the form of recommended methods, strategies, and technologies.

Projects shall consider and assess the potential advantages and benefits of the recommended design guidelines in relationship to the specific goals, requirements and conditions of the project.
4.1.11. GSAS Healthcare Design Assessment 2015

Provides information for rating the ecological impacts of new healthcare buildings, including specialist hospitals, general hospitals, out-patient hospitals, primary care health centers and especially bio-medical research laboratories.
4.1.12. **GSAS Healthcare Design Guidelines 2015**

Documents that continuously evolve to include timely and relevant sustainable strategies that could help mitigate the negative effects of the project.

Intended to be used as a practical resource to supplement the design assessment manual.

Contains descriptive information for consideration to help attain the specific credit for each criterion in the GSAS categories. These suggestions are in the form of recommended methods, strategies, and technologies.

Projects shall consider and assess the potential advantages and benefits of the recommended design guidelines in relationship to the specific goals, requirements and conditions of the project.
4.1.13. GSAS Workers’ Accommodation Design Assessment 2015

The Workers Accommodation scheme is developed based on the international labor standards and best practices employed in different parts of the world.

The objective should be to ensure “adequate and decent housing accommodation and a suitable living environment for workers”.

This scheme defines the relevant criteria to meet the sustainability objectives of GSAS when designing workers accommodation.

Documents that continuously evolve to include timely and relevant sustainable strategies that could help mitigate the negative effects of the project.

Intended to be used as a practical resource to supplement the design assessment manual.

Contains descriptive information for consideration to help attain the specific credit for each criterion in the GSAS categories. These suggestions are in the form of recommended methods, strategies, and technologies.

Projects shall consider and assess the potential advantages and benefits of the recommended design guidelines in relationship to the specific goals, requirements and conditions of the project.
4.1.15. GSAS Operations Assessment 2015

Provide information for the evaluation of the environmental impact of building operations, verifies the original design intent, evaluate changes made through renovations and changes, and considers what impacts the project can mitigate.
4.1.16. GSAS Operations Guidelines 2015

Provide recommendations and guidance for the effective implementation of the sustainable goals of each criterion within the facility Operations of existing buildings pertaining to Energy, Water and Indoor Environmental Performance.

Intended to supplement the Operations Assessment manual.
4.1.17. GSAS Construction: Guidelines & Assessment 2015

Provides information on the assessment of the aspects of the construction process that has a lasting environmental impact, performs measurements related to normative standards and accepted practices, and considers what impacts the project can mitigate. The issues discussed are related to five main categories of Site, Energy, Water, Materials and Management & Operations.

Provides recommendations and guidance for the effective implementation of the sustainable goals of each criterion within the Construction assessment of the aspects of the construction process.
4.1.18. Other Publications

Request for Proposal (RFP) Preparation

A guide to facilitate the preparation of an RFP and Project Brief in the pre-design stages of development.

Building Energy Application Manual

Master document for the application and implementation of the CEN/ISO energy performance standard and all its related standards to different types of buildings. The Building Energy Application is a guide for using the CEN standards with localized normative references of energy performance and regulation code for the region.

Building Energy Guidelines

A series of guidelines for designers to improve building energy performance in the region.
### 4.1 GSAS Publications

#### 4.1.19. Training Manual - Parts (I & II)

A comprehensive resource for GSAS users throughout the entire design phase of a project consisting of two volumes (Parts I and II).

It is used as a study guide to become a GSAS Certified Green Professional or Trainer.

Incorporates two typologies, Commercial and Residential with complete write-up related to the assessment of these two typologies.

The training manual introduces each category and then provides a comprehensive description and example for each criterion, followed by justifications and improvements as deemed necessary for each typology.
A globally recognised symbol of sustainable engineering

The GSAS system awards one of six levels of certifications to projects, from one star to six stars, depending on their environmental and social impact. Assessment can be conducted to certify the project in the design, construction and operations phases.