

Land Registration and Property Valuation Project

Credit no. 6306-MD

Contract No. MD-PSA-346761-GO-RFB

Contract title:

***Supply and Installation of the State Register of Objects of Technical-Constructions
Infrastructure (ROITE) Information System***

between

Public Services Agency

and

Datum LLC

Dated: August 21, 2023

1. CONTRACT AGREEMENT NO. MD-PSA-346761-GO-RFB

THIS CONTRACT AGREEMENT is made

the *21st* day of *August 2023*.

BETWEEN

- (1) **Public Services Agency**, a *Public Institution* of the Government of *the Republic of Moldova*, and having its principal place of business at *42, A. Puskin str., MD-2012, Chisinau, Republic of Moldova*, represented by *Mr. Sergiu MANIC*, Deputy Director (hereinafter called “the Purchaser”), and
- (2) **Datum LLC**, a corporation incorporated under the laws of *Azerbaijan* and having its principal place of business at *Tabriz str. 794th block, 2B, Narimanov dist. Baku, Azerbaijan, AZ1008.*, represented by *Mr. Jamal I. ISMAYILOV*, General Manager (hereinafter called “the Supplier”).

WHEREAS the Purchaser desires to engage the Supplier to supply, install, achieve Operational Acceptance of, and support the following Information System *State Register of Objects of Technical-Constructions Infrastructure (ROITE) Information System* (“the System”), and the Supplier has agreed to such engagement upon and subject to the terms and conditions appearing below in this Contract Agreement.

NOW IT IS HEREBY AGREED as follows:

- | | |
|--------------------|---|
| Article 1. | 1.1 Contract Documents (Reference GCC Clause 1.1 (a) (ii)) |
| Contract Documents | The following documents shall constitute the Contract between the Purchaser and the Supplier, and each shall be read and construed as an integral part of the Contract: <ol style="list-style-type: none">(a) This Contract Agreement and the Appendices attached to the Contract Agreement(b) Special Conditions of Contract(c) General Conditions of Contract(d) Technical Requirements (including Implementation Schedule)(e) The Supplier’s bid and original Price Schedules(f) Code of Conduct for Supplier’s Personnel |
| | 1.2 Order of Precedence (Reference GCC Clause 2) |
| | In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above, provided that Appendix 7 shall prevail over all provisions of the Contract |

Agreement and the other Appendices attached to the Contract Agreement and all the other Contract Documents listed in Article 1.1 above.

1.3 Definitions (Reference GCC Clause 1)

Capitalized words and phrases used in this Contract Agreement shall have the same meanings as are ascribed to them in the General Conditions of Contract.

Article 2.

2.1 Contract Price (Reference GCC Clause 1.1(a)(viii) and GCC Clause 11)

Contract Price and
Terms of Payment

The Purchaser hereby agrees to pay to the Supplier the Contract Price in consideration of the performance by the Supplier of its obligations under the Contract. The Contract Price shall be the aggregate of: **USD 498 350.00 (four hundred ninety-eight thousand three hundred fifty US Dollars, 00 cents)**, as specified in the Grand Summary Price Schedule.

The Contract Price shall be understood to reflect the terms and conditions used in the specification of prices in the detailed price schedules, including the terms and conditions of the associated Incoterms, and the taxes, duties and related levies if and as identified.

Article 3.

3.1 Effective Date (Reference GCC Clause 1.1 (e) (ix))

Effective Date for
Determining Time
for Operational
Acceptance

The time allowed for supply, installation, and achieving Operational Acceptance of the System shall be determined from the date when all of the following conditions have been fulfilled:

- (a) This Contract Agreement has been duly executed for and on behalf of the Purchaser and the Supplier;
- (b) The Supplier has submitted to the Purchaser the performance security and the advance payment security, in accordance with GCC Clause 13.2 and GCC Clause 13.3;
- (c) The Purchaser has paid the Supplier the advance payment, in accordance with GCC Clause 12;

Each party shall use its best efforts to fulfill the above conditions for which it is responsible as soon as practicable.

3.2 If the conditions listed under 3.1 are not fulfilled within two (2) months from the date of this Contract Agreement because of reasons not attributable to the Supplier, the parties shall discuss and agree on an equitable adjustment to the Contract Price and the Time for Achieving Operational Acceptance and/or other relevant conditions of the Contract.

Article 4.

4.1 The Appendixes listed below shall be deemed to form an integral part of this Contract Agreement.

Appendixes

4.2 Reference in the Contract to any Appendix shall mean the Appendixes listed below and attached to this Contract Agreement, and the Contract shall be read and construed accordingly.

APPENDIXES

- Appendix 1. Supplier's Representative
- Appendix 2. Adjudicator
- Appendix 3. List of Approved Subcontractors
- Appendix 4. Categories of Software
- Appendix 5. Custom Materials
- Appendix 6. Revised Price Schedules (if any)
- Appendix 7. Minutes of Contract Finalization Discussions and Agreed-to Contract Amendments

IN WITNESS WHEREOF the Purchaser and the Supplier have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

Signatures of the Parties

FOR THE PURCHASER

**PUBLIC INSTITUTION "PUBLIC SERVICES
AGENCY"**

Adress: Republic of Moldova,
Chisinau, No. 42, Aleksandr Puşkin str.,
MD-2012

Fiscal Code: 1002600024700

Account no: MD35TRPIAA317110B16000AC

Bank: Ministerul Finanțelor –
Trezoreria de Stat

Bank Code: TREZMD2X

FOR THE SUPPLIER

"DATUM" LLC

Address: Tabriz str., 794th block, 2B, Narimanov dist.
Baku, Azerbaijan, AZ1008.

Company Registration Number: 2101020074081000

Company Identification Number (TIN): 2001215881

Account no: AZ87UBAZ28290482940160USD001
SWIFT: UBAZAZ22

Bank: UNIBANK CB 11

Bank Code: 502058

Bank's Address: Azerbaijan., Baku., Ahmad Rajabli
Street 1/15 AZ1052

Intermediary Bank: RAIFFEISEN BANK
INTERNATIONAL AG, Vienna, Austria

SWIFT: RZBAATWW

Signed by: **Sergiu MANIC¹**



Title: **Deputy Director**

Signed by: **Jamal I. ISMAYILOV**



Title: **General Manager**

¹ Authorized to sign through Power of attorney nr. 01/9383 dated December 8, 2021.

Appendix 1. to Contract Agreement No. MD-PSA-346761-GO-RFB

Supplier's Representative

In accordance with GCC Clause 1.1 (b) (iv), the Supplier's Representative is:

Name: *Jamal I. ISMAYILOV*

Title: *General Manager*

In accordance with GCC Clause 4.3, the Supplier's addresses for notices under the Contract are:

Address of the Supplier's Representative: *Tabriz str. 794th block, 2B, Narimanov dist. Baku, Azerbaijan, AZ1008.*

Fallback address of the Supplier: *4 apt. 6 house, Ismayil Mammadov str., Nizami dist., Baku city, AZ1142*

Signatures of the Parties

FOR THE PURCHASER

PUBLIC INSTITUTION

“PUBLIC SERVICES AGENCY”

Signed by: **Sergiu MANIC**

Title: *Deputy Director*



FOR THE SUPPLIER

DATUM LLC

Signed by: **Jamal I. ISMAYILOV**

Title: *General Manager*



Appendix 2. to Contract Agreement No. MD-PSA-346761-GO-RFB Adjudicator

In accordance with GCC Clause 1.1 (b) (viii), the agreed-upon Adjudicator is:

Name: *Matthew Hearsom*

Address: Morrisons Solicitors LLP, 5th Floor, Sterling House, London SW19 4DP

Telephone: +44 (0) 20 8971 1028

In accordance with GCC Clause 43.1.3, the agreed-upon fees and reimbursable expenses are:

The proposed hourly fee is **GBP £150**

Reimbursable Expenses: *dispute-related telephone, fax, and other communications costs, as well as all costs associated with any trips to the site(s), if any. All such expenses will be reimbursed at the actual costs against receipt.*

Signatures of the Parties

FOR THE PURCHASER

PUBLIC INSTITUTION

“PUBLIC SERVICES AGENCY”

Signed by: **Sergiu MANIC**

Title: *Deputy Director*



FOR THE SUPPLIER

DATUM LLC

Signed by: **Jamal I. ISMAYILOV**

Title: *General Manager*



Appendix 3. to Contract Agreement No. MD-PSA-346761-GO-RFB
List of Approved Subcontractors

The Purchaser has approved use of the following Subcontractors nominated by the Supplier for carrying out the item or component of the System indicated. Where more than one Subcontractor is listed, the Supplier is free to choose between them, but it must notify the Purchaser of its choice sufficiently in advance of the time when the subcontracted work needs to commence to give the Purchaser reasonable time for review. In accordance with GCC Clause 20.1, the Supplier is free to submit proposals for Subcontractors for additional items from time to time. No subcontracts shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Purchaser and their names have been added to this list of Approved Subcontractors, subject to GCC Clause 20.3.

Item	Approved Subcontractors	Place of Registration
Utility Network, Programming, System Administration/Network /Security, Database, Web/Graphic design and develop and Quality Assurance/Control of supply or services provided by the Subcontractor	Geolab Bilgi Teknolojileri Limited Şirketi	Mustafa Kemal mahallesi, 2139. Sokak, Ekim Plaza, 2/16 Çankaya, Ankara, Turkey

Signatures of the Parties

FOR THE PURCHASER
PUBLIC INSTITUTION
“PUBLIC SERVICES AGENCY”
 Signed by: **Sergiu MANIC**

FOR THE SUPPLIER
DATUM LLC

Signed by: **Jamal I. ISMAYILOV**

Title: *Deputy Director*

Title: *General Manager*



Appendix 4. to Contract Agreement No. MD-PSA-346761-GO-RFB

Categories of Software

The following table assigns each item of Software supplied and installed under the Contract to one of the three categories: (i) System Software, (ii) General-Purpose Software, or (iii) Application Software; and to one of the two categories: (i) Standard Software or (ii) Custom Software and to one of the two categories: (i) Proprietary or (ii) Open Source.

The proposed technology for the development of ROITE is open source. Below are the technological solutions proposed to implement the ROITE project for information processing, storage and visualization. No proprietary commercial software will be used. In addition, the links of the relevant open-source license(s) are below. <https://geoserver.org/license/> <https://www.gnu.org/licenses/old-licenses/gpl-2.0.txt>

Title	System	General Purpose	Application	Standard	Open Source
QGIS			x	x	x
Geoserver			x	x	x
PostgreSQL			x	x	x
.Net Core Web API		x		x	x
Linux	x			x	x
Angular 10+			x	x	x
OpenLayers/ Leaflet		x		x	x

Signatures of the Parties

FOR THE PURCHASER
PUBLIC INSTITUTION
“PUBLIC SERVICES AGENCY”
 Signed by: **Sergiu MANIC**

Title: *Deputy Director*



FOR THE SUPPLIER
DATUM LLC
 Signed by: **Jamal I. ISMAYILOV**

Title: *General Manager*



Appendix 5. to Contract Agreement No. MD-PSA-346761-GO-RFB Custom Materials

The follow table specifies the Custom Materials the Supplier will provide under the Contract.

Custom Materials
<i>Inception report (inc. analyses and detailed final project plan and other relevant documents that will be defined in project plan such as System development plan, Detailed analysis document, Detailed system description documentation)</i>
<i>Test reports and scenarios</i>
<i>Training materials</i>
<i>User Manual</i>
<i>Quick Reference Guide</i>
<i>System Operations Guide</i>
<i>System Architecture Document</i>
<i>FAQ</i>
<i>Technical Architecture</i>

Signatures of the Parties

FOR THE PURCHASER
PUBLIC INSTITUTION
"PUBLIC SERVICES AGENCY"
Signed by: **Sergiu MANIC**

Title: *Deputy Director*



FOR THE SUPPLIER
DATUM LLC

Signed by: **Jamal I. ISMAYILOV**

Title: *General Manager*



**Appendix 6. to Contract Agreement No. MD-PSA-346761-GO-RFB
Revised Price Schedules**

Not applicable

Signatures of the Parties

FOR THE PURCHASER

PUBLIC INSTITUTION

“PUBLIC SERVICES AGENCY”

Signed by: **Sergiu MANIC**

FOR THE SUPPLIER

DATUM LLC

Signed by: **Jamal I. ISMAYILOV**

Title: *Deputy Director*



Title: *General Manager*



**Appendix 7. to Contract Agreement No. MD-PSA-346761-GO-RFB
Minutes of Contract Finalization Discussions and Agreed-to Contract
Amendments**

The attached Contract amendments (if any) shall form part of this Contract Agreement and, where differences exist, shall supersede the relevant clauses in the GCC, SCC, Technical Requirements, or other parts of this Contract as defined in GCC Clause 1.1 (a) (ii).

Signatures of the Parties

FOR THE PURCHASER
PUBLIC INSTITUTION
“PUBLIC SERVICES AGENCY”
Signed by: **Sergiu MANIC**

Title: *Deputy Director*



FOR THE SUPPLIER
DATUM LLC
Signed by: **Jamal I. ISMAYILOV**

Title: *General Manager*



SPECIAL CONDITIONS OF CONTRACT NO. MD-PSA-346761-GO-RFB

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Special Conditions of Contract No. MD-PSA-346761-GO-RFB

The following Special Conditions of Contract (SCC) shall supplement or amend the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions of the SCC shall prevail over those in the General Conditions of Contract. For the purposes of clarity, any referenced GCC clause numbers are indicated in the left column of the SCC.

A. CONTRACT AND INTERPRETATION

Definitions (GCC Clause 1)

GCC 1.1 (a) (ix)	The applicable edition of the Procurement Regulation is dated: the World Bank's "Procurement Regulations for IPF Borrowers" <i>dated July 2016, revised November 2017.</i>
GCC 1.1 (b) (i)	The Purchaser is: Public Services Agency
GCC 1.1 (b) (ii)	The Project Manager is: Vladlena Prisacari, Coordinating Cadastral Engineer, Cadastral Department, Public Services Agency
GCC 1.1 (e) (i)	The Purchaser's Country is: Republic of Moldova.
GCC 1.1 (e) (x)	For the purposes of this clause, the contract shall be valid through June 30, 2025.
GCC 1.1 (e) (xiii)	Not applicable.

Notices (GCC Clause 4)

GCC 4.3	47, A. Puskin str., MD-2005, Chisinau, Republic of Moldova Email: vladlena.prisacari@asp.gov.md Tel. (+373 22) 207674 Fallback address of the Purchaser: 47, Aleksandr Puşkin str., 4th floor, MD-2005, Chisinau, Republic of Moldova e-mail: pief.procurement@asp.gov.md Tel: (+373 22) 881004
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B. SUBJECT MATTER OF CONTRACT

Scope of the System (GCC Clause 7)

GCC 7.3	The Supplier's obligations under the Contract will include the following recurrent cost items, as identified in the Recurrent Cost tables in the Supplier's Bid:
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	<i>Detailed specifications are provided in Section VII. Requirements for the Information System, D. SERVICE SPECIFICATIONS, 8.7 Piloting, as well as in the System Inventory Table (Recurrent Cost Items).</i>
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Time for Commencement and Operational Acceptance (GCC Clause 8)

GCC 8.1	The Supplier shall commence work on the System within: <i>not later than 5 days from the Effective Date of the Contract as defined in Article 3 of the Contract Agreement.</i>
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Supplier’s Responsibilities (GCC Clause 9)

GCC 9.1	Health and safety manual is not required
GCC 9.8	The following sustainable procurement contractual provisions apply: <i>none.</i>
GCC 9.18	The Supplier <i>is not required</i> to make security arrangements for the Project Site/s.

C. PAYMENT

Contract Price (GCC Clause 11)

GCC 11.2	Adjustments to the Contract Price shall be as follows: <i>not applicable.</i>
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Terms of Payment (GCC Clause 12)

GCC 12.1	<p>Subject to the provisions of GCC Clause 12 (Terms of Payment), the Purchaser shall pay the Contract Price to the Supplier according to the categories and in the manner specified below. Only the categories Advance Payment and Complete System Integration relate to the entire Contract Price. In other payment categories, the term "total Contract Price" means the total cost of goods or services under the specific payment category. Within each such category, the Contract Implementation Schedule may trigger pro-rata payments for the portion of the total Contract Price for the category corresponding to the goods or services actually Delivered, Installed, or Operationally Accepted, at unit prices and in the currencies specified in the Price Schedules of the Contract Agreement.</p> <p>(a) Advance Payment</p> <p><i>USD 46 835,00 (forty-six thousand eight hundred thirty five US Dollars, 00 cents), ten percent (10%) of the entire Contract Price, exclusive of all Recurrent Costs, shall be paid against receipt of a claim accompanied by the Advance Payment Security specified in GCC Clause 13.2.</i></p> <p>(b) Custom/Standard Software and Custom/Standard Materials:</p>
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USD 70 252,50 (seventy thousand two hundred fifty two US Dollars, 50 cents), fifteen percent (15%) of the Contract Price, exclusive of all Recurrent Costs, shall be paid against approval by the Purchaser of **the Inception Report**, prepared in line with para. 8.9 Reporting arrangements from SECTION VII - REQUIREMENTS OF THE INFORMATION SYSTEM, chapter D. SERVICE SPECIFICATIONS – SUPPLY & INSTALL ITEMS.

(c) System Installation:

USD 46 835,00 (forty-six thousand eight hundred thirty five US Dollars, 00 cents), ten percent (10%) of the Contract Price, exclusive of all Recurrent Costs, shall be paid against Installation Certificate for **Web-Services** to be issued in accordance with SCC for GCC Clause 26.

USD 46 835,00 (forty-six thousand eight hundred thirty five US Dollars, 00 cents), ten percent (10%) of the Contract Price, exclusive of all Recurrent Costs, shall be paid against Installation Certificate for **Reception of Requests & Registration of Applications in PSA BusinessCad and PDSE** to be issued in accordance with SCC for GCC Clause 26.

USD 46 835,00 (forty-six thousand eight hundred thirty five US Dollars, 00 cents), ten percent (10%) of the Contract Price, exclusive of all Recurrent Costs, shall be paid against Installation Certificate for **ROITE functionalities for QC of Utility Network, Complete Modules for Registration of Utility Infra incl. ROITE State Register, and Expanded e-Cadastre Portal for Public Access** to be issued in accordance with SCC for GCC Clause 26.

(d) Training

USD 70 252,50 (seventy thousand two hundred fifty two US Dollars, 50 cents), fifteen percent (15%) of the Contract Price, exclusive of all Recurrent Costs, shall be paid against approval by the Purchaser of Training Reports for the **Various Management & Administration Training and Training End Users (TOT)**, performed in line with the provisions of paras. 8.5, 10.1, 10,4 from SECTION VII - REQUIREMENTS OF THE INFORMATION SYSTEM.

(e) Services other than Training:

USD 46 835,00 (forty-six thousand eight hundred thirty five US Dollars, 00 cents), ten percent (10%) of the Contract Price against approval by the Purchaser of all documentation (User Manual (including training manuals), Quick Reference Guide, Context Sensitive On-line Help text, System Operations Guide, System Architecture Document, FAQ), including **Source code** and Final Report.

(f) Complete System Integration

	<p><i>USD 93 670,00 (ninety-three thousand six hundred seventy US Dollars, 00 cents)</i>, twenty percent (20%) of the Contract Price, exclusive of all Recurrent Costs, as final payment against Operational Acceptance of the System as an integrated whole.</p> <p>(g) Recurrent Costs</p> <p>one hundred percent (100%) of the price of <i>the services actually delivered during the Piloting</i> will be paid monthly on submission and Purchaser's approval of invoices.</p>
GCC 12.3	The Purchaser shall pay to the Supplier interest on the delayed payments at a rate of 0.3 percent per delayed month.
GCC 12.4	The Supplier will invoice the Purchaser in the currency used in the Contract Agreement and the Price Schedules it refers to, for Goods and Services supplied locally, and the conversion between this currency and MDL for payment purposes - in case the two currencies are different - will be made as of the actual payment date using the exchange rate found in the National Bank of Moldova .

Securities (GCC Clause 13)

GCC 13.3.1	The Performance Security shall be denominated in <i>the currency of the Contract</i> for an amount equal to eight (8) percent of the Contract Price, excluding any Recurrent Costs.
GCC 13.3.4	During the Warranty Period (i.e., after Operational Acceptance of the System), the Performance Security shall be reduced to two (2) percent of the Contract Price, including Recurrent Costs.

Taxes and Duties (GCC Clause 14)

GCC 14	Goods, Works and Services imported or procured under the Land Registration and Property Valuation Project are exempted from excises, customs and customs clearance taxes and VAT applied at zero rate in the Purchaser's country as per the Government Decision of the Republic of Moldova no. 246 as of April 08, 2010 (its latest revision).
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D. INTELLECTUAL PROPERTY

Copyright (GCC Clause 15)

GCC 15.3	The Purchaser may assign, license, or otherwise voluntarily transfer its contractual rights to use the Standard Software or elements of the Standard Software, without the Supplier's prior written consent, under
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	the following circumstances: <i>in case of structural reorganization of the Purchaser's structural units and all successors according to changes in legislation of Purchaser Country.</i>
GCC 15.4	The Purchaser's and Supplier's rights and obligations with respect to Custom Software or elements of the Custom Software are as follows: <i>All intellectual property rights for the Custom Software and for Custom Materials shall belong to the Purchaser.</i> <i>The purchaser shall have sole rights to use the Custom Software or Custom Materials as well as to determine the right to use of the Custom Software or Custom Materials by a third party. Such rights are valid throughout and limited to the territory of the Purchaser's Country.</i>
GCC 15.5	<i>No software escrow contract is required for the execution of the Contract.</i>

Software License Agreements (GCC Clause 16)

GCC 16.1 (a) (iv)	<i>There are no Special Conditions of Contract applicable to GCC Clause 16.1 (a) (iv)</i>
GCC 16.1 (b) (vi)	<i>There are no Special Conditions of Contract applicable to GCC Clause 16.1 (b) (vi)</i>
GCC 16.1 (b) (vii)	<i>There are no Special Conditions of Contract applicable to GCC Clause 16.1 (b) (vii)</i>
GCC 16.2	<i>There are no Special Conditions of Contract applicable to GCC Clause 16.2</i>

Confidential Information (GCC Clause 17)

GCC 17.1	There are no Special Conditions of Contract applicable to GCC Clause 17.1
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E. SUPPLY, INSTALLATION, TESTING, COMMISSIONING, AND ACCEPTANCE OF THE SYSTEM

Representatives (GCC Clause 18)

GCC 18.1	<i>The Purchaser's Project Manager shall have the following limitations to his/her authority to represent the Purchaser in matters relating to the Contract:</i> The Purchaser's Project Manager shall have the authority to represent the Purchaser on all day-to-day matters relating to the System and shall be the person giving or receiving notices on behalf of the Purchaser pursuant to GCC Clause 4 - any approvals of the project documents, consents,
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	instructions, orders, certificates, information and other communication referring to the development of the <i>State Register of Objects of Technical-Constructions Infrastructure (ROITE) Information System</i> .
GCC 18.2.2	The Supplier's Representative shall have the following limitations to his authority to represent the Supplier in matters relating to the Contract: The Supplier's Representative shall have the authority to represent the Supplier on all day-to-day matters relating to the System, and shall be the person giving or receiving notices on behalf of the Supplier pursuant to GCC Clause 4 - any approvals of the project documents, consents, instructions, orders, certificates, information and other communication referring to the development of the <i>State Register of Objects of Technical-Constructions Infrastructure (ROITE) Information System</i> .

Project Plan (GCC Clause 19)

GCC 19.1	<p>Chapters in the Project Plan shall address the following subject:</p> <ul style="list-style-type: none"> (a) <i>Project Organization and Management Sub-Plan, including management authorities, responsibilities, and contacts, as well as task, time and resource-bound schedules (in GANTT format);</i> (b) <i>Implementation Sub-Plan;</i> (c) <i>Training Sub-Plan;</i> (d) <i>Testing and Quality Assurance Sub-Plan;</i> (e) <i>Warranty Defect Repair and Technical Support Service Sub-Plan</i> (f) <i>System Design proposal (specifically focus on deviations comparing to this Tech. Specification incl. clear motivation)</i> (g) <i>Estimation of ICT resources for test and production environment</i> (h) <i>Pilot Project Plan approach</i> (i) <i>Test scenarios for pre-commissioning and Test scenarios for Commissioning should be incorporated in the Project plan and created during developments of all modules by the Supplier.</i> (j) <i>Proposal of the content of the Monthly reporting.</i>
GCC 19.2	Within not more than <i>eight (8) weeks</i> from the Effective Date of the Contract, the Supplier shall present a Project Plan to the Purchaser.
GCC 19.6	<p><i>The Supplier shall submit to the Purchaser:</i></p> <p>The Supplier shall submit to the Purchaser the following reports:</p>

	<p>Monthly Progress reports submitted before the 7th day of the next month, summarizing progress of activities implemented in the previous month:</p> <p>(i) <i>results accomplished during the prior period</i></p> <p>(ii) <i>cumulative deviations to date from schedule of progress milestones as specified in the Agreed and Finalized Project Plan</i></p> <p>(iii) <i>corrective actions to be taken to return to planned schedule of progress; proposed revisions to planned schedule</i></p> <p>(iv) <i>other issues and outstanding problems; proposed actions to be taken</i></p> <p>(v) <i>resources that the Supplier expects to be provided by the Purchaser and/or actions to be taken by the Purchaser in the next reporting period</i></p> <p>(vi) <i>other issues or potential problems (risks, challengers, etc.) the Supplier foresees that could impact on project progress and/or effectiveness.</i></p>
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Design and Engineering (GCC Clause 21)

GCC 21.3.1	<p><i>The Supplier shall prepare and furnish to the Project Manager the following documents for which the Supplier must obtain the Project Manager's approval before proceeding with work on the System covered by the documents:</i></p> <ul style="list-style-type: none"> • Detailed analyses of the current situation and recommendation • Project plan • System design proposal • Estimation of ICT resources for test and production environment • Test scenarios for pre-commissioning and Test scenarios for Commissioning should be incorporated in the Project plan and created during developments of all modules by the Supplier. • Proposal of the content of the monthly report.
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Product Upgrades (GCC Clause 23)

GCC 23.4	<i>There are no Special Conditions of Contract applicable to GCC Clause 23.4.</i>
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Inspections and Tests (GCC Clause 25)

GCC 25	<i>There are no Special Conditions of Contract applicable to GCC Clause 25.</i>
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Commissioning and Operational Acceptance (GCC Clause 27)

GCC 27.2.1	<i>There are no Special Conditions of Contract applicable to GCC Clause 27.2.1.</i>
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F. GUARANTEES AND LIABILITIES

Operational Acceptance Time Guarantee (GCC Clause 28)

GCC 28.2	<i>There are no Special Conditions of Contract applicable to GCC Clause 28.2.</i>
GCC 28.3	<i>There are no Special Conditions of Contract applicable to GCC Clause 28.3.</i>

Defect Liability (GCC Clause 29)

GCC 29.1	<i>There are no Special Conditions of Contract applicable to GCC Clause 29.1.</i>
GCC 29.4	The Warranty Period shall commence from the date of Operational Acceptance of the System and extend for 12 months .
GCC 29.10	During the Warranty Period, the Supplier must follow the requirements defined in Technical Requirements, D. SERVICE SPECIFICATIONS – Supply & Install Items, 8.9, 8.11, 8.12)

Functional Guarantees (GCC Clause 30)

GCC 30	<i>There are no Special Conditions of Contract applicable to GCC Clause 30.</i>
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G. RISK DISTRIBUTION

Insurances (GCC Clause 37)

GCC 37.1 (c)	The Supplier shall obtain Third-Party Liability Insurance in the amount of Contract price, excluding Recurrent Costs with deductible limits of no more than one thousand (1,000.00) US dollars . The insured Party shall be the Supplier . The Insurance shall cover the period from beginning Effective Date of the Contract until Operational Acceptance of the entire System .
GCC 37.1 (e)	<i>There are no Special Conditions of Contract applicable to GCC Clause 37.1 (e).</i>

H. CHANGE IN CONTRACT ELEMENTS

Changes to the System (GCC Clause 39)

GCC 39.4	<p>Value Engineering</p> <p>The Purchaser <i>will</i> consider a Value Engineering Proposal.</p> <p>When the Purchaser will consider a Value Engineering Proposal and if the value engineering proposal is approved by the Purchaser the amount to be paid to the Supplier shall be ten (10) percent of the reduction in the Contract Price.</p>
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I. SETTLEMENT OF DISPUTES

Settlement of Disputes (GCC Clause 43)

GCC 43.1.4	The Appointing Authority for the Adjudicator is: <i>The International Commercial Arbitration Court of the Chamber of Commerce and Industry of the Republic of Moldova.</i>
GCC 43.2.3	<p>If the Supplier is from outside the Purchaser’s Country arbitration proceedings shall be conducted in accordance with the rules of arbitration of <i>the International Chamber of Commerce (ICC)</i>. These rules, in the version in force at the time of the request for arbitration, will be deemed to form part of this Contract.</p> <p>If the Supplier is a national of the Purchaser’s Country, any dispute between the Purchaser and a Supplier arising in connection with the present Contract shall be referred to arbitration in accordance with the laws of the Purchaser’s country.</p>

Signatures of the Parties

FOR THE PURCHASER

PUBLIC INSTITUTION

“PUBLIC SERVICES AGENCY”

Signed by: **Sergiu MANIC**

Title: *Deputy Director*



FOR THE SUPPLIER

DATUM LLC

Signed by: **Jamal I. ISMAYILOV**

Title: *General Manager*



**GENERAL CONDITIONS OF CONTRACT NO. MD-PSA-346761-GO-
RFB**

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General Conditions of Contract

A. CONTRACT AND INTERPRETATION

1. Definitions

1.1 In this Contract, the following terms shall be interpreted as indicated below.

(a) contract elements

- (i) **“Contract”** means the Contract Agreement entered into between the Purchaser and the Supplier, together with the Contract Documents referred to therein. The Contract Agreement and the Contract Documents shall constitute the Contract, and the term “the Contract” shall in all such documents be construed accordingly.
- (ii) **“Contract Documents”** means the documents specified in Article 1.1 (Contract Documents) of the Contract Agreement (including any amendments to these Documents).
- (iii) **“Contract Agreement”** means the agreement entered into between the Purchaser and the Supplier using the form of Contract Agreement contained in the Sample Contractual Forms Section of the bidding documents and any modifications to this form agreed to by the Purchaser and the Supplier. The date of the Contract Agreement shall be recorded in the signed form.
- (iv) **“GCC”** means the General Conditions of Contract.
- (v) **“SCC”** means the Special Conditions of Contract.
- (vi) **“Technical Requirements”** means the Technical Requirements in Section VII of the bidding documents.
- (vii) **“Implementation Schedule”** means the Implementation Schedule in Section VII of the bidding documents.
- (viii) **“Contract Price”** means the price or prices defined in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement.
- (ix) **“Procurement Regulations”** refers to the edition **specified in the SCC** of the World Bank “Procurement_Regulations for IPF Borrowers”.
- (x) **“bidding documents”** refers to the collection of documents issued by the Purchaser to instruct and inform potential suppliers of the processes for bidding, selection of the winning bid, and Contract formation, as well as the contractual conditions governing the relationship between the Purchaser and the Supplier. The General and Special Conditions of Contract, the Technical Requirements, and all other documents included in the bidding documents reflect the

Procurement Regulations that the Purchaser is obligated to follow during procurement and administration of this Contract.

- (xi) **“Sexual Exploitation and Abuse” “(SEA)”** means the following:

Sexual Exploitation is defined as any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another.

Sexual Abuse is defined as the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions.

- (xii) **“Sexual Harassment” “(SH)”** is defined as unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature by the Supplier’s Personnel with other Supplier’s, Subcontractors’ or Purchaser’s personnel.

(b) entities

- (i) **“Purchaser”** means the entity purchasing the Information System, as **specified in the SCC**.
- (ii) **“Purchaser’s Personnel”** means all staff, labor and other employees of the Project Manager and of the Purchaser engaged in fulfilling the Purchaser’s obligations under the Contract; and any other personnel identified as Purchaser’s Personnel, by a notice from the Purchaser to the Supplier;
- (iii) **“Project Manager”** means the person **named as such in the SCC** or otherwise appointed by the Purchaser in the manner provided in GCC Clause 18.1 (Project Manager) to perform the duties delegated by the Purchaser.
- (iv) **“Supplier”** means the firm or Joint Venture whose bid to **perform the Contract** has been accepted by the Purchaser and is named as such in the Contract Agreement.
- (v) **“Supplier’s Representative”** means any person **nominated** by the Supplier and named as such in the Contract Agreement or otherwise approved by the Purchaser in the manner provided in GCC Clause 18.2 (Supplier’s Representative) to perform the duties delegated by the Supplier.
- (vi) **“Supplier’s Personnel”** means all personnel whom the Supplier utilizes in the execution of the Contract, including the staff, labor and other employees of the Supplier and each Subcontractor; and any other personnel assisting the Supplier in the execution of the Contract;

- (vii) **“Subcontractor”** means any firm to whom any of the obligations of the Supplier, including preparation of any design or supply of any Information Technologies or other Goods or Services, is subcontracted directly or indirectly by the Supplier.
 - (viii) **“Adjudicator”** means the person named in Appendix 2 of the Contract Agreement, **appointed** by agreement between the Purchaser and the Supplier to make a decision on or to settle any dispute between the Purchaser and the Supplier referred to him or her by the parties, pursuant to GCC Clause 43.1 (Adjudication).
 - (ix) **“The World Bank”** (also called “The Bank”) means the International Bank for Reconstruction and Development (IBRD) or the International Development Association (IDA).
- (c) scope
- (i) **“Information System,”** also called **“the System,”** means all the Information Technologies, Materials, and other Goods to be supplied, installed, integrated, and made operational (exclusive of the Supplier’s Equipment), together with the Services to be carried out by the Supplier under the Contract.
 - (ii) **“Subsystem”** means any subset of the System identified as such in the Contract that may be supplied, installed, tested, and commissioned individually before Commissioning of the entire System.
 - (iii) **“Information Technologies”** means all information processing and communications-related hardware, Software, supplies, and consumable items that the Supplier is required to supply and install under the Contract.
 - (iv) **“Goods”** means all equipment, machinery, furnishings, Materials, and other tangible items that the Supplier is required to supply or supply and install under the Contract, including, without limitation, the Information Technologies and Materials, but excluding the Supplier’s Equipment.
 - (v) **“Services”** means all technical, logistical, management, and any other Services to be provided by the Supplier under the Contract to supply, install, customize, integrate, and make operational the System. Such Services may include, but are not restricted to, activity management and quality assurance, design, development, customization, documentation, transportation, insurance, inspection, expediting, site preparation, installation, integration, training, data migration, Pre-commissioning, Commissioning, maintenance, and technical support.

- (vi) “The Project Plan” means the document to be developed by the Supplier and approved by the Purchaser, pursuant to GCC Clause 19, based on the requirements of the Contract and the Preliminary Project Plan included in the Supplier’s bid. The “Agreed Project Plan” is the version of the Project Plan approved by the Purchaser, in accordance with GCC Clause 19.2. Should the Project Plan conflict with the Contract in any way, the relevant provisions of the Contract, including any amendments, shall prevail.
- (vii) “Software” means that part of the System which are instructions that cause information processing Subsystems to perform in a specific manner or execute specific operations.
- (viii) “System Software” means Software that provides the operating and management instructions for the underlying hardware and other components, and is identified as such in Appendix 4 of the Contract Agreement and such other Software as the parties may agree in writing to be Systems Software. Such System Software includes, but is not restricted to, micro-code embedded in hardware (i.e., “firmware”), operating systems, communications, system and network management, and utility software.
- (ix) “General-Purpose Software” means Software that supports general-purpose office and software development activities and is identified as such in Appendix 4 of the Contract Agreement and such other Software as the parties may agree in writing to be General- Purpose Software. Such General-Purpose Software may include, but is not restricted to, word processing, spreadsheet, generic database management, and application development software.
- (x) “Application Software” means Software formulated to perform specific business or technical functions and interface with the business or technical users of the System and is identified as such in Appendix 4 of the Contract Agreement and such other Software as the parties may agree in writing to be Application Software.
- (xi) “Standard Software” means Software identified as such in Appendix 4 of the Contract Agreement and such other Software as the parties may agree in writing to be Standard Software.
- (xii) “Custom Software” means Software identified as such in Appendix 4 of the Contract Agreement and such other Software as the parties may agree in writing to be Custom Software.
- (xiii) “Source Code” means the database structures, dictionaries, definitions, program source files, and any other symbolic representations necessary for the compilation, execution, and

subsequent maintenance of the Software (typically, but not exclusively, required for Custom Software).

- (xiv) “Materials” means all documentation in printed or printable form and all instructional and informational aides in any form (including audio, video, and text) and on any medium, provided to the Purchaser under the Contract.
- (xv) “Standard Materials” means all Materials not specified as Custom Materials.
- (xvi) “Custom Materials” means Materials developed by the Supplier at the Purchaser’s expense under the Contract and identified as such in Appendix 5 of the Contract Agreement and such other Materials as the parties may agree in writing to be Custom Materials. Custom Materials includes Materials created from Standard Materials.
- (xvii) “Intellectual Property Rights” means any and all copyright, moral rights, trademark, patent, and other intellectual and proprietary rights, title and interests worldwide, whether vested, contingent, or future, including without limitation all economic rights and all exclusive rights to reproduce, fix, adapt, modify, translate, create derivative works from, extract or re-utilize data from, manufacture, introduce into circulation, publish, distribute, sell, license, sublicense, transfer, rent, lease, transmit or provide access electronically, broadcast, display, enter into computer memory, or otherwise use any portion or copy, in whole or in part, in any form, directly or indirectly, or to authorize or assign others to do so.
- (xviii) “Supplier’s Equipment” means all equipment, tools, apparatus, or things of every kind required in or for installation, completion and maintenance of the System that are to be provided by the Supplier, but excluding the Information Technologies, or other items forming part of the System.

(d) activities

- (i) “Delivery” means the transfer of the Goods from the Supplier to the Purchaser in accordance with the current edition Incoterms specified in the Contract.
- (ii) “Installation” means that the System or a Subsystem as specified in the Contract is ready for Commissioning as provided in GCC Clause 26 (Installation).
- (iii) “Pre-commissioning” means the testing, checking, and any other required activity that may be specified in the Technical Requirements that are to be carried out by the Supplier in preparation for Commissioning of the System as provided in GCC Clause 26 (Installation).

- (iv) “Commissioning” means operation of the System or any Subsystem by the Supplier following Installation, which operation is to be carried out by the Supplier as provided in GCC Clause 27.1 (Commissioning), for the purpose of carrying out Operational Acceptance Test(s).
 - (v) “Operational Acceptance Tests” means the tests specified in the Technical Requirements and Agreed Project Plan to be carried out to ascertain whether the System, or a specified Subsystem, is able to attain the functional and performance requirements specified in the Technical Requirements and Agreed Project Plan, in accordance with the provisions of GCC Clause 27.2 (Operational Acceptance Test).
 - (vi) “Operational Acceptance” means the acceptance by the Purchaser of the System (or any Subsystem(s) where the Contract provides for acceptance of the System in parts), in accordance with GCC Clause 27.3 (Operational Acceptance).
- (e) place and time
- (i) “Purchaser’s Country” is the **country named in the SCC**.
 - (ii) “Supplier’s Country” is the country in which the Supplier is legally organized, as named in the Contract Agreement.
 - (iii) **Unless otherwise specified in the SCC** “Project Site(s)” means the place(s) in the Site Table in the Technical Requirements Section for the supply and installation of the System.
 - (iv) “Eligible Country” means the countries and territories eligible for participation in procurements financed by the World Bank as defined in the Procurement Regulations.
 - (v) “Day” means calendar day of the Gregorian Calendar.
 - (vi) “Week” means seven (7) consecutive Days, beginning the day of the week as is customary in the Purchaser’s Country.
 - (vii) “Month” means calendar month of the Gregorian Calendar.
 - (viii) “Year” means twelve (12) consecutive Months.
 - (ix) “Effective Date” means the date of fulfillment of all conditions specified in Article 3 (Effective Date for Determining Time for Achieving Operational Acceptance) of the Contract Agreement, for the purpose of determining the Delivery, Installation, and Operational Acceptance dates for the System or Subsystem(s).
 - (x) “Contract Period” is the time period during which this Contract governs the relations and obligations of the Purchaser and Supplier in relation to the System, as **unless otherwise specified in the SCC**, the Contract shall continue in force

until the Information System and all the Services have been provided, unless the Contract is terminated earlier in accordance with the terms set out in the Contract.

- (xi) “Defect Liability Period” (also referred to as the “Warranty Period”) means the period of validity of the warranties given by the Supplier commencing at date of the Operational Acceptance Certificate of the System or Subsystem(s), during which the Supplier is responsible for defects with respect to the System (or the relevant Subsystem[s]) as provided in GCC Clause 29 (Defect Liability).
- (xii) “The Coverage Period” means the Days of the Week and the hours of those Days during which maintenance, operational, and/or technical support services (if any) must be available.
- (xiii) The Post-Warranty Services Period” means the number of years **defined in the SCC** (if any), following the expiration of the Warranty Period during which the Supplier may be obligated to provide Software licenses, maintenance, and/or technical support services for the System, either under this Contract or under separate contract(s).

2. Contract Documents

- 2.1 Subject to Article 1.2 (Order of Precedence) of the Contract Agreement, all documents forming part of the Contract (and all parts of these documents) are intended to be correlative, complementary, and mutually explanatory. The Contract shall be read as a whole.

3. Interpretation

- 3.1 Governing Language

3.1.1 **Unless otherwise specified in the SCC**, all Contract Documents and related correspondence exchanged between Purchaser and Supplier shall be written in the language of these bidding documents (English), and the Contract shall be construed and interpreted in accordance with that language.

3.1.2 If any of the Contract Documents or related correspondence are prepared in a language other than the governing language under GCC Clause 3.1.1 above, the translation of such documents into the governing language shall prevail in matters of interpretation. The originating party, with respect to such documents shall bear the costs and risks of such translation.

- 3.2 Singular and Plural

The singular shall include the plural and the plural the singular, except where the context otherwise requires.

- 3.3 Headings

The headings and marginal notes in the GCC are included for ease of reference and shall neither constitute a part of the Contract nor affect its interpretation.

3.4 Persons

Words importing persons or parties shall include firms, corporations, and government entities.

3.5 Incoterms

Unless inconsistent with any provision of the Contract, the meaning of any trade term and the rights and obligations of parties thereunder shall be as prescribed by the Incoterms

Incoterms means international rules for interpreting trade terms published by the International Chamber of Commerce (latest edition), 38 Cours Albert 1^{er}, 75008 Paris, France.

3.6 Entire Agreement

The Contract constitutes the entire agreement between the Purchaser and Supplier with respect to the subject matter of Contract and supersedes all communications, negotiations, and agreements (whether written or oral) of parties with respect to the subject matter of the Contract made prior to the date of Contract.

3.7 Amendment

No amendment or other variation of the Contract shall be effective unless it is in writing, is dated, expressly refers to the Contract, and is signed by a duly authorized representative of each party to the Contract.

3.8 Independent Supplier

The Supplier shall be an independent contractor performing the Contract. The Contract does not create any agency, partnership, joint venture, or other joint relationship between the parties to the Contract.

Subject to the provisions of the Contract, the Supplier shall be solely responsible for the manner in which the Contract is performed. All employees, representatives, or Subcontractors engaged by the Supplier in connection with the performance of the Contract shall be under the complete control of the Supplier and shall not be deemed to be employees of the Purchaser, and nothing contained in the Contract or in any subcontract awarded by the Supplier shall be construed to create any contractual relationship between any such employees, representatives, or Subcontractors and the Purchaser.

3.9 Joint Venture

If the Supplier is a Joint Venture of two or more firms, all such firms shall be jointly and severally bound to the Purchaser for the fulfillment of the provisions of the Contract and shall designate one of such firms to act as a leader with authority to bind the Joint Venture. The composition or constitution of the Joint Venture shall not be altered without the prior consent of the Purchaser.

3.10 Nonwaiver

3.10.1 Subject to GCC Clause 3.10.2 below, no relaxation, forbearance, delay, or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect, or restrict the rights of that party under the Contract, nor shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

3.10.2 Any waiver of a party's rights, powers, or remedies under the Contract must be in writing, must be dated and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.

3.11 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity, or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

3.12 Country of Origin

"Origin" means the place where the Information Technologies, Materials, and other Goods for the System were produced or from which the Services are supplied. Goods are produced when, through manufacturing, processing, Software development, or substantial and major assembly or integration of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components. The Origin of Goods and Services is distinct from the nationality of the Supplier and may be different.

4. Notices

4.1 Unless otherwise stated in the Contract, all notices to be given under the Contract shall be in writing and shall be sent, pursuant to GCC Clause 4.3 below, by personal delivery, airmail post, special courier, facsimile, electronic mail, or Electronic Data Interchange (EDI), with the following provisions.

4.1.1 Any notice sent by facsimile, electronic mail, or EDI shall be confirmed within two (2) days after dispatch by notice sent by airmail post or special courier, except as otherwise specified in the Contract.

4.1.2 Any notice sent by airmail post or special courier shall be deemed (in the absence of evidence of earlier receipt) to have been delivered ten (10) days after dispatch. In proving the fact of dispatch, it shall be sufficient to show that the envelope containing such notice was properly addressed, stamped, and conveyed to the postal authorities or courier service for transmission by airmail or special courier.

4.1.3 Any notice delivered personally or sent by facsimile, electronic mail, or EDI shall be deemed to have been delivered on the date of its dispatch.

4.1.4 Either party may change its postal, facsimile, electronic mail, or EDI addresses for receipt of such notices by ten (10) days' notice to the other party in writing.

4.2 Notices shall be deemed to include any approvals, consents, instructions, orders, certificates, information and other communication to be given under the Contract.

4.3 Pursuant to GCC Clause 18, notices from/to the Purchaser are normally given by, or addressed to, the Project Manager, while notices from/to the Supplier are normally given by, or addressed to, the Supplier's Representative, or in its absence its deputy if any. If there is no appointed Project Manager or Supplier's Representative (or deputy), or if their related authority is limited by the SCC for GCC Clauses 18.1 or 18.2.2, or for any other reason, the Purchaser or Supplier may give and receive notices at their fallback addresses. The address of the Project Manager and the fallback address of the Purchaser are as **specified in the SCC** or as subsequently established/amended. The address of the Supplier's Representative and the fallback address of the Supplier are as specified in Appendix 1 of the Contract Agreement or as subsequently established/amended.

5. Governing Law

5.1 The Contract shall be governed by and interpreted in accordance with the laws of the country **specified in the SCC**.

5.2 Throughout the execution of the Contract, the Supplier shall comply with the import of goods and services prohibitions in the Purchaser's Country when

(a) as a matter of law or official regulations, the Borrower's country prohibits commercial relations with that country; or

(b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's Country prohibits any import of goods from that country or any payments to any country, person, or entity in that country.

6. Fraud and Corruption

6.1 The Bank requires compliance with the Bank's Anti-Corruption Guidelines and its prevailing sanctions policies and procedures as set forth in the WBG's Sanctions Framework, as set forth in the Appendix 1 to the GCC.

6.2 The Purchaser requires the Suppliers to disclose any commissions or fees that may have been paid or are to be paid to agents or any other party with respect to the bidding process or execution of the Contract. The information disclosed must include at least the name and address of the agent or other party, the amount and currency, and the purpose of the commission, gratuity or fee.

B. SUBJECT MATTER OF CONTRACT

- 7. Scope of the System**
- 7.1 Unless otherwise expressly **limited in the SCC** or Technical Requirements, the Supplier's obligations cover the provision of all Information Technologies, Materials and other Goods as well as the performance of all Services required for the design, development, and implementation (including procurement, quality assurance, assembly, associated site preparation, Delivery, Pre-commissioning, Installation, Testing, and Commissioning) of the System, in accordance with the plans, procedures, specifications, drawings, codes, and any other documents specified in the Contract and the Agreed Project Plan.
- 7.2 The Supplier shall, unless specifically excluded in the Contract, perform all such work and / or supply all such items and Materials not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Operational Acceptance of the System as if such work and / or items and Materials were expressly mentioned in the Contract.
- 7.3 The Supplier's obligations (if any) to provide Goods and Services as implied by the Recurrent Cost tables of the Supplier's bid, such as consumables, spare parts, and technical services (e.g., maintenance, technical assistance, and operational support), are as **specified in the SCC**, including the relevant terms, characteristics, and timings.
- 8. Time for Commencement and Operational Acceptance**
- 8.1 The Supplier shall commence work on the System within the period **specified in the SCC**, and without prejudice to GCC Clause 28.2, the Supplier shall thereafter proceed with the System in accordance with the time schedule specified in the Implementation Schedule and any refinements made in the Agreed Project Plan.
- 8.2 The Supplier shall achieve Operational Acceptance of the System (or Subsystem(s) where a separate time for Operational Acceptance of such Subsystem(s) is specified in the Contract) in accordance with the time schedule specified in the Implementation Schedule and any refinements made in the Agreed Project Plan, or within such extended time to which the Supplier shall be entitled under GCC Clause 40 (Extension of Time for Achieving Operational Acceptance).

9. Supplier's Responsibilities

9.1 The Supplier shall conduct all activities with due care and diligence, in accordance with the Contract and with the skill and care expected of a competent provider of information technologies, information systems, support, maintenance, training, and other related services, or in accordance with best industry practices. In particular, the Supplier shall provide and employ only technical personnel who are skilled and experienced in their respective callings and supervisory staff who are competent to adequately supervise the work at hand. The Supplier shall ensure that its Subcontractors carryout the work on the Information System in accordance with the Contract, including complying with relevant environmental and social requirements and the obligations set out in GCC Clause 9.9.

The Supplier shall at all times take all reasonable precautions to maintain the health and safety of the Supplier's Personnel employed for the execution of the Contract at the Project Site/s in the Purchaser's country where the Contract is executed.

If **required in the SCC**, the Supplier shall submit to the Purchaser for its approval a health and safety manual which has been specifically prepared for the Contract.

The health and safety manual shall be in addition to any other similar document required under applicable health and safety regulations and laws.

The health and safety manual shall set out any applicable health and safety requirement under the Contract,

(a) which may include:

- (i) the procedures to establish and maintain a safe working environment;
- (ii) the procedures for prevention, preparedness and response activities to be implemented in the case of an emergency event (i.e. an unanticipated incident, arising from natural or man-made hazards);
- (iii) the measures to be taken to avoid or minimize the potential for community exposure to water-borne, water-based, water-related, and vector-borne diseases,
- (iv) the measures to be implemented to avoid or minimize the spread of communicable diseases; and

(b) any other requirements stated in the Purchaser's Requirements.

9.2 The Supplier confirms that it has entered into this Contract on the basis of a proper examination of the data relating to the System provided by the Purchaser and on the basis of information that the Supplier could have obtained from a visual inspection of the site (if access to the site was available) and of other data readily available to the Supplier relating to the System as at the date twenty-eight (28) days prior to bid

submission. The Supplier acknowledges that any failure to acquaint itself with all such data and information shall not relieve its responsibility for properly estimating the difficulty or cost of successfully performing the Contract.

- 9.3 The Supplier shall be responsible for timely provision of all resources, information, and decision making under its control that are necessary to reach a mutually Agreed Project Plan (pursuant to GCC Clause 19.2) within the time schedule specified in the Implementation Schedule. Failure to provide such resources, information, and decision-making may constitute grounds for termination pursuant to GCC Clause 41.2.
- 9.4 The Supplier shall acquire in its name all permits, approvals, and/or licenses from all local, state, or national government authorities or public service undertakings in the Purchaser's Country that are necessary for the performance of the Contract, including, without limitation, visas for the Supplier's Personnel and entry permits for all imported Supplier's Equipment. The Supplier shall acquire all other permits, approvals, and/or licenses that are not the responsibility of the Purchaser under GCC Clause 10.4 and that are necessary for the performance of the Contract.
- 9.5 The Supplier shall comply with all laws in force in the Purchaser's Country. The laws will include all national, provincial, municipal, or other laws that affect the performance of the Contract and are binding upon the Supplier. The Supplier shall indemnify and hold harmless the Purchaser from and against any and all liabilities, damages, claims, fines, penalties, and expenses of whatever nature arising or resulting from the violation of such laws by the Supplier or its personnel, including the Subcontractors and their personnel, but without prejudice to GCC Clause 10.1. The Supplier shall not indemnify the Purchaser to the extent that such liability, damage, claims, fines, penalties, and expenses were caused or contributed to by a fault of the Purchaser.
- 9.6 Any Information Technologies or other Goods and Services that will be incorporated in or be required for the System and other supplies shall have their Origin, as defined in GCC Clause 3.12, in a country that shall be an Eligible Country, as defined in GCC Clause 1.1 (e) (iv).
- 9.7 Pursuant to paragraph 2.2 e. of the Appendix 1 to the General Conditions of Contract, the Supplier shall permit and shall cause its agents (where declared or not), subcontractors, subconsultants, service providers, suppliers, and personnel, to permit, the Bank and/or persons appointed by the Bank to inspect the site and/or the accounts, records and other documents relating to the procurement process, selection and/or contract execution, and to have such accounts, records and other documents audited by auditors appointed by the Bank. The Supplier's and its Subcontractors' and subconsultants' attention is drawn to GCC Clause 6.1 (Fraud and Corruption) which provides, inter alia, that acts

intended to materially impede the exercise of the Bank's inspection and audit rights constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility pursuant to the Bank's prevailing sanctions procedures).

9.8 The Supplier shall conform to the sustainable procurement contractual provisions, if and as **specified in the SCC**.

9.9 **Code of Conduct**

The Supplier shall have a Code of Conduct for the Supplier's Personnel employed for the execution of the Contract at the Project Site/s.

The Supplier shall take all necessary measures to ensure that each such personnel is made aware of the Code of Conduct including specific behaviors that are prohibited, and understands the consequences of engaging in such prohibited behaviors.

These measures include providing instructions and documentation that can be understood by such personnel, and seeking to obtain that person's signature acknowledging receipt of such instructions and/or documentation, as appropriate.

The Supplier shall also ensure that the Code of Conduct is visibly displayed in the Project Site/s as well as, as applicable, in areas outside the Project Site/s accessible to the local community and any project affected people. The posted Code of Conduct shall be provided in languages comprehensible to the Supplier's Personnel, Purchaser's Personnel and the local community.

The Supplier's Management Strategy and Implementation Plans, if applicable, shall include appropriate processes for the Supplier to verify compliance with these obligations.

9.10 The Supplier shall, in all dealings with its labor and the labor of its Subcontractors currently employed on or connected with the Contract, pay due regard to all recognized festivals, official holidays, religious or other customs, and all local laws and regulations pertaining to the employment of labor.

9.11 The Supplier, including its Subcontractors, shall comply with all applicable safety obligations. The Supplier shall at all times take all reasonable precautions to maintain the health and safety of the Supplier's Personnel employed for the execution of Contract at the Project Site/s.

9.12 Training of Supplier's Personnel

The Supplier shall provide appropriate training to relevant Supplier's Personnel on any applicable environmental and social aspect of the Contract, including appropriate sensitization on prohibition of SEA, health and safety.

As stated in the Purchaser's Requirements or as instructed by the Project Manager, the Supplier shall also allow appropriate opportunities for the relevant personnel to be trained on any applicable environmental and social aspects of the Contract by the Purchaser's Personnel and/or other personnel assigned by the Purchaser.

The Supplier shall provide training on SEA and SH, including its prevention, to any of its personnel who has a role to supervise other Supplier's Personnel.

9.13 Stakeholder engagements

The Supplier shall provide relevant contract- related information, as the Purchaser and/or Project Manager may reasonably request to conduct contract stakeholder engagement. "Stakeholder" refers to individuals or groups who:

- (a) are affected or likely to be affected by the Contract; and
- (b) may have an interest in the Contract.

The Supplier may also directly participate in contract stakeholder engagements, as the Purchaser and/or Project Manager may reasonably request.

9.14 Forced Labor

The Supplier, including its Subcontractors, shall not employ or engage forced labour. Forced labour consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour-contracting arrangements.

No persons shall be employed or engaged who have been subject to trafficking. Trafficking in persons is defined as the recruitment, transportation, transfer, harbouring or receipt of persons by means of the threat or use of force or other forms of coercion, abduction, fraud, deception, abuse of power, or of a position of vulnerability, or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purposes of exploitation.

9.15 Child Labor

The Supplier, including its Subcontractors, shall not employ or engage a child under the age of 14 unless the national law specifies a higher age (the minimum age).

The Supplier, including its Subcontractors, shall not employ or engage a child between the minimum age and the age of 18 in a manner that is likely to be hazardous, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.

The Supplier, including its Subcontractors, shall only employ or engage children between the minimum age and the age of 18 after an appropriate risk assessment has been conducted by the Supplier with the Project Manager's consent. The Supplier shall be subject to regular monitoring by the Project Manager that includes monitoring of health, working conditions and hours of work.

Work considered hazardous for children is work that, by its nature or the circumstances in which it is carried out, is likely to jeopardize the health, safety, or morals of children. Such work activities prohibited for children include work:

- (a) with exposure to physical, psychological or sexual abuse;
- (b) underground, underwater, working at heights or in confined spaces;
- (c) with dangerous machinery, equipment or tools, or involving handling or transport of heavy loads;
- (d) in unhealthy environments exposing children to hazardous substances, agents, or processes, or to temperatures, noise or vibration damaging to health; or
- (e) under difficult conditions such as work for long hours, during the night or in confinement on the premises of the employer.

9.16 Non-Discrimination and Equal Opportunity

The Supplier shall not make decisions relating to the employment or treatment of personnel for the execution of the Contract on the basis of personal characteristics unrelated to inherent job requirements. The Supplier shall base the employment of personnel for the execution of the Contract on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to any aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices.

Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination. The Supplier shall provide protection and assistance as necessary to ensure non-discrimination and equal opportunity, including for specific groups such as women, people with disabilities, migrant workers and children (of working age in accordance with GCC Clause 9.15).

9.17 Personnel Grievance Mechanism

The Supplier shall have a grievance mechanism for personnel employed in the execution of the Contract to raise workplace concerns. The grievance mechanism shall be proportionate to the

nature, scale, risks and impacts of the Contract. The grievance mechanism may utilize existing grievance mechanisms, provided that they are properly designed and implemented, address concerns promptly, and are readily accessible to such personnel.

9.18 Security of the Project Site

If stated in the SCC, the Supplier shall be responsible for the security at the Project Site/s including providing and maintaining at its own expense all lighting, fencing, and watching when and where necessary for the proper execution and the protection of the locations, or for the safety of the owners and occupiers of adjacent property and for the safety of the public.

In making security arrangements, the Supplier shall be guided by applicable laws and any other requirements that may be stated in the Purchaser's Requirements.

The Supplier shall (i) conduct appropriate background checks on any personnel retained to provide security; (ii) train the security personnel adequately (or determine that they are properly trained) in the use of force (and where applicable, firearms), and appropriate conduct towards the Supplier's Personnel, Purchaser's Personnel and affected communities; and (iii) require the security personnel to act within the applicable Laws and any requirements set out in the Purchaser's Requirements.

The Supplier shall not permit any use of force by security personnel in providing security except when used for preventive and defensive purposes in proportion to the nature and extent of the threat.

9.19 Recruitment of Persons

The Supplier shall not recruit, or attempt to recruit, either on limited time or permanent basis or through any other contractual agreement, staff and labor from amongst the Purchaser's Personnel.

9.20 **Unless otherwise specified in the SCC** the Supplier shall have no other Supplier responsibilities.

10. Purchaser's Responsibilities

10.1 The Purchaser shall ensure the accuracy of all information and/or data to be supplied by the Purchaser to the Supplier, except when otherwise expressly stated in the Contract.

10.2 The Purchaser shall be responsible for timely provision of all resources, information, and decision making under its control that are necessary to reach an Agreed Project Plan (pursuant to GCC Clause 19.2) within the time schedule specified in the Implementation Schedule. Failure to provide such resources, information, and decision making may constitute grounds for Termination pursuant to GCC Clause 41.3.1 (b).

- 10.3 The Purchaser shall be responsible for acquiring and providing legal and physical possession of the site and access to it, and for providing possession of and access to all other areas reasonably required for the proper execution of the Contract.
- 10.4 If requested by the Supplier, the Purchaser shall use its best endeavors to assist the Supplier in obtaining in a timely and expeditious manner all permits, approvals, and/or licenses necessary for the execution of the Contract from all local, state, or national government authorities or public service undertakings that such authorities or undertakings require the Supplier or Subcontractors or the Supplier's Personnel, as the case may be, to obtain.
- 10.5 In such cases where the responsibilities of specifying and acquiring or upgrading telecommunications and/or electric power services falls to the Supplier, as specified in the Technical Requirements, SCC, Agreed Project Plan, or other parts of the Contract, the Purchaser shall use its best endeavors to assist the Supplier in obtaining such services in a timely and expeditious manner.
- 10.6 The Purchaser shall be responsible for timely provision of all resources, access, and information necessary for the Installation and Operational Acceptance of the System (including, but not limited to, any required telecommunications or electric power services), as identified in the Agreed Project Plan, except where provision of such items is explicitly identified in the Contract as being the responsibility of the Supplier. Delay by the Purchaser may result in an appropriate extension of the Time for Operational Acceptance, at the Supplier's discretion.
- 10.7 Unless otherwise specified in the Contract or agreed upon by the Purchaser and the Supplier, the Purchaser shall provide sufficient, properly qualified operating and technical personnel, as required by the Supplier to properly carry out Delivery, Pre-commissioning, Installation, Commissioning, and Operational Acceptance, at or before the time specified in the Implementation Schedule and the Agreed Project Plan.
- 10.8 The Purchaser will designate appropriate staff for the training courses to be given by the Supplier and shall make all appropriate logistical arrangements for such training as specified in the Technical Requirements, SCC, the Agreed Project Plan, or other parts of the Contract.
- 10.9 The Purchaser assumes primary responsibility for the Operational Acceptance Test(s) for the System, in accordance with GCC Clause 27.2, and shall be responsible for the continued operation of the System after Operational Acceptance. However, this shall not limit in any way the Supplier's responsibilities after the date of Operational Acceptance otherwise specified in the Contract.

- 10.10 The Purchaser is responsible for performing and safely storing timely and regular backups of its data and Software in accordance with accepted data management principles, except where such responsibility is clearly assigned to the Supplier elsewhere in the Contract.
- 10.11 All costs and expenses involved in the performance of the obligations under this GCC Clause 10 shall be the responsibility of the Purchaser, save those to be incurred by the Supplier with respect to the performance of the Operational Acceptance Test(s), in accordance with GCC Clause 27.2.
- 10.12 **Unless otherwise specified in the SCC** the Purchaser shall have no other Purchaser responsibilities.

C. PAYMENT

11. Contract Price

- 11.1 The Contract Price shall be as specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement.
- 11.2 Unless an adjustment clause is **provided for in the SCC**, the Contract Price shall be a firm lump sum not subject to any alteration, except in the event of a Change in the System pursuant to GCC Clause 39 or to other clauses in the Contract;
- 11.3 The Supplier shall be deemed to have satisfied itself as to the correctness and sufficiency of the Contract Price, which shall, except as otherwise provided for in the Contract, cover all its obligations under the Contract.

12. Terms of Payment

- 12.1 The Supplier's request for payment shall be made to the Purchaser in writing, accompanied by an invoice describing, as appropriate, the System or Subsystem(s), Delivered, Pre-commissioned, Installed, and Operationally Accepted, and by documents submitted pursuant to GCC Clause 22.5 and upon fulfillment of other obligations stipulated in the Contract.

The Contract Price shall be paid as **specified in the SCC**.

- 12.2 No payment made by the Purchaser herein shall be deemed to constitute acceptance by the Purchaser of the System or any Subsystem(s).
- 12.3 Payments shall be made promptly by the Purchaser, but in no case later than forty five (45) days after submission of a valid invoice by the Supplier. In the event that the Purchaser fails to make any payment by its respective due date or within the period set forth in the Contract, the Purchaser shall pay to the Supplier interest on the amount of such delayed payment at the rate(s) **specified in the SCC**

for the period of delay until payment has been made in full, whether before or after judgment or arbitration award.

12.4 Payments shall be made in the currency(ies) specified in the Contract Agreement, pursuant to GCC Clause 11. For Goods and Services supplied locally, payments shall be made **as specified in the SCC.**

12.5 **Unless otherwise specified in the SCC,** payment of the foreign currency portion of the Contract Price for Goods supplied from outside the Purchaser's Country shall be made to the Supplier through an irrevocable letter of credit opened by an authorized bank in the Supplier's Country and will be payable on presentation of the appropriate documents. It is agreed that the letter of credit will be subject to Article 10 of the latest revision of *Uniform Customs and Practice for Documentary Credits*, published by the International Chamber of Commerce, Paris.

13. Securities

13.1 Issuance of Securities

The Supplier shall provide the securities specified below in favor of the Purchaser at the times and in the amount, manner, and form specified below.

13.2 Advance Payment Security

13.2.1 The Supplier shall provide within twenty-eight (28) days of the notification of Contract award an Advance Payment Security in the amount and currency of the Advance Payment specified in SCC for GCC Clause 12.1 above and valid until the System is Operationally Accepted.

13.2.2 The security shall be in the form provided in the bidding documents or in another form acceptable to the Purchaser. The amount of the security shall be reduced in proportion to the value of the System executed by and paid to the Supplier from time to time and shall automatically become null and void when the full amount of the advance payment has been recovered by the Purchaser. **Unless otherwise specified in the SCC,** the reduction in value and expiration of the Advance Payment Security are calculated as follows:

$P*a/(100-a)$, where "P" is the sum of all payments effected so far to the Supplier (excluding the Advance Payment), and "a" is the Advance Payment expressed as a percentage of the Contract Price pursuant to the SCC for GCC Clause 12.1.

The security shall be returned to the Supplier immediately after its expiration.

13.3 Performance Security

- 13.3.1 The Supplier shall, within twenty-eight (28) days of the notification of Contract award, provide a security for the due performance of the Contract in the amount and currency **specified in the SCC.**
- 13.3.2 The security shall be a bank guarantee in the form provided in the Sample Contractual Forms Section of the bidding documents, or it shall be in another form acceptable to the Purchaser.
- 13.3.3 The security shall automatically become null and void once all the obligations of the Supplier under the Contract have been fulfilled, including, but not limited to, any obligations during the Warranty Period and any extensions to the period. The security shall be returned to the Supplier no later than twenty-eight (28) days after its expiration.
- 13.3.4 Upon Operational Acceptance of the entire System, the security shall be reduced to the amount **specified in the SCC**, on the date of the Operational Acceptance, so that the reduced security would only cover the remaining warranty obligations of the Supplier.

14. Taxes and Duties

- 14.1 For Goods or Services supplied from outside the Purchaser's country, the Supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the Purchaser's country. Any duties, such as importation or customs duties, and taxes and other levies, payable in the Purchaser's country for the supply of Goods and Services from outside the Purchaser's country are the responsibility of the Purchaser unless these duties or taxes have been made part of the Contract Price in Article 2 of the Contract Agreement and the Price Schedule it refers to, in which case the duties and taxes will be the Supplier's responsibility.
- 14.2 For Goods or Services supplied locally, the Supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted Goods or Services to the Purchaser. The only exception are taxes or duties, such as value-added or sales tax or stamp duty as apply to, or are clearly identifiable, on the invoices and provided they apply in the Purchaser's country, and only if these taxes, levies and/or duties are also excluded from the Contract Price in Article 2 of the Contract Agreement and the Price Schedule it refers to.
- 14.3 If any tax exemptions, reductions, allowances, or privileges may be available to the Supplier in the Purchaser's Country, the Purchaser shall use its best efforts to enable the Supplier to benefit from any such tax savings to the maximum allowable extent.
- 14.4 For the purpose of the Contract, it is agreed that the Contract Price specified in Article 2 (Contract Price and Terms of Payment) of the

Contract Agreement is based on the taxes, duties, levies, and charges prevailing at the date twenty-eight (28) days prior to the date of bid submission in the Purchaser's Country (also called "Tax" in this GCC Clause 14.4). If any Tax rates are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation or application of any Tax occurs in the course of the performance of the Contract, which was or will be assessed on the Supplier, its Subcontractors, or their employees in connection with performance of the Contract, an equitable adjustment to the Contract Price shall be made to fully take into account any such change by addition to or reduction from the Contract Price, as the case may be.

D. INTELLECTUAL PROPERTY

15. Copyright

- 15.1 The Intellectual Property Rights in all Standard Software and Standard Materials shall remain vested in the owner of such rights.
- 15.2 The Purchaser agrees to restrict use, copying, or duplication of the Standard Software and Standard Materials in accordance with GCC Clause 16, except that additional copies of Standard Materials may be made by the Purchaser for use within the scope of the project of which the System is a part, in the event that the Supplier does not deliver copies within thirty (30) days from receipt of a request for such Standard Materials.
- 15.3 The Purchaser's contractual rights to use the Standard Software or elements of the Standard Software may not be assigned, licensed, or otherwise transferred voluntarily except in accordance with the relevant license agreement or **unless otherwise specified in the SCC** to a legally constituted successor organization (e.g., a reorganization of a public entity formally authorized by the government or through a merger or acquisition of a private entity).
- 15.4 **Unless otherwise specified in the SCC**, the Intellectual Property Rights in all Custom Software and Custom Materials specified in Appendices 4 and 5 of the Contract Agreement (if any) shall, at the date of this Contract or on creation of the rights (if later than the date of this Contract), vest in the Purchaser. The Supplier shall do and execute or arrange for the doing and executing of each necessary act, document, and thing (as legally sufficient) that the Purchaser may consider necessary or desirable to perfect the right, title, and interest of the Purchaser in and to those rights. In respect of such Custom Software and Custom Materials, the Supplier shall ensure that the holder of a moral right in such an item does not assert it, and the Supplier shall, if requested to do so by the Purchaser and where permitted by applicable law, ensure that the holder of such a moral right waives it.

15.5 **Unless otherwise specified in the SCC**, escrow arrangements shall NOT be required.

16. Software License Agreements

16.1 Except to the extent that the Intellectual Property Rights in the Software vest in the Purchaser, the Supplier hereby grants to the Purchaser license to access and use the Software, including all inventions, designs, and marks embodied in the Software.

Such license to access and use the Software shall:

- (a) be:
 - (i) nonexclusive;
 - (ii) fully paid up and irrevocable (except that it shall terminate if the Contract terminates under GCC Clauses 41.1 or 41.3);
 - (iii) **unless otherwise specified in the SCC** valid throughout the territory of the Purchaser's Country;
 - (iv) **unless otherwise specified in the SCC** subject to NO additional restrictions.
- (b) permit the Software to be:
 - (i) used or copied for use on or with the computer(s) for which it was acquired (if specified in the Technical Requirements and/or the Supplier's bid), plus a backup computer(s) of the same or similar capacity, if the primary is(are) inoperative, and during a reasonable transitional period when use is being transferred between primary and backup;
 - (ii) used or copied for use on or transferred to a replacement computer(s), (and use on the original and replacement computer(s) may be simultaneous during a reasonable transitional period) provided that, if the Technical Requirements and/or the Supplier's bid specifies a class of computer to which the license is restricted, the replacement computer(s) is(are) within that class;
 - (iii) if the nature of the System is such as to permit such access, accessed from other computers connected to the primary and/or backup computer(s) by means of a local or wide-area network or similar arrangement, and used on or copied for use on those other computers to the extent necessary to that access;
 - (iv) reproduced for safekeeping or backup purposes;
 - (v) customized, adapted, or combined with other computer software for use by the Purchaser, provided that derivative software incorporating any substantial part of the delivered,

restricted Software shall be subject to same restrictions as are set forth in this Contract;

- (vi) **unless otherwise specified in the SCC**, disclosed to, and reproduced for use by, support service suppliers and their subcontractors, to the extent reasonably necessary to the performance of their support service contracts, subject to the same restrictions as are set forth in this Contract; and
- (vii) **unless otherwise specified in the SCC** disclosed to, and reproduced for use by, NO other parties.

16.2 The Supplier has the right to audit the Standard Software to verify compliance with the above license agreements. **Unless otherwise specified in the SCC**, the Purchaser will make available to the Supplier, within seven (7) days of a written request, accurate and up-to-date records of the number and location of copies, the number of authorized users, or any other relevant data required to demonstrate use of the Standard Software as per the license agreement. If and only if, expressly agreed in writing between the Purchaser and the Supplier, Purchaser will allow, under a pre-specified agreed procedure, the execution of embedded software functions under Supplier's control, and unencumbered transmission of resulting information on software usage.

17. Confidential Information

17.1 **Unless otherwise specified in the SCC**, the "Receiving Party" (either the Purchaser or the Supplier) shall keep confidential and shall not, without the written consent of the other party to this Contract ("the Disclosing Party"), divulge to any third party any documents, data, or other information of a confidential nature ("Confidential Information") connected with this Contract, and furnished directly or indirectly by the Disclosing Party prior to or during performance, or following termination, of this Contract.

17.2 For the purposes of GCC Clause 17.1, the Supplier is also deemed to be the Receiving Party of Confidential Information generated by the Supplier itself in the course of the performance of its obligations under the Contract and relating to the businesses, finances, suppliers, employees, or other contacts of the Purchaser or the Purchaser's use of the System.

17.3 Notwithstanding GCC Clauses 17.1 and 17.2:

- (a) the Supplier may furnish to its Subcontractor Confidential Information of the Purchaser to the extent reasonably required for the Subcontractor to perform its work under the Contract; and
- (b) the Purchaser may furnish Confidential Information of the Supplier: (i) to its support service suppliers and their subcontractors to the extent reasonably required for them to

perform their work under their support service contracts; and
(ii) to its affiliates and subsidiaries,

in which event the Receiving Party shall ensure that the person to whom it furnishes Confidential Information of the Disclosing Party is aware of and abides by the Receiving Party's obligations under this GCC Clause 17 as if that person were party to the Contract in place of the Receiving Party.

- 17.4 The Purchaser shall not, without the Supplier's prior written consent, use any Confidential Information received from the Supplier for any purpose other than the operation, maintenance and further development of the System. Similarly, the Supplier shall not, without the Purchaser's prior written consent, use any Confidential Information received from the Purchaser for any purpose other than those that are required for the performance of the Contract.
- 17.5 The obligation of a party under GCC Clauses 17.1 through 17.4 above, however, shall not apply to that information which:
- (a) now or hereafter enters the public domain through no fault of the Receiving Party;
 - (b) can be proven to have been possessed by the Receiving Party at the time of disclosure and that was not previously obtained, directly or indirectly, from the Disclosing Party;
 - (c) otherwise lawfully becomes available to the Receiving Party from a third party that has no obligation of confidentiality;
 - (d) is being provided to the Bank.
- 17.6 The above provisions of this GCC Clause 17 shall not in any way modify any undertaking of confidentiality given by either of the parties to this Contract prior to the date of the Contract in respect of the System or any part thereof.
- 17.7 **Unless otherwise specified in the SCC**, the provisions of this GCC Clause 17 shall survive the termination, for whatever reason, of the Contract for three (3) years.

E. SUPPLY, INSTALLATION, TESTING, COMMISSIONING, AND ACCEPTANCE OF THE SYSTEM

18. Representatives 18.1 Project Manager

If the Project Manager is not named in the Contract, then within fourteen (14) days of the Effective Date, the Purchaser shall appoint and notify the Supplier in writing of the name of the Project Manager. The Purchaser may from time to time appoint some other person as the Project Manager in place of the person previously so appointed and shall give a notice of the name of such other person

to the Supplier without delay. No such appointment shall be made at such a time or in such a manner as to impede the progress of work on the System. Such appointment shall take effect only upon receipt of such notice by the Supplier. **Unless otherwise specified in the SCC** (if any), the Project Manager shall have the authority to represent the Purchaser on all day-to-day matters relating to the System or arising from the Contract, and shall normally be the person giving or receiving notices on behalf of the Purchaser pursuant to GCC Clause 4.

18.2 Supplier's Representative

18.2.1 If the Supplier's Representative is not named in the Contract, then within fourteen (14) days of the Effective Date, the Supplier shall appoint the Supplier's Representative and shall request the Purchaser in writing to approve the person so appointed. The request must be accompanied by a detailed curriculum vitae for the nominee, as well as a description of any other System or non-System responsibilities the nominee would retain while performing the duties of the Supplier's Representative. If the Purchaser does not object to the appointment within fourteen (14) days, the Supplier's Representative shall be deemed to have been approved. If the Purchaser objects to the appointment within fourteen (14) days giving the reason therefor, then the Supplier shall appoint a replacement within fourteen (14) days of such objection in accordance with this GCC Clause 18.2.1.

18.2.2 **Unless otherwise specified in the SCC** (if any), the Supplier's Representative shall have the authority to represent the Supplier on all day-to-day matters relating to the System or arising from the Contract, and shall normally be the person giving or receiving notices on behalf of the Supplier pursuant to GCC Clause 4.

18.2.3 The Supplier shall not revoke the appointment of the Supplier's Representative without the Purchaser's prior written consent, which shall not be unreasonably withheld. If the Purchaser consents to such an action, the Supplier shall appoint another person of equal or superior qualifications as the Supplier's Representative, pursuant to the procedure set out in GCC Clause 18.2.1.

18.2.4 The Supplier's Representative and staff are obliged to work closely with the Purchaser's Project Manager and staff, act within their own authority, and abide by directives issued by the Purchaser that are consistent with the terms of the Contract. The Supplier's Representative is responsible for managing the activities of the Supplier's Personnel.

18.2.5 The Supplier's Representative may, subject to the approval of the Purchaser (which shall not be unreasonably withheld), at any time delegate to any person any of the powers, functions, and authorities vested in him or her. Any such delegation may be revoked at any time. Any such delegation or revocation shall be subject to a prior notice signed by the Supplier's Representative and shall specify the powers, functions, and authorities thereby delegated or revoked. No such delegation or revocation shall take effect unless and until the notice of it has been delivered.

18.2.6 Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with GCC Clause 18.2.5 shall be deemed to be an act or exercise by the Supplier's Representative.

18.3 Removal of Supplier's Personnel

18.3.1 The Project Manager may require the Supplier to remove (or cause to be removed) the Supplier's Representative or any other person employed by the Supplier in the execution of the Contract, who:

- (a) persists in any misconduct or lack of care;
- (b) carries out duties incompetently or negligently;
- (c) fails to comply with any provision of the Contract;
- (d) persists in any conduct which is prejudicial to safety, health, or the protection of the environment;
- (e) based on reasonable evidence, is determined to have engaged in Fraud and Corruption during the execution of the Contract;
- (f) has been recruited from the Purchaser's Personnel;
- (g) engages in any other behaviour which breaches the Code of Conduct, as applicable;

If appropriate, the Supplier shall then promptly appoint (or cause to be appointed) a suitable replacement with equivalent skills and experience.

Notwithstanding any requirement from the Project Manager to remove or cause to remove any person, the Supplier shall take immediate action as appropriate in response to any violation of (a) through (g) above. Such immediate action shall include removing (or causing to be removed) from work on the System, any person Employed by the Supplier in the execution of the Contract who engages in (a), (b), (c), (d), (e) or (g) above or has been recruited as stated in (f) above.

18.3.2 If any representative or person employed by the Supplier is removed in accordance with GCC Clause 18.3.1, the Supplier

shall, where required, promptly appoint a suitable replacement with equivalent skills and experience.

19. Project Plan

- 19.1 In close cooperation with the Purchaser and based on the Preliminary Project Plan included in the Supplier's bid, the Supplier shall develop a Project Plan encompassing the activities specified in the Contract. The contents of the Project Plan shall be as **specified in the SCC** and/or Technical Requirements.
- 19.2 **Unless otherwise specified in the SCC**, within thirty (30) days from the Effective Date of the Contract, the Supplier shall present a Project Plan to the Purchaser. Such submission to the Purchaser shall include any applicable environmental and social management plan to manage environmental and social risks and impacts. The Purchaser shall, within fourteen (14) days of receipt of the Project Plan, notify the Supplier of any respects in which it considers that the Project Plan does not adequately ensure that the proposed program of work, proposed methods, and/or proposed Information Technologies will satisfy the Technical Requirements and/or the SCC (in this Clause 19.2 called "non-conformities" below). The Supplier shall, within five (5) days of receipt of such notification, correct the Project Plan and resubmit to the Purchaser. The Purchaser shall, within five (5) days of resubmission of the Project Plan, notify the Supplier of any remaining non-conformities. This procedure shall be repeated as necessary until the Project Plan is free from non-conformities. When the Project Plan is free from non-conformities, the Purchaser shall provide confirmation in writing to the Supplier. This approved Project Plan ("the Agreed Project Plan") shall be contractually binding on the Purchaser and the Supplier.
- 19.3 If required, the impact on the Implementation Schedule of modifications agreed during finalization of the Agreed Project Plan shall be incorporated in the Contract by amendment, in accordance with GCC Clauses 39 and 40.
- 19.4 The Supplier shall undertake to supply, install, test, and commission the System in accordance with the Agreed Project Plan and the Contract.
- 19.5 **Unless otherwise specified in the SCC**, the Supplier shall submit to the Purchaser Monthly Progress Reports summarizing:
- (i) results accomplished during the prior period;
 - (ii) cumulative deviations to date from schedule of progress milestones as specified in the Agreed Project Plan;
 - (iii) corrective actions to be taken to return to planned schedule of progress; proposed revisions to planned schedule;

- (iv) other issues and outstanding problems; proposed actions to be taken;
- (v) resources that the Supplier expects to be provided by the Purchaser and/or actions to be taken by the Purchaser in the next reporting period;
- (vi) status of compliance to environmental and social requirements, as applicable;
- (vii) other issues or potential problems the Supplier foresees that could impact on project progress and/or effectiveness.

19.6 The Supplier shall submit to the Purchaser other (periodic) reports as specified in the SCC.

19.7 Immediate Reporting requirement

The Supplier shall inform the Project Manager immediately of any allegation, incident or accident in Project Site/s, which has or is likely to have a significant adverse effect on the environment, the affected communities, the public, Purchaser's Personnel or Supplier's Personnel. This includes, but is not limited to, any incident or accident causing fatality or serious injury; significant adverse effects or damage to private property; or any allegation of SEA and/or SH. In case of SEA and/or SH, while maintaining confidentiality as appropriate, the type of allegation (sexual exploitation, sexual abuse or sexual harassment), gender and age of the person who experienced the alleged incident should be included in the information.

The Supplier, upon becoming aware of the allegation, incident or accident, shall also immediately inform the Purchaser of any such incident or accident on the Subcontractors' or suppliers' premises relating to the Contract which has or is likely to have a significant adverse effect on the environment, the affected communities, the public, Purchaser's Personnel or Supplier's Personnel. The notification shall provide sufficient detail regarding such incidents or accidents.

The Supplier shall provide full details of such incidents or accidents to the Project Manager within the timeframe agreed with the Purchaser.

The Purchaser shall require its Subcontractors to immediately notify it of any incidents or accidents referred to in this Sub- Clause.

20. Subcontracting

20.1 Appendix 3 (List of Approved Subcontractors) to the Contract Agreement specifies critical items of supply or services and a list of Subcontractors for each item that are considered acceptable by the Purchaser. If no Subcontractors are listed for an item, the Supplier shall prepare a list of Subcontractors it considers qualified and wishes to be added to the list for such items. The Supplier may from time to time propose additions to or deletions from any such list.

The Supplier shall submit any such list or any modification to the list to the Purchaser for its approval in sufficient time so as not to impede the progress of work on the System. Submission by the Supplier, for addition of any Subcontractor not named in the Contract, shall also include the Subcontractor's declaration in accordance with Appendix 2 to the GCC- Sexual exploitation and Abuse (SEA) and/or Sexual Harassment (SH) Performance Declaration. Approval by the Purchaser of a Subcontractor(s) shall not relieve the Supplier from any of its obligations, duties, or responsibilities under the Contract.

- 20.2 The Supplier may, at its discretion, select and employ Subcontractors for such critical items from those Subcontractors listed pursuant to GCC Clause 20.1. If the Supplier wishes to employ a Subcontractor not so listed, or subcontract an item not so listed, it must seek the Purchaser's prior approval under GCC Clause 20.3.
- 20.3 For items for which pre-approved Subcontractor lists have not been specified in Appendix 3 to the Contract Agreement, the Supplier may employ such Subcontractors as it may select, provided: (i) the Supplier notifies the Purchaser in writing at least twenty-eight (28) days prior to the proposed mobilization date for such Subcontractor, including by providing the Subcontractor's declaration in accordance with Appendix 2 to the GCC- Sexual exploitation and Abuse (SEA) and/or Sexual Harassment (SH) Performance Declaration; and (ii) by the end of this period either the Purchaser has granted its approval in writing or fails to respond. The Supplier shall not engage any Subcontractor to which the Purchaser has objected in writing prior to the end of the notice period. The absence of a written objection by the Purchaser during the above specified period shall constitute formal acceptance of the proposed Subcontractor. Except to the extent that it permits the deemed approval of the Purchaser of Subcontractors not listed in the Contract Agreement, nothing in this Clause, however, shall limit the rights and obligations of either the Purchaser or Supplier as they are specified in GCC Clauses 20.1 and 20.2, or in Appendix 3 of the Contract Agreement.
- 20.4 The Supplier shall ensure that its Subcontractors comply with the relevant ES requirements and the obligations set out in GCC Clause 9.9.

21. Design and Engineering

- 21.1 Technical Specifications and Drawings
 - 21.1.1 The Supplier shall execute the basic and detailed design and the implementation activities necessary for successful installation of the System in compliance with the provisions of the Contract or, where not so specified, in accordance with good industry practice.

The Supplier shall be responsible for any discrepancies, errors or omissions in the specifications, drawings, and other technical documents that it has prepared, whether such specifications, drawings, and other documents have been approved by the Project Manager or not, provided that such discrepancies, errors, or omissions are not because of inaccurate information furnished in writing to the Supplier by or on behalf of the Purchaser.

21.1.2 The Supplier shall be entitled to disclaim responsibility for any design, data, drawing, specification, or other document, or any modification of such design, drawings, specification, or other documents provided or designated by or on behalf of the Purchaser, by giving a notice of such disclaimer to the Project Manager.

21.2 Codes and Standards

Wherever references are made in the Contract to codes and standards in accordance with which the Contract shall be executed, the edition or the revised version of such codes and standards current at the date twenty-eight (28) days prior to date of bid submission shall apply. During Contract execution, any changes in such codes and standards shall be applied after approval by the Purchaser and shall be treated in accordance with GCC Clause 39.3.

21.3 Approval/Review of Controlling Technical Documents by the Project Manager

21.3.1 **Unless otherwise specified in the SCC**, there will NO Controlling Technical Documents required. However, **if the SCC specifies** Controlling Technical Documents, the Supplier shall prepare and furnish such documents for the Project Manager's approval or review.

Any part of the System covered by or related to the documents to be approved by the Project Manager shall be executed only after the Project Manager's approval of these documents.

GCC Clauses 21.3.2 through 21.3.7 shall apply to those documents requiring the Project Manager's approval, but not to those furnished to the Project Manager for its review only.

21.3.2 Within fourteen (14) days after receipt by the Project Manager of any document requiring the Project Manager's approval in accordance with GCC Clause 21.3.1, the Project Manager shall either return one copy of the document to the Supplier with its approval endorsed on the document or shall notify the Supplier in writing of its disapproval of the document and the reasons for disapproval and the modifications that the Project Manager proposes. If the Project Manager fails to take such action within

the fourteen (14) days, then the document shall be deemed to have been approved by the Project Manager.

21.3.3 The Project Manager shall not disapprove any document except on the grounds that the document does not comply with some specified provision of the Contract or that it is contrary to good industry practice.

21.3.4 If the Project Manager disapproves the document, the Supplier shall modify the document and resubmit it for the Project Manager's approval in accordance with GCC Clause 21.3.2. If the Project Manager approves the document subject to modification(s), the Supplier shall make the required modification(s), and the document shall then be deemed to have been approved, subject to GCC Clause 21.3.5. The procedure set out in GCC Clauses 21.3.2 through 21.3.4 shall be repeated, as appropriate, until the Project Manager approves such documents.

21.3.5 If any dispute occurs between the Purchaser and the Supplier in connection with or arising out of the disapproval by the Project Manager of any document and/or any modification(s) to a document that cannot be settled between the parties within a reasonable period, then, in case the Contract Agreement includes and names an Adjudicator, such dispute may be referred to the Adjudicator for determination in accordance with GCC Clause 43.1 (Adjudication). If such dispute is referred to an Adjudicator, the Project Manager shall give instructions as to whether and if so, how, performance of the Contract is to proceed. The Supplier shall proceed with the Contract in accordance with the Project Manager's instructions, provided that if the Adjudicator upholds the Supplier's view on the dispute and if the Purchaser has not given notice under GCC Clause 43.1.2, then the Supplier shall be reimbursed by the Purchaser for any additional costs incurred by reason of such instructions and shall be relieved of such responsibility or liability in connection with the dispute and the execution of the instructions as the Adjudicator shall decide, and the Time for Achieving Operational Acceptance shall be extended accordingly.

21.3.6 The Project Manager's approval, with or without modification of the document furnished by the Supplier, shall not relieve the Supplier of any responsibility or liability imposed upon it by any provisions of the Contract except to the extent that any subsequent failure results from modifications required by the Project Manager or inaccurate information furnished in writing to the Supplier by or on behalf of the Purchaser.

21.3.7 The Supplier shall not depart from any approved document unless the Supplier has first submitted to the Project Manager

an amended document and obtained the Project Manager's approval of the document, pursuant to the provisions of this GCC Clause 21.3. If the Project Manager requests any change in any already approved document and/or in any document based on such an approved document, the provisions of GCC Clause 39 (Changes to the System) shall apply to such request.

22. Procurement, Delivery, and Transport

22.1 Subject to related Purchaser's responsibilities pursuant to GCC Clauses 10 and 14, the Supplier shall manufacture or procure and transport all the Information Technologies, Materials, and other Goods in an expeditious and orderly manner to the Project Site.

22.2 Delivery of the Information Technologies, Materials, and other Goods shall be made by the Supplier in accordance with the Technical Requirements.

22.3 Early or partial deliveries require the explicit written consent of the Purchaser, which consent shall not be unreasonably withheld.

22.4 Transportation

22.4.1 The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during shipment. The packing, marking, and documentation within and outside the packages shall comply strictly with the Purchaser's instructions to the Supplier.

22.4.2 The Supplier will bear responsibility for and cost of transport to the Project Sites in accordance with the terms and conditions used in the specification of prices in the Price Schedules, including the terms and conditions of the associated Incoterms.

22.4.3 **Unless otherwise specified in the SCC**, the Supplier shall be free to use transportation through carriers registered in any eligible country and to obtain insurance from any eligible source country.

22.5 **Unless otherwise specified in the SCC**, the Supplier will provide the Purchaser with shipping and other documents, as specified below:

22.5.1 For Goods supplied from outside the Purchaser's Country:

Upon shipment, the Supplier shall notify the Purchaser and the insurance company contracted by the Supplier to provide cargo insurance by cable, facsimile, electronic mail, or EDI with the full details of the shipment. The Supplier shall promptly send the following documents to the Purchaser by mail or courier, as appropriate, with a copy to the cargo insurance company:

(a) two copies of the Supplier's invoice showing the description of the Goods, quantity, unit price, and total amount;

- (b) usual transportation documents;
- (c) insurance certificate;
- (d) certificate(s) of origin; and
- (e) estimated time and point of arrival in the Purchaser's Country and at the site.

22.5.2 For Goods supplied locally (i.e., from within the Purchaser's country):

Upon shipment, the Supplier shall notify the Purchaser by cable, facsimile, electronic mail, or EDI with the full details of the shipment. The Supplier shall promptly send the following documents to the Purchaser by mail or courier, as appropriate:

- (a) two copies of the Supplier's invoice showing the Goods' description, quantity, unit price, and total amount;
- (b) delivery note, railway receipt, or truck receipt;
- (c) certificate of insurance;
- (d) certificate(s) of origin; and
- (e) estimated time of arrival at the site.

22.6 Customs Clearance

- (a) The Purchaser will bear responsibility for, and cost of, customs clearance into the Purchaser's country in accordance the particular Incoterm(s) used for Goods supplied from outside the Purchaser's country in the Price Schedules referred to by Article 2 of the Contract Agreement.
- (b) At the request of the Purchaser, the Supplier will make available a representative or agent during the process of customs clearance in the Purchaser's country for goods supplied from outside the Purchaser's country. In the event of delays in customs clearance that are not the fault of the Supplier:
 - (i) the Supplier shall be entitled to an extension in the Time for Achieving Operational Acceptance, pursuant to GCC Clause 40;
 - (ii) the Contract Price shall be adjusted to compensate the Supplier for any additional storage charges that the Supplier may incur as a result of the delay.

23. Product Upgrades

23.1 At any point during performance of the Contract, should technological advances be introduced by the Supplier for Information Technologies originally offered by the Supplier in its bid and still to be delivered, the Supplier shall be obligated to offer to the Purchaser the latest versions of the available Information Technologies having equal or better performance or functionality at

the same or lesser unit prices, pursuant to GCC Clause 39 (Changes to the System).

23.2 At any point during performance of the Contract, for Information Technologies still to be delivered, the Supplier will also pass on to the Purchaser any cost reductions and additional and/or improved support and facilities that it offers to other clients of the Supplier in the Purchaser's Country, pursuant to GCC Clause 39 (Changes to the System).

23.3 During performance of the Contract, the Supplier shall offer to the Purchaser all new versions, releases, and updates of Standard Software, as well as related documentation and technical support services, within thirty (30) days of their availability from the Supplier to other clients of the Supplier in the Purchaser's Country, and no later than twelve (12) months after they are released in the country of origin. In no case will the prices for these Software exceed those quoted by the Supplier in the Recurrent Costs tables in its bid.

23.4 **Unless otherwise specified in the SCC**, during the Warranty Period, the Supplier will provide at no additional cost to the Purchaser all new versions, releases, and updates for all Standard Software that are used in the System, within thirty (30) days of their availability from the Supplier to other clients of the Supplier in the Purchaser's country, and no later than twelve (12) months after they are released in the country of origin of the Software.

23.5 The Purchaser shall introduce all new versions, releases or updates of the Software within eighteen (18) months of receipt of a production-ready copy of the new version, release, or update, provided that the new version, release, or update does not adversely affect System operation or performance or require extensive reworking of the System. In cases where the new version, release, or update adversely affects System operation or performance, or requires extensive reworking of the System, the Supplier shall continue to support and maintain the version or release previously in operation for as long as necessary to allow introduction of the new version, release, or update. In no case shall the Supplier stop supporting or maintaining a version or release of the Software less than twenty four (24) months after the Purchaser receives a production-ready copy of a subsequent version, release, or update. The Purchaser shall use all reasonable endeavors to implement any new version, release, or update as soon as practicable, subject to the twenty-four-month-long stop date.

**24. Implementation,
Installation, and
Other Services**

24.1 The Supplier shall provide all Services specified in the Contract and Agreed Project Plan in accordance with the highest standards of professional competence and integrity.

24.2 Prices charged by the Supplier for Services, if not included in the Contract, shall be agreed upon in advance by the parties (including, but not restricted to, any prices submitted by the Supplier in the Recurrent Cost Schedules of its Bid) and shall not exceed the prevailing rates charged by the Supplier to other purchasers in the Purchaser's Country for similar services.

25. Inspections and Tests

25.1 The Purchaser or its representative shall have the right to inspect and/or test any components of the System, as specified in the Technical Requirements, to confirm their good working order and/or conformity to the Contract at the point of delivery and/or at the Project Site.

25.2 The Purchaser or its representative shall be entitled to attend any such inspections and/or tests of the components, provided that the Purchaser shall bear all costs and expenses incurred in connection with such attendance, including but not limited to all inspection agent fees, travel, and related expenses.

25.3 Should the inspected or tested components fail to conform to the Contract, the Purchaser may reject the component(s), and the Supplier shall either replace the rejected component(s), or make alterations as necessary so that it meets the Contract requirements free of cost to the Purchaser.

25.4 The Project Manager may require the Supplier to carry out any inspection and/or test not specified in the Contract, provided that the Supplier's reasonable costs and expenses incurred in the carrying out of such inspection and/or test shall be added to the Contract Price. Further, if such inspection and/or test impedes the progress of work on the System and/or the Supplier's performance of its other obligations under the Contract, due allowance will be made in respect of the Time for Achieving Operational Acceptance and the other obligations so affected.

25.5 If any dispute shall arise between the parties in connection with or caused by an inspection and/or with regard to any component to be incorporated in the System that cannot be settled amicably between the parties within a reasonable period of time, either party may invoke the process pursuant to GCC Clause 43 (Settlement of Disputes), starting with referral of the matter to the Adjudicator in case an Adjudicator is included and named in the Contract Agreement.

26. Installation of the System

26.1 As soon as the System, or any Subsystem, has, in the opinion of the Supplier, been delivered, Pre-commissioned, and made ready for Commissioning and Operational Acceptance Testing in accordance with the Technical Requirements, the SCC and the Agreed Project Plan, the Supplier shall so notify the Purchaser in writing.

26.2 The Project Manager shall, within fourteen (14) days after receipt of the Supplier's notice under GCC Clause 26.1, either issue an Installation Certificate in the form specified in the Sample Contractual Forms Section in the bidding documents, stating that the System, or major component or Subsystem (if Acceptance by major component or Subsystem is specified pursuant to the SCC for GCC Clause 27.2.1), has achieved Installation by the date of the Supplier's notice under GCC Clause 26.1, or notify the Supplier in writing of any defects and/or deficiencies, including, but not limited to, defects or deficiencies in the interoperability or integration of the various components and/or Subsystems making up the System. The Supplier shall use all reasonable endeavors to promptly remedy any defect and/or deficiencies that the Project Manager has notified the Supplier of. The Supplier shall then promptly carry out retesting of the System or Subsystem and, when in the Supplier's opinion the System or Subsystem is ready for Commissioning and Operational Acceptance Testing, notify the Purchaser in writing, in accordance with GCC Clause 26.1. The procedure set out in this GCC Clause 26.2 shall be repeated, as necessary, until an Installation Certificate is issued.

26.3 If the Project Manager fails to issue the Installation Certificate and fails to inform the Supplier of any defects and/or deficiencies within fourteen (14) days after receipt of the Supplier's notice under GCC Clause 26.1, or if the Purchaser puts the System or a Subsystem into production operation, then the System (or Subsystem) shall be deemed to have achieved successful Installation as of the date of the Supplier's notice or repeated notice, or when the Purchaser put the System into production operation, as the case may be.

27. Commissioning and Operational Acceptance

27.1 Commissioning

27.1.1 Commissioning of the System (or Subsystem if specified pursuant to the SCC for GCC Clause 27.2.1) shall be commenced by the Supplier:

- (a) immediately after the Installation Certificate is issued by the Project Manager, pursuant to GCC Clause 26.2; or
- (b) as otherwise specified in the Technical Requirement or the Agreed Project Plan; or
- (c) immediately after Installation is deemed to have occurred, under GCC Clause 26.3.

27.1.2 The Purchaser shall supply the operating and technical personnel and all materials and information reasonably required to enable the Supplier to carry out its obligations with respect to Commissioning.

Production use of the System or Subsystem(s) shall not commence prior to the start of formal Operational Acceptance Testing.

27.2 Operational Acceptance Tests

27.2.1 The Operational Acceptance Tests (and repeats of such tests) shall be the primary responsibility of the Purchaser (in accordance with GCC Clause 10.9), but shall be conducted with the full cooperation of the Supplier during Commissioning of the System (or major components or Subsystem[s]), to ascertain whether the System (or major component or Subsystem[s]) conforms to the Technical Requirements and meets the standard of performance quoted in the Supplier's bid, including, but not restricted to, the functional and technical performance requirements. **Unless otherwise specified in the SCC**, the Operational Acceptance Tests during Commissioning will be conducted as specified in the Technical Requirements and/or the Agreed Project Plan.

At the Purchaser's discretion, Operational Acceptance Tests may also be performed on replacement Goods, upgrades and new version releases, and Goods that are added or field-modified after Operational Acceptance of the System.

27.2.2 If for reasons attributable to the Purchaser, the Operational Acceptance Test of the System (or Subsystem[s] or major components, pursuant to the SCC for GCC Clause 27.2.1) cannot be successfully completed within ninety (90) days from the date of Installation or any other period agreed upon in writing by the Purchaser and the Supplier, the Supplier shall be deemed to have fulfilled its obligations with respect to the technical and functional aspects of the Technical Specifications, SCC and/or the Agreed Project Plan, and GCC Clause 28.2 and 28.3 shall not apply.

27.3 Operational Acceptance

27.3.1 Subject to GCC Clause 27.4 (Partial Acceptance) below, Operational Acceptance shall occur in respect of the System, when

- (a) the Operational Acceptance Tests, as specified in the Technical Requirements, and/or SCC and/or the Agreed Project Plan have been successfully completed; or
- (b) the Operational Acceptance Tests have not been successfully completed or have not been carried out for reasons that are attributable to the Purchaser within the period from the date of Installation or any other agreed-upon period as specified in GCC Clause 27.2.2 above; or

- (c) the Purchaser has put the System into production or use for sixty (60) consecutive days. If the System is put into production or use in this manner, the Supplier shall notify the Purchaser and document such use.

27.3.2 At any time after any of the events set out in GCC Clause 27.3.1 have occurred, the Supplier may give a notice to the Project Manager requesting the issue of an Operational Acceptance Certificate.

27.3.3 After consultation with the Purchaser, and within fourteen (14) days after receipt of the Supplier's notice, the Project Manager shall:

- (a) issue an Operational Acceptance Certificate; or
- (b) notify the Supplier in writing of any defect or deficiencies or other reason for the failure of the Operational Acceptance Tests; or
- (c) issue the Operational Acceptance Certificate, if the situation covered by GCC Clause 27.3.1 (b) arises.

27.3.4 The Supplier shall use all reasonable endeavors to promptly remedy any defect and/or deficiencies and/or other reasons for the failure of the Operational Acceptance Test that the Project Manager has notified the Supplier of. Once such remedies have been made by the Supplier, the Supplier shall notify the Purchaser, and the Purchaser, with the full cooperation of the Supplier, shall use all reasonable endeavors to promptly carry out retesting of the System or Subsystem. Upon the successful conclusion of the Operational Acceptance Tests, the Supplier shall notify the Purchaser of its request for Operational Acceptance Certification, in accordance with GCC Clause 27.3.3. The Purchaser shall then issue to the Supplier the Operational Acceptance Certification in accordance with GCC Clause 27.3.3 (a), or shall notify the Supplier of further defects, deficiencies, or other reasons for the failure of the Operational Acceptance Test. The procedure set out in this GCC Clause 27.3.4 shall be repeated, as necessary, until an Operational Acceptance Certificate is issued.

27.3.5 If the System or Subsystem fails to pass the Operational Acceptance Test(s) in accordance with GCC Clause 27.2, then either:

- (a) the Purchaser may consider terminating the Contract, pursuant to GCC Clause 41.2.2;
- or
- (b) if the failure to achieve Operational Acceptance within the specified time period is a result of the failure of the Purchaser to fulfill its obligations under the Contract,

then the Supplier shall be deemed to have fulfilled its obligations with respect to the relevant technical and functional aspects of the Contract, and GCC Clauses 30.3 and 30.4 shall not apply.

27.3.6 If within fourteen (14) days after receipt of the Supplier's notice the Project Manager fails to issue the Operational Acceptance Certificate or fails to inform the Supplier in writing of the justifiable reasons why the Project Manager has not issued the Operational Acceptance Certificate, the System or Subsystem shall be deemed to have been accepted as of the date of the Supplier's said notice.

27.4 Partial Acceptance

27.4.1 If so specified in the SCC for GCC Clause 27.2.1, Installation and Commissioning shall be carried out individually for each identified major component or Subsystem(s) of the System. In this event, the provisions in the Contract relating to Installation and Commissioning, including the Operational Acceptance Test, shall apply to each such major component or Subsystem individually, and Operational Acceptance Certificate(s) shall be issued accordingly for each such major component or Subsystem of the System, subject to the limitations contained in GCC Clause 27.4.2.

27.4.2 The issuance of Operational Acceptance Certificates for individual major components or Subsystems pursuant to GCC Clause 27.4.1 shall not relieve the Supplier of its obligation to obtain an Operational Acceptance Certificate for the System as an integrated whole (if so specified in the SCC for GCC Clauses 12.1 and 27.2.1) once all major components and Subsystems have been supplied, installed, tested, and commissioned.

27.4.3 In the case of minor components for the System that by their nature do not require Commissioning or an Operational Acceptance Test (e.g., minor fittings, furnishings or site works, etc.), the Project Manager shall issue an Operational Acceptance Certificate within fourteen (14) days after the fittings and/or furnishings have been delivered and/or installed or the site works have been completed. The Supplier shall, however, use all reasonable endeavors to promptly remedy any defects or deficiencies in such minor components detected by the Purchaser or Supplier.

F. GUARANTEES AND LIABILITIES

28. Operational Acceptance Time Guarantee

28.1 The Supplier guarantees that it shall complete the supply, Installation, Commissioning, and achieve Operational Acceptance of the System (or Subsystems, pursuant to the SCC for GCC Clause 27.2.1) within the time periods specified in the Implementation Schedule and/or the Agreed Project Plan pursuant to GCC Clause

8.2, or within such extended time to which the Supplier shall be entitled under GCC Clause 40 (Extension of Time for Achieving Operational Acceptance).

- 28.2 **Unless otherwise specified in the SCC**, if the Supplier fails to supply, install, commission, and achieve Operational Acceptance of the System (or Subsystems pursuant to the SCC for GCC Clause 27.2.1) within the time for achieving Operational Acceptance specified in the Implementation Schedule or the Agreed Project Plan, or any extension of the time for achieving Operational Acceptance previously granted under GCC Clause 40 (Extension of Time for Achieving Operational Acceptance), the Supplier shall pay to the Purchaser liquidated damages at the rate of one half of one percent per week as a percentage of the Contract Price (exclusive of Recurrent Costs if any), or the relevant part of the Contract Price if a Subsystem has not achieved Operational Acceptance. The aggregate amount of such liquidated damages shall in no event exceed the amount of ten (10) percent of the Contract Price (exclusive of Recurrent Costs if any). Once the Maximum is reached, the Purchaser may consider termination of the Contract, pursuant to GCC Clause 41.2.2.
- 28.3 **Unless otherwise specified in the SCC**, liquidated damages payable under GCC Clause 28.2 shall apply only to the failure to achieve Operational Acceptance of the System (and Subsystems) as specified in the Implementation Schedule and/or Agreed Project Plan. This Clause 28.3 shall not limit, however, any other rights or remedies the Purchaser may have under the Contract for other delays.
- 28.4 If liquidated damages are claimed by the Purchaser for the System (or Subsystem), the Supplier shall have no further liability whatsoever to the Purchaser in respect to the Operational Acceptance time guarantee for the System (or Subsystem). However, the payment of liquidated damages shall not in any way relieve the Supplier from any of its obligations to complete the System or from any other of its obligations and liabilities under the Contract.

29. Defect Liability

- 29.1 The Supplier warrants that the System, including all Information Technologies, Materials, and other Goods supplied and Services provided, shall be free from defects in the design, engineering, Materials, and workmanship that prevent the System and/or any of its components from fulfilling the Technical Requirements or that limit in a material fashion the performance, reliability, or extensibility of the System and/or Subsystems. **Unless otherwise specified in the SCC**, there will be NO exceptions and/or limitations to this warranty with respect to Software (or categories of Software). Commercial warranty provisions of products supplied

under the Contract shall apply to the extent that they do not conflict with the provisions of this Contract.

- 29.2 The Supplier also warrants that the Information Technologies, Materials, and other Goods supplied under the Contract are new, unused, and incorporate all recent improvements in design that materially affect the System's or Subsystem's ability to fulfill the Technical Requirements.
- 29.3 **Unless otherwise specified in the SCC**, the Supplier warrants that: (i) all Goods components to be incorporated into the System form part of the Supplier's and/or Subcontractor's current product lines, and (ii) they have been previously released to the market.
- 29.4 **Unless otherwise specified in the SCC**, the Warranty Period shall commence from the date of Operational Acceptance of the System (or of any major component or Subsystem for which separate Operational Acceptance is provided for in the Contract) and shall extend for thirty-six (36) months.
- 29.5 If during the Warranty Period any defect as described in GCC Clause 29.1 should be found in the design, engineering, Materials, and workmanship of the Information Technologies and other Goods supplied or of the Services provided by the Supplier, the Supplier shall promptly, in consultation and agreement with the Purchaser regarding appropriate remedying of the defects, and at its sole cost, repair, replace, or otherwise make good (as the Supplier shall, at its discretion, determine) such defect as well as any damage to the System caused by such defect. Any defective Information Technologies or other Goods that have been replaced by the Supplier shall remain the property of the Supplier.
- 29.6 The Supplier shall not be responsible for the repair, replacement, or making good of any defect, or of any damage to the System arising out of or resulting from any of the following causes:
- (a) improper operation or maintenance of the System by the Purchaser;
 - (b) normal wear and tear;
 - (c) use of the System with items not supplied by the Supplier, unless otherwise identified in the Technical Requirements, or approved by the Supplier; or
 - (d) modifications made to the System by the Purchaser, or a third party, not approved by the Supplier.
- 29.7 The Supplier's obligations under this GCC Clause 29 shall not apply to:
- (a) any materials that are normally consumed in operation or have a normal life shorter than the Warranty Period; or

- (b) any designs, specifications, or other data designed, supplied, or specified by or on behalf of the Purchaser or any matters for which the Supplier has disclaimed responsibility, in accordance with GCC Clause 21.1.2.
- 29.8 The Purchaser shall give the Supplier a notice promptly following the discovery of such defect, stating the nature of any such defect together with all available evidence. The Purchaser shall afford all reasonable opportunity for the Supplier to inspect any such defect. The Purchaser shall afford the Supplier all necessary access to the System and the site to enable the Supplier to perform its obligations under this GCC Clause 29.
- 29.9 The Supplier may, with the consent of the Purchaser, remove from the site any Information Technologies and other Goods that are defective, if the nature of the defect, and/or any damage to the System caused by the defect, is such that repairs cannot be expeditiously carried out at the site. If the repair, replacement, or making good is of such a character that it may affect the efficiency of the System, the Purchaser may give the Supplier notice requiring that tests of the defective part be made by the Supplier immediately upon completion of such remedial work, whereupon the Supplier shall carry out such tests.
- If such part fails the tests, the Supplier shall carry out further repair, replacement, or making good (as the case may be) until that part of the System passes such tests. The tests shall be agreed upon by the Purchaser and the Supplier.
- 29.10 **Unless otherwise specified in the SCC**, the response times and repair/replacement times for Warranty Defect Repair are specified in the Technical Requirements. Nevertheless, if the Supplier fails to commence the work necessary to remedy such defect or any damage to the System caused by such defect within two weeks the Purchaser may, following notice to the Supplier, proceed to do such work or contract a third party (or parties) to do such work, and the reasonable costs incurred by the Purchaser in connection with such work shall be paid to the Purchaser by the Supplier or may be deducted by the Purchaser from any monies due the Supplier or claimed under the Performance Security.
- 29.11 If the System or Subsystem cannot be used by reason of such defect and/or making good of such defect, the Warranty Period for the System shall be extended by a period equal to the period during which the System or Subsystem could not be used by the Purchaser because of such defect and/or making good of such defect.
- 29.12 Items substituted for defective parts of the System during the Warranty Period shall be covered by the Defect Liability Warranty for the remainder of the Warranty Period applicable for the part replaced or three (3) months, whichever is greater. For reasons of

information security, the Purchaser may choose to retain physical possession of any replaced defective information storage devices.

29.13 At the request of the Purchaser and without prejudice to any other rights and remedies that the Purchaser may have against the Supplier under the Contract, the Supplier will offer all possible assistance to the Purchaser to seek warranty services or remedial action from any subcontracted third-party producers or licensor of Goods included in the System, including without limitation assignment or transfer in favor of the Purchaser of the benefit of any warranties given by such producers or licensors to the Supplier.

30. Functional Guarantees

30.1 The Supplier guarantees that, once the Operational Acceptance Certificate(s) has been issued, the System represents a complete, integrated solution to the Purchaser's requirements set forth in the Technical Requirements and it conforms to all other aspects of the Contract. The Supplier acknowledges that GCC Clause 27 regarding Commissioning and Operational Acceptance governs how technical conformance of the System to the Contract requirements will be determined.

30.2 If, for reasons attributable to the Supplier, the System does not conform to the Technical Requirements or does not conform to all other aspects of the Contract, the Supplier shall at its cost and expense make such changes, modifications, and/or additions to the System as may be necessary to conform to the Technical Requirements and meet all functional and performance standards. The Supplier shall notify the Purchaser upon completion of the necessary changes, modifications, and/or additions and shall request the Purchaser to repeat the Operational Acceptance Tests until the System achieves Operational Acceptance.

30.3 If the System (or Subsystem[s]) fails to achieve Operational Acceptance, the Purchaser may consider termination of the Contract, pursuant to GCC Clause 41.2.2, and forfeiture of the Supplier's Performance Security in accordance with GCC Clause 13.3 in compensation for the extra costs and delays likely to result from this failure.

31. Intellectual Property Rights Warranty

31.1 The Supplier hereby represents and warrants that:

- (a) the System as supplied, installed, tested, and accepted;
- (b) use of the System in accordance with the Contract; and
- (c) copying of the Software and Materials provided to the Purchaser in accordance with the Contract

do not and will not infringe any Intellectual Property Rights held by any third party and that it has all necessary rights or at its sole expense shall have secured in writing all transfers of rights and other consents necessary to make the assignments, licenses, and

other transfers of Intellectual Property Rights and the warranties set forth in the Contract, and for the Purchaser to own or exercise all Intellectual Property Rights as provided in the Contract. Without limitation, the Supplier shall secure all necessary written agreements, consents, and transfers of rights from its employees and other persons or entities whose services are used for development of the System.

**32. Intellectual
Property Rights
Indemnity**

- 32.1 The Supplier shall indemnify and hold harmless the Purchaser and its employees and officers from and against any and all losses, liabilities, and costs (including losses, liabilities, and costs incurred in defending a claim alleging such a liability), that the Purchaser or its employees or officers may suffer as a result of any infringement or alleged infringement of any Intellectual Property Rights by reason of:
- (a) installation of the System by the Supplier or the use of the System, including the Materials, in the country where the site is located;
 - (b) copying of the Software and Materials provided the Supplier in accordance with the Agreement; and
 - (c) sale of the products produced by the System in any country, except to the extent that such losses, liabilities, and costs arise as a result of the Purchaser's breach of GCC Clause 32.2.
- 32.2 Such indemnity shall not cover any use of the System, including the Materials, other than for the purpose indicated by or to be reasonably inferred from the Contract, any infringement resulting from the use of the System, or any products of the System produced thereby in association or combination with any other goods or services not supplied by the Supplier, where the infringement arises because of such association or combination and not because of use of the System in its own right.
- 32.3 Such indemnities shall also not apply if any claim of infringement:
- (a) is asserted by a parent, subsidiary, or affiliate of the Purchaser's organization;
 - (b) is a direct result of a design mandated by the Purchaser's Technical Requirements and the possibility of such infringement was duly noted in the Supplier's Bid; or
 - (c) results from the alteration of the System, including the Materials, by the Purchaser or any persons other than the Supplier or a person authorized by the Supplier.
- 32.4 If any proceedings are brought or any claim is made against the Purchaser arising out of the matters referred to in GCC Clause 32.1, the Purchaser shall promptly give the Supplier notice of such

proceedings or claims, and the Supplier may at its own expense and in the Purchaser's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

If the Supplier fails to notify the Purchaser within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Purchaser shall be free to conduct the same on its own behalf. Unless the Supplier has so failed to notify the Purchaser within the twenty-eight (28) days, the Purchaser shall make no admission that may be prejudicial to the defense of any such proceedings or claim. The Purchaser shall, at the Supplier's request, afford all available assistance to the Supplier in conducting such proceedings or claim and shall be reimbursed by the Supplier for all reasonable expenses incurred in so doing.

32.5 The Purchaser shall indemnify and hold harmless the Supplier and its employees, officers, and Subcontractors from and against any and all losses, liabilities, and costs (including losses, liabilities, and costs incurred in defending a claim alleging such a liability) that the Supplier or its employees, officers, or Subcontractors may suffer as a result of any infringement or alleged infringement of any Intellectual Property Rights arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided to the Supplier in connection with this Contract by the Purchaser or any persons (other than the Supplier) contracted by the Purchaser, except to the extent that such losses, liabilities, and costs arise as a result of the Supplier's breach of GCC Clause 32.8.

32.6 Such indemnity shall not cover

- (a) any use of the design, data, drawing, specification, or other documents or materials, other than for the purpose indicated by or to be reasonably inferred from the Contract;
- (b) any infringement resulting from the use of the design, data, drawing, specification, or other documents or materials, or any products produced thereby, in association or combination with any other Goods or Services not provided by the Purchaser or any other person contracted by the Purchaser, where the infringement arises because of such association or combination and not because of the use of the design, data, drawing, specification, or other documents or materials in its own right.

32.7 Such indemnities shall also not apply:

- (a) if any claim of infringement is asserted by a parent, subsidiary, or affiliate of the Supplier's organization;
- (b) to the extent that any claim of infringement is caused by the alteration, by the Supplier, or any persons contracted by the Supplier, of the design, data, drawing, specification, or other

documents or materials provided to the Supplier by the Purchaser or any persons contracted by the Purchaser.

32.8 If any proceedings are brought or any claim is made against the Supplier arising out of the matters referred to in GCC Clause 32.5, the Supplier shall promptly give the Purchaser notice of such proceedings or claims, and the Purchaser may at its own expense and in the Supplier's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim. If the Purchaser fails to notify the Supplier within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Supplier shall be free to conduct the same on its own behalf. Unless the Purchaser has so failed to notify the Supplier within the twenty-eight (28) days, the Supplier shall make no admission that may be prejudicial to the defense of any such proceedings or claim. The Supplier shall, at the Purchaser's request, afford all available assistance to the Purchaser in conducting such proceedings or claim and shall be reimbursed by the Purchaser for all reasonable expenses incurred in so doing.

33. Limitation of Liability

33.1 Provided the following does not exclude or limit any liabilities of either party in ways not permitted by applicable law:

- (a) the Supplier shall not be liable to the Purchaser, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Supplier to pay liquidated damages to the Purchaser; and
- (b) the aggregate liability of the Supplier to the Purchaser, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to any obligation of the Supplier to indemnify the Purchaser with respect to intellectual property rights infringement.

G. RISK DISTRIBUTION

34. Transfer of Ownership

34.1 With the exception of Software and Materials, the ownership of the Information Technologies and other Goods shall be transferred to the Purchaser at the time of Delivery or otherwise under terms that may be agreed upon and specified in the Contract Agreement.

34.2 Ownership and the terms of usage of the Software and Materials supplied under the Contract shall be governed by GCC Clause 15 (Copyright) Clause 16 (Software License Agreements), and any elaboration in the Technical Requirements.

35. Care of the System

34.3 Ownership of the Supplier’s Equipment used by the Supplier and its Subcontractors in connection with the Contract shall remain with the Supplier or its Subcontractors.

35.1 The Purchaser shall become responsible for the care and custody of the System or Subsystems upon their Delivery. The Purchaser shall make good at its own cost any loss or damage that may occur to the System or Subsystems from any cause from the date of Delivery until the date of Operational Acceptance of the System or Subsystems, pursuant to GCC Clause 27 (Commissioning and Operational Acceptance), excepting such loss or damage arising from acts or omissions of the Supplier, its employees, or subcontractors.

35.2 If any loss or damage occurs to the System or any part of the System by reason of:

- (a) (insofar as they relate to the country where the Project Site is located) nuclear reaction, nuclear radiation, radioactive contamination, a pressure wave caused by aircraft or other aerial objects, or any other occurrences that an experienced Supplier could not reasonably foresee, or if reasonably foreseeable could not reasonably make provision for or insure against, insofar as such risks are not normally insurable on the insurance market and are mentioned in the general exclusions of the policy of insurance taken out under GCC Clause 37;
- (b) any use not in accordance with the Contract, by the Purchaser or any third party;
- (c) any use of or reliance upon any design, data, or specification provided or designated by or on behalf of the Purchaser, or any such matter for which the Supplier has disclaimed responsibility in accordance with GCC Clause 21.1.2,

the Purchaser shall pay to the Supplier all sums payable in respect of the System or Subsystems that have achieved Operational Acceptance, notwithstanding that the same be lost, destroyed, or damaged. If the Purchaser requests the Supplier in writing to make good any loss or damage to the System thereby occasioned, the Supplier shall make good the same at the cost of the Purchaser in accordance with GCC Clause 39. If the Purchaser does not request the Supplier in writing to make good any loss or damage to the System thereby occasioned, the Purchaser shall either request a change in accordance with GCC Clause 39, excluding the performance of that part of the System thereby lost, destroyed, or damaged, or, where the loss or damage affects a substantial part of the System, the Purchaser shall terminate the Contract pursuant to GCC Clause 41.1.

35.3 The Purchaser shall be liable for any loss of or damage to any Supplier’s Equipment which the Purchaser has authorized to locate

within the Purchaser's premises for use in fulfillment of Supplier's obligations under the Contract, except where such loss or damage arises from acts or omissions of the Supplier, its employees, or subcontractors.

**36. Loss of or
Damage to
Property;
Accident or
Injury to
Workers;
Indemnification**

- 36.1 The Supplier and each and every Subcontractor shall abide by the job safety, insurance, customs, and immigration measures prevalent and laws in force in the Purchaser's Country.
- 36.2 Subject to GCC Clause 36.3, the Supplier shall indemnify and hold harmless the Purchaser and its employees and officers from and against any and all losses, liabilities and costs (including losses, liabilities, and costs incurred in defending a claim alleging such a liability) that the Purchaser or its employees or officers may suffer as a result of the death or injury of any person or loss of or damage to any property (other than the System, whether accepted or not) arising in connection with the supply, installation, testing, and Commissioning of the System and by reason of the negligence of the Supplier or its Subcontractors, or their employees, officers or agents, except any injury, death, or property damage caused by the negligence of the Purchaser, its contractors, employees, officers, or agents.
- 36.3 If any proceedings are brought or any claim is made against the Purchaser that might subject the Supplier to liability under GCC Clause 36.2, the Purchaser shall promptly give the Supplier notice of such proceedings or claims, and the Supplier may at its own expense and in the Purchaser's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim. If the Supplier fails to notify the Purchaser within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Purchaser shall be free to conduct the same on its own behalf. Unless the Supplier has so failed to notify the Purchaser within the twenty-eight (28) day period, the Purchaser shall make no admission that may be prejudicial to the defense of any such proceedings or claim. The Purchaser shall, at the Supplier's request, afford all available assistance to the Supplier in conducting such proceedings or claim and shall be reimbursed by the Supplier for all reasonable expenses incurred in so doing.
- 36.4 The Purchaser shall indemnify and hold harmless the Supplier and its employees, officers, and Subcontractors from any and all losses, liabilities, and costs (including losses, liabilities, and costs incurred in defending a claim alleging such a liability) that the Supplier or its employees, officers, or Subcontractors may suffer as a result of the death or personal injury of any person or loss of or damage to property of the Purchaser, other than the System not yet achieving Operational Acceptance, that is caused by fire, explosion, or any other perils, in excess of the amount recoverable from insurances

procured under GCC Clause 37 (Insurances), provided that such fire, explosion, or other perils were not caused by any act or failure of the Supplier.

36.5 If any proceedings are brought or any claim is made against the Supplier that might subject the Purchaser to liability under GCC Clause 36.4, the Supplier shall promptly give the Purchaser notice of such proceedings or claims, and the Purchaser may at its own expense and in the Supplier's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim. If the Purchaser fails to notify the Supplier within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Supplier shall be free to conduct the same on its own behalf. Unless the Purchaser has so failed to notify the Supplier within the twenty-eight (28) days, the Supplier shall make no admission that may be prejudicial to the defense of any such proceedings or claim. The Supplier shall, at the Purchaser's request, afford all available assistance to the Purchaser in conducting such proceedings or claim and shall be reimbursed by the Purchaser for all reasonable expenses incurred in so doing.

36.6 The party entitled to the benefit of an indemnity under this GCC Clause 36 shall take all reasonable measures to mitigate any loss or damage that has occurred. If the party fails to take such measures, the other party's liabilities shall be correspondingly reduced.

37. Insurances

37.1 The Supplier shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurance set forth below. The identity of the insurers and the form of the policies shall be subject to the approval of the Purchaser, who should not unreasonably withhold such approval.

(a) Cargo Insurance During Transport

as applicable, 110 percent of the price of the Information Technologies and other Goods in a freely convertible currency, covering the Goods from physical loss or damage during shipment through receipt at the Project Site.

(b) Installation "All Risks" Insurance

as applicable, 110 percent of the price of the Information Technologies and other Goods covering the Goods at the site from all risks of physical loss or damage (excluding only perils commonly excluded under "all risks" insurance policies of this type by reputable insurers) occurring prior to Operational Acceptance of the System.

(c) Third-Party Liability Insurance

On terms as **specified in the SCC**, covering bodily injury or death suffered by third parties (including the Purchaser's personnel) and loss of or damage to property (including the Purchaser's property and any Subsystems that have been accepted by the Purchaser) occurring in connection with the supply and installation of the Information System.

(d) Automobile Liability Insurance

In accordance with the statutory requirements prevailing in the Purchaser's Country, covering use of all vehicles used by the Supplier or its Subcontractors (whether or not owned by them) in connection with the execution of the Contract.

(e) Other Insurance (if any), as **specified in the SCC**.

- 37.2 The Purchaser shall be named as co-insured under all insurance policies taken out by the Supplier pursuant to GCC Clause 37.1, except for the Third-Party Liability, and the Supplier's Subcontractors shall be named as co-insured under all insurance policies taken out by the Supplier pursuant to GCC Clause 37.1 except for Cargo Insurance During Transport. All insurer's rights of subrogation against such co-insured for losses or claims arising out of the performance of the Contract shall be waived under such policies.
- 37.3 The Supplier shall deliver to the Purchaser certificates of insurance (or copies of the insurance policies) as evidence that the required policies are in full force and effect.
- 37.4 The Supplier shall ensure that, where applicable, its Subcontractor(s) shall take out and maintain in effect adequate insurance policies for their personnel and vehicles and for work executed by them under the Contract, unless such Subcontractors are covered by the policies taken out by the Supplier.
- 37.5 If the Supplier fails to take out and/or maintain in effect the insurance referred to in GCC Clause 37.1, the Purchaser may take out and maintain in effect any such insurance and may from time to time deduct from any amount due the Supplier under the Contract any premium that the Purchaser shall have paid to the insurer or may otherwise recover such amount as a debt due from the Supplier.
- 37.6 Unless otherwise provided in the Contract, the Supplier shall prepare and conduct all and any claims made under the policies affected by it pursuant to this GCC Clause 37, and all monies payable by any insurers shall be paid to the Supplier. The Purchaser shall give to the Supplier all such reasonable assistance as may be required by the Supplier in connection with any claim under the relevant insurance policies. With respect to insurance claims in which the Purchaser's interest is involved, the Supplier shall not give any release or make any compromise with the insurer without the prior written consent of the Purchaser. With respect to insurance

claims in which the Supplier's interest is involved, the Purchaser shall not give any release or make any compromise with the insurer without the prior written consent of the Supplier.

38. Force Majeure

- 38.1 "Force Majeure" shall mean any event beyond the reasonable control of the Purchaser or of the Supplier, as the case may be, and which is unavoidable notwithstanding the reasonable care of the party affected and shall include, without limitation, the following:
- (a) war, hostilities, or warlike operations (whether a state of war be declared or not), invasion, act of foreign enemy, and civil war;
 - (b) rebellion, revolution, insurrection, mutiny, usurpation of civil or military government, conspiracy, riot, civil commotion, and terrorist acts;
 - (c) confiscation, nationalization, mobilization, commandeering or requisition by or under the order of any government or de jure or de facto authority or ruler, or any other act or failure to act of any local state or national government authority;
 - (d) strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication, industrial dispute, shipwreck, shortage or restriction of power supply, epidemics, quarantine, and plague;
 - (e) earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone, hurricane, storm, lightning, or other inclement weather condition, nuclear and pressure waves, or other natural or physical disaster;
 - (f) failure, by the Supplier, to obtain the necessary export permit(s) from the governments of the Country(s) of Origin of the Information Technologies or other Goods, or Supplier's Equipment provided that the Supplier has made all reasonable efforts to obtain the required export permit(s), including the exercise of due diligence in determining the eligibility of the System and all of its components for receipt of the necessary export permits.
- 38.2 If either party is prevented, hindered, or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances of the event of Force Majeure within fourteen (14) days after the occurrence of such event.
- 38.3 The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is

prevented, hindered, or delayed. The Time for Achieving Operational Acceptance shall be extended in accordance with GCC Clause 40 (Extension of Time for Achieving Operational Acceptance).

- 38.4 The party or parties affected by the event of Force Majeure shall use reasonable efforts to mitigate the effect of the event of Force Majeure upon its or their performance of the Contract and to fulfill its or their obligations under the Contract, but without prejudice to either party's right to terminate the Contract under GCC Clause 38.6.
- 38.5 No delay or nonperformance by either party to this Contract caused by the occurrence of any event of Force Majeure shall:
- (a) constitute a default or breach of the Contract;
 - (b) (subject to GCC Clauses 35.2, 38.3, and 38.4) give rise to any claim for damages or additional cost or expense occasioned by the delay or nonperformance,
- if, and to the extent that, such delay or nonperformance is caused by the occurrence of an event of Force Majeure.
- 38.6 If the performance of the Contract is substantially prevented, hindered, or delayed for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) days on account of one or more events of Force Majeure during the time period covered by the Contract, the parties will attempt to develop a mutually satisfactory solution, failing which, either party may terminate the Contract by giving a notice to the other.
- 38.7 In the event of termination pursuant to GCC Clause 38.6, the rights and obligations of the Purchaser and the Supplier shall be as specified in GCC Clauses 41.1.2 and 41.1.3.
- 38.8 Notwithstanding GCC Clause 38.5, Force Majeure shall not apply to any obligation of the Purchaser to make payments to the Supplier under this Contract.

H. CHANGE IN CONTRACT ELEMENTS

39. Changes to the System

39.1 Introducing a Change

- 39.1.1 Subject to GCC Clauses 39.2.5 and 39.2.7, the Purchaser shall have the right to propose, and subsequently require, the Project Manager to order the Supplier from time to time during the performance of the Contract to make any change, modification, addition, or deletion to, in, or from the System (interchangeably called "Change"), provided that such Change falls within the general scope of the System, does not constitute unrelated work, and is technically practicable, taking into account both the state of advancement of the System and the technical

compatibility of the Change envisaged with the nature of the System as originally specified in the Contract.

A Change may involve, but is not restricted to, the substitution of updated Information Technologies and related Services in accordance with GCC Clause 23 (Product Upgrades).

- 39.1.2 The Supplier may from time to time during its performance of the Contract propose to the Purchaser (with a copy to the Project Manager) any Change that the Supplier considers necessary or desirable to improve the quality or efficiency of the System. The Purchaser may at its discretion approve or reject any Change proposed by the Supplier.
 - 39.1.3 Notwithstanding GCC Clauses 39.1.1 and 39.1.2, no change made necessary because of any default of the Supplier in the performance of its obligations under the Contract shall be deemed to be a Change, and such change shall not result in any adjustment of the Contract Price or the Time for Achieving Operational Acceptance.
 - 39.1.4 The procedure on how to proceed with and execute Changes is specified in GCC Clauses 39.2 and 39.3, and further details and sample forms are provided in the Sample Contractual Forms Section in the bidding documents.
 - 39.1.5 Moreover, the Purchaser and Supplier will agree, during development of the Project Plan, to a date prior to the scheduled date for Operational Acceptance, after which the Technical Requirements for the System shall be “frozen.” Any Change initiated after this time will be dealt with after Operational Acceptance.
- 39.2 Changes Originating from Purchaser
- 39.2.1 If the Purchaser proposes a Change pursuant to GCC Clauses 39.1.1, it shall send to the Supplier a “Request for Change Proposal,” requiring the Supplier to prepare and furnish to the Project Manager as soon as reasonably practicable a “Change Proposal,” which shall include the following:
 - (a) brief description of the Change;
 - (b) impact on the Time for Achieving Operational Acceptance;
 - (c) detailed estimated cost of the Change;
 - (d) effect on Functional Guarantees (if any);
 - (e) effect on any other provisions of the Contract.
 - 39.2.2 Prior to preparing and submitting the “Change Proposal,” the Supplier shall submit to the Project Manager a “Change Estimate Proposal,” which shall be an estimate of the cost of

preparing the Change Proposal, plus a first approximation of the suggested approach and cost for implementing the changes. Upon receipt of the Supplier's Change Estimate Proposal, the Purchaser shall do one of the following:

- (a) accept the Supplier's estimate with instructions to the Supplier to proceed with the preparation of the Change Proposal;
- (b) advise the Supplier of any part of its Change Estimate Proposal that is unacceptable and request the Supplier to review its estimate;
- (c) advise the Supplier that the Purchaser does not intend to proceed with the Change.

39.2.3 Upon receipt of the Purchaser's instruction to proceed under GCC Clause 39.2.2 (a), the Supplier shall, with proper expedition, proceed with the preparation of the Change Proposal, in accordance with GCC Clause 39.2.1. The Supplier, at its discretion, may specify a validity period for the Change Proposal, after which if the Purchaser and Supplier has not reached agreement in accordance with GCC Clause 39.2.6, then GCC Clause 39.2.7 shall apply.

39.2.4 The pricing of any Change shall, as far as practicable, be calculated in accordance with the rates and prices included in the Contract. If the nature of the Change is such that the Contract rates and prices are inequitable, the parties to the Contract shall agree on other specific rates to be used for valuing the Change.

39.2.5 If before or during the preparation of the Change Proposal it becomes apparent that the aggregate impact of compliance with the Request for Change Proposal and with all other Change Orders that have already become binding upon the Supplier under this GCC Clause 39 would be to increase or decrease the Contract Price as originally set forth in Article 2 (Contract Price) of the Contract Agreement by more than fifteen (15) percent, the Supplier may give a written notice of objection to this Request for Change Proposal prior to furnishing the Change Proposal. If the Purchaser accepts the Supplier's objection, the Purchaser shall withdraw the proposed Change and shall notify the Supplier in writing of its acceptance.

The Supplier's failure to so object to a Request for Change Proposal shall neither affect its right to object to any subsequent requested Changes or Change Orders, nor affect its right to take into account, when making such subsequent objection, the percentage increase or decrease in the Contract Price that any Change not objected to by the Supplier represents.

39.2.6 Upon receipt of the Change Proposal, the Purchaser and the Supplier shall mutually agree upon all matters contained in the Change Proposal. Within fourteen (14) days after such agreement, the Purchaser shall, if it intends to proceed with the Change, issue the Supplier a Change Order. If the Purchaser is unable to reach a decision within fourteen (14) days, it shall notify the Supplier with details of when the Supplier can expect a decision. If the Purchaser decides not to proceed with the Change for whatever reason, it shall, within the said period of fourteen (14) days, notify the Supplier accordingly. Under such circumstances, the Supplier shall be entitled to reimbursement of all costs reasonably incurred by it in the preparation of the Change Proposal, provided that these do not exceed the amount given by the Supplier in its Change Estimate Proposal submitted in accordance with GCC Clause 39.2.2.

39.2.7 If the Purchaser and the Supplier cannot reach agreement on the price for the Change, an equitable adjustment to the Time for Achieving Operational Acceptance, or any other matters identified in the Change Proposal, the Change will not be implemented. However, this provision does not limit the rights of either party under GCC Clause 6 (Settlement of Disputes).

39.3 Changes Originating from Supplier

If the Supplier proposes a Change pursuant to GCC Clause 39.1.2, the Supplier shall submit to the Project Manager a written "Application for Change Proposal," giving reasons for the proposed Change and including the information specified in GCC Clause 39.2.1. Upon receipt of the Application for Change Proposal, the parties shall follow the procedures outlined in GCC Clauses 39.2.6 and 39.2.7. However, should the Purchaser choose not to proceed or the Purchaser and the Supplier cannot come to agreement on the change during any validity period that the Supplier may specify in its Application for Change Proposal, the Supplier shall not be entitled to recover the costs of preparing the Application for Change Proposal, unless subject to an agreement between the Purchaser and the Supplier to the contrary.

39.4 Value engineering. The Supplier may prepare, at its own cost, a value engineering proposal at any time during the performance of the Contract. The value engineering proposal shall, at a minimum, include the following;

- (a) the proposed change(s), and a description of the difference to the existing Contract requirements;
- (b) a full cost/benefit analysis of the proposed change(s) including a description and estimate of costs (including life cycle costs) the Purchaser may incur in implementing the value engineering proposal; and

- (c) a description of any effect(s) of the change on performance/functionality.

The Purchaser may accept the value engineering proposal if the proposal demonstrates benefits that:

- (a) accelerates the delivery period; or
- (b) reduces the Contract Price or the life cycle costs to the Purchaser; or
- (c) improves the quality, efficiency, safety or sustainability of the systems; or
- (d) yields any other benefits to the Purchaser,

without compromising the necessary functions of the systems.

If the value engineering proposal is approved by the Purchaser and results in:

- (a) a reduction of the Contract Price; the amount to be paid to the Supplier shall be the percentage specified in the SCC of the reduction in the Contract Price; or
- (b) an increase in the Contract Price; but results in a reduction in life cycle costs due to any benefit described in (a) to (d) above,

the amount to be paid to the Supplier shall be the full increase in the Contract Price.

40. Extension of Time for Achieving Operational Acceptance

40.1 The time(s) for achieving Operational Acceptance specified in the Schedule of Implementation shall be extended if the Supplier is delayed or impeded in the performance of any of its obligations under the Contract by reason of any of the following:

- (a) any Change in the System as provided in GCC Clause 39 (Change in the Information System);
- (b) any occurrence of Force Majeure as provided in GCC Clause 38 (Force Majeure);
- (c) default of the Purchaser; or
- (d) any other matter specifically mentioned in the Contract;

by such period as shall be fair and reasonable in all the circumstances and as shall fairly reflect the delay or impediment sustained by the Supplier.

40.2 Except where otherwise specifically provided in the Contract, the Supplier shall submit to the Project Manager a notice of a claim for an extension of the time for achieving Operational Acceptance, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable after the

commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and supporting particulars of the claim, the Purchaser and the Supplier shall agree upon the period of such extension. In the event that the Supplier does not accept the Purchaser's estimate of a fair and reasonable time extension, the Supplier shall be entitled to refer the matter to the provisions for the Settlement of Disputes pursuant to GCC Clause 43.

40.3 The Supplier shall at all times use its reasonable efforts to minimize any delay in the performance of its obligations under the Contract.

41. Termination

41.1 Termination for Purchaser's Convenience

41.1.1 The Purchaser may at any time terminate the Contract for any reason by giving the Supplier a notice of termination that refers to this GCC Clause 41.1.

41.1.2 Upon receipt of the notice of termination under GCC Clause 41.1.1, the Supplier shall either as soon as reasonably practical or upon the date specified in the notice of termination

- (a) cease all further work, except for such work as the Purchaser may specify in the notice of termination for the sole purpose of protecting that part of the System already executed, or any work required to leave the site in a clean and safe condition;
- (b) terminate all subcontracts, except those to be assigned to the Purchaser pursuant to GCC Clause 41.1.2 (d) (ii) below;
- (c) remove all Supplier's Equipment from the site, repatriate the Supplier's Personnel from the site, remove from the site any wreckage, rubbish, and debris of any kind;
- (d) in addition, the Supplier, subject to the payment specified in GCC Clause 41.1.3, shall
 - (i) deliver to the Purchaser the parts of the System executed by the Supplier up to the date of termination;
 - (ii) to the extent legally possible, assign to the Purchaser all right, title, and benefit of the Supplier to the System, or Subsystem, as at the date of termination, and, as may be required by the Purchaser, in any subcontracts concluded between the Supplier and its Subcontractors;
 - (iii) deliver to the Purchaser all nonproprietary drawings, specifications, and other documents prepared by the

Supplier or its Subcontractors as of the date of termination in connection with the System.

41.1.3 In the event of termination of the Contract under GCC Clause 41.1.1, the Purchaser shall pay to the Supplier the following amounts:

- (a) the Contract Price, properly attributable to the parts of the System executed by the Supplier as of the date of termination;
- (b) the costs reasonably incurred by the Supplier in the removal of the Supplier's Equipment from the site and in the repatriation of the Supplier's Personnel;
- (c) any amount to be paid by the Supplier to its Subcontractors in connection with the termination of any subcontracts, including any cancellation charges;
- (d) costs incurred by the Supplier in protecting the System and leaving the site in a clean and safe condition pursuant to GCC Clause 41.1.2 (a); and
- (e) the cost of satisfying all other obligations, commitments, and claims that the Supplier may in good faith have undertaken with third parties in connection with the Contract and that are not covered by GCC Clauses 41.1.3 (a) through (d) above.

41.2 Termination for Supplier's Default

41.2.1 The Purchaser, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons therefore to the Supplier, referring to this GCC Clause 41.2:

- (a) if the Supplier becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, if the Supplier is a corporation, a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Supplier takes or suffers any other analogous action in consequence of debt;
- (b) if the Supplier assigns or transfers the Contract or any right or interest therein in violation of the provision of GCC Clause 42 (Assignment); or
- (c) if the Supplier, in the judgment of the Purchaser has engaged in Fraud and Corruption, as defined in paragraph 2.2 a. of the Appendix 1 to the GCC, in competing for or in executing the Contract, including but

not limited to willful misrepresentation of facts concerning ownership of Intellectual Property Rights in, or proper authorization and/or licenses from the owner to offer, the hardware, software, or materials provided under this Contract.

41.2.2 If the Supplier:

- (a) has abandoned or repudiated the Contract;
- (b) has without valid reason failed to commence work on the System promptly;
- (c) persistently fails to execute the Contract in accordance with the Contract or persistently neglects to carry out its obligations under the Contract without just cause;
- (d) refuses or is unable to provide sufficient Materials, Services, or labor to execute and complete the System in the manner specified in the Agreed Project Plan furnished under GCC Clause 19 at rates of progress that give reasonable assurance to the Purchaser that the Supplier can attain Operational Acceptance of the System by the Time for Achieving Operational Acceptance as extended;

then the Purchaser may, without prejudice to any other rights it may possess under the Contract, give a notice to the Supplier stating the nature of the default and requiring the Supplier to remedy the same. If the Supplier fails to remedy or to take steps to remedy the same within thirty (30) days of its receipt of such notice, then the Purchaser may terminate the Contract forthwith by giving a notice of termination to the Supplier that refers to this GCC Clause 41.2.

41.2.3 Upon receipt of the notice of termination under GCC Clauses 41.2.1 or 41.2.2, the Supplier shall, either immediately or upon such date as is specified in the notice of termination:

- (a) cease all further work, except for such work as the Purchaser may specify in the notice of termination for the sole purpose of protecting that part of the System already executed or any work required to leave the site in a clean and safe condition;
- (b) terminate all subcontracts, except those to be assigned to the Purchaser pursuant to GCC Clause 41.2.3 (d) below;
- (c) deliver to the Purchaser the parts of the System executed by the Supplier up to the date of termination;
- (d) to the extent legally possible, assign to the Purchaser all right, title and benefit of the Supplier to the System or Subsystems as at the date of termination, and, as may be

required by the Purchaser, in any subcontracts concluded between the Supplier and its Subcontractors;

- (e) deliver to the Purchaser all drawings, specifications, and other documents prepared by the Supplier or its Subcontractors as at the date of termination in connection with the System.

41.2.4 The Purchaser may enter upon the site, expel the Supplier, and complete the System itself or by employing any third party. Upon completion of the System or at such earlier date as the Purchaser thinks appropriate, the Purchaser shall give notice to the Supplier that such Supplier's Equipment will be returned to the Supplier at or near the site and shall return such Supplier's Equipment to the Supplier in accordance with such notice. The Supplier shall thereafter without delay and at its cost remove or arrange removal of the same from the site.

41.2.5 Subject to GCC Clause 41.2.6, the Supplier shall be entitled to be paid the Contract Price attributable to the portion of the System executed as at the date of termination and the costs, if any, incurred in protecting the System and in leaving the site in a clean and safe condition pursuant to GCC Clause 41.2.3 (a). Any sums due the Purchaser from the Supplier accruing prior to the date of termination shall be deducted from the amount to be paid to the Supplier under this Contract.

41.2.6 If the Purchaser completes the System, the cost of completing the System by the Purchaser shall be determined. If the sum that the Supplier is entitled to be paid, pursuant to GCC Clause 41.2.5, plus the reasonable costs incurred by the Purchaser in completing the System, exceeds the Contract Price, the Supplier shall be liable for such excess. If such excess is greater than the sums due the Supplier under GCC Clause 41.2.5, the Supplier shall pay the balance to the Purchaser, and if such excess is less than the sums due the Supplier under GCC Clause 41.2.5, the Purchaser shall pay the balance to the Supplier. The Purchaser and the Supplier shall agree, in writing, on the computation described above and the manner in which any sums shall be paid.

41.3 Termination by Supplier

41.3.1 If:

- (a) the Purchaser has failed to pay the Supplier any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause **pursuant to the SCC**, or commits a substantial breach of the Contract, the Supplier may give a notice to the Purchaser that requires payment of such sum, with interest on this sum as stipulated in GCC Clause 12.3,

requires approval of such invoice or supporting documents, or specifies the breach and requires the Purchaser to remedy the same, as the case may be. If the Purchaser fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such approval, fails to remedy the breach or take steps to remedy the breach within fourteen (14) days after receipt of the Supplier's notice; or

- (b) the Supplier is unable to carry out any of its obligations under the Contract for any reason attributable to the Purchaser, including but not limited to the Purchaser's failure to provide possession of or access to the site or other areas or failure to obtain any governmental permit necessary for the execution and/or completion of the System;

then the Supplier may give a notice to the Purchaser of such events, and if the Purchaser has failed to pay the outstanding sum, to approve the invoice or supporting documents, to give its reasons for withholding such approval, or to remedy the breach within twenty-eight (28) days of such notice, or if the Supplier is still unable to carry out any of its obligations under the Contract for any reason attributable to the Purchaser within twenty-eight (28) days of the said notice, the Supplier may by a further notice to the Purchaser referring to this GCC Clause 41.3.1, forthwith terminate the Contract.

41.3.2 The Supplier may terminate the Contract immediately by giving a notice to the Purchaser to that effect, referring to this GCC Clause 41.3.2, if the Purchaser becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, being a corporation, if a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Purchaser takes or suffers any other analogous action in consequence of debt.

41.3.3 If the Contract is terminated under GCC Clauses 41.3.1 or 41.3.2, then the Supplier shall immediately:

- (a) cease all further work, except for such work as may be necessary for the purpose of protecting that part of the System already executed, or any work required to leave the site in a clean and safe condition;
- (b) terminate all subcontracts, except those to be assigned to the Purchaser pursuant to Clause 41.3.3 (d) (ii);

- (c) remove all Supplier's Equipment from the site and repatriate the Supplier's Personnel from the site.
- (d) In addition, the Supplier, subject to the payment specified in GCC Clause 41.3.4, shall:
 - (i) deliver to the Purchaser the parts of the System executed by the Supplier up to the date of termination;
 - (ii) to the extent legally possible, assign to the Purchaser all right, title, and benefit of the Supplier to the System, or Subsystems, as of the date of termination, and, as may be required by the Purchaser, in any subcontracts concluded between the Supplier and its Subcontractors;
 - (iii) to the extent legally possible, deliver to the Purchaser all drawings, specifications, and other documents prepared by the Supplier or its Subcontractors as of the date of termination in connection with the System.

41.3.4 If the Contract is terminated under GCC Clauses 41.3.1 or 41.3.2, the Purchaser shall pay to the Supplier all payments specified in GCC Clause 41.1.3 and reasonable compensation for all loss, except for loss of profit, or damage sustained by the Supplier arising out of, in connection with, or in consequence of such termination.

41.3.5 Termination by the Supplier pursuant to this GCC Clause 41.3 is without prejudice to any other rights or remedies of the Supplier that may be exercised in lieu of or in addition to rights conferred by GCC Clause 41.3.

41.4 In this GCC Clause 41, the expression "portion of the System executed" shall include all work executed, Services provided, and all Information Technologies, or other Goods acquired (or subject to a legally binding obligation to purchase) by the Supplier and used or intended to be used for the purpose of the System, up to and including the date of termination.

41.5 In this GCC Clause 41, in calculating any monies due from the Purchaser to the Supplier, account shall be taken of any sum previously paid by the Purchaser to the Supplier under the Contract, including any advance payment paid **pursuant to the SCC**.

42. Assignment

42.1 Neither the Purchaser nor the Supplier shall, without the express prior written consent of the other, assign to any third party the Contract or any part thereof, or any right, benefit, obligation, or interest therein or thereunder, except that the Supplier shall be entitled to assign either absolutely or by way of charge any monies due and payable to it or that may become due and payable to it under the Contract.

I. SETTLEMENT OF DISPUTES

43. Settlement of Disputes

43.1 Adjudication

43.1.1 If any dispute of any kind whatsoever shall arise between the Purchaser and the Supplier in connection with or arising out of the Contract, including without prejudice to the generality of the foregoing, any question regarding its existence, validity, or termination, or the operation of the System (whether during the progress of implementation or after its achieving Operational Acceptance and whether before or after the termination, abandonment, or breach of the Contract), the parties shall seek to resolve any such dispute by mutual consultation. If the parties fail to resolve such a dispute by mutual consultation within fourteen (14) days after one party has notified the other in writing of the dispute, then, if the Contract Agreement in Appendix 2 includes and names an Adjudicator, the dispute shall, within another fourteen (14) days, be referred in writing by either party to the Adjudicator, with a copy to the other party. If there is no Adjudicator specified in the Contract Agreement, the mutual consultation period stated above shall last twenty-eight (28) days (instead of fourteen), upon expiry of which either party may move to the notification of arbitration pursuant to GCC Clause 43.2.1.

43.1.2 The Adjudicator shall give his or her decision in writing to both parties within twenty-eight (28) days of the dispute being referred to the Adjudicator. If the Adjudicator has done so, and no notice of intention to commence arbitration has been given by either the Purchaser or the Supplier within fifty-six (56) days of such reference, the decision shall become final and binding upon the Purchaser and the Supplier. Any decision that has become final and binding shall be implemented by the parties forthwith.

43.1.3 The Adjudicator shall be paid an hourly fee at the rate specified in the Contract Agreement plus reasonable expenditures incurred in the execution of duties as

Adjudicator, and these costs shall be divided equally between the Purchaser and the Supplier.

43.1.4 Should the Adjudicator resign or die, or should the Purchaser and the Supplier agree that the Adjudicator is not fulfilling his or her functions in accordance with the provisions of the Contract, a new Adjudicator shall be jointly appointed by the Purchaser and the Supplier. Failing agreement between the two within twenty-eight (28) days, the new Adjudicator shall be appointed at the request of either party by the Appointing Authority **specified in the SCC**, or, if no Appointing Authority is **specified in SCC**, the Contract shall, from this point onward and until the parties may otherwise agree on an Adjudicator or an Appointing Authority, be implemented as if there is no Adjudicator.

43.2 Arbitration

43.2.1 If

- (a) the Purchaser or the Supplier is dissatisfied with the Adjudicator's decision and acts before this decision has become final and binding pursuant to GCC Clause 43.1.2, or
- (b) the Adjudicator fails to give a decision within the allotted time from referral of the dispute pursuant to GCC Clause 43.1.2, and the Purchaser or the Supplier acts within the following fourteen (14) days, or
- (c) in the absence of an Adjudicator from the Contract Agreement, the mutual consultation pursuant to GCC Clause 43.1.1 expires without resolution of the dispute and the Purchaser or the Supplier acts within the following fourteen (14) days,

then either the Purchaser or the Supplier may act to give notice to the other party, with a copy for information to the Adjudicator in case an Adjudicator had been involved, of its intention to commence arbitration, as provided below, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given.

43.2.2 Any dispute in respect of which a notice of intention to commence arbitration has been given, in accordance with GCC Clause 43.2.1, shall be finally settled by arbitration. Arbitration may be commenced prior to or after Installation of the Information System.

43.2.3 Arbitration proceedings shall be conducted in accordance with the rules of procedure **specified in the SCC**.

43.3 Notwithstanding any reference to the Adjudicator or arbitration in this clause,

- (a) the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree;
- (b) the Purchaser shall pay the Supplier any monies due the Supplier.

Signatures of the Parties

FOR THE PURCHASER
PUBLIC INSTITUTION
“PUBLIC SERVICES AGENCY”
Signed by: **Sergiu MANIC**

Title: *Deputy Director*



FOR THE SUPPLIER
DATUM LLC
Signed by: **Jamal I. ISMAYILOV**

Title: *General Manager*



APPENDIX 1
to General Conditions of Contract No. MD-PSA-346761-GO-RFB
Fraud and Corruption
(Text in this Appendix shall not be modified)

1. Purpose

1.1 The Bank’s Anti-Corruption Guidelines and this annex apply with respect to procurement under Bank Investment Project Financing operations.

2. Requirements

2.1 The Bank requires that Borrowers (including beneficiaries of Bank financing); bidders (applicants/proposers), consultants, contractors and suppliers; any sub-contractors, sub-consultants, service providers or suppliers; any agents (whether declared or not); and any of their personnel, observe the highest standard of ethics during the procurement process, selection and contract execution of Bank-financed contracts, and refrain from Fraud and Corruption.

2.2 To this end, the Bank:

a. Defines, for the purposes of this provision, the terms set forth below as follows:

- i. “corrupt practice” is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
- ii. “fraudulent practice” is any act or omission, including misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain financial or other benefit or to avoid an obligation;
- iii. “collusive practice” is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;
- iv. “coercive practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
- v. “obstructive practice” is:
 - (a) deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive, or collusive practice; and/or threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or
 - (b) acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under paragraph 2.2 e. below.

b. Rejects a proposal for award if the Bank determines that the firm or individual recommended for award, any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/ or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;

c. In addition to the legal remedies set out in the relevant Legal Agreement, may take other appropriate actions, including declaring misprocurement, if the Bank determines at any time that

representatives of the Borrower or of a recipient of any part of the proceeds of the loan engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices during the procurement process, selection and/or execution of the contract in question, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur, including by failing to inform the Bank in a timely manner at the time they knew of the practices;

- d. Pursuant to the Bank's Anti-Corruption Guidelines, and in accordance with the Bank's prevailing sanctions policies and procedures, may sanction a firm or individual, either indefinitely or for a stated period of time, including by publicly declaring such firm or individual ineligible (i) to be awarded or otherwise benefit from a Bank-financed contract, financially or in any other manner;¹ (ii) to be a nominated² sub-contractor, consultant, manufacturer or supplier, or service provider of an otherwise eligible firm being awarded a Bank-financed contract; and (iii) to receive the proceeds of any loan made by the Bank or otherwise to participate further in the preparation or implementation of any Bank-financed project;
- e. Requires that a clause be included in bidding/request for proposals documents and in contracts financed by a Bank loan, requiring (i) bidders (applicants/proposers), consultants, contractors, and suppliers, and their sub-contractors, sub-consultants, service providers, suppliers, agents personnel, permit the Bank to inspect³ all accounts, records and other documents relating to the procurement process, selection and/or contract execution, and to have them audited by auditors appointed by the Bank.

Signatures of the Parties

FOR THE PURCHASER

PUBLIC INSTITUTION

"PUBLIC SERVICES AGENCY"

Signed by: **Sergiu MANIC**

Title: **Deputy Director**

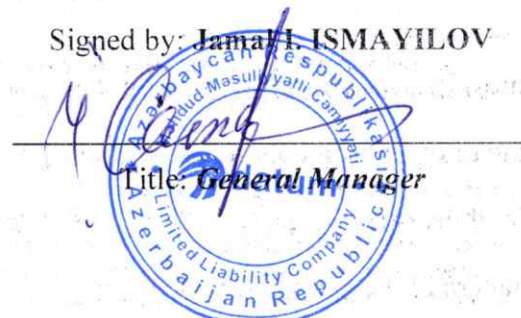


FOR THE SUPPLIER

DATUM LLC

Signed by: **Jamal ISMAYILOV**

Title: **General Manager**



¹ For the avoidance of doubt, a sanctioned party's ineligibility to be awarded a contract shall include, without limitation, (i) applying for pre-qualification, expressing interest in a consultancy, and bidding, either directly or as a nominated sub-contractor, nominated consultant, nominated manufacturer or supplier, or nominated service provider, in respect of such contract, and (ii) entering into an addendum or amendment introducing a material modification to any existing contract.

² A nominated sub-contractor, nominated consultant, nominated manufacturer or supplier, or nominated service provider (different names are used depending on the particular bidding document) is one which has been: (i) included by the bidder in its pre-qualification application or bid because it brings specific and critical experience and know-how that allow the bidder to meet the qualification requirements for the particular bid; or (ii) appointed by the Borrower.

³ Inspections in this context usually are investigative (i.e., forensic) in nature. They involve fact-finding activities undertaken by the Bank or persons appointed by the Bank to address specific matters related to investigations/audits, such as evaluating the veracity of an allegation of possible Fraud and Corruption, through the appropriate mechanisms. Such activity includes but is not limited to: accessing and examining a firm's or individual's financial records and information, and making copies thereof as relevant; accessing and examining any other documents, data and information (whether in hard copy or electronic format) deemed relevant for the investigation/audit, and making copies thereof as relevant; interviewing staff and other relevant individuals; performing physical inspections and site visits; and obtaining third party verification of information.

APPENDIX 2
to General Conditions of Contract No. MD-PSA-346761-GO-RFB

**Sexual Exploitation and Abuse (SEA) and/or Sexual Harassment (SH)
Performance Declaration for Subcontractors**

Subcontractor's Name: *GEOLAB Bilgi Teknolojileri Limited Şirketi*

Date: *14, August, 2023*

Contract reference *MD-PSA-346761-GO-RFB*

SEA and/or SH Declaration
We: x (a) have not been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations. <input type="checkbox"/> (b) are subject to disqualification by the Bank for non-compliance with SEA/ SH obligations. <input type="checkbox"/> (c) had been subject to disqualification by the Bank for non-compliance with SEA/ SH obligations, and were removed from the disqualification list. An arbitral award on the disqualification case has been made in our favor.
<i>[If (c) above is applicable, attach evidence of an arbitral award reversing the findings on the issues underlying the disqualification.]</i>
Period of disqualification: From: _____ To: _____

Name of the Subcontractor **GEOLAB Bilgi Teknolojileri Limited Şirketi**

Name of the person duly authorized to sign on behalf of the Subcontractor **Yener Türkmenoğlu**

Title of the person signing on behalf of the Subcontractor **General Manager**

Signature of the person named above _____

Date signed **14 day of August 2023**

Countersignature of authorized representative of the Supplier:

Signature: _____

Date signed 14 day of August 2023

**TECHNICAL REQUIREMENTS (INCLUDING IMPLEMENTATION
SCHEDULE)**

TO CONTRACT No. MD-PSA-346761-GO-RFB

**(INCLUDING TECHNICAL REQUIREMENTS, IMPLEMENTATION SCHEDULE, SYSTEM
INVENTORY TABLES, BACKGROUND AND INFORMATIONAL MATERIALS)**

REQUIREMENTS FOR STATE REGISTER OF OBJECTS OF TECHNICAL-CONSTRUCTIONS INFRASTRUCTURE (ROITE) INFORMATION SYSTEM

(INCLUDING TECHNICAL REQUIREMENTS, IMPLEMENTATION SCHEDULE, SYSTEM
INVENTORY TABLES, BACKGROUND AND INFORMATIONAL MATERIALS)

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A. ACRONYMS USED IN THE TECHNICAL REQUIREMENTS

0.1 Acronym Table

Term	Explanation
ALRC /AFRC	Agency for Land Relations and Cadastre of the Republic of Moldova
API	Application Programming Interface
BPR	Business Process Engineering
CMF	PSA's (Regional) Multi-functional Centre
CMS	Content Management System
CRS	Coordinate Reference System
CSW	Catalogue Service for the Web
DB	Database
DBMS	Database Management System
DCAT	Data Catalogue Vocabulary
GIS	Geographic Information System
GML	Geography Markup Language
GPS	Global Positioning System
HTTPS	Hyper Text Transfer Protocol Secure
HW	Hardware
IaaS	Infrastructure as a Service
IDB	Information Data Base
INDS	Infrastructura Națională de Date Spațiale
INSPIRE	INfrastructure for SPatial InfoRmation In Europe
ISO	International Standards Organization
JSON	Java Script Object Notation
LADM	Land Administration Domain Model
LAN	Local Area Network
LDAP	Lightweight Directory Access Protocol
LPA	Local Public Authority
M-Cloud	Infrastructure as a Service set up by Government of Moldova
M, O, P	Mandatory, Optional, Preferable
NSDI	National Spatial Data Infrastructure
SAML	Security Assertion Markup Language

OGC	Open Geospatial Consortium
OS	Operating System
OTS	Off The Shelf
OWASP	Open Web Application Security Project
PDSE	Platform for Development of Electronic Services (E-gov.)
PPR	Project Progress Report
PSA	Public Service Agency
PWA	Progressive Web App
RAID	Redundant array of inexpensive disks
RAM	Random access memory
RDF	Resource Description Framework
REST	Representational State Transfer
RIA	Rich Internet Application
ROITE	State Register of Objects of Technical-Constructions Infrastructure
QA	Quality Assurance
SDI	Spatial Data Infrastructure

RWD	Responsive Web Design
SAAS	Software As A Service
SDI	Spatial Data Infrastructure
SEO	Search Engine Optimization
SOA	Service Oriented Architecture
SOAP	Simple Object Access Protocol
SSO	Single Sign On
SW	Software
TLS	Transport Layer Security
TCP/IP	Transmission Control Protocol / Internet Protocol
ToT	Training of Trainers
UI	User Interface
UMC	Universal Map Component
W3C	World Wide Web Consortium
WAN	Wide Area Network
WFS	Web Feature Service
WMS	Web Map Service
WMTS	Web Map Tile Service
WPS	Web Processing Service
WYSIWYG	What You See Is What You Get
XML	Extensible Markup Language

B. FUNCTIONAL, ARCHITECTURAL AND PERFORMANCE REQUIREMENTS

1. Introduction

1.1 Objective

The main objective of this document is to describe detailed technical requirements for developing the automated information system “Register of Urban Technical Infrastructure Facilities” (ROITE).

The detailed technical requirements described in this system will have to be reviewed and minor changes could be necessary during project analysis phase in order to incorporate any changes derived from the amending of the legislative and normative frameworks to support the “Register of urban technical infrastructure facilities”.

1.2 The concept of ROITE

The concept of the automated information system ”Registry of Technical and Utility Infrastructure Facilities” has been approved Governmental Decision (see Resolution No. 133 from 24.02.2014).

AIS ROITE is a component of the National Geographic Information System and is the official source of information on technical and utility infrastructure facilities, the structural elements of technical and utility infrastructure facilities, the ownership and other real rights, the areas of protection of technical and utility infrastructure facilities, as well as the existing restrictions in the use of land included in the protection zone.

AIS ROITE aims to ensure building of information resources of ROITE and to provide information on technical and utility infrastructure facilities, the ownership and other real rights thereto.

AIS ROITE is designed to provide identification of facilities and elements of technical and utility infrastructure as physical objects, which is the object of registration for departmental and interdepartmental information systems.

1.3 National Legislation and Norms

The main law on which the ROITE is defined is the **Law no. 150/2017** regarding ROITE, which provides for the creation of ROITE is created for the purpose of collecting, accumulating, processing, systematizing, keeping, using and providing data regarding technical-constructions infrastructure objects, the rights over them, their protection areas, as well as the restrictions related to the protection zones

According to **Art. (4)** of the Law, the subjects of the registration are their owners and other holders of patrimonial rights over them, and the objects of the registration are the technical-building infrastructure objects, namely:

- 1) the objects of transport infrastructure, namely:
 - a) roads;
 - b) railways;
 - c) constructions, other than buildings, installations and equipment located on the land (water) surface of the aerodrome (airport);

- d) the constructions, other than the buildings, installations and equipment located on the territory and in the waters of the seaport;
- 2) energy infrastructure objects:
 - a) electrical networks;
 - b) natural gas networks;
- 3) the objects of public communal household systems:
 - a) drinking water supply systems;
 - b) sewerage networks;
 - c) thermal energy networks;
 - d) lighting networks;
 - e) traffic light networks;
 - f) electric transport networks;
 - g) waste management systems;
- 4) electronic communications networks;
- 5) the objects of pipeline transportation (the pipeline, other constructions and installations that are part of the respective objects), the objects for storing and marketing petroleum products, irrigation systems, drying systems.

The **Art. 5** establishes the subjects of legal relations regarding ROITE:

1. The owner of the Register is the State;
2. The owner of the Register is the Land Relations and Cadaster Agency;
3. The holder of the Register is the Public Services Agency. Register Holder:
 - a) manages the automated information system "Register of technical-constructions infrastructure objects";
 - b) appoints persons responsible for the registration of technical-constructions infrastructure objects and the rights over them;
 - c) accumulates, systematizes and preserves the information regarding the technical-constructions infrastructure objects and the rights over them;
 - d) organizes the provision of information from the database, establishes the structure and way of their provision;
 - e) ensures the security of data storage and transfer of data through the network.
4. The right to register the technical-constructions infrastructure object and the rights over it is held by the registrar of the Register within the Public Services Agency.
5. Data provider for the Register is a natural person or a legal person under private law or under public law who submits to the Register holder the documents that serve as the basis for the registration of the technical-constructions infrastructure object and the rights over it.
6. Recipients of data from the Register are public authorities, individuals and legal entities.

The register must contain entries related to the technical-building infrastructure objects, the rights over them, the rights holders and the documents confirming the respective rights, the structural elements of the objects in question and their protection areas. The concrete content of attributive data necessary for the description of the technical-constructions infrastructure object and its structural elements in the Register is established by a **regulation approved by the Government**. The draft normative act is developed by the PSA and will be promoted for approval after consultation with the ROITE Supplier.

According to **Art. 8** of the law the method of maintenance of the Register **is established by the Government**, is developed by the PSA and will be promoted for approval after consultation with the ROITE Supplier.

Article 9 establishes the exchange of data between the registers. Thus, SIA ROITE will use data from state registers and specialized cadasters. The automatic exchange of data between the information system of the Register and other state information resources and services is ensured free of charge through the interoperability platform established by the Government (MCloud).

Article 10 sets out the ROITE documents. The Register contains the following documents:

- a) the documents that serve as the basis for the registration of the technical-constructions infrastructure object;
- b) the documents that serve as the basis for the registration of rights over the real estate property;
- c) the documents that serve as the basis for the registration of restrictions related to the protection zone of the technical-constructions infrastructure object;
- d) the digital plan of the technical-constructions infrastructure object;
- e) technological documents.

If the holders of rights over the technical-building infrastructure networks hold the data on paper, the documents that serve as the basis for the registration of the technical-building infrastructure object are drawn up by the rights holder over the technical-building infrastructure object or to certified cadastral engineers or surveyors. The content and the way of drawing up the documents that serve as the basis for the registration of the technical-building infrastructure object are established by the Government. The draft Regulation is being developed and will be promoted for approval after consultation with the ROITE Supplier.

The law nominates the documents that serve as the basis for the registration of rights over immovable property:

- a) administrative documents issued by the public authorities empowered in the way established by the legislation;
- b) court decisions;
- c) other documents regarding the birth or transmission of rights over technical-constructions infrastructure objects, issued according to the legislation in force on the date of birth or transmission of rights concerned.

The restrictions related to the protection zone of the technical-constructions infrastructure object are registered under the Law or the normative act that establishes them.

The Register documents and other documents required for registration are kept in the digital archive of the Public Services Agency in digital format or in scanned copies, their authenticity being confirmed by the electronic signature of the registrar or the person who made the copies.

The registration of the technical-constructions infrastructure object and the rights over it is confirmed by an extract from the Register (**Art. 12**).

The law establishes that the information in the Register is public. Any person has the right to request information about the cadastral plan of the technical-constructions infrastructure object and the rights over the respective property registered in the Register, with the exception of data that constitute state

secrets. For this, ROITE needs to be authorized and protected in accordance with the provisions of the Regulation on ensuring the secret regime, approved by **GD. No. 1176/2010**. At the commissioning stage of ROITE, Information and Security Service will be requested to assess its compliance with the approved "Specific Security Requirements".

Access for visualizing and searching the information in the Register is available to the public free of charge. The supply of information by downloading and transformation services of the Register is performed for a fee. For public authorities, the services for visualizing, searching and downloading information from the Register are free.

The tariffs for the provision of registration and data provision services are established by the Government.

Further are number of laws and regulations available in Moldova regarding the Cadastre of Technical-Building Infrastructure Objects, which allow the PSA to carry out its activity according to a secure legal framework:

- The Law on National Spatial Data Infrastructure No. 254 from 2016 that represents the transposition of the INSPIRE Directive into the legislative framework. The Law on National Spatial Data Infrastructure determines the coordinating body, the advisory body, who are the obligors of the Law and what are their obligations, to which spatial data does it refer and which is the national geoportal. **Special attention is paid to interoperability**, and the services necessary for it and metadata and the obligation to create the same as deadlines. According to Law No. 254, public entities are responsible for the full content, quality and availability of spatial data, network services and metadata. Further for these topics the following laws are applicable;
- Law No. LP599/1999 of 30.09.1999 for the approval of the Commercial Maritime Navigation Code of the Republic of Moldova;
- Law No. 309 of 17-07-2003 Railway Transport Code;
- Law No. 301 of 21-12-2017 Aviation Code of the Republic of Moldova;
- Law No. LP509/1995 of 22.06.1995 Roads;
- Law No. LP592/1995 of 26.09.1995 regarding transport through main pipelines;
- Law No. LP272/1999 of 10.02.1999 on drinking water; the real estate cadastre;
- Law No. LP241/2007 of 15.11.2007 regarding electronic communications;
- Law No. LP461/2001 of 30.07.2001 regarding the oil products market;
- Law No. LP1402/2002 of 24.10.2002 community household public services;
- Law No. 835-XIII of 17.05.96 on the principles of urban planning and territorial development;
- Law No. 1402 of 24.10.2002 community household public services;
- Law No. 467 of 21.11.2003 regarding computerization and state information resources;
- Law No. 436 of 28.12.2006 on local public administration;
- Law No. 142 of 02.07.2010 regarding energy efficiency;
- Law No. 124 of 23.12.2009 regarding electricity;
- Law No. 123 of 23.12.2009 regarding natural gas and other legislative acts of reference;
- Law No. 303 of 13.12.2013 regarding the public service of water supply and sewage
- Law No. 1543 of 25.02.1998 on the real estate cadastre
- Law No. 150/2017 regarding the public utilities Register
- Law 163 of 09.07.2010 is the legislative act which regulated the country-PLA construction and demolition procedure of all buildings and the procedure for providing information of urban

planning documentation. The conform Art. 2 by the local authority planning certificate informs recipients all planning documentation and according NCM_B.01.02 protection zones are part of the planning documents and information about them to be generated by the information system owned by the public authority local under its jurisdiction;

- Law 835 of 17.05.1996 is the basic law governing urban plans and their documentation, planning management procedures, operations planning and landscaping, regulations on functional urban cadastre.
- Government Resolution no. 1300 of 27.11.2001, pt. 1.4 establishes the Ministry of Regional Development and Construction as a national public authority responsible for creating functional cadastre and locally - local authorities. Pct. 3.5 establishes content cadastre of urban networks;
- Government Resolution 285 of 05.23.1896 on approval of the reception building and related facilities, regulate the operation of all building commissioning including construction of infrastructure and technical infrastructure;
- NCM_B.01.02 - is the norm in construction approved for Moldova which establishes the methodology for drafting and approval of the urban planning and content.
- RT 38370656-002:2006 “Software lifecycle processes”;
- GOVERNMENT DECISION No. 738/2017 on approval of Regulation with regard to norms for creating and updating metadata for spatial data sets and services.
- GOVERNMENT DECISION no. 737/2017 on approval of Regulation with regard to norms for creating network services and deadline for their implementation
- GOVERNMENT DECISION no. 683 on approval of Regulation with regard to norms of application which set the technical modalities for interoperability and harmonisation of spatial data sets and services.
- The Discovery Services shall fully comply with INSPIRE “Technical Guidance for the implementation of INSPIRE Discovery Services version 3.1”. All four services operations shall be implemented:
 - Get Discovery Service Metadata
 - Discover Metadata
 - Publish Metadata
 - Link Discovery service.

1.4 The current developments/updating of the legal framework

In order to obtain a fully operational system, some premises were created based on the situation and the legal and technical normative framework existing at the moment in the Republic of Moldova. These premises are prerequisites for a proper implementation of the system, and the absence of any of them should mean re-examination of the whole concept and validation of the feasibility of implementation under the conditions described in this document.

Thus, it is necessary to modify and complete the normative acts regarding the mandatory registration of public utilities, the development of the normative acts regarding the registration procedures provided by **Law 150/2017**.

The system, including the procedures, has been designed based on the presumption of meeting the premises listed in the following paragraphs:

- 1) Amending the legislation in the field so that it will stipulate that the public utilities are subject to state registration in the Public Utilities Register;

- 2) Development of the Regulation regarding the content and method of drawing up the documents that serve as basis for the registration of public utilities (Art. 10 paragraph (3) of Law 150/2017);
- 3) Development of the Regulation on how to keep the Public Utilities Register (Art. 8 of Law 150/2017);
- 4) Development of the document regarding the concrete content of attribute data necessary for the description of the engineering network and its structural elements in the Register (Art. 7 para. (3) of Law 150/2017);
- 5) Development of the registration plan of the public utilities (Art. 21 para. (3) letter d) of Law 150/2017);
- 6) Development of the guide on how to prepare digital cadastral documentation for the registration of public utilities networks;
- 7) Approval of tariffs for the provision of registration and data provision services by the Government (Art. 16 para. (3) of Law 150/2017).

2. Business Function Requirements to be met by the State Utility Infra Networks ROITE Register

2.1. Background information

Any state and its Public Authority are busy with the sustainable development of its territory, including the urban and rural land areas. However, the proper urban planning cannot be achieved without the proper information about existing or planned technical infrastructure facilities above and under the ground, and at this moment in Moldova there is a lack of this information at one place of the administration level, it is only partially kept by utilities companies administering public services.

However, the situation in the Utility/Infrastructure Sector related to the needs of information system ROITE can be summarized as follows.

Regarding the data – There are huge differences:

- regarding how of the data on networks is collected/registered (digital/paper/none),
- coverage of own registration (it could be 100%, 30% or 0%),
- various geo-referenced precision of recorded network (tens of centimetres, meters or unknown),
- various status of records/maintenance (up-to-date, or partly updated or completely outdated).

ICT organization and ICT systems

- Some network Operators have this very well organized (e.g., 70 Fte in IT Dept.), sometimes only the first nucleus of IT organization, or none (0 or max. 2fte) are in place.
- There are variety of ICT systems in use (if any), e.g.: very professional ones (Intergraph, ESRI), Open Source (QGIS), but there are also some Operators that do not have any network registration system in place;
- In these cases, the available digital data on the networks, especially regarding the new projects, might be received by the Utility Operator from the contracting engineering company and recorded/stored on the floppy or memory stick, but not stored/downloaded to any IT system
- Variety of digital data formats/standards/etc. is used.

- Till now there is no any example of utility network digital data sharing processes between the utility companies and/or external organization(s).

Challenges

- Many network operators missing a lot of data about their networks, sometimes even these data are not recorded on paper,
- Some Operators is lacking the human and financial resources for ICT systems and for Digital transformation,
- If they have started digital transformation, then they have often huge backlog in digitizing of own networks; But there are few that at least a part of their networks quickly can be presented on-line and registered in the State Utility Register.

Conclusions

- It became clear that situation by the Utility operators is not homogeneous, not standardized and vary per organization. However, practically all Utility Stakeholders have confirmed their interest to participate in the ROITE Utility Cadastre Project and related to its Pilot.
- ROITE is the system that will have to manage and maintain this information, which according to the approved Gov. Resolution on Creation of the Automated Information System “Registry of Technical and Utility Infrastructure Facilities” No. 133 of 24.02.2014, and must have the following functions:
 - ensuring a single methodological base for registration of technical and utility infrastructure facilities and of the rights thereon;
 - creating a system for protecting the holders of rights on technical and utility infrastructure facilities;
 - creating specialized cadasters of technical and utility infrastructure facilities according to single standards;
 - creating a single (consolidated) data base on technical and utility infrastructure facilities and of the rights thereon;
 - creating an open system to inform the real estate market about technical and utility infrastructure facilities and the existing restrictions concerning the use of land included in the facilities’ protection zone;
 - organizing a data base for planning and arranging the land and a basis for the proper functioning of technical and utility infrastructure.

2.2 Overall Objectives of Utility Networks Register

The overall objective of establishing of **ROITE system** and within the **Technical-Constructions Infrastructure Objects Register** is to have a unique Registration of the Utility Infra data/owners/operators of infrastructure assets and their rights related to the infrastructural objects in one State Register, as being essential data for the ownership transfer, leasing, mortgage requests, etc. and any other aspects of economic and social situation in Moldova.

Then in the long-term the goal is also to decrease significantly the damages in the utility networks during the ground and any others excavators’ works and then minimizing the emergency situations (e.g. explosions in the gas network, cutting of heating, electricity, internet, etc.), providing to the interested parties the necessary geo en attribute data on Utility Infra networks before they start to perform any engineering ground activities.

2.3. Specific Objectives of ROITE system as basis for Utility Networks Register

The specific objectives of establishing of ROITE system in Moldova is twofold:

- Homogenies and standardized data capture (geo-referenced location and descriptive attributes) of **Technical-Constructions Infrastructure Objects** (called shortly **Utility Infra**) in order to assure their unique identification and registration in the State ROITE Register Information incl. the rights over them, the rights holders and the documents confirming the respective rights, the structural elements of the objects concerned and their protection areas, conform above-mentioned **Law no. 150/2017**.
- Then continues updating of this data set for the whole territory of Moldova, and 24/7 presentation/publishing/availability of these Utility Infra networks on-line via e-Cadastre, conform above-mentioned Law no. 150/2017 and via national **NSDI Geoportal** for all interested parties, conform the **Law no.254 /2016**.

2.4 ROITE Stakeholders

Three main Stakeholders will be involved in this system: The **Infrastructure Utility/Facility owners/Operators** (mainly utility companies, but it could be also the citizens or other legal entities), the **Public Services Agency (PSA)** and the **Local Public Authorities** (also known as LPA).



ROITE in the middle of PSA, LPA and Facility/Utility Operators/Owners

These stakeholders have different needs, some of them overlapping or not with the ones from the others, but ROITE will support all of them and provide the following:

- **Infrastructure Utility/Facility Owners/Operators:** by assuring easy access to the data and information of any other Operator infrastructure e.g. active in the same area (essential for

designing, implementing of any new Infra projects and maintaining the existing one), leading to minimizing of unwishful damages in their networks during the excavators activities, the due the registration in the State Utility Register of their Objects and Rights increasing their legal security of the ownership for their assets

- **Public Authorities:** conform legal background locally responsible for utility data set often used to during urban planning and management, decreasing the development costs and development durations
- **Public Services Agency:** having as State organization the lead in a standard data availability 24/7 for interested parties and registration of infrastructure the objects according to existing legal requirements.

Utility/Infra Operators

These Operators are companies (public or private) that administers or manages a public service making use of technical urban infrastructure facilities. and managing network infrastructure, providing services and products (e.g. gas, electricity, etc.) to the End-users (citizens or companies).

Business processes of these companies heavily depend on their own registry of infrastructures, which is usually used to optimize their operational costs related to maintenance of their networks.

In Moldova we can distinguish the following types of Operators:

- Water and Sewer Networks
- Electrical Networks
- Gas Networks
- Heat Networks
- Road Networks
- Rail Networks
- Transport facilities (port/harbour, airport)
- Electronic communication networks
- Waste Management

Public Administration

Central Public Administration (CPA) becomes a key stakeholder when talking about Technical Infrastructure Facilities since different ministries manage different types of infrastructure:

- Ministerul Infrastructurii și Dezvoltării Regionale manages the energy infrastructure (gas, electricity); transport infrastructure (roads, railways, airports, ports);

Ministry of Environment - water infrastructure (water and sanitation, irrigation and drainage systems, hydraulic structures, waste management) ;

- Public Services Agency (PSA) - State Register of the Territorial Administrative Units and lists of Moldova, Register of urban and technical infrastructure facilities;
- National Regulatory Agency for Electronic Communications and Information Technology– electronic communications infrastructure.

It is important to highlight that these ministries have the competences to manage some public infrastructures, but they are not providing any “cadastre” services to third parties, since it is not their

competence. Therefore, in general, the relation of CPA to ROITE is like any other administrator, which owns or manages a certain infrastructure or service.

Some entities in/or under the CPA, like Public Services Agency or ALRC, have a special role by ROITE therefore they are briefly highlighted as separate Stakeholder.

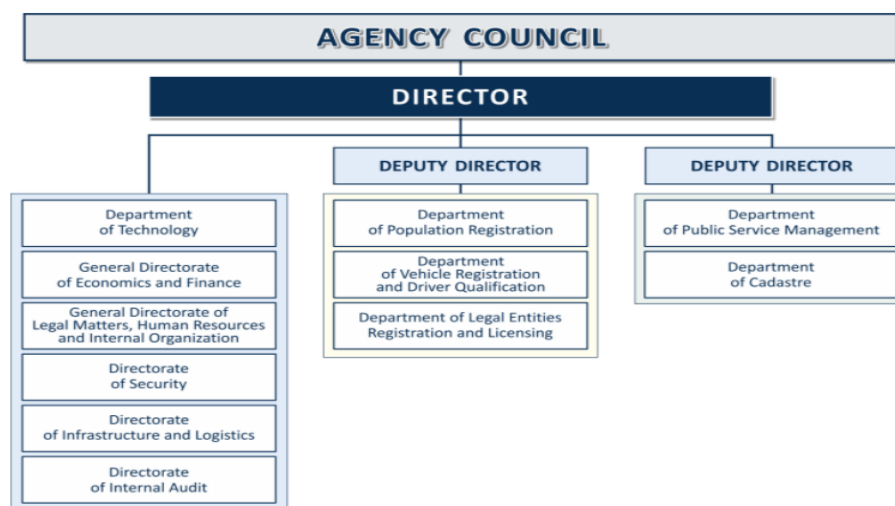
ALRC

The **ALRC** is responsible for the development and implementation of the State policy on surveying, mapping and cadastre. Then the ALRC Agency is responsible also for the development of the National Geographic Information System (NGIS) and the National Spatial Data Infrastructure (NSDI) including **NSDI Geoport**.

Public Services Agency (PSA) – The Purchaser

Public Services Agency (PSA) manages, at a national level, the cadastre and registry, until now of real estate properties (land and buildings), but also is doing all necessary preparation to host and to manage the Utility/Technical infrastructure Cadaster/Register.

According to the mission and vision of Public Services Agency the Cadastre is a unitary, compulsory and systematic inventory of all the real estate of the country in terms of quantity, quality and legal, no matter in whose possession the property is located, and representation on cadastral plans and cadastral documents.



Internal structure of Public Services Agency (from its website)

The PSA organization through its subsidiaries provides a range of services for registration of immovable property (buildings and land, apartments, other spaces isolated portions of the basement, separate water bodies), rights instruments, facts or related legal reports.

Simultaneously with the registration of rights to immovable property PSA through its subsidiaries provides information of Cadastre data to individuals and businesses.

Within Public Services Agency there are 3 main Registers:

- Real Estate Registry
- State Register of territorial administrative units and streets of localities in Moldova
- Technical Infrastructure/Utility Registry (to be developed under this assignment)

The registration of technical infrastructure facilities, which is to be kept, according to the Law No. 150/2017, by the Public Services Agency, as established by the Government, must come to complement the real state registry and provide mechanisms to support new business processes arising from this new registry.

Public Authorities and Municipalities

The Law on Public Administration defines local public administration as a totality of Local Public Authorities (LPA) created within the law to meet general needs of the residents of a certain territorial administrative unit.

The provision of urban and territorial planning (see Law No.835-XIII of 17.05.96 and Law No. 436 of 28.12.2006) is one of the primary tasks of local public authorities. So, it is at the local level that urban planning and project coordination, including the authorizing the execution of construction/excavators works (Law nr. 163 din 09.07. 2010) with different utility companies must be done.

Thus, LPA's are responsible for meeting key Public Service delivery needs, including a primary responsibility for urban and rural functions based on Utility/Technical infrastructure facilities, such as water supply, electricity, central heating, etc. and the local road construction and maintenance (Gov. Decision nr. 458/2017).

Furthermore, LPA's play an important role in Utility/Technical infra facilities management due close relation with service Operators and their responsibility for citizens.

In this sense the ROITE system need to support LPAs' in the implementing their responsibilities regarding the technical infrastructure facilities.

From this point of view, LPA's will basically:

- Provide data about the assets (technical infrastructure facilities) owned or administered by them (if any available),
- Will get access to the data/information of all the registered assets in their territory or any other part of Moldova,
- Notify the beneficiary on requirements on the use of land as described in ROITE according to registered objects and restrictions.

3. Overall description of the ROITE as State Utility Register

3.1 Business Rationale and Strategy

The main target of the ROITE system is to register Operators/Owners Utility Infra networks in the **State Register of Technical-Constructions Infrastructure Objects**, and as part of Open Data policy, to provide to all stakeholders and the broad Public with a single access point data on the Utility infrastructure information in the Republic of Moldova incl. Metadata.

In other words, the Register and access via appropriate Portal to the Utility infra data shall be a gate into searching and viewing spatial and attributive data from various Operators in this sector of the Republic of Moldova, clearly showing which data and services are available and where, and making them available to the interested entities and allowing to download/received the graphical and attribute data to the entitled and allowed to access them parties.

The main targets are to:

- Establishing of State Utility Cadaster **Register of Technical-Constructions Infrastructure Objects** in a relational Database, wherein the graphical data accompanied by the attribute and legal data on **the Objects** (e.g. specific infrastructure network with its structure and attributes) incl. Protection Zones, and **the Subjects** (Operator of the infrastructure) and related between Subject and Object **Right(s)** will be registered and keep updated.
- Make the Utility networks incl. related to it metadata available for searching and viewing.
- Provide discovery services to external systems (like **NSDI Geoportal** of ALRC in Moldova)
- Provide stakeholders with an application to manage and update the data and metadata.
- Utilising the existing at PSA IT systems (like e-Cadastre) establishing the E-services via E-Cadastre Portal/Website and collaboration page for visibility of Utility networks and data collection (download).

The adopted business strategy prescribes a distributed solution. In general, the infrastructure data shall be stored, maintained and managed by the responsible Network Operators and the extract from their Databases (Open data) needs to be stored in the front-end Information databases available on-line in real time (24/7) to the Users via the Web-Services (to be established by the ROITE Supplier) and any to be defined with Utility Operator applications. The roles and responsibilities of different agencies are described in the Moldovan law 254/2016, article 10:

https://www.legis.md/cautare/getResults?doc_id=101889&lang=ro.

Because of this policy, the major Open Data for the Public and related to its services shall be stored and managed by the custodians, meaning that any NSDI Geoportal shall not include among its functionalities the copying of the Operators network data and provision of services centrally. The exception to this rule, will be a case when the Operator will apply at PSA for the Registration within ROITE System of its specific assets (**Technical-Constructions Infrastructure Objects**).

If a Utility Operator will not have any own digital system to store and maintain its network data, but will have only some data on its Utility Infra network on external memory carriers (floppies, memory sticks, etc.) from previously performed projects, this Utility data with the necessary official request for Registration needs to be submitted at any local PSA office. This digital data usually comes from the Operator's Contractors that have executed various Utility Infra projects for the Operator.

3.2 Concept of ROITE System

3.2.1. Introduction

In principle it is required for ROITE system to develop and implement a system that will follow defined above in *Chapter 3.1 Business Rationale and Strategy*, wherein a number of existing PSA IT systems and governmental IT platform will be used.

As mentioned above, the main task of ROITE is to assure and facilitate efficiently the **Registration of the Technical-Constructions Infrastructure Objects (Utilities Infra Networks/Facilities** (incl. Object/owner/operator identification and ownership/usage rights) in the State Utility Register ROITE (comparable to classic Property Registration Register).

This should lead to the unique legal Registration of available utility networks/assets (*Objects*) in the Public State Register, including the related to its owner/operator (*Subject*), then also the rights and obligations (*Right*), incl. the responsibilities /limitation/etc., and assuring registration of the changes (history).

But also, ROITE must have conform **the INSPIRE Directive transposed in national LAW nr.254/2016 on NSDI** a function that enables **to find and to view and to download the digital information of Utility Infra in Moldova, as available digitally by the various Utility Operators** (where they are, what they represent and who is operating it, incl. complete Metadata) based on the geo-referenced data (GIS maps). All this should be realized via the Web-Services.

The required ROITE system dealing mainly with the infrastructure data, needs to be interoperable with other governmental systems, incl. communication and data sharing between PSA ROITE and the NSDI Geoportal..

Conform INSPIRE Directive transposed in national LAW nr.254/2016 on NSDI the open data should be accessible via Web-Services to any person/subject (physical or legal one) who has any interest for it. However, in Moldova, as similarly applied also in other countries, before getting access to view/download any utility data, the interested person/party needs to identify itself in ROITE system.

Then the main goal of this very useful Web-Service functionality is providing the utility infra network information on-line, incl. Metadata 24/7, in order to prevent of unwishful excavators' accidents and damages as often occur to the utility infra networks (especially by machinery underground works (digging)). The ROITE system must guarantee an easy way of providing of the utility data consist of the geo-referenced location of utilities networks associated with their attributes to all interested parties. Providing such a national service will lead in long term to significant cost saving, standardization of utility data and improved safety, etc.

3.2.2. Web-Services

In the similar to ROITE solutions and **NSDI Geoportal** are well-known Web-Services to be used. It must be obvious that Utility Networks/Data Infrastructure is fundamentally about facilitation and coordination of the sharing and if necessary, exchange of data between stakeholders within the Utility sector but also including the broad Public, and it comprises of core components: an institutional framework, technical standards, and fundamental datasets.

Therefore, ROITE needs to adopt specific standards of the OGC and NSDI for the contents and schemes, design and processes, network protocols, exchange and transfer standards.

It will have definite interactive query-based search engine to facilitate search, location, access, geoprocessing of the spatial data accompanied by infra-attributes.

The ROITE Supplier needs to develop/provide solution for an internal and external website to support to Utility Operators and PSA and ALRC internal and external existing and potential users.

The ROITE Supplier needs to discuss closely with the Client (PSA) and Utility Operators on the types of information that are needed to be in the internal and external domain. Appropriate measures would be taken to ensure security and minimize vulnerability to hacking/viruses/Trojans, etc.

In addition, if required, the Supplier will facilitate the hosting of these web-services using appropriate arrangements (outsourced or internal) in consultation with the Client.

Then the EU INSPIRE Directive and NSDI Law 254/16 defines ‘**interoperability**’, which means the possibility for data sets to be combined, and for services to interact, without repetitive manual intervention, in such a way that the result is coherent and the added value of the data sets and services is enhanced (e.g. **NSDI Geoportal**).

That is why providing descriptions of available data sets and services in the form of Metadata are also of importance.

With regards to the Web-portals and EU INSPIRE Directive and NSDI Law it is expected that the following functionality will be available in AIS:

- Viewing of dynamic spatial data
- Search/Discovery for spatial data
- Download the copy of spatial and raster data (for authorized users)
- Coordinate Transformation to transform data from one spatial reference system to another one (if necessary)
- Making Query for the Database dumps (Downloads of sets of data) per type of available utility network
- Additional functionalities based on user needs assessment as defined during the Inception phase.

Hereby a short description of often used Web-Services that can be used within ROITE.

View Map Service (WMS) - (*Print View Service (WMS), Convert View Service (WMS) to PDF*)

Web Map Service (WMS) is an international standard for dynamic spatial data sharing via Internet where data are published in the form of digital image files. The list of standards is available on the website of Open Geospatial Consortium (OGC): <http://www.opengeospatial.org/standards/wms>.

Detailed information on the sharing of spatial data in accordance with the standards of INSPIRE can be found at: <http://inspire.jrc.ec.europa.eu/index.cfm/pageid/5> and Government decision 254/2018 published on <https://inds.gov.md>.

It could be for example the spatial data like: Orthophoto, Aerial photography, Satellite images, Utility Network data stored in a GIS system, DEM, LPIS, Cadastral data, Topographic Maps, etc. and can be used through WMS and VFS services.

There is suitable tool that allows user to connect to WMS server and then display the map. The most popular map data formats used to render the image are GIF, JPEG and PNG.

All services provided by communes and counties must be based on appropriate and universal schema. Symbolization rules are determined to make layers data readable in particular on the white background, black and white or coloured orthophoto background.

Discovery Service (CSW) – (*Print Discovery service (CSW), Convert Discovery service (CSW) to PDF*)

Catalogue Service for Web (CSW) makes it possible to search for spatial data, spatial data sets and network services based on corresponding metadata stored in data collection system in compliance with OGC CSW specification.

The term of metadata is defined as "data about data" and describes data features like information about data geographical localization, resolution, scale, creation date of data and other important details.

The list of standards is available on the website of Open Geospatial Consortium (OGC): <http://www.opengeospatial.org/standards/specifications/catalog> . Detailed information on the sharing of spatial data in accordance with the standards of INSPIRE can be found at: <http://inspire.jrc.ec.europa.eu/index.cfm/pageid/5> .

In Moldova standards on sharing of spatial data are according Government Decision 737/2017 related creation of network services published on <https://inds.gov.md>.

CSW service allows to quick and easily search for spatial data. The service is based on two basic components of a metadata repository and catalogue of metadata. Metadata are used to:

- describe existing data
- search of data form catalogue of metadata

Catalogue metadata enables spatial data to be searched based on corresponding metadata. Discovery services as well as metadata act as the main pillar of Spatial Data Infrastructure based on Service Oriented Architecture (SOA). The discovery service supports functionality for connecting it to a view service.

ROITE NSDI Geoportal must provide the following CSW minimum services National Metadata Catalogue and INSPIRE Metadata Catalogue - to be validated by the Beneficiary (PSA).

~~In the catalogue of the INSPIRE metadata are published metadata for collections and services covered by the INSPIRE monitoring and it is integrated with the European metadata directory.~~

The national metadata catalogue publishes the metadata from the metadata catalogue INSPIRE and others.

Download Service (WFS) - (*Print Download service (WFS), Convert Download service (WFS) to PDF*)

Web Feature Service (WFS) enables copy of spatial data or such parties to be download based on accepted criteria for selections. Thanks to existing schemas the service does not require the user to meet the additional technological and software conditions.

The list of standards is available on the website of Open Geospatial Consortium (OGC): <http://www.opengeospatial.org/standards/wfs> . Detailed information on the sharing of spatial data in

accordance with the standards of INSPIRE can be found at:

<http://inspire.jrc.ec.europa.eu/index.cfm/pageid/5>.

In contrary to WMS service, response for request addressed to WFS service contains source data that consists of geometry and corresponding attributes. Such resulting data can be involved in spatial analysis process.

WFS service enables to retrieve data stored in different formats and different sources. The transformation of questions from source data to appropriate format (databases, format files) belongs to server-side functionality. This solution increases the quality of services and does not require the user advanced knowledge.

Download Service (WCS) - (*Print Download service (WCS), Convert Download service (WCS) to PDF*)

Web Coverage Service (WCS) enables retrieving raster data. This is the data type of coverage such as aerial photography, satellite images, land cover, elevation and any data stored in raster format. WCS enables access to particular data and reach resources of spatial information. Similar to WFS, Web Coverage Service provides an ability to download parts of data depends on customer requirements or restrictions.

The list of standards is available on the website of Open Geospatial Consortium (OGC):

<http://www.opengeospatial.org/standards/wcs>.

Detailed information on the sharing of spatial data in accordance with standards of INSPIRE can be found at: <http://inspire.jrc.ec.europa.eu/index.cfm/pageid/5>.

In the Republic of Moldova all services are provided according the Government decision 737/2017 published on <https://inds.gov.md>.

Web Coordinate Transformation Server (WCTS) – (*Print Web Coordinate Transformation Server (WCTS), Convert Web Coordinate Transformation Server (WCTS) to PDF*).

Web Coordinate Transformation Server (WCTS) allows you to transform data from one spatial reference system to another. These types of transformations include both simple transformations and inverse transformations.

WCTS service is useful when it used data from different sources, and the application does not allow for this type of transformation. Please note that WCTS service is used only for the transformation of coordinate systems of INSPIRE data.

View Service (WMTS)

Web Map Tile Service (WMTS) is a standard protocol for serving pre-rendered georeferenced map tiles over the Internet. The specification was developed and first published by the Open Geospatial Consortium (OGC). The process of generating tiles is started after the update of the product while the files are stored on servers in the appropriate structure. The use of such a solution accelerates service response to a user query on a map section because the return is already prepared graphics as opposed to the WMS service, which generates the image file each time after receipt of such order.

API Service

API service is a java-script library that lets a user embed a map on a html web page. It allows to take advantage of additional Geoportal functionalities like:

- finding an address point,
- zooming in to specific coordinates,
- adding text information to a map view.

Download Service (ATOM) – (*Print Download service (ATOM); Convert Download service (ATOM) to PDF*)

ATOM download service enables copy of pre-defined spatial dataset or pre-defined parties of dataset to be download with no ability to query datasets or select user-defined subsets of datasets. Detailed information on the sharing of spatial data in accordance with the standards of INSPIRE can be found at: <http://inspire.jrc.ec.europa.eu/index.cfm/pageid/5>.

Dictionary Service

Dictionary services provide reference data dictionary from the scope of the system address, ie dictionaries villages, streets, and addresses. These dictionaries are available in two modes: on-line and off-line, differing in both primary purpose of use as well as the way organizations access to the data dictionary.

Online dictionaries are available as a service (SOAP returns data as XML) as well as services (REST returns data in JSON and XML formats). In addition, you have a simple HTML interface for easy example of using the REST service.

Services dictionaries offline are used to provide data for the update of reference dictionaries stored in external systems. The data are made available in the form of packages (.zip) containing dictionaries towns, streets, and addresses for municipalities. There are also packages aggregate, i.e. Containing w / in the dictionaries for all municipalities of the county or province. Dictionaries contain both current data and historical data.

The necessary Web-services for making the ROITE system operational must be adopted/established, but it does not mean that all will be necessary. The Supplier must, based on his proposed technology decide which ones guaranteeing providing the overall system functionality.

The above network services in the Republic of Moldova are provided according Government Decision 737/2017 published on <https://inds.gov.md>.

3.2.3 Existing at PSA IT systems (as available for ROITE)

Because some of required ROITE system functionalities are already developed and implemented within the PSA IT environment, it is suggested that ROITE system that should be developed by the Supplier, there where possible use them, like e-Cadastre Portal, CMF Platform, BusinesCad, etc. Then also a number of governmental platforms like PDSE, MCloud, MConnect, MPass, MSign, MLog, MPay, MNotify, etc. where useful/applicable should applied.

A short info on the available at PSA IT useful systems for ROITE is provided below.

SIA "BusinessCad"

Management of Requests for services offered by ÎS "Cadastru". The system contains information about executors, the cost of works, the status of requests, etc.

SIA "Internal Security"

The main objective of SIA "Internal Security" consists in automating the process of collecting information regarding all users, IS Cadastru collaborators, who use the existing systems in IS Cadastru, simultaneously verifying access to the information provided by these systems.

SIA "Internal Security" is expected to be a single-entry point for all users who use the internal systems of IS Cadastru. For this, two services operate within the subsystem: one to ensure access and another to change the password."

SIA "RUAT"

SIA "State Register of Administrative-Territorial Units and Streets in Localities of the Republic of Moldova" ("RSUAT") represents an automated register of administrative-territorial units (districts, cities (municipalities), villages (municipalities), localities, including liquidated ones) and of the basic elements of the urban infrastructure (streets, buildings), qualified as addresses of physical objects. The register is used to identify the elements of the urban and rural infrastructure as physical objects, which constitute the record object of the departmental and interdepartmental information systems, as well as establishes the connection with the postal address system, used both by information systems and by natural persons and legal in everyday life.

SIA "e-Cadastru"

SIA "e-Cadastru" is intended for receiving through the Internet textual and graphic information about immovable property, information about owners, their rights, prohibitions and encumbrances, data about the valuation of objects, as well as information about addresses from the address register, data about assessment areas

Access to data is allowed only to a certain circle of users.

The information is accessible for viewing on the screen, saving the textual information in HTML format, saving the graphic information in MapInfo format, printing." The services offered by this system are:

- Universal search
- Obtaining data from the register
- Preparation of evaluation data
- Search by owner
- Search by address
- Selection of a cadastral number
- Preparation of data from the register in the form of a document for the owner
- Export graphic files to XML files

SIA SGARI

The purpose of the automated information system "System for Managing Access to Informational Resources" (further SGARI) is to create and implement a universal, unified system for managing access to informational resources of PSA.

SGARI is an inter security system developed by PSA. It has features mainly the

authentication, authorization

More in detail in SGARI, the functionality regarding the creation and processing of the following types of processes is realized:

- Connecting, modifying or disconnecting internal users;
- Evidence of role sets for internal users;
- Connecting external users;
- Modification of the contract;
- Password reset for internal users;
- Designation of the administrator for internal users;
- Maintenance the list of external users;
- Testing the access for the internal users;
- Password reset for external users;
- Deleting of a contact;
- Testing the access for the for external users;
- Blocking/unblocking user access to information systems;
- Maintenance of the list of administrators for external users;
- Blocking/unblocking the access for external users according to the contract.

WEBDAV

The WebDAV stands for "Web-based Distributed Authoring and Versioning". It is a set of extensions to the HTTP protocol which allows users to collaboratively edit and manage files on remote web servers. DAV is applied as a network file system that is efficient for Internet browsing and can process entire files while maintaining good performance in a high latency environment. In addition, DAV is widely used as a protocol for accessing and manipulating the content of document management systems over the Internet.

CMF

Multi-Functional Centre is a kind Front Office, for receiving services requests to be performed/delivered by PSA and transferring these requests to the dedicated PSA Units (Back Office).

More detailed and extended list of available at PSA IT systems/tools with their characteristics is provided in the **Annex I**.

In case the Bidder has already similar to ROITE IT system, or its components ready, and the use of some of above-mentioned PSA IT systems/tools will be not necessary, assuming that the offered system will consist of a nearly most of ROITE functionalities, he/she is free to offer such a solution that should lead to cheaper and quicker ROITE development and implementation.

This might be a case, if the Bidder has already a comparable so-called OTS (Off The Shelf) system (or main its components) ready. The Bidders with such OTS solutions are very welcome to bid.

In this case, in order to provide to the PSA as the Beneficiary, a realistic picture what is ready and what needs to be developed the Bidder has to present what is ready conform the Evaluation Template that is presented in this Tech. Specs in the **Chapter 8.2**.

In this Template the Bidder can easy asses/evaluate its own OTS (Off The Shelf) solutions/modules vs the requirements from this Tech. Specs and identify what is **Already Available (AA)**, what is **Partly Available (PA)** and what needs **To Be Developed (TBD)**.

3.2.4 Available for ROITE e-government platforms

Conform the standard requirements of the E-Governance Agency (AGE) in Moldova, in accordance with the provisions of the Procurement Coordination Methodology in the field of information and communications technology, approved by Government Decision no. 544/2019 (hereinafter - Methodology), the Public Services Agency (PSA) systems (thus also ROITE) must the following criteria:

- **M-Cloud** as IaaS platform. M-Cloud is by far most important service for many governmental IT systems, it is stipulated in Government Decision that Public Entities are obligated to use M-Cloud for establishment of IT systems. The Moldovan government has put into operation the common technology platform, known as the M-Cloud, in order to improve IT service consumption expenditure. The M-Cloud platform capitalizes on government spending and consolidates data centres in a joint management form. Thus, the costs are significantly reduced, the officials' work becomes more efficient and ultimately generates quality public services.

Resources are planned annually and number of public authorities is already using M-Cloud. AFRC is using M-Cloud for several years now. M-Cloud is primary built up to support Infrastructure as a Service but it also offers colocation services for public authorities.

M-Cloud is built upon VMware vRealize Suite and VMware ESXi 7.0 which is proven cloud technology and basically industry standard for setting up larger scale cloud environments.

Regarding the operating system supported currently M-Cloud natively supports:

- Windows Server 2008 R2
- Windows Server 2012 R2
- Windows Server 2016
- Ubuntu Linux 16 Server
- CentOS Linux 7

Other operating systems are available on request.

Regarding backup snapshots of virtual servers are available whether manually done or scheduled in disk space limits. Additionally, NetBackup tenant available on request.

- Based on the strategic objectives of AGE, the modernization of public services through their reengineering and digitization, we aim to ensure the creation of a channel for the provision of public services, through which the front-line segment (front-office) of service provision will be ensured through the government portal of public services "Front Office Digitization Information System" (hereinafter **PDSE**). Thus, the Beneficiaries complete and send the applications to the PSA through the PDSE and, as appropriate, attach the necessary documents. In this case, PSA examines the submitted requests and produces the results of service provision (Back-office).
- With a view to ensuring the development of SIA ROITE, expanding the circle of users, as well as with a view to increasing the quality of public services provided and ensuring information security, we consider it appropriate to ensure integrations with:
 - the governmental electronic authentication and access control service (**MPass**) (GD no. 1090/2013) – for authentication and control of user access to the information system;
 - the governmental electronic journaling service (**MLog**) (GD no. 708/2014) - secure and flexible journaling and audit mechanism, ensuring the events records keeping, in the context of the use of information systems;

- the integrated governmental electronic service of electronic signature (**MSign**) (GD no. 405/2014) - for the application and verification of the authenticity of the electronic signature by users (including in the context of the use of information systems and electronic services);
 - the governmental electronic payment service "**Mpay**" (GD no. 329/2012) - as a unique mechanism for payment for public services;
 - the government electronic notification service "**MNotify**" (GD no. 376/2020) - for sending notifications to users in order to notify them about the events produced in connection with the provision of services or other events relevant to the recipients;
 - integration with the automated information system "Register of representative powers based on electronic signature" (**MPower**) (GD no. 375/2020), to automatically use the powers of attorney defined through it;
 - ensuring the exposure of the data they hold in their own registers and information systems under the Entrepreneur's Governmental Portal (GD no. 412/2020), as well as, as the case may be, within the Citizen's Governmental Portal "**MCabinet**" (GD no. 413/2020)
 - the "**MConnect**" interoperability platform (art. 6, point 3) from Law no. 142/2018 on data exchange and interoperability, for the free exchange of data within the public sector;
 - development of the solution will be carried out and hosted on the basis of the common government platform "**MCloud**" (GD no. 128/2014).
- Based on the above, PSA, while developing SIA ROITE, **will give priority to Open-Source technologies** that have demonstrated continuous development. As an example, we reproduce the technology stack adopted by AGE for the development of government platforms:
 - C# programming language;
 - Web framework ASP.NET MVC Core;
 - RDBMS - SQL Server;
 - Container engine - Docker;
 - Container orchestration - Kubernetes;
 - Cache server, session store-SQL Server or Redis.

3.2.5 Systems Users

The Internal Users will be the various ALRC and PSA authorized employees.

At this moment the number of Internal Users is estimated as ca.10.

The External Users will be initially the various governmental bodies: Ministries, Municipalities (Planners), Central Office of Statistics, Chamber of Commerce, various constructing and road excavators' companies, Real Estate Developing Agencies, Plant protection offices, commercial banks, Notaries, Construction company, Cadastral/ Geodetic companies, etc.

With regards to External User, including the Utility Operators, LPA, and all kind of municipal and organisations, the number is estimated for ca. 2000.

Anyway, in the longer perspective, based on Open Data policy, also more private individuals will become the End-Users, as they should benefit from the available services.

All Users/Clients prior any data receipt must be registered in administrative part of the System incl. their interest, received data, payments, etc.

At the same time, please find below a list of main services that will be executed and business processes will be drawn up based on them

Nr/o	Name of the provided services
1	Execution of cadastral works
1.1	Preparation of cadastral documentation for the registration of the technical-building infrastructure objects
1.2	Formation of the technical-building infrastructure objects (separation / merger)
2	Registration Services
2.1	Primary registration of the technical-building infrastructure objects
2.2	Updating the data on the technical-building infrastructure objects (reconstruction/presentation of the higher precision plan)
2.3	Deletion of the technical-building infrastructure objects (demolition)
2.4	Primary registration of the right to the technical-building infrastructure objects
2.5	Current registration of the right to the technical-building infrastructure objects
2.6	Registration of the newly formed infrastructure objects
2.7	Registration of the technical-building infrastructure objects and the right to it
2.8.	Registration of other real rights over the technical-building infrastructure objects
2.9	Making corrections, changes in registrations, correcting errors
3	Information provision services
3.1.	Release of the extract from the Register of technical-building infrastructure objects
3.2.	Release of the certificate from the Register of technical-building infrastructure objects
3.3	Release of the plan of the technical-building infrastructure objects
3.4.	Provision of information from the electronic archive.
3.5	Downloading a dataset of targets in an area

3.2.6 ROITE locations

Taking into account the possibilities of the information infrastructure of electronic communications it is expected that SIA ROITE will be organized only in two levels:

Central level - that will be located in the Chisinau. The main function is to ensure the central register storage, maintenance and hosting of information including providing the user access mainly through internet (for external users mainly through the NSDI Geoportal).

Regional level – will be located at the Territorial Cadastral Services. At this level, the main function is to collect information (cadastral works) and transmit it to the Central level via CMF, in cases where the holders of infrastructure object do not have any digital information system, or only paper documents.

C. UTILITY INFRA REGISTRATION IN ROITE STATE REGISTER

4. High-level System Concept

4.1. Introduction

Following the internationally recognized Object Registration Model as applied for immovable assets, that consists of registration data on *Subject, Object and Right*, and also having in mind that some Infra/Networks are changing very often (even per day) their networks, it requires **rather unique and smart dynamic registration system**. Therefore, this type of concept is also proposed here.

The ROITE system must provide the possibility to perform the Registration of the Utility Infra network objects on a specific registration day (e.g., the 1st registration), based on the Operator request. This is done in the “static” part of the system – for registration in Utility Public Register, wherein the utility data collection is realised via the Web-Services from the Utility Operators providing their network data to PSA in principle 24/7.

The Web-services of Utility Operators should reflect the up-to-date (dynamically changing) Utility data and allows to view, download, and/or if required to perform the so-called DB dump of the specific Network assets (geographic location of the networks assets with the all attributes) at any moment of time, as ready data for the 1st or any next (updating) registration.

Then, for example, if required e.g., each half of year an update of registration could be performed, then a network operator will need to request it (submit additional requesting documents) to PSA, and then the so-called Database dump of the Operator specific network as part of data collection process needs to be performed.

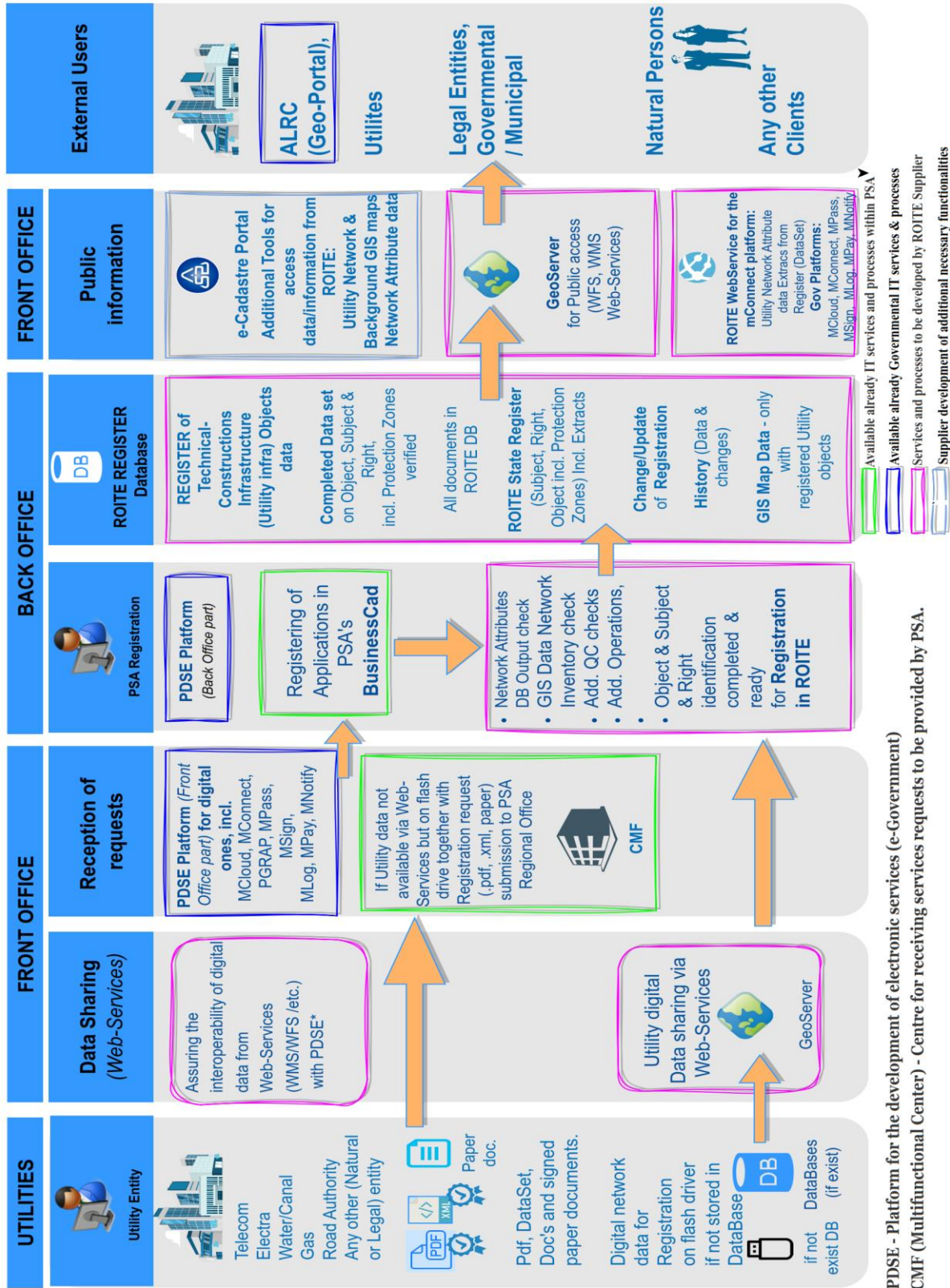
This update registration, after a number of procedural steps (see details presented further in the described ROITE Business Processes) will be officially registered in **the Technical-Constructions Infrastructure Objects Register** (incl. object/owner/operator/Protection zone identification and ownership/usage rights), and the Operator or any other interested Clients can request and receive digital certificate/extract from PSA State Utility Infra ROITE Register (Database) system.

4.2. High-Level ROITE System Concept Architecture

The below slide presents the **High-Level Architecture Concept of ROITE system as Utility Infra Network Registration in the State Register and it’s publishing** the system.

The registration of Utility Infra Network (Objects/Rights/etc.) process occurs conform the below presented concept configuration.

ROITTE Utility Infra Open Data Collection, Registration and Publishing Information



* PDSE - Platform for the development of electronic services (e-Government)

* CMF (Multifunctional Center) - Centre for receiving services requests to be provided by PSA.

In the legenda of above High-Level Concept Architecture by colours it is shown which specific IT Tools/System from PSA and from Moldovan e-Government platforms can be used (integrated with and/or made interoperable) by the ROITE system (as described in detail in *Chapter 3*). Also direct intermobility linkage with ALRC NSDI Geoportal is presented.

4.3. Registration Business Processes

It is clear that as well the Registration of Utility Operator Technical-Constructions Infrastructure Objects (networks) starts with publishing by the Operator of available digital network data (graphical and attribute data) via the Web-Services (WMS/WFS/etc.). This networks web availability will serve as data source for data collection regarding the object for PSA.

For registration, the Utility Operator submits also on-line to PSA its official request for the registration of his Technical-Constructions Infrastructure Objects (network) with additional defined by law documents.

The gathered on a specific day necessary data, in combination with additional data/documents submitted, must undergo some checks and output of it, will be a set of data ready for Object Registration - Utility Network data with info on *Subject, Object (incl. Protection Zone) and Rights* allowing the Registrar officially to register the network in ROITE State Utility Register/Database.

Doing it for the 1st time is so-called 1st Registration, but it can/should be following any Utility network change resulting in an update Registration (2nd and N-registration) , that need to be also stored in the State Utility ROITE Register Database and the data representing the old situation goes into the History Database (e-Archive).

It must be understood that the Database record of ROITE Database Register will be the legal proof of registration, and from that record in the Database, the **Digital Registration Certificate/Extract** can be issued to the requiring party(ies).


Obviously, within the ROITE there is a need to be develop and implement some additional complementary processes, like registration of requests, payments, shared data with other stake-holders, etc.

In case the Utility Operator does not has own IT system wherein his utility network is stored/maintained, then for the Registration he/she needs to approach any PSA Regional Office (CMF) submitting there his request, together with the available network data (digital or analogue) and additional documents. This request and submitted data will be automatic processed (if necessary, converted from analogue in to digital) and registered in the PSA's BusinesCad and then in PDSE system.

The Utility Infra Data Flow from the Utility Operator to ROITE and vice versa looks then approx. as follows:

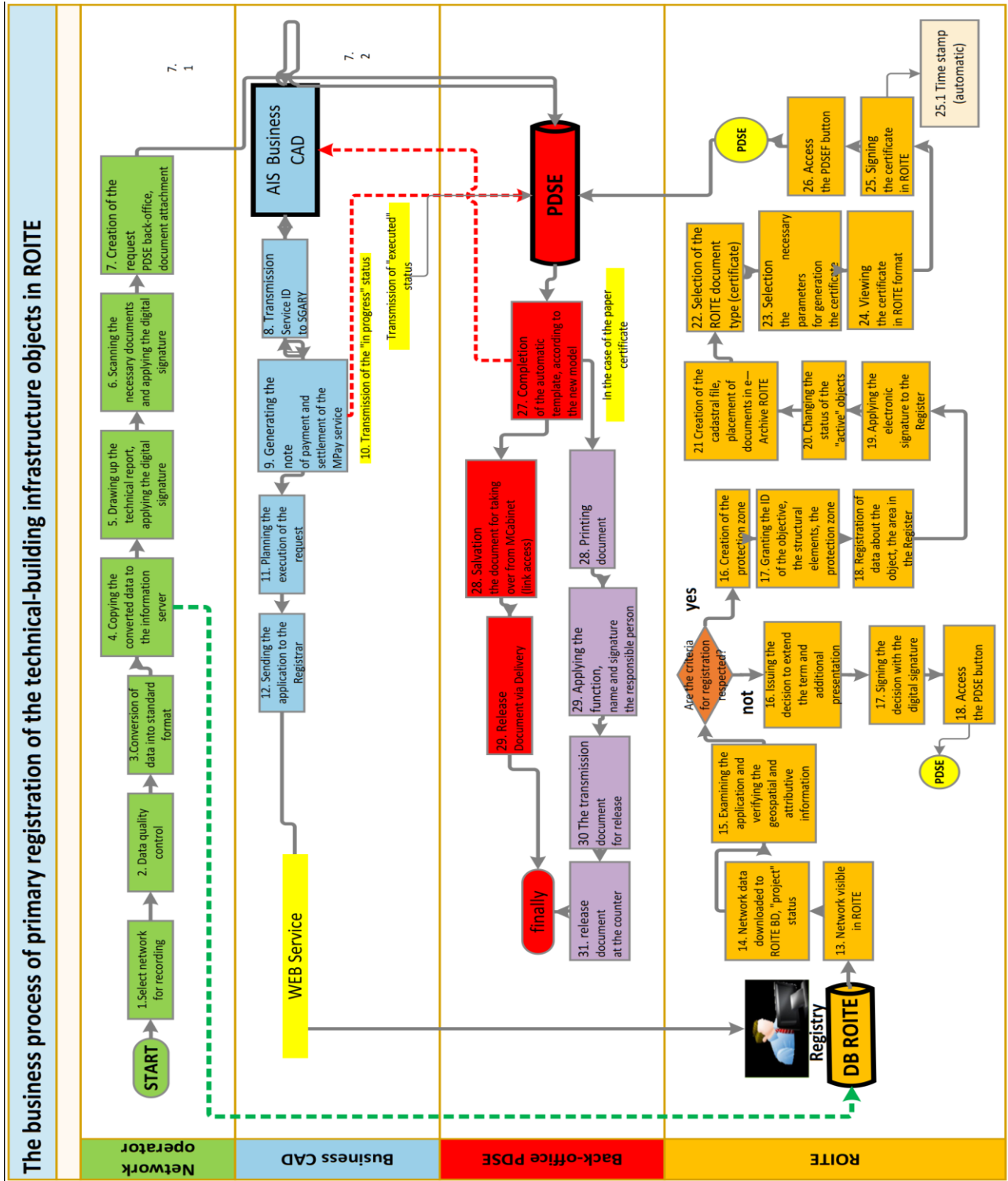
**Utility Infra Network Data Flow (vector and attribute) -
for Registration**

1st Registration

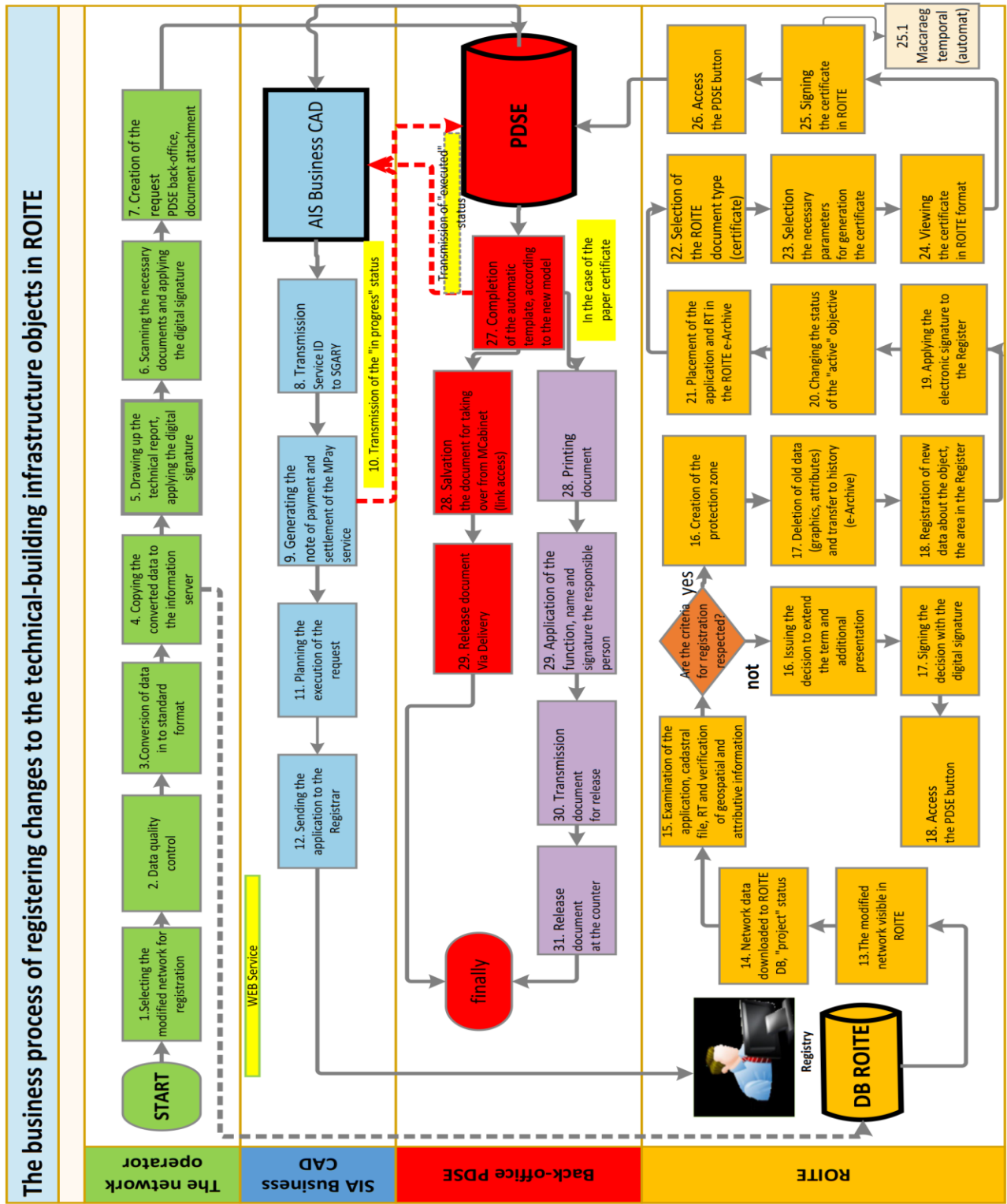
Nr.	Stakeholder / IT Environment	Business Process/Action	Data Status	Additional actions Utility Operator	Additional actions PSA
1.	Utility Network Operator's IT system incl. own Operational/Production DataBase	Selection of the Network to be registered (<i>complete, component, etc.</i>)	Network data in preparation		PSA request to Operator to prepare the Network Data as part of Information Database incl. visibility/access/download via the Web-Services in the readable format
2.	Utility Network Operator's IT system incl. own Operational/Production DataBase	Operator own QC of selected Network Data set (<i>completeness, relation graphical-attributes, topology, etc.</i>)			
3.	Utility Network Operator's IT system incl. own Operational/Production DataBase	If required, conversion of Dataset into Webservice readable format, preferable into QGIS/Postgres compatible formats (<i>Network data from some systems will not require conversion - are readable for Web-Service</i>)			
4.	Utility Network Operator's IT system & Extra Information DataBase (<i>available for the ROITE Web-Service</i>)	Copying of converted data into standard Network Data format into the Information Database/Server			
5.	PSA's ROITE	Utility Network visible and accessible via Web- Services	Active Network Data available for ROITE & for Public (<i>To view / download, if required also ready for Registration</i>)		
6.	PSA's ROITE	Selected Data Network (vector and attribute) via Web-Services from Utility Network downloading (dumping) in the Temporary Object Database (DB dumped)	Active Network Data from the Web downloaded (dumped) - with the Temporary Status (<i>Ready for Identification & QC & Registration</i>) stored on Utility Public Register Database	Network Operator's requests PSA to Register the Utility Infra Object (Network Data) as presented/in Information Database to be accessed via Web-Services	
7.	PSA's ROITE	Selected Data Network QC/Verification (<i>Data Format, Completeness, Topology, GIS consistency (Attributes vs Graphical Data), Meta Data consistency, Random Geodetic Accuracy check; incl. Identification of the Operator</i>)	The selected for Registration Active Network Data verified (<i>Status Temporary Object - ready for Registration</i>)		
8.	PSA's ROITE	The Utility Infra Object Registration Process of selected Data Network (Object) and recording it in the State Utility ROITE Register	State Utility Object verified and Registered in ROITE (<i>Status: Object Registered</i>)		PSA send the Digital Certificate of Object Registration from State Utility ROITE Register Database as extract to the Utility Operator (email or post); This info is also made available also for Public viewing.
9.	PSA's ROITE	Verification of the Utility Infra Operator's (Subject) Rights to the Object; (<i>Ownership documents, Gov. decisions, etc.</i>)	State Utility Operator's/Subject's Rights to Object Verified (<i>Subject Rights to Object Status</i>)		
10.	PSA's ROITE	Registration Process of Subject's Rights to the selected Utility Infra Data Network (Object) and its storing in the State Utility ROITE Register	Public Utility Operator's/Subject's Rights to Object Registered (<i>Subject Rights to Object Status</i>)		PSA send the Digital Certificate of Rights (and/or its limitations) from the State Utility ROITE Register Database as extract to the Operator; This info is also made available for Public viewing via e-Cadastre portal - Public Information Front Office
N- Registration					
	Registration of changes	<i>It will be the same process as above, except that the old data needs to go to history DataBase (e-Archive DB) then called Not Active/Historical Data and the new one will be valid (Active)</i>			
	The same actions for Utility Operator and ROITE as above (for 1st Reg.)	Updating of the selected Utility Infra Network with the new data via Web-service download/dump (vector and attribute data) and storing the old (not Active) Utility Infra Network data to the History of State Utility ROITE Register e-Archive DataBase	New Utility Infra Network (or its elements/parts) and Rights Registered in State Utility Register; Old/Not Active Utility Infra Network stored in e-Archive (<i>Object Status: Historical /Not Active</i>)		

Below the initial versions of main Business Processes description is presented.

The business process steps regarding the Utility Object Initial Registration in ROITE.

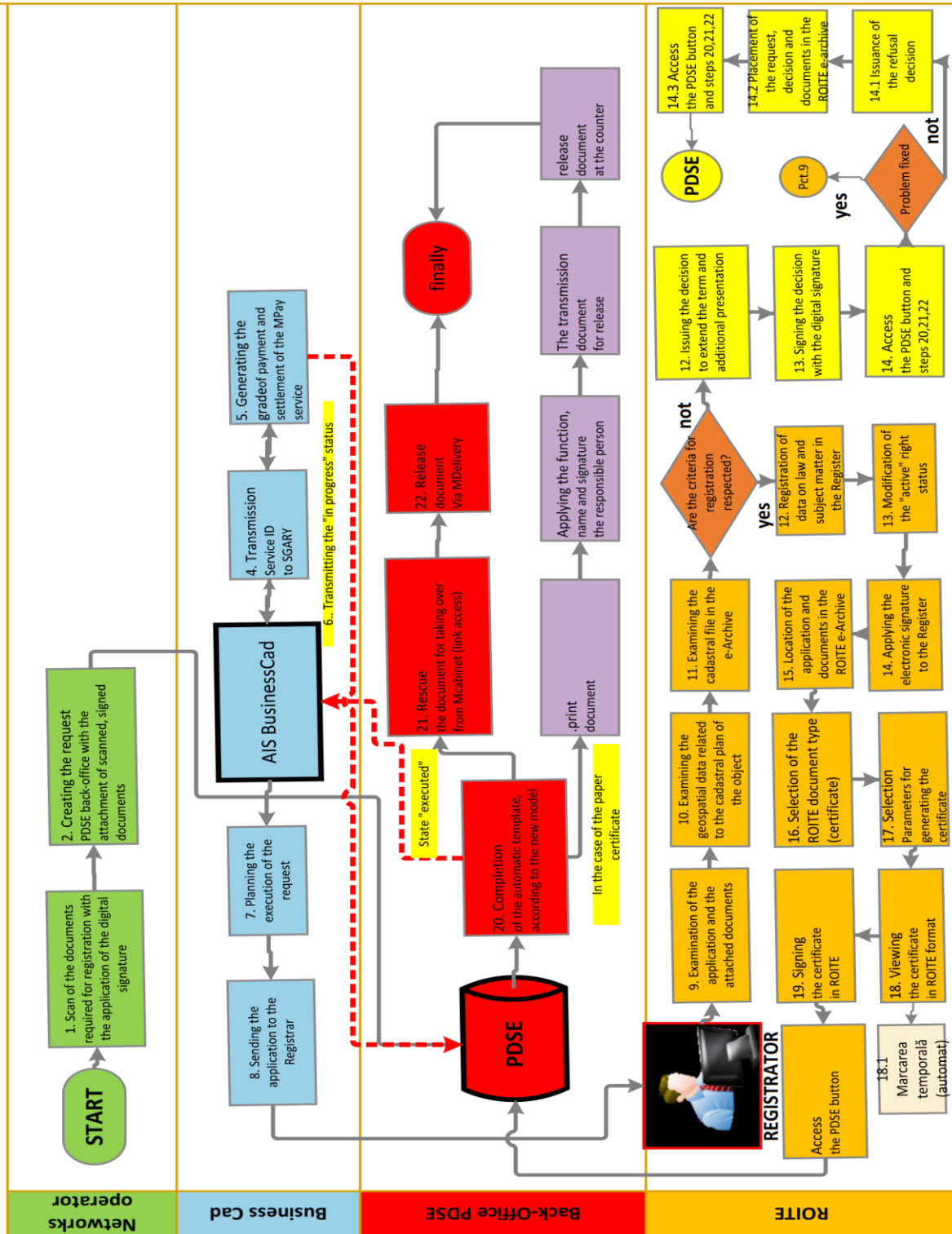


The business process steps regarding the secondary Utility Object Registration (in case of Change).

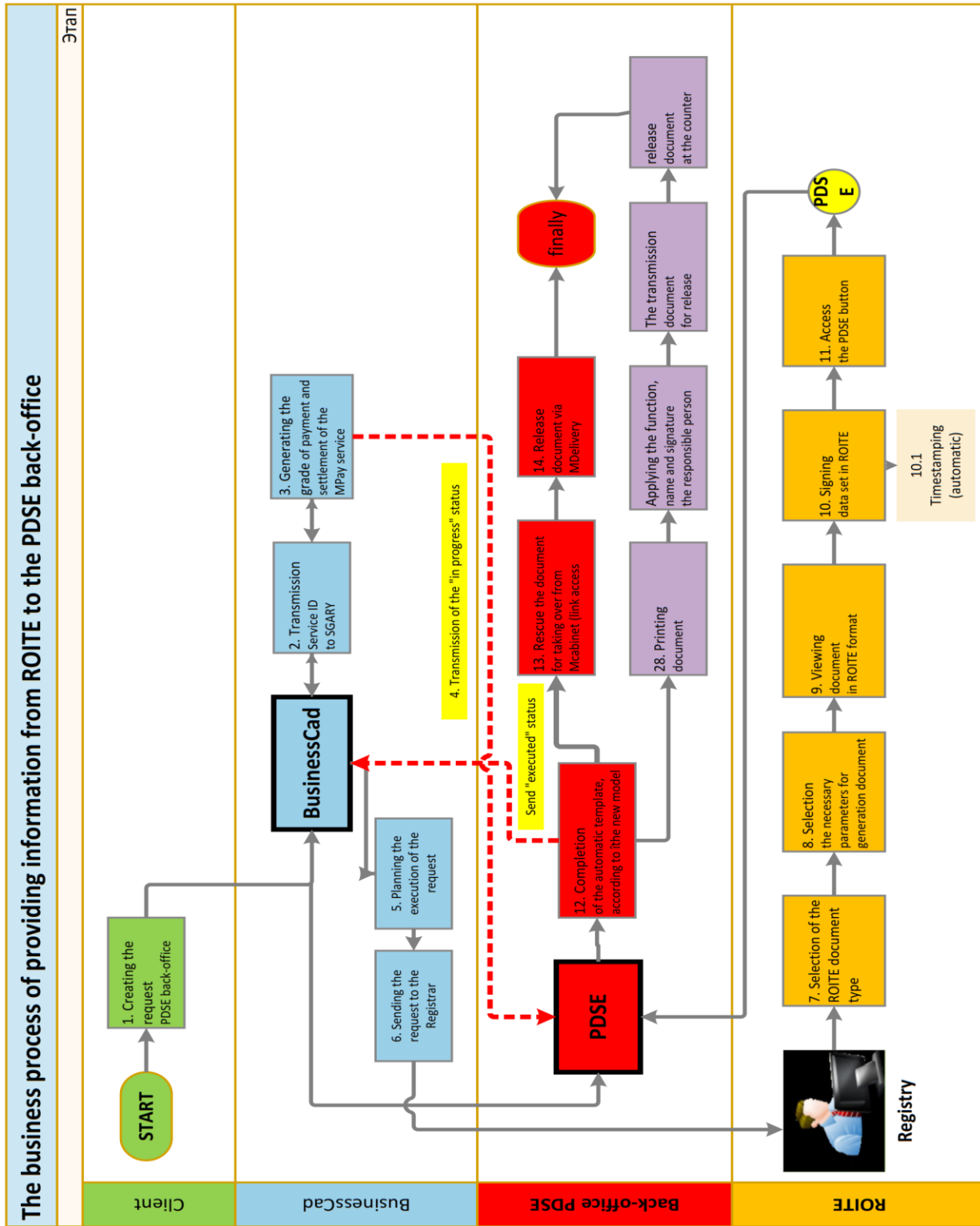


The business process steps regarding the **Registration of Rights to the Utility Infra Object(s)**.

The business process of registering the rights on the technical-building infrastructure objects

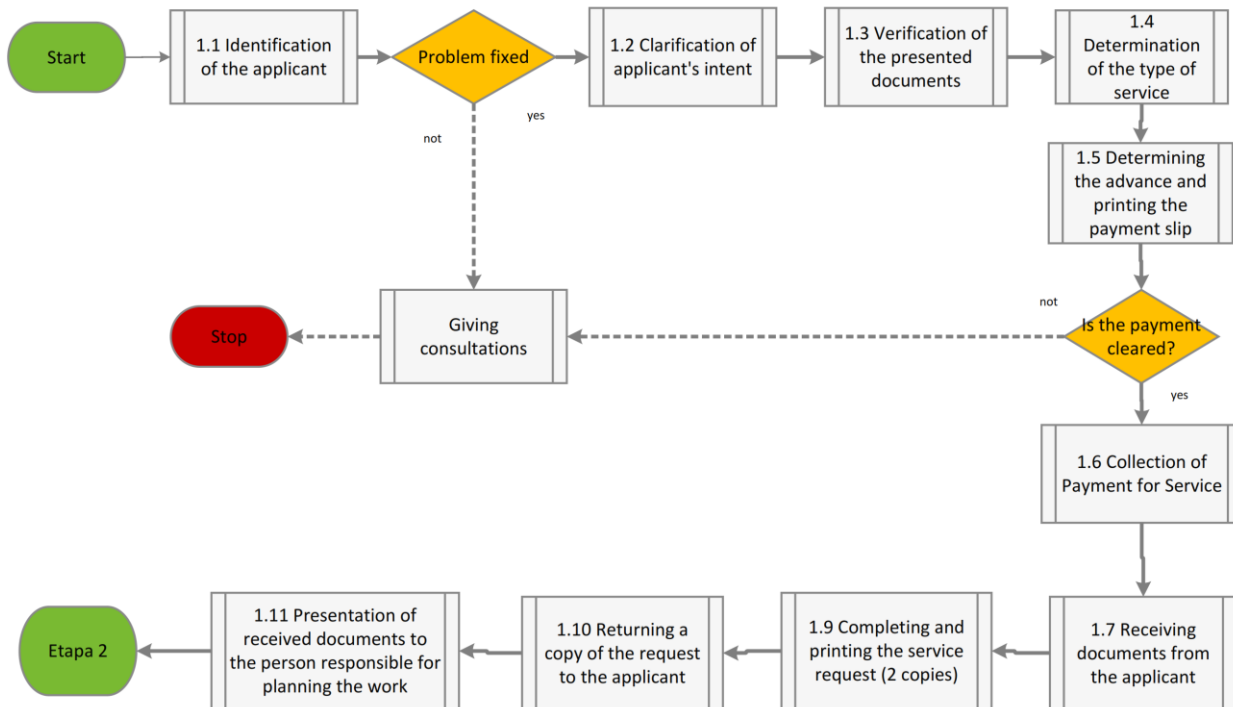


The business process steps regarding providing information from ROITE to PDSE Back-Office.



The business process steps regarding the **receiving the Registration request at the Local PSA Desk (CMF)**, before entering in the **BusinesCad & PDSE**.

Receiving the application at the counter (SIA BusinesCad)



However, before starting the development of ROITE, in the Inception Phase the Supplier has to verify all presented Business Processes, and validate the findings with the PSA and based on his proposed technology and specific solution, applying the BPR (Business Process Re-engineering). The result should be more efficient automated Registration processes. Then, the proposed new solutions need to be validated and approved by the Beneficiary (PSA).

4.4. ROITE Outputs and Products

The accessible from the Utility Entities, mainly via Web-Service (or via CMF) Utility infra digital data, after ROITE verification and registration processes will be made accessible also via Web-Services for all interested external and internal Users/Parties.

It is assumed that **for general Public** (after user identification and registration) any existing **Utility Infra data** for which the legal framework defines them as open **will be accessible as Open Data via ALRC NSDI Geoportal**, this as an extra Utility layer within this portal, and also via PSA e-Cadastre portal.

It means that the registered Utility network data will be available for the external users on Geo-Server of ALRC NSDI Geoportal.

Then, for **professional Utility Users**, like Utility Companies, ground operating Engineering, Road excavators' companies and constructing companies, etc. for the specific network data, on request and payment, will be made available with complete attribute data for the selected geographic location/area based on requester to PSA and **via PSA e-Cadastre Portal**.

For those Users that will be interested in the legal proof of Registration (*Subject, Object, Right and if applicable the Protections Zone*) of the specific Technical-Constructions Infrastructure Object, the ROITE system will issue the Digital Registration Certificate/Extract from the State Utility Infra ROITE Register Database.

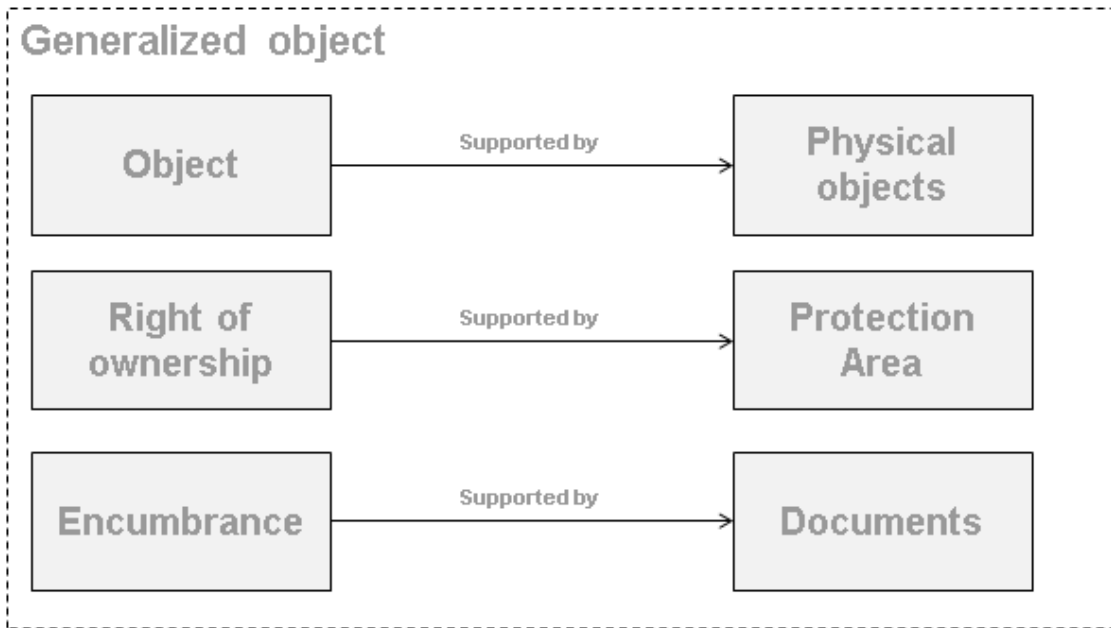
Any additional Outputs/Products from the system are possible and should be discussed with the Beneficiary (PSA). Some of the data in the Register could be protected and may not be open.

4.5. Data to be managed

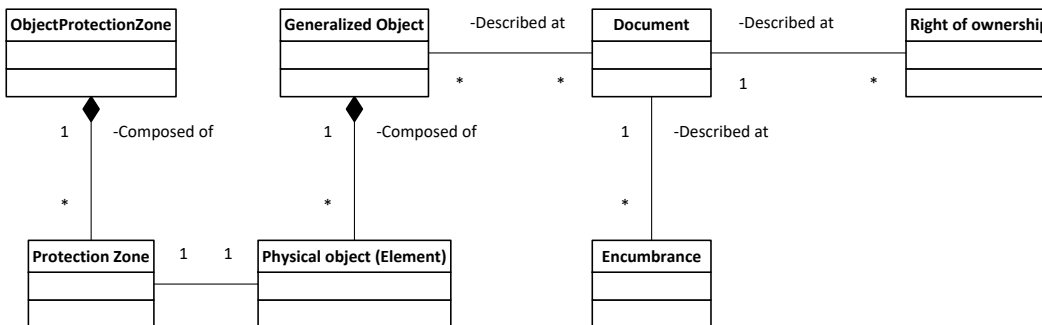
This section describes the data sets of ROITE. They are divided based on significant aspects, e.g. their relation to the organization, their function and use in the Cadastre domain

Data set
Physical elements
Objects
Documents
Rights
Protection Areas
Transaction registry
Persons (juridical or physical)
Auxiliary datasets like base map (reference information, like digital orthophotos, administrative boundaries, etc.)

The most important element in ROITE is called “Object” (or Generalized Object), it is what the Utility Operator actually will register and it links all data and concepts in the system. An abstract conceptual data model is represented in the next diagram, including the relation between the most important types of data to be managed by ROITE.



A more detailed diagram with a UML Conceptual Data Model of all the elements is included in the following figure.



In the case of national objects (i.e. very high voltage electric networks, national roads, etc.) Facility Operators/owners will make their network data available via Web-Services or provide information directly to PSA which will be responsible to upload, register and maintain that information in ROITE.

As mentioned, the ROITE Register Database needs to be design and developed conform the Land Administration Domain Model (LADM), that is defined in ISO 19152.

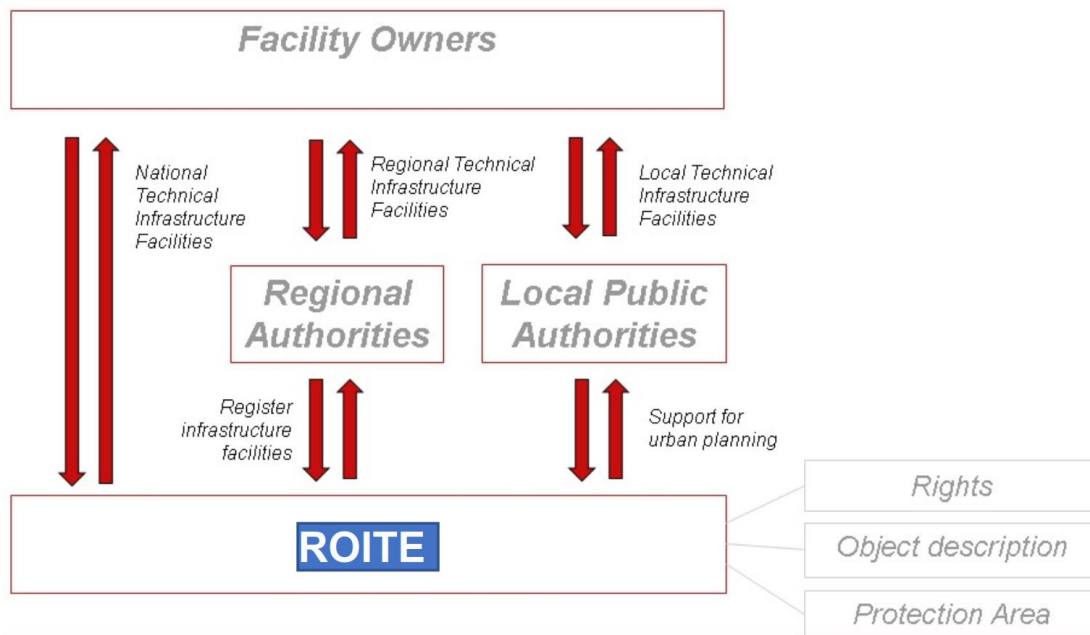


Figure above presents the different stakeholders interacting with ROITE regarding the Registration

4.6. Objects (generalized objects)

A Generalized Object (or simply called Object) is the entity that generates data on the technical and utility infrastructure facility, the elements of the facility, its protection zone, the rights and the encumbrances on the infrastructure facility, the restrictions in the use of land included in the protection zone.

The types of infrastructure objects are described conform the Law no. 150/2017 in Chapter 1.3 of the Technical Specifications.

The Technical and Utility Infrastructure Objects are composed of complex structures that can be represented as a set of related to each other elements. Depending on the infrastructure facility and the type of service provided, the type of elements to be registered may be different.

Each Object will be identified by a unique identifier, which will never be used again in the system, even in the case that the Object is deleted from the system or become non-active.

4.7. Physical elements (Objects)

Physical elements are complex linear facilities (pipes, networks, cables, routes for transport, etc.), as well as buildings and facilities, that are part of the public or common utility equipment, specially the underground one. The complex linear objects, constructions and facilities are the structural elements of the infrastructure facility.

A detailed list of elements to be registered is included the classifiers is described in the Annex 2.

Each Element will be identified by a unique identifier, which will never be used again in the system, even in the case that the Element is deleted from the system.

4.8. Documents

Documents will be included in the package of information required to register an object, and will include legal and technical documents, to be provided in digital format (XML, PDF, DOC, GML, image, etc.) with or without digital signature according to the legislation.

The Utility Operators/Utility right Holders who hold cadastral documentation on paper, organize the inventory and digitization of cadastral documentation (further – preparation of digital cadastral documentation) in the manner established by the Government. If the rights holder does not have an information system (e.g. natural person, local public administration authority), the digital cadastral documentation, drawn up in the established manner, will serve as the basis for registration in the Register, and submit the technical file, the scanned documents and the digital package to the Agency Public Services through electronic communications or submit them for registration at the counter of the multifunctional office of the Public Services Agency (CMF) on memory media (memory sticks, etc.).

4.9. Rights

The rights to technical and utility infrastructure facilities can be:

- Right of ownership
- Encumbrance, or
- other real rights or limitation to them.

Rights are about an object, and the rights' Holders can be a Physical person (the information on Subject is retrieved from the State Registry of the Population), or a Legal Entity (the information object is retrieved from the State Registry of Legal Entities) or the combination of them.

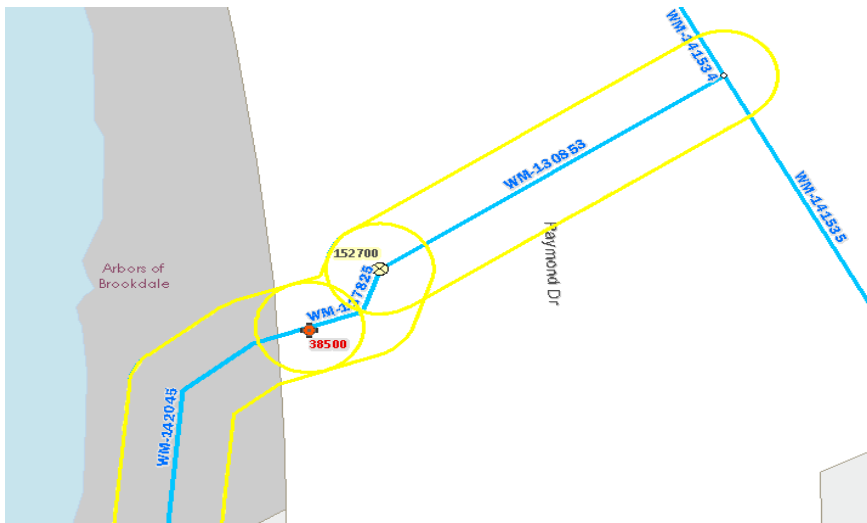
Each Right must be supported by a document, for example a deed/privatisation act, etc. sufficiently confirming the right to be registered.

4.10. Protection Areas

A Protection Area is the zone adjacent to technical and utility infrastructure facilities (left- right-around), extended in space, required to ensure normal operating conditions and protection of facilities within which special requirements for land owners and users are set.

Protection Areas must be a geometry calculated conform the pre-described conditions and buffering/encircling the network elements' geometry at a specified distance. Different buffer distances for different type of Elements may apply; The parameters for Protection Zones are defined in the normative acts that regulate the protection zones for different types of objects.

On the image below, an example of a Protection Area (yellow polygon) for an Object made of different water pipes (blue lines), a valve (yellow symbol) and a hydrant (red symbol) is shown.



Example of Protection Area

4.11. Transaction Registry

A transaction is generated for each business operation in the system; a registration of new objects, or sequential registration is based on Operator request to update / to reflect a change of Object or ownership (Right), or deleting an object from the Registry, because an object has been deactivated or demolished, etc.

Each transaction must be linked to data operation by their Object ID. During operation, a case is associated to this transaction which will be linked to the Object of the transaction and through the Object ID with all the elements and associated documentation provided for the purpose of introducing related changes in the system.

Because the ROITE is a Cadastre/Register system, so cancelled data cannot be deleted from the system. The deleted objects/instances and former versions of the Objects that are inactivated, must be stored in the History Register (Database) and still having the (historical) relationship to the actual versions.

4.12. Persons (Subjects – Legal entities, or Physical persons or combination)

A Subject will be the Owner/Operator of the Technical Infrastructure facility that will apply for the Registration of its Infra assets. A person may be a natural and non-natural (e.g. citizens, legally referred to as subjects and generally referred to as parties), who can act as party, or Entity that plays a role in relation to the Object Right.

4.13. Auxiliary datasets

There can be additional data sources (to Physical Objects, Documents, Rights, Protection Areas, Transactions and Persons), which are not parts of the business information managed by ROITE but are often visualized together with them. Some additional data sources map layers and can be the following:

- Photos of the Objects
- Scans of the field schemes
- Orthophoto images

- Other vector or raster base maps (Google Maps, OpenStreetMap, ArcGIS base map, etc.)
- Web Maps published by local authorities
- Etc.

These additional data must be linked to the registered Object.

Other datasets are:

- User and security information (profiles, permissions, etc.)
- Classifiers or data dictionaries
- References to legal documents (laws) which are supporting a resolution.

5. ROITE Registration Functional Modules

The following diagram describes the interaction modules, grouped in four main subsystems:

5.1. Support

This subsystem groups some generic modules, that could support any other system, since they have not any specific functionality related to ROITE, although all of them are required in order to get this system working.

5.2. Public Interfaces

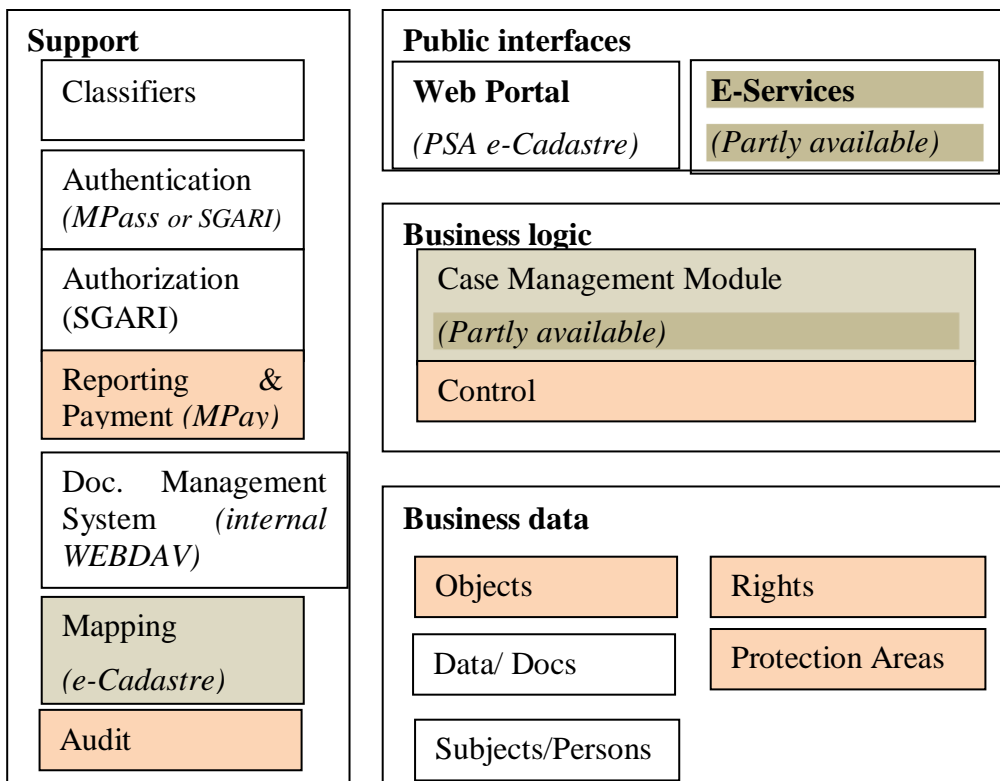
A difference is made between modules accessed by third parties (external users) and the other modules. Some specific considerations regarding mainly security must be considered.

5.3. Business logic

This subsystem is the one in charge of keeping the business workflows and managing tasks for registers.

5.4. Business modules

Here below, the modules are created based on the identified data sets, something that reflects the organizational and functional structure of information to be managed by ROITE. Each business data module will encapsulate the logic (integrity, quality, characterization, timing, precision, accuracy) defined for each type of element, and will be responsible for the persistence of information.



ROITE subsystems and modules

The above listed modules describe a ROITE system.

It is assumed that:

- **light-brown** rectangles blocs representing the modules that **need to be developed** within the scope of ROITE implementation,
- **blank blocks** representing the part of the ROITE system wherein **the existing IT systems in PSA and/or available e-Government platforms** can be used by the ROITE developer (see previous *Chapter 3*. for details), the ROITE should integrated with it and/or be fully interoperable to it.,
- **grey blocks** showing the IT components that are available at PSA, but requiring update/additional expanding.

The support by PSA, including documentation and technical support from the IT Department will be provided.

5.5. Business data

The **Object Module** provides functions that allow listing Physical Objects and their links and attributes according to classifiers available in **Annex 2**, presenting them on a map, changing their features/relations or deactivating them. These functions are invoked by Case Management that links data handling to a particular case and makes procedures transparent. Changes are controlled by some business rules, including:

- Topology
- Numbering
- Data Integrity

The **Protection Areas Module** provides functions that allow listing Protection Areas linked to an object and all its Elements, including attributes describing the existing restrictions in that zone, presenting them on a map, changing their features/relations or deactivating them.

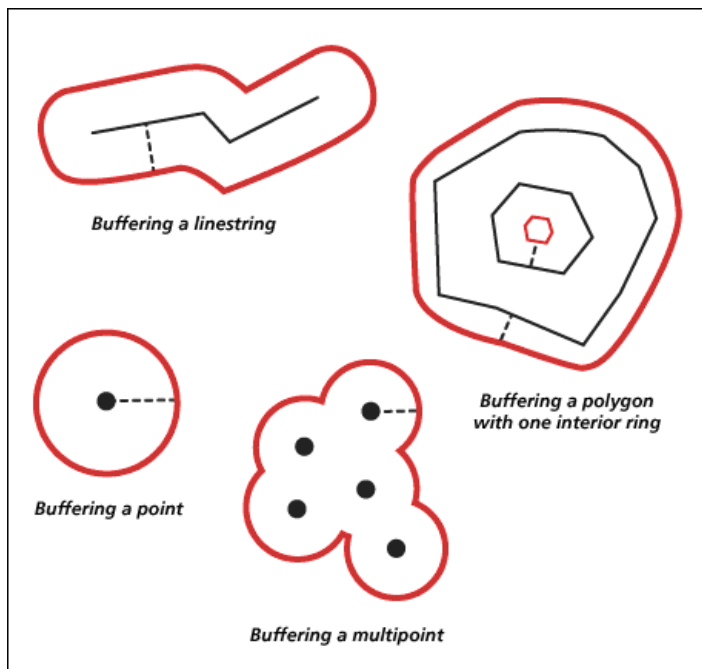
Changes are controlled by some business rules, including:

- Buffering according to distances described in existing classifiers
- Topology rules
- Data Integrity

Protection areas are linked to an Object, and they will be calculated based on object's geometry and registered in the system in the same transaction than the object itself.

Protection Areas will be calculated in the following way:

- A buffer geometry will be calculated for each Element geometry (see picture below to understand how buffering works)
- Buffer geometries for all Elements being part of the same object will be fused (usually known as “dissolve spatial operator”) so that a unique geometry is registered for a Protection Area.



Calculating Protection Areas for Elements

The **Rights Module** manages rights related to Physical Infra/Utility Objects. This module provides functions that allow listing rights and their links and attributes, alter rights and their features/relations, or deactivate/delete the rights. These functions are invoked by case management that links data handling to a particular case and makes procedures transparent. Changes are controlled by business data integrity rules, for example:

- each right must have at least one right holder,
- each right must be linked to one Object
- each right must be linked to at least one document

- etc.

The **Documents/Data Module** manages documents/data provided by the infrastructure objects Operators/Owners. This module provides functions that allow listing documents /data and their links and attributes, alter their relations with other Objects and/or Elements or deactivate them. These functions are invoked by Case Management that links data handling to a particular case and makes procedures transparent.

Documents cannot ever be changed in the system; they are stored as they are provided by the owner.

Changes are controlled by business data integrity rules, for example:

- each document must be linked at least to one owner,
- each document must be linked to one Object
- one document may support one or more rights
- etc.

The Documents/Data Module will be supported with PSA internal WEBDAV.

The **Subjects/ Persons Module** manages data of natural and legal persons, clients and holders of various rights. In order to update persons' data, the ROITE system accesses external registers. The Person Module provides functions to list persons and their links and attributes, to present linked objects on the map, compare them to external registers, perform manual or automatic modification of attributes imported from external registers. These functions are invoked by case management that links data handling to a particular case and makes procedures transparent. Changes are controlled by some business rules, including:

- Data Integrity within ROITE, e.g. one person will always be referred with the same unique ID, one Object will be linked to at least one person (owner),
- Data Integrity with other registers, so that a person is just registered once within the systems at PSA.

Based on provide earlier in this Tech. Specs info the ROITE REGISTER must use and be interoperable with the Civil Register, Address Register, Building Register, Business Register, TAX and others, if exist in digital form. Data structure should be compliant with the structure of the existing digital register, relevant to the Register of Technical-Constructions Infrastructure Objects.

5.6. Business logic

The **Case Management Module** manages tasks for registers, and it assists officers in carrying out their tasks in relation to cases (registration requests and applications). Case management invokes functions according to the choreography stored by the existing application, BusinesCad. Therefore, BusinesCad could manage the work-flow of case settling.

The Case Management Module gets data concerning the yet unclosed cases and their choreography from the PSA BusinesCad. Wherein its Agent Module provides case management functions to Officers who can select from the assigned tasks awaiting completion. The Module guides the Officer through the business procedure of this particular task by evoking the relevant services (screens or web pages) of the Registers while controlling the procedure according to the BusinesCad high level choreography.

The Case Management Module will be a facade to isolate ROITE from the low-level workflow management functions so that, if necessary, a new system could replace BusinesCad in the future without affecting to the other modules in the system.

The **Control Module** provides a control layer, including registration logic to the Case Management Module which only understands about tasks. Control Module integrates the logic of registration, interacting with all other Business Data Modules, including registration of:

- Objects
- Elements
- Protection Areas

The Control Module is the Control layer is in principle based on the **MVC** (Model-View-Control paradigm approach).

In general, in MVC designs, the Control Module (named Controller) manages the communication between the model (the information about objects, elements, restrictions) and the view (how information is presented to the user). Thus, the Control module provides:

- Business rules to link the presentation (the windows seen by the user) with the information stored in the registry (objects)
- Business rules to integrate other modules of the system

This module is related to business (integration/interoperability of all modules, including cadastral and registration) logic, whereas the Case Management Module is related to task management.

5.7. Support

The **Classifiers Module** is a system-wide used code dictionary, which provides services to access/ insert/ deactivate codes in the dictionary. It manages the history of classifiers as well; inactivated and earlier used classifiers are available too.

Different kind of classifiers will be supported:

Objects Catalogue

The list of types of Objects and Elements will be included. This will be used by the Registration Module in order to get a dynamic way to modify in the future data requirements and Objects to be registered according to any further legal or technical norm development that might occur.

Rules

This will support all dynamic rules to be used in the system, providing an easy way to disable validation rules, or even modifying the behaviour of the system (e.g. this will allow modifying the distance of protection areas according to changes in technical norms).

Generic data dictionaries, to be used in list or combo-box controls.

The **Authentication Module** (SGARI and/or MPass) will provide services to identify and authenticate users. This will include:

- Verification of passwords or any other corporate mechanism to identify users

and supporting that SSO functionality within ROITE system. User will not have to identify himself/herself more than once.

- For external users the 2-stage identification mechanism (e.g. confirmation via sms/email code/etc.) needs to be applied.

The **Authorization Module** (SGARI) will manage information that defines operations that can be executed by an entity in the context of ROITE. A role and context-based authorization model for various authorization roles of various type of Users in the system, that will allow controlling access permissions (the word “right” is not used, although is commonly seen in this context, in order avoid a misunderstanding about business rights, e.g. ownership) based on the users’ position, function and actual task, e.g. an officer can have access to archived documents that have direct relation to an ongoing case assigned to him/her.

This module will manage the flexible functions to list users, roles, permissions and their relation with menu entries, functionalities, and data access. These functions are invoked by case management that links data handling to a particular case and makes procedures transparent. Changes are controlled by some business rules, including:

- Data Integrity, e.g. one role will always be mapped to at least one user, permissions will always be linked to at least one role, etc.
- The “System Administrator” role will be defined, which will be the only one allowed to manage business classifiers and to grand or delete the specific roles.

The **Reporting & Payment Module** will provide business reports as well as statistics about system usage. This module will provide regular statistics of ROITE work; it extracts data from both Case Management Module and Registration Module and automatically carries out periodical update of statistical data and produce also the confirmation to the interested parties of Object Registration (Extracts).

Also, this Module will take care for payment for registration and any other money flows related to ordering the related to ROITE PSA services and products. It is assumed, that it will regards mainly the on-line digital money flows and it will use the governmental MPay platform (to be investigated and incorporated within at PSA existing system).

The **Document Management System Module** will manage ROITE documents in a homogenous way. It must be implemented by a set of standard services intended for document creation, uploading, searching, viewing and downloading according to a defined set of document characteristics. It can use partly the PSA internal WEBDAV and BusinesCad.

However, the ROITE developer will need completely to design and develop the Document Archive in the ROITE to allow managing the electronic documents in an application dealing with preparation, registration, and archiving them for long-term access and trouble-shooting search.

The **Mapping Module** will provide visualization and edition capabilities of spatial data according to WMS and WFS standards. This module will have access to ROITE spatial data sets (e.g. as accessible via Web-Services, as other data available in ROITE), as well as to additional spatial data (orthophotos,

external map services, etc.). This module will also provide geoprocessing services (spatial transformation, geometry calculation, spatial relation, topology, etc.) according to the WPS standard. One of the main roles of the Geoprocessing server is to calculate geometries of Protection Areas from the spatial geometry of Physical Objects.

The mapping module will be supported by a Geographic Information System and will be the module responsible of:

- Data Display
- Graphical display, e.g. maps and graphs with symbols, labels or annotations.
- Textual or alphanumeric display from the graphical view, incl. attribute data attached to the graphic element
- Browsing, querying and windowing (zoom in, zoom out, pan, etc.)
- Data searching and retrieval, e.g. on points, lines or areas, on user defined criteria (alphanumeric or spatial, e.g. address, co-ordinate, etc.)
- Data Pre-processing and Manipulation
- Data validation and editing, e.g. checking and correction of geometries
- Geometric conversion, e.g. scale changes, projection changes, map transformations, rotation
- Buffer generation, e.g. calculating and defining protection zones.
- Simple Data Analysis - performed from the graphic as from the attribute (alphanumeric) part of database
- Measurement, e.g. line length, area calculations, distance and directions.
- Encapsulate Database Management
- Multi-user access to the geodatabase.
- Editing and updating of the geodatabase
- Maintenance of database spatial integrity
- Topology control/cleaning
- Creating via a query the specific dataset dump from the graphical and attribute database
- Many other standard GIS functions.

The **Audit Module** will provide log management that aggregates data from several sources, e.g. network, servers, databases, applications and consolidates monitored data. It will also manage long-term storage of historical data to facilitate correlation of data over time. Data about User actions (who, what and when does each task) will be logged.

Different levels of log will be supported:

- Debug, only should be used during development and stabilization phases of the project, as well as during support when an uncontrolled behavior is experienced and a very high level of detail about the system is needed.
- Info, both error and informative messages will be provided. It will include information about errors as well as normal operation of the system.
- Error, the lowest level of detail is only expected to be used when the minimum level of detail is needed and no information about successful operations is needed.

5.8. Public Interfaces

The broad public access to Utility Infra Open networks data will be provided as one of the data layers via ALRC NSDI Geoportal (after Client identification and registration).

However, for more professional users, the Public (External Users) access to ROITE selected data sets will be realised mainly **via e-Cadastre & PSA Geo-Server** that serves as ROITE **Utility Web and E-services Module** and in principle it will provide both free and paid (after Client identification and registration) on-line access to PSA Utility Services/Data (finding/viewing/downloading). It will provide mostly the quick access to the utility network map and attribute of registered Utility data, and any other information related to the performed infrastructure object registrations.

There are 3 main ways to receive the Utility data/information from PSA required via e-Cadastre Portal services:

- The Client can direct view/access, download data from the Portal within his/her authorization/credit, or
- It will be delivered/send by PSA digitally via email or other electronic communication (both can be free of charge and after payment).
- The Client can order a service/product which will delivered at the identified local PSA office or send by regular mail (usually after the payment).

In order to achieve an integrated solution regarding this kind of services, it is expected that some functions of these existing at PSA IT tools, like e-Cadastre Portal need to be updated and/or expanded for the specific ROITE requirements/functionalities.

Therefore, the Supplier, in the Inception phase, needs to assess all what is available at PSA (software systems, current hardware and ICT infrastructure) and what is necessary for its ROITE solution. Please pay attention also to *Chapter 6 – Technical Infrastructure* and *Chapter 7.2 Interoperability*.

The characteristics of the existing at PSA IT systems are provided in *Annex 1* to this Tech. Specs.

The **E-Services Module** will provide an interface to support the share/exchange of information with other services. The SOA principles must be considered and the integration/ interoperability with the governmental Enterprise Service Bus will be driving the design of this module.

At least these types of services must be provided:

- Spatial data sharing services conform INSPIRE Directive
- Business data sharing services to encapsulate information requests from third party systems.

But this module should also take care for any other necessary Front Desk e-Services, like receiving from external Users access requests, on-line payments, any data/information sharing, etc.

5.9. Functions supporting Data Load

ROITE will have two different ways to load data into the system:

- Based on on-line Utility Operator registration application, creating via a query the dataset dump from the specific utility network (graphical and attribute database) from Web-Services to ROITE, wherein the dumped/copied data (graphical and attribute accompanied by Metadata) will serve as identification of the Object data that undergoes the registration.
- In case of lack of own IT system with network data by a Utility Operator (as in some cases it is still the case), based on Utility Operator registration application, the Operator needs to deliver all documents and digital data—through electronic communications or submit them for

registration at the counter of the multifunctional office (CMF) of the Public Services Agency on memory media (memory sticks, etc.). This data will be checked first at PSA and if necessary, processes accordingly to the registration requirements/rules/needs.

It is advisable, that the implementation of ROITE data dump/load from Web-Services, will be based on an Extract-Transform-Load approach, which will be supported by a set of tools. These tools will:

- Create log files indicating the results of the steps.
- Generate reports concerning the amount of data managed and successfully transferred by all types of objects/elements
- Validate data integrity rules before loading anything into the system
- If necessary, provide a rollback mechanism in order to undo a load operation if needed by any legal or technical reason.

6. Technical Infrastructure

The role of Supplier is not limited just to ROITE Software development, but it is expected that the ROITE Supplier will also act as **so-called System Integrator**, this implicit that the Bidder must be a company that specializes also in bringing together various component subsystems into a whole, including the existing Beneficiary IT systems (Hardware and Software) and e-governmental platforms and ensuring that those subsystems function well together. The Systems Integrators generally have to be good at matching clients' needs with existing products. A similar acting is expected from the ROITE Supplier.

The purchase of Hardware (HW) and/or necessary infrastructure is not part of this tender, however the ROITE supplier needs to take into consideration in the first place not only the existing at PSA IT software systems and platforms, but also the exiting HW and Infra as available at PSA IT Centre considering the below presented recommendations.

If the existing HW and Infra will be not sufficient, the ROITE Supplier must develop ASAP the necessary Technical Specs for additional necessary HW and Infra that need to be purchased, taking into account the PSA purchase and technological policy aspects. When the HW/ Infra will be delivered, the ROITE Supplier needs from its System Integrator position to supervise the installation of ordered by PSA extra HW/Infra.

As mentioned, the ROITE system should be primarily based on infrastructure as already is available at PSA ICT Centre. The activities concerning the technical infrastructure within the project need to focus on maintaining the existing infrastructure, optimizing its usage and sustainable development.

Development of the technical infrastructure, aimed at adjusting the existing infrastructure to the needs of the ROITE project, should be based on sizing the existing tools and services. The method used allowed to determine results regarding the number of business operations and their distribution according to business services, data volumes and their distribution according to business services as well as indicators presenting efficiency of both application and database layers, expressed in units that are an industry standard. Results of sizing allowed for optimal planning of infrastructure development.

Development of infrastructure included the following activities:

- providing sufficient capacity of Internet access ((primary and reserve connection),
- adding the necessary virtualization environment as well as for servers, application servers, databases and operating systems as well as other tools,
- developing the network infrastructure,
- creating mechanisms for infrastructure monitoring,
- developing/adjusting infrastructure that provides system security,
- developing/adjusting hardware infrastructure.

Using the consolidation platform in the Database layer and storage space proved to be an important factor optimizing the infrastructure usage. This solution ensured high quality of the environment, which was also achieved with the use of a smaller amount of database processes and other hardware resources, than would be needed in case of traditional architecture. The solution did also prove to generate lower costs, which was due to optimization of several core database processors, lower needs for computational power of the servers as well as easier and less labour-intensive management of the IT environment. The usage of a consolidation platform does also allow for a fast process of identifying and reproducing any eventual problems in an integrated environment, covered with a homogeneous supporting service and with an ability to distribute resources of the database platform flexibly and automatically, including computational power and disc capacity, according to current needs.

6.1 Back-up and Disaster-Recovery

The Supplier is responsible for setting up the safely and timely storing of regular backups (daily) of the data in the e-Cadastre Portal and Software in accordance with data management principles proposed by Supplier and accepted by the Purchaser.

Disaster-Recovery: During the maintenance period of the software, it will be required to set up the Disaster Recovery.

The procedure has to be tested at least once. **The recovery time for a restore of the data and software needs to be max. 48 hours.**

D. SERVICE SPECIFICATIONS – SUPPLY & INSTALL ITEMS

7. ROITE General Requirements

The high-level requirement for the Supplier, as defined in this Tech. Specs, is to develop and implement and to pilot the complete REGISTER of Technical Constructions infrastructure Objects (ROITE) including online services for submission of applications and access to information, and assuring interoperability with other PSA systems and governmental platforms/standards. Hereby more specific requirements how it should be achieved.

7.1. Modularization

Complexity must be reduced through clear separation of collaboration scenarios into mutually independent, yet interoperable interaction modules. The principle of high cohesion and loose coupling must address the detailed design of ROITE system.

Consistent modular design must be developed so that modules can be added, documented, split apart, substituted, inverted (made visible and usable to a larger number of other modules) and ported (made accessible to a system, which follows a different set of design rules with the help of adapter modules) without requiring considerable redesign efforts implementation in other modules.

7.2. Interoperability

From the business point of view, technical infrastructure facilities (utility) information should be widely used by the various spatial planners, construction companies, real estate developers, utility companies' self, the excavators active by any infrastructure/constructing project, then the broad public and central and local government institutions in Moldova in order to administer the existing assets in the most efficient way.

The EU defines two major policies for Public Administration Sector with regard to information and communication scope that need to be always implemented, namely:

- Information Society,
- e-Government.

Wherein, there are very clear requirements for the national IT systems, and that these systems must assure **a high level of interoperability** and this has to be realised via:

- interconnection
- data integration
- e-services access
- content management metadata.

Because the ROITE system will be part of Moldovan e-Government and has to support Information Society in Moldova, the ROITE system **must assure full interoperability between various governmental information systems/databases**. This means practically that the information system of

the Register uses data from state registers and specialized cadasters and enables the automatic sharing of data between the information systems.

ROITE interoperability with e-Government platforms

At the same time, from the technical point of view, there is an increasing demand for electronic services expected from e-government platforms incl. PSA/CADASTRU.

Therefore, ROITE system has to be fully interoperable with a number of the Moldovan government launched e-government IT platforms like ESB via the common government technology platform (**MCloud**)(Law no. 142/2018) and is interconnected with the **MConnect** interoperability platform, with the governmental platform of registers and permissive documents (**PGRAP**) (HG no. 717/2014), with the governmental electronic authentication and access control service (**Mpass**) (HG no. 1090/2013), with the integrated government digital signature service (**Msign**) (HG no. 405/2014), with the government electronic journaling service (**MLog**) (HG no. 708/2014), with the government service of electronic payments "**Mpay**"(HG no. 329/2012), with the service government electronic notification "**MNotify**" (HG no. 376/2020)" (see for more description the *Chapter 3* of this Tech. Specs).

ROITE interoperability/ integration with existing PSA IT system modules

Some of the required IT system components described in this document are part of or are being used by other systems – for details see *Chapter 3*. Reusing of these components has the following benefits:

- Systems maintenance is not duplicated and no additional effort is needed to maintain modules which are similar (or even identical) to the ones already existing
- Optimized usage of hardware and software resources
- Reduces TCO (Total Cost of Ownership) of IT infrastructure.

On the other hand, in order to avoid additional technical risks in the ROITE development and deployment, well known interfaces must be defined and agreed in order to make possible the integration/ interoperability of these components with the minimum impact to all systems.

It can use partly the PSA internal WEBDAV and BusinesCad.

Interfaces with existing modules

Module	Available interfaces
Authentication	SGARI or MPass
Authorization	SGARI
Document Archive system	To be developed in the framework of ROITE
WFS/WMS	Geo-server GIS server supporting WMS, WFS, WPS, SLD
Mapping	QGIS
PDSE	Reception of applications

The right holder	SOAP/REST interface to be provided by CADASTRU
Classifiers	SOAP/REST interface to be provided by CADASTRU.

The integration of all external modules described in the Table above must be done according to the interoperability and architecture guidelines of this document. In particular, all services will be published and accessed via the ESB.

ROITE interoperability (to other existing systems) will be done on several levels:

- For the needs of Map viewer component interoperability will be done by use of external standard spatial network services (WMS, WMTS and WFS).
- For the download of metadata from other systems standard discovery service (CSW) will be used (if necessary)
- For the bulk publishing of Metadata CSW service will be used (if necessary).
- Harvesting methods will be processed using standard discovery service (CSW service).
- Additional integration with the other existing IT systems will be done using API and REST/SOAP services.

ROITE interoperability with existing in Moldova State Registers

There are already in Moldova a number of State Registers (persons, addresses, etc.) that providing the unique and authentic data, that are obligatory to use in all governmental IT systems and Databases.

Considering the requirement for ROITE of high level of interoperability it must be considered that ROITE will use the data related to the technical-building infrastructure objects from the following informational resources:

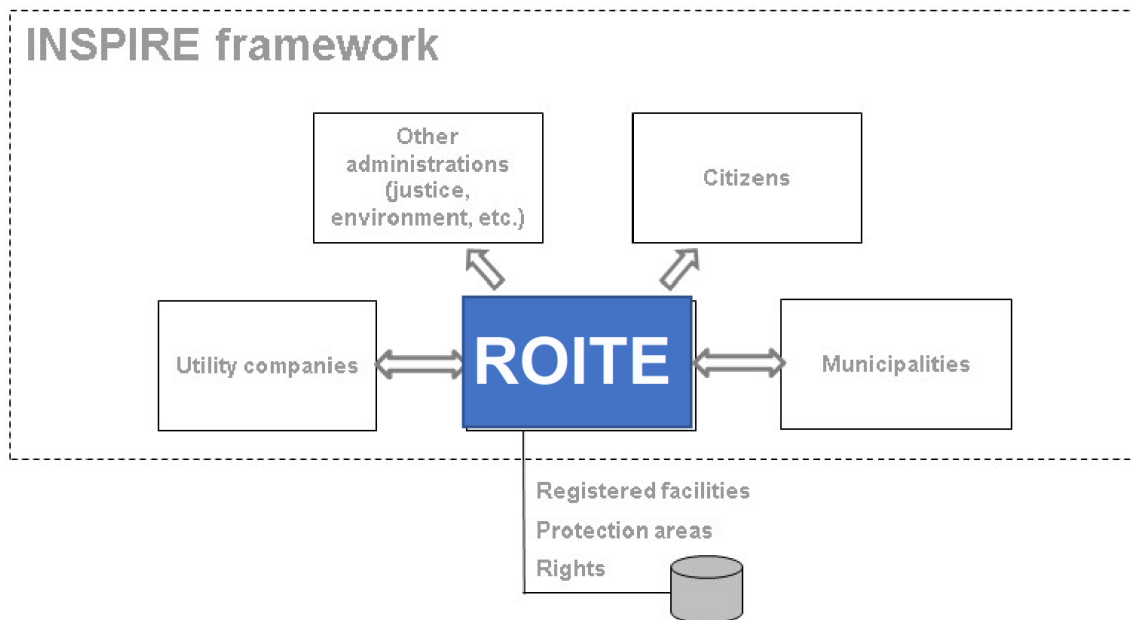
- Urban Functional Cadastre – the special informational resource that includes all the information related to the communal infrastructure, created with the help of the integrated automated informational system for recording the given infrastructure;
- Transport Infrastructure Cadastre – the special informational resource that includes all the information related to the infrastructure of roads, railways, airports, ports, created with the help of the integrated automated informational system for recording the respective infrastructure;
- Energy Infrastructure Cadastre – the special informational resource that includes all the information related to the electricity and gas networks, created with the help of the integrated automated informational system for recording the respective infrastructure;
- Electronic Communications Networks Cadastre – the special information resource that includes all the information related to electronic communications networks, created with the help of the integrated automated information system for recording the given infrastructure.
- Water Cadastre - will deliver information about hydrotechnical constructions;
- SIA "State Register of the Population" - contains data about natural persons and their identification documents;
- SIA "State Register of Legal Entities" - contains data on legal entities and their identification documents. Information must be added to this informational resource regarding the date on which the competence of the public administration authority begins and expires;

- SIA "State Register of Administrative-Territorial Units and Streets in the territory of Moldova" - contains data about the status, name, boundaries of administrative-territorial units of all levels, addresses of buildings and isolated rooms;
- SIA "Cadastre of Real Estate" - contains spatial and textual data of real estate and data on their rights holders.

Furthermore, a specific European framework to guarantee spatial data interoperability is described in INSPIRE Directive.

It is required that ROITE system will fully be interoperable with all these platforms due the high demand of this type of information and the technical framework for exchange of information, mean that:

- The EBS standard (including specifications for message formats and service interfaces) is to be adopted.
- Communication standards must be supported to provide the best interoperability and least dependence with specific system components and technologies
- INSPIRE Directive must be supported and will drive the implementation of standard interfaces for the exchange of spatial data.



INSPIRE framework and ROITE

Syntactical interoperability is usually associated with data formats and communication protocols. The messages transferred by communication protocols need to have a well-defined syntax and encoding, even if it is only in the form of bit-tables. There are many protocols carrying data or content, and this can be represented using high-level transfer syntaxes, see some important examples included in the next table:

Supported formats and protocols

Category	Examples
Transport standards	HTTP, HTTPS, FTP, FTPS, SMTP
Message formats	MIME, S/MIME

Data standards	XML and XML Schema
Protocols	SOAP, REST, UDDI, WPS, WFS, WMS, CMIS
Specifications	Web Service Description Language (WSDL)

7.3. Data Model

The data stored in ROITE Register must be based on well-recognized and broad recommended Land Administration Domain Model (LADM), that is defined in ISO 19152:2012.

This model defines basic information-related components of land administration (including those over water and land, and elements above and below the surface of the earth), thus also all Utility Infra networks, providing mainly a conceptual model with four packages related to parties (people and organizations); basic administrative units, rights, responsibilities, and restrictions (ownership rights); spatial units (parcels, and the legal space of buildings and utility networks); spatial sources (surveying), and spatial representations (geometry and topology);

7.4. Meeting Strategic Requirements

The ROITE architecture should meet the following strategic IT requirements:

- Internal and external interoperability of IT systems
- Sufficient level of IT security
- Adoption of Open Standards
- Flexible and easy adoption of business process changes
- Scalability in terms of the growing performance requirements

The ROITE system has to be built on the international recognized technological platforms/solutions/standards. As well the Open Sources platforms (preferred), as well commercial vendor applications, databases, etc. are welcome. However, if commercial platform will be proposed, their OTS price needs to be included in the total bidder price envelope.

The proposed/to be applied system development methodology it could be the classic “Waterfall” or “Agile” one. As mentioned before, if the (nearly) ready OTS solutions meeting the most of ROITE requirements are available they are very welcome.

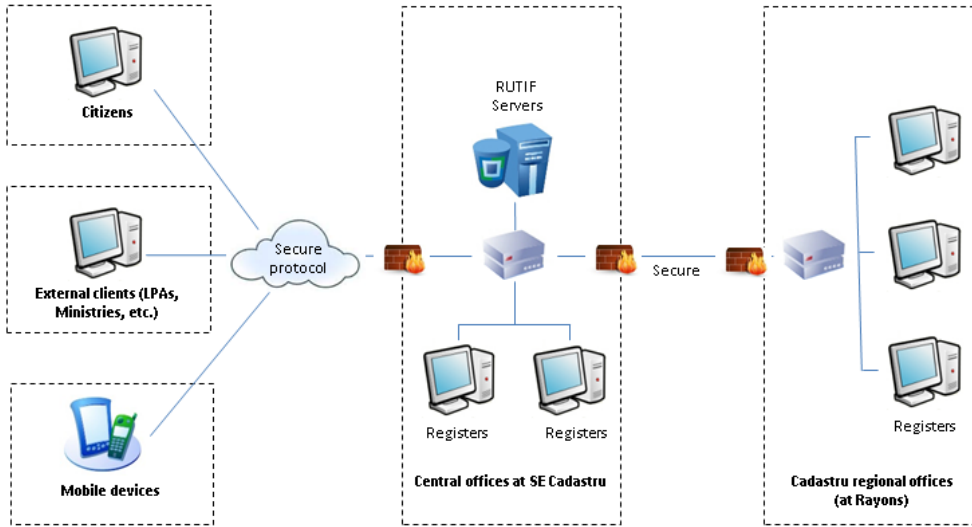
The ROITE system Supplier/developer has to consider that the project duration/system development incl. Pilot is limited to 1 year.

It is required that after it the ROITE supplier will perform the Pilot project, wherein minimum the data of 3-4 Utility Operators will be successfully implemented.

7.5 HW/Infra Architecture

Centralized HW ROITE

ROITE will be an entirely centralized software application which will receive files from external clients and communicate with external bodies centrally.



Centralized ROITE

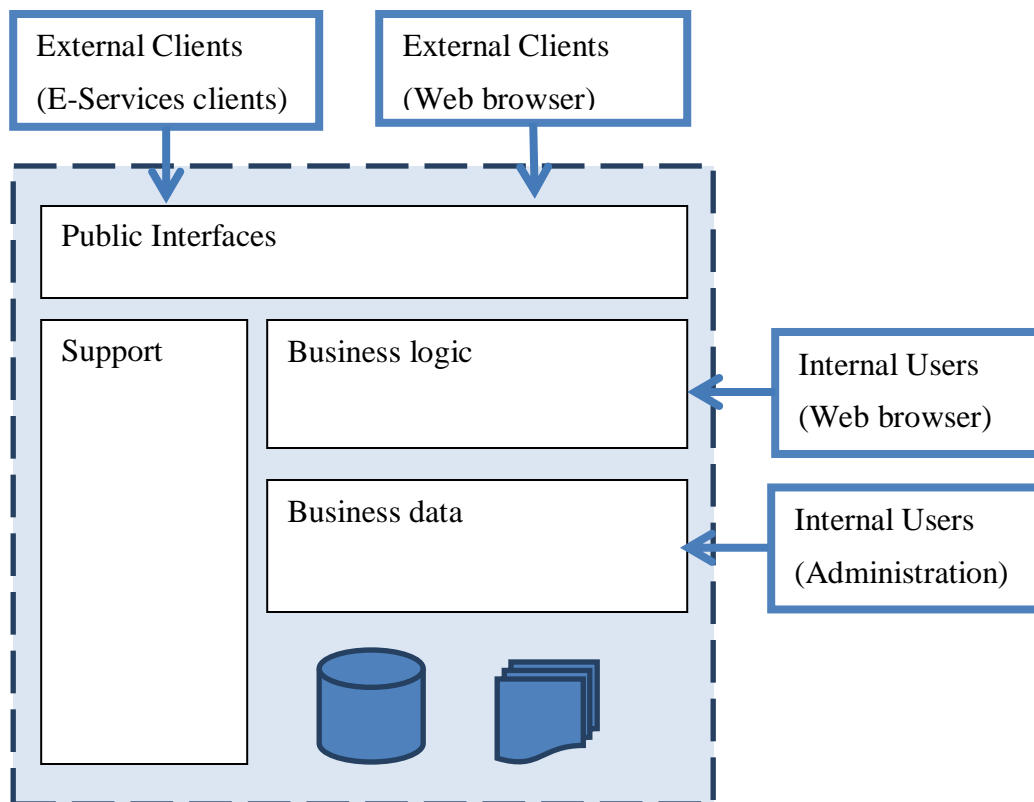
Client Server Architecture

ROITE will be built based on Web Clients-Server architecture. Clients should communicate via web services or HTTP (secured or not depending on type –external or internal-type of client).

Only some parts of administration of base software components, if technologically necessary, will use thick (desktop) applications. This will provide an additional level of scalability and ease of maintenance, including fast and transparent version upgrade (only deployment on the server will be required since no installation on clients will be needed).

Different levels of security will be available:

- External clients will always access the system through a secured layer (public interfaces) usually deployed on a DMZ (demilitarized network) or any other comparable solution.
- Internal Users will access mostly directly the Application server, which will provide a better performance since less security controls will be needed.



External vs Internal ROITE clients

7.6. Virtualization of Hardware

ROITE servers will run on a virtualized environment which makes possible the reallocation of resources among servers and easy porting the ROITE system to a remote Data Centre.

7.7. Utilization of existing peripherals

ROITE will utilize existing peripherals such as printers, plotters, scanners and bar code readers, which are important for tracing, storing and archiving paper documents.

7.8. Electronic verification and digital signature

ROITE shall provide means for the use of electronic verification, digital signature (see <https://mpass.gov.md>) and time stamp in order to store certified documents in Document Archive and exchange these files via electronic services.

7.9. Service-Oriented Architecture

ROITE is to be designed and developed based on the concept of Service-Oriented Architecture. A link between independent systems via service-oriented approach is a mandatory requirement (SOAP and REST).

This concept breaks down the functionality of a software application to lower-level functions, i.e. services then, using these services, build up an architecture which provides the requested functionality and could easily be altered or extended by utilizing the existing services. The next table contains a brief summary of the design principles to be addressed:

SOA principles for the detailed system design

Principle	Description
Standardized Service Contract	Services adhere to a service-description
Loose Coupling	Services minimize dependencies on each other
Service Abstraction	Services hide the logic they encapsulate from the outside world
Service Reusability	Logic is divided into services with the intent of maximizing reuse
Service Autonomy	Services should have control over the logic they encapsulate
Service Statelessness	Ideally, services should be stateless
Service Discoverability	Services can be discovered (usually in a service registry)
Service Composability	Services break big problems into little problems
Service Interoperability	Services should use standards that allow diverse subscribers to use the service

The ESB enables the integration/ interoperability of various technologies which are compatible with the open standards of SOA. This gives some freedom in indicating technology components.

In the following picture a SOA layer architecture proposal is shown, where each layer consists of a set of building blocks that define the key responsibilities of that layer. Components are connected to one another across layers and thus provide a definition of the association between layers. It is preferred that ROITE be developed as shown on the diagram bellow including the integration/interoperability of existing systems.

7.10. High availability

Service levels to be provided are described in the following table.

Service Level Agreement

Module	Interface
Accessibility	24 hours <ul style="list-style-type: none"> • from 7:00 to 19:00 all business functions • from 19:00 to 24:00 maintenance functions • Non-stop access to on-line services

Availability	<p>99% availability throughout the year</p> <ul style="list-style-type: none"> • Excluding force major and third party caused failures • A maximum of 48 hours exceptional downtime can be eliminated at the business level <p>Maintenance activity</p> <ul style="list-style-type: none"> • fixing or upgrading hardware • upgrading patches of standards software • installing patches or upgrading software applications
Recovery Point Objective (RPO), that is to say, the point back in time to which you must be able to recover systems and data after a failure	Maximum non-availability time according to accessibility and availability values
Recovery Time Objective (RTO), that is to say, is the amount of time a system can be down without major impact to your business	Maximum non-availability time according to accessibility and availability values

7.11. Standards

ISO Standards

The most relevant ISO standards to be supported by ROITE are listed in the next table.

ISO Standards

Standard	When / Where to be used
ISO 19152 “Geographic information – Land Administration Domain Model” (LADM)	To be used in data modelling within ROITE regarding the Objects, Subjects, Rights
ISO 19115 “Geographic Information – Metadata”, ISO 19139 Serialization in XML	To be used when creating metadata for each one of the layers to be maintained and shared by ROITE
ISO 19109:2005 Rules for application schema ISO 19119:2005 Services ISO 19136/OGC GML (Geographic Markup Language) ISO 19142/OGC WFS (Web Feature Services) ISO 19128/OGC WMS (Web Map Services)	Exchange of geographic information, both for inputs and outputs

7.12. INSPIRE Data Model guidelines

INSPIRE Data Specifications are available for the main data themes to be managed by ROITE, and although these data specifications have been developed based on lists of geographical entities restricted to those potentially linked with environmental issues (according to the INSPIRE directive fundamentals), they provide a well-organized and solid framework to be extended with specific ROITE requirements.

In the following table, the main data model guidelines to be used are listed.

INSPIRE Data Model guidelines

Standard	When / Where to be used
D2.8.III.6 INSPIRE Data Specification on Utility and Government Services – Technical Guidelines	Design and implementation of spatial data elements for Utility and Government Services, including Electricity network, Oil, Gas & Chemicals network, Sewer network and Electronic Communication network
D2.8.I.7 Data Specification on Transport Networks – Technical Guidelines	Design and implementation of spatial data elements for Transport Networks.
D2.8.I.9 Data Specification on Protected Sites– Technical Guidelines	Design and implementation of spatial data elements for Protected Sites.

7.13. Requirements to INSPIRE Discovery Services

The Discovery Services component is mainly assured via existing ALRC National **NSDI Geoportal** that stores most of national metadata and provide the online metadata services to external and internal systems. The specific thematic ROITE Metadata Client Component uses it too, but for specific utility data its creates if necessary and uses own additional more detailed thematic ROITE Metadata.

The Discovery Services shall comply with INSPIRE “*Technical Guidance for the implementation of INSPIRE Discovery Services version 3.1*” or higher and NSDI law

All four services operations shall be implemented:

- Get Discovery Service Metadata
- Discover Metadata
- Publish Metadata
- Link Discovery service

The Publish Metadata operation with the Harvest option.

The access point, for the European INSPIRE portal, also for the Metadata of Moldavian Utility Operators and Agencies is provided via ALRC **NSDI Geoportal** incl. .

The Web- Service in relation to ROITE data will be generally open as Open Data, after identification and registration of the requiring User.. For some actions like downloads of contents extra authorization might be applied (to be validated by PSA). The same will be applicable for the Digital Rights Management component is involved for purposes of monitoring and administration.

8. Scope of Delivery

8.1. Main Parts Overview

The delivery shall consist of software modules and services for testing, installation, training initial roll-out and pilot. **No hardware shall be part of the delivery.** However, the Supplier shall confirm that they can comply with the current available infrastructure. If not, then the ROITE Supplier must develop the Technical Specification for the necessary additional hardware and infra components. This will be purchased by PSA separately.

The system components shall be installed for the PSA:

- Full developed REGISTER of Technical Constructions infrastructure Objects including online services for submission of applications and access to information, incl. interoperability with other systems and governmental platforms
- Web-Services to find, view and download of Utility data (in various type data (vector, attribute, metadata, etc).
- Utility ROITE website and collaboration platform with links to **ALRC NSDI Geoportal** and to active (having the digital data and systems) Utility network operators
- Business Data (Objects)
- Protection Areas
- Rights
- Documents
- Persons (Subjects)
- Case Management (Business logic)
- Control
- Support (Classifiers, Authentically, Authorization, Reporting and Payment, Document Management System)
- Mapping
- Auditing
- Public Interfaces
- E- services.

The technological stack of the solution (software) being built should take into account the use of Open-Source software versions (both community and enterprise) to the maximum extent possible.

If both commercial and Open-Source software are available, an Open-Source solution should be preferred. If commercial software is offered all licensing cost shall be covered by the Supplier included in his bid price envelope.

The Bidder is free propose a deviation from the requested system Components and Modules if this will lead to enhanced efficiency, lower the cost, but still assuring the required objectives/goals of the ROITE system.



8.2. Bidder's ready solutions

Having in mind the short project duration the Bidders that have ready some software Modules providing the required or very close to it functionality for ROITE (called *Of The Shelf (OTS)*) have to indicated them in the Proposal (it will be an issue of Bid Evaluation) using for it an Evaluation Template. In this Template, the Bidder needs to assess its own OTS solutions/modules vs ToR requirements and identify what is **Already Available (AA)**, what is **Partly Available (PA)** and what needs **To Be Developed (TBD)**.

In this way the existing Bidder’s OTS system components wherein the existing and well operating in OTS system functionality, technology, solutions, etc. will be verified with the needs of the ROITE as initially defined in this Specs.

Then below presented Evaluation Template, need to be used and it will serve as a guide and input to this exercise.

In this Template the Bidder needs assess of own OTS vs this Tech. Specs requirements. There need to be indicated what is **Already Available (AA)**, what is **Partly Available (PA)** and what needs **To Be Developed (TBD)**. This assessment is accompanied with short explanation how **AA** have been achieved, then for **PA** also explaining what is already available and what extra or differently needs to be developed/configured.

Tech. Specs Requirement / Description	Status of current Module / Component (especially OTS): AA - Already Available, PA - Partly Available TBD- To Be Developed	 Short description of existing OTS Functionality / Methodology, Technology or  To be taken Actions / Methodology / Develop. duration/ etc. (for PA and TBD)	Additional Comments (Time indications, etc.)

The same is required for TBD including an estimation of the time necessary to develop the missing parts.

Then, during the Project Inception phase, all provided information will be verified vs local findings in described in the updated Detailed Project Plan.

This verification activity will focus on adjusting of existing already available (AA) functionalities/services (e.g. User interface in Romanian etc.) and then mainly focusing on development of missing in the OTS the TBD functionalities/services and upgrading of partly available (PA) functionality/services.

For all delivered modules the well documented **Source Code** needs to be delivered to PSA with the rights to use it for maintenance and future upgrades of software modules.

8.3. System Analysis, Design and Customization/Development

The Supplier must perform, a detailed analysis of requirements, use to maximum extend available Open-Source solutions and to do necessary customization / configuration / development to meet the needs of the ROITE System.

The analysis will have to be performed for all modules, where the assumption can be made that all the software will be installed in the M-cloud of Moldova.

The documentation requirements are detailed for all modules in the following paragraphs.

8.4. Software development method to be described in the Supplier's Bid

As mentioned above, the Bidder is free to propose according to his approach the most appropriate ROITE system development methodology that should lead to quick and efficient results. It could e.g. be the classic “**Waterfall**” or “**Agile**”. As mentioned before, the (nearly) **ready OTS solutions** meeting the most of ROITE requirements are very welcome.

It is required that the ROITE Supplier will provide support to the Purchaser during the Piloting stage, wherein minimum the data of 3-4 Utility Infra Operators will be successfully participating.

The ROITE system Supplier/developer has to consider that the software development and its piloting is limited to 1 year – 10 months for implementation and 2 for piloting.

8.5. Training and Training Materials

The Supplier MUST provide the following Training Services and Materials

8.5.1. Training materials

Training materials shall be created for:

- Training of Registers,
- Training of Super Users,
- Training of PSA Web site programmer (if relevant),
- Training of PSA IT staff for system operation,
- Training of PSA Database manager

Training for the End-Users (this could be the Training of Trainers (ToT) methodology).

Training materials for the user level of training must be made in the form of a Guide (user manual) with examples supported by diagrams, flowcharts, screenshots and detailed step-by-step instructions that explain the execution of each task.

User training materials must cover all functions of the developed system and should cover individual functional modules and supported functions independently so that it could be easier to involve additional colleagues to perform specific tasks with clearly segregated roles later on. If within one functional module there is functionality that depends on the hierarchical level, it is necessary to clearly separate the descriptions for each hierarchical level (e.g. in the case of a website a certain role can create content but doesn't have right to publish content, while another role has a higher level of rights to create content but

additionally also has the right to publish that content and content created by persons who do not have the right to publish content).

Training materials for the Administrator-level training must also be developed in the form of a guide with examples supported by diagrams, flowcharts, screenshots and detailed step-by-step instructions explaining the execution of each task. Training materials for Administrator level training must include, but are not limited to, procedures for installing individual functional modules, configuring all parts of the system, exporting and importing data, viewing log records, etc. Training materials for Administrator level training must cover individual functional modules separately in order it could be easier to involve additional colleagues to perform specific tasks with clearly segregated roles later on.

All training materials for the Administrator must be in Romanian or English. All training materials for the Users must be in Romanian. All training materials must be delivered in an editable electronic form (e.g. OpenDocument Format - ODF and/or Microsoft Office Open XML). Also, all training materials must be delivered in sufficient quantity to provide at least one set for each trainee. Compliance with common graphic elements (colors, fonts) which will be used in the development of the application solution itself is also expected, in order to further emphasize the connection of training materials with the system they cover.

8.5.2. Training

Training shall be performed using Training materials as defined in the Training Plan. Training must be conducted separately for various target groups. For details, please view *Chapter 10.4.2.8. Training requirements*.

For ant Training group, it is estimated that the maximum number of participants who will attend the training should not extend 5-6 people max.

The estimated duration of training is a maximum of 5 days for each group. The maximum daily load is 7 hours, which includes a break of one hour for lunch after the first half of the lecture (3 + 1 + 3). Training must be performed on weekdays (Monday-Friday). The start of training should be planned at 09:00, the lunch break at 12:00 and the end of training at 16:00. After a maximum of 1:30 hours of training, it is necessary to provide a break of 15 minutes and provide refreshments (water, tea, coffee, pastries). It is also necessary to provide lunch for training participants.

The training location will be defined by the PSA in co-operation with the Supplier. All training costs except premises shall be covered by the Supplier (including refreshments during breaks, lunch for participants, notepads and pens etc.).

Trainings must take place within a time frame in order that they do not overlap so that it is possible, if necessary, for the same persons to participate in both types of training.

The training shall be performed by the persons who participated in the development of the training material.

Upon completion of the training, all participants who have undergone trainings must be issued a certificate of successful completion of training in the form of a certificate.

8.6. Data Conversion and Download

The Supplier must provide services and tools to support and perform the following Data Conversion and Data Download Services:

- The Network data as used/stored by the Utility Operator internal IT system needs to be filtered and continuously migrated/copied into the Front-End Information Database (and updated by any change) and there stored there in a standard/readable for the OGC Web-services format – in principle it will be the task of the Utility Operator, however in the system preparation and piloting phase must be initially guided by the System Supplier.
- In case of the Utility Operator that do not has any IT system in place, only the network data stored on individual data carriers in various formats, then Supplier, if necessary, should propose the data conversion into the same format as used for the Web-services (Preferred Open-Source formats like *QGIS/Postgresql*), and help the Utility Operator to transform available data into the OGC complied format.
- Information from the Web-Services isn't expected to be migrated, however for the network registration, using the standard system query a dump(download) of Database (graphical and attribute data) of specific network needs to be assured.

8.7. Piloting

The Supplier need to perform Pilot activities under the current contract.

The Pilot is the activity undertaken to test the system in a realistic setting and learn if the system needs changes/adjustments prior to full-scale deployment.

Main activities under pilot include:

1. Guide and support the Purchaser in all activities related to the piloting of the new IT system;
2. Establishing the Web-Services
3. Assist the Utility Operators to make available their network Open Data as front-end data in the standardized format for Web-Services
4. Receive the feedback of the end-users
5. Improve the IT systems design and functionalities based on users' feedback, practical use experience and observed results.
6. Identify necessary or desirable changes to the system.

During this stage, the data of minimum 3-4 Utility Infra Operators will be successfully participating.

The ROITE system Supplier/developer has to consider that the software development and its initial implementation/piloting is limited to 1 year.

For the Pilot implementation incl. necessary ROITE improvements max. 2 Months are reserved.

8.8. Documentation Requirements

The Supplier MUST prepare and provide at least the following Documentation.

For the delivered system, it is necessary to provide documentation that describes in detail the system and functionalities, which includes, but is not limited to:

1. User Manual (including training manuals)
2. Quick Reference Guide
3. Context Sensitive On-line Help text

4. System Operations Guide and Maintenance Manual
5. System Architecture Document
6. FAQ
7. Documented in English Source Code

1. User Manual

The User Guide contains the procedures by which the users use the application to respond to business events. It is an instruction manual. It also is the basis for user training. New application users use the User Manual.

2. Quick Reference Guide

Quick Reference Guide provide tips and description for the main functionalities. Experienced users take advantage of the Quick Reference Guide. The Quick Reference Guide is organized by system function. Each section of the Quick Reference Guide explains the details of a single system function. It includes information on each field and option, data validation, error messages, etc. Experienced users use the Quick Reference Guide for information on infrequently used functions. They also use it to confirm bugs.

3. Context Sensitive On-line Help text

This is the help text that the user can reference from within the application. In most cases, you derive the Online Help Text directly from the Quick Reference Guide.

4. System Operations Guide

The System Operations Guide is a compilation of all system operations procedures. Its organization is similar to that of the User Manual. The System Operations Guide must provide recommendations on how to perform backup and recovery in order to prevent data loss and define which system elements need to be backed up and how. System operations personnel use the System Operations Guide in learning how to back-up the application system, how to perform recovery operations, audit, etc. The System Operations Guide must provide recommendations and an overview of the activities that need to be performed in order for the system to function stably and reliably. The System Operations Guide must include a list of activities and a time frame when it is necessary to carry out which specific activity in order to monitor the system and prevent malfunctions.

5. System Architecture Document

The detailed System Architecture Document describes the technical aspects of the application. It specifies the application system's components, versions and other related data and describes design decisions and architecture. The System Architecture Document must unambiguously provide a detailed overview of all relevant information about the system such as server names, IP addresses used, which software is installed on each server, resources per server (CPU, RAM, HDD), etc.... System Architecture Document must also unambiguously provide a detailed overview of the module connections and mutual interaction and provide a pictorial / schematic overview of the connections and interactions in order to show the connection and interaction of individual modules in the simplest possible way. Future application maintainers use the System Architecture Document as a resource.

6. FAQ

The FAQ documentation must provide an overview of the expected most frequently asked questions of end users and provide answers to them in a concise and simple form that is understandable to the widest circle of users.

7. Source Code

For all delivered modules Source Code must be delivered to PSA with rights to use it for maintenance and future upgrades or any changes of software modules. The Source Code documentation must be in English.

In addition, the "FAQ" "Quick Reference Guide" and "Context Sensitive On-line Help" must be delivered in Romanian and English.

All documentation must be provided in an editable electronic form (e.g. OpenDocument Format - ODF and/or Microsoft Office Open XML).

Also, all documentation must be delivered in a minimum of 3 printed copies. Compliance with common graphic elements (colors, fonts) which will be used in the development of the application solution itself is also expected, in order to further emphasize the connection of documentation with the system it covers.

8.9. Reporting arrangements

The main contract duration period is planned for 12 months, excl. Warranty and Maintenance period. During that period Supplier shall produce Monthly Progress Reports and a Final Report at the end of the contract as specified in the table below. Final report summarizes project activities including solved project issues.

The **Inception Report** must, as minimum contain the following information:

- Detailed analyses of the current situation and recommendation, incl. the update of Bidder Overview Template of **Already-Available (AA)**, **Partly-Available (PA)**, **To-Be- Develop (TBD)** functionalities/modules and based on finding the proposed approach of proceeding (see more explanation on the Overview Template in above chapter of this Specs).
- Detailed description of the proposed system development methodology
- The result of inventory of existing at PSA hardware and infra versus required configuration
- Project Plan must consist of:
 - Project Organization and Management Sub-Plan, including management authorities, responsibilities, and contacts, as well as task, time and resource-bound schedules (in GANTT format);
 - Implementation Sub-Plan;
 - Training Sub-Plan;
 - Testing and Quality Assurance Sub-Plan;
 - Warranty Defect Repair and Technical Support Service Sub-Plan
- System Design proposal (specifically focus on deviations comparing to this Tech. Specification incl. clear motivation)
- Estimation of ICT resources for test and production environment
- Pilot Project Plan approach
- Test scenarios for pre-commissioning and Test scenarios for Commissioning should be incorporated in the Project plan and created during developments of all modules by the Supplier.
- Proposal of the content of the Monthly reporting.

No.	Reporting description	Deadline
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1.	Inception Report prepared after receiving Functionalities specification acceptance by Purchaser	2 months from the contract effective date
2	<p>Monthly reports summarizing progress of activities implemented in the previous month:</p> <p>(i) <i>results accomplished during the prior period</i></p> <p>(ii) <i>cumulative deviations to date from schedule of progress milestones as specified in the Agreed and Finalized Project Plan</i></p> <p>(iii) <i>corrective actions to be taken to return to planned schedule of progress; proposed revisions to planned schedule</i></p> <p>(iv) <i>other issues and outstanding problems; proposed actions to be taken</i></p> <p>(v) <i>resources that the Supplier expects to be provided by the Purchaser and/or actions to be taken by the Purchaser in the next reporting period</i></p> <p>(vi) <i>other issues or potential problems (risks, challengers, etc.) the Supplier foresees that could impact on project progress and/or effectiveness.</i></p>	Before 7 th day of the next month
3	Final Report	2 weeks before the end of the project duration

8.10. Requirements for the Supplier's Technical Team

The Supplier MUST maintain a key Technical Team of the following roles and skill levels during the Supply and Installation Activities under the Contract.

Project Team Leader: at least 10 years of working experience and at least 7 years of experience in implementing Geospatial Solutions. Knowledge of Geospatial needs of an SDI and Open-Source project is required, in order to act as a mediator among the technical team and the Purchaser. The candidate is required to show at least experience for two similar projects in the past 5 years. Additionally, 5 years of experience working on position of manager /team leader of similar assignments. Experience with Agile methodology will be an asset. University degree is required.

Land Administration Expert: At 10 years of experience working in the field of Property Registration and Cadastre, with clear record of experience of State Register and automation of property registration process. The experience in registration of Technical Infrastructure/Utilities and Business Process Re-Engineering (BPR) is an advantage. University degree is required.

System Analyst/Software Design Expert: at least 10 years of working experience and at least 5 years of experience in software design for Geospatial Open-Source Solutions and working with the Web-Services. Additionally, 2 years of experience working in similar assignments will be an asset. Computer science or geo related university degree is required.

Utility Expert: at least 5 years of working experience with Utilities and at least 3 years' experience in the projects involving digital spatial data of Utilities. Experience of working with Web-Services large scale Open-Source Implementation projects will be advantage. University degree is required.

Training Expert: at least 5 years of working experience and at least 3 years of experience with capacity building programs related to ICT and linkages programs on education. University degree is required.

Additionally, to the requested key Technical Team, the following expertise have to be also available:

- Programming Expert
- System Administration/Network /Security Expert
- Documentation Expert
- Database Expert
- Web/Graphic designer and developer
- Quality Assurance/Control Expert.

The above-mentioned expertise can be covered by the experts of the core technical team or additional staff can be engaged.

Requirements for the experts that are not in the core team are the following:

- minimum 3 years of experience in similar Open-Source or commercial systems used in the Geo-information sector - adequate to the project requirements
- minimum 3 years of experience in the appropriate work field.

Knowledge and working experience in development of state registers and geo-portals is preferable.

The official Project language (written communication, reporting, etc.) is English, however the working Project language will be mainly Romanian (event. Russian could be used as alternative).

For all expert's knowledge of the English language is required, and

- knowledge of Romanian and/or Russian for **Project Team Leader** is advantage, if not available, then the Supplier's team, if necessary, needs to assure translation/interpretation facility.
- knowledge of Romanian is required for **Training expert**.
- knowledge of Romanian and/or Russian is an advantage for **Land Administration Expert, System Analyst/Software Design Expert, Utility Expert.**

8.11. Requirements Warranty Defect Repair

The Supplier MUST provide the following service under the Contract or, as appropriate under separate contracts (as specified in the bidding documents).

Warranty Defect Repair Service: The supplier will warrant that the Software will perform without Defects during the term of the Contract and Warranty period. If the software does not perform as required, the Supplier will use all reasonable efforts, consistent with industry standards, to solve the Defect in the software accordance with the technical demands as listed in this document. This also cover updates in normal industry standards.

This means that during the Warranty Period, the Supplier must fix all defects reported by the Purchaser, commencing the work necessary to remedy defects or damage within 3 working days for non-critical errors. For critical errors the supplier must commence the work necessary to remedy defects or damage within 24 working hours, provide fixing time and report on fixing progress hourly.

For the purpose of this clause Critical errors mean that the System is not operational or stable. Important functional component is down or unavailable. Loss of Data or interruption in the main

process flow. System component unusable due to failure or incorrect functionality. Users are not able to perform any work.

Hourly progress report will be provided for critical errors.

The warranty period will cover a minimum of one (1) year and the problems will be solved on-site if needed.

8.12. Technical Support

The Supplier MUST provide the following services under the Contract or, as appropriate under separate contracts (as specified in the bidding documents).

Technical Assistance: During the warranty period it is expected that if the Purchaser needs support of all the modules for maintenance or further development this will be supported with a minimum of once every 3 months.

Post-Warranty Maintenance Services: After the warranty period, a renewed SLA contract for 2 years regarding maintenance will be considered.

The Supplier will make sure there are regular updates of the proposed software as part of the Maintenance contract. The Supplier will offer a planning of the regular maintenance. This will include updates of the Metadata standards and the latest IT-standards, including security and interoperability. The performance of the software will have to comply with the INSPIRE directive (NSPIRE Directive 2007/2/EC of the European Parliament).

This will include, for the duration of the maintenance contract, problems regarding the performance reported by the Purchaser according to the agreed SLAs; It is expected that Supplier response time will not exceed 48 hours in case of severe performance issues. With critical items a response time of 1 working week is required.

8.13. Requirements of the Supplier's Supporting Technical Team

The Supplier MUST propose and provide a technical team to cover the Purchaser's anticipated Post-Operational Acceptance Technical Assistance Activities Requirements (e.g., modification of the Information System to comply with changing legislation, standards and regulations) - as a Change Order (not included in the current total Supplier price envelope).

9. Testing and Quality Assurance Requirements

The Testing process is an integrated approach to testing the quality of all elements of the System. It shall include both functionally oriented module testing and business-oriented module integration/interoperability as well as acceptance testing. All business-oriented testing should establish firm traceability back to business and functional requirements. The process emphasizes a common planning approach to all types of testing. Testing must contain module testing, as well as other forms of testing, such as module integration/interoperability and overall systems testing. The Testing process approach first identifies testing requirements and maintains and enhances them through the end of the project.

Development Standards for the User Interface produce a QA checklist of behavioural tests that are performed during module testing. The Testing process must be based on a useful and representative dataset to be able to perform all different kinds of tests. The testing process contributes to the development of integrated test plans, fully tested software, and independently confirmed software tests and results.

9.1 Pre-commissioning Tests

In addition to the Supplier's standard check-out and set-up tests, the Supplier (with the assistance of the Purchaser) must perform following tests on the System and its Subsystems before Installation will be deemed to have occurred and the Purchaser will issue the Installation Certificate(s):

- Module / Function test for each specified System function in isolation
- Module Integration/Interoperability Test for a group of System Functions

Supplier's obligation is to prepare detailed test material for executing Pre-commissioning tests. The following should be included when preparing test material:

- Develop detailed test material
This includes defining scenarios, scripts, timelines, checklists, processes, test sets, and test cases.
- Establish procedures
Write test procedures (steps to actually perform tests). Specific procedures are described within each test case or test script. These procedures include descriptions of how to set up the test, the sequence of tests, what is being tested, the conditions needed for a specific test, and the test's expected results. Ensure that procedures are executed properly.

Generate and validate test data.

Following steps should be performed as part of this activity:

- Use/modify existing data (import/export data)
- Verify data compliance (data validation)
- Create procedures to refresh data once testing begins.
- Establish verification criteria.
- Identify resources

Coordinate and review detailed test material

For this review, use a variety of techniques, including readiness review, procedure walk-throughs or reviews, dry runs.

9.2 Operational Tests and Acceptance

Purchaser (with the assistance of the Supplier) will perform following operational acceptance test on the System and its Subsystems/modules following Installation to determine whether the System and the Subsystems/modules meet all the requirements mandated for Operational Acceptance:

- Module / Function test for each specified System function (module) in isolation
- Module Integration/Interoperability Test for a group of System Functions (modules)
- Performance Test for a group of System Functions (modules)

Once User Acceptance, so called review process for individual modules/features is finished, the overall User Acceptance tests (so called Commissioning tests) can be prepared.

Successful completion of the Supplier development performance will be measured through a series of formal test performed by the Beneficiary on migrated data, and all modules/processes delivered by the Supplier.

The Commissioning acceptance test shall demonstrate that the System Supplier have met each and every requirement specified for the tested migrated data, functions, modules and reports, so that the actual transition and installation of the ROITE System and Databases within the PSA Agency will be done.

The executables of the ROITE System & Databases will be installed and then the (complete) data will be loaded.

As a result of this part of application development process, including acceptance by the PSA, the PSA system could go live, as a whole functional and operational automated system.

Prior to this application development process, the earlier specified by the Supplier hardware and Infra (if necessary) will be installed and tested within the existing infrastructure and prior to the end of this application development process. Then, also the different groups of Users will be trained.

Due to nature of the project and short delivery times, modules will be delivered for acceptance in whole duration of project according to Work Plan. Per delivered project plan there is dedicated final phase of overall/complete round of acceptance testing.

Application acceptance process consists of several steps:

- Preparation of test cases and scenarios,
- Purchaser approval of proposed scenarios,
- Purchaser testing using approved scenarios,
- Classification of errors found during acceptance testing to be performed by the Supplier,
- Error correction in specified terms to be performed by the Supplier.

The PSA acceptance will be based on type and quantity of Errors occurred during ROITE testing, that are to be classified into the following levels:

- **Error A** – serious error that cause a specified part of the system is not operational at all.
- **Error B** – error of a particular function of the system that does not cause unacceptability of system operation.
- **Error C** – error that does not cause any lack of operability of the system (for example graphical layout or grammatical misspelling).

- **New requirement** – proposal of a change in system operation, which was not mentioned in requirement analysis.

Error classification	Acceptance	Required correction
Error A	Does not allow acceptance	Must be corrected
Error B	Max. 3 error B allows acceptance	Must be corrected in specified period
Error C	Allows acceptance	Must be corrected in specified period
New requirement	Allows acceptance	New requirement will be recorded and the decision of its realization will be made following the Change Management procedure.

10. Requirements Overview (Obligations Summary Catalogue)

In this section, major requirements for both the Project and the System are listed. This section includes the requirements for which a proposal or explicit acceptance is expected, but the general description of the System provided in the whole Specs document must be considered as major requirements.

10.1. Specific Work Timeline for deliverables

The Bidder based on his approach, technology and available (ready)solutions is required to present in his Proposal a draft of Project Plan presenting all deliverables/milestones as they will be scheduled over the whole project duration.

Wherein, as the first deliverable the Detailed Project Plan must be delivered within maximum 2 Months from the contract effective date (the end of Inception Phase).

Because the various System development methods could be chosen by the various Bidders (Waterfall, Agile, OTS Ready Solution/Modules), therefore below only an example Deliverables Table, as part of Project Plan is provided. The Bidder must describe it conform his proposed System development method.

#	Scope of work	Deliverable	Time
1	Drafting the Project Plan	Overall Detailed Project Plan	Within 2 months from contract effective date
2	Requirement analysis	Needs Assessment Report regarding the existing currently at PSA Systems (SW & HW and Infra) and the specification (if required) additional minimum HW/Infra tools; Site Preparation Plan, Technical Support Facilities Plan, etc.	Needs Assessment Report & HW/Infra specs (if necessary) within 2 months from contract effective date; Other plans within 5 months
3	Preparation of real-world object catalogue	Preparation of real-world object catalogue	Within 5 months from contract effective date
4	Conceptual Data Model development	Conceptual Data Model	Within 3 months from contract effective data
5	Purchase and Supply and installation of own Software, and assuring that ROITE will work efficient, and if necessary, drafting Specs for HW and Infra incl. supervising HW Supplier delivery and installation (regarding event.	A role of System Integrator activity, incl. Software development/ Communication Plan, assuring the hardware and software installed at site to the PSA' satisfaction.	Duration of the Project

	separately purchased HW etc.)		
6	Centralized database	A Centralized ROITE database containing available spatial, attribute or statistical data sets and metadata sets ready for registration within ROITE, and after registration as legal proof of registration and related to it rights& limitations	Within 10 months from contract effective date
7	Data accessibility and transfer	As described in the Tech. Space the Utility Infra network data must be accessible in OGC compliant interoperable data format and for registration transferred/downloaded to PSA	Within 5 months from contract effective date
8	Customization of data/software	Customized data (GML)/ software code for the GIS Portal with necessary documentation	Within 5 months from contract effective date
9	Adopting of PSA e-Cadastre as GIS Portal	A web-accessible e-Cadastre GIS Portal with the above requirement/ specifications	Within 9months
10	Definition and Publishing metadata	A Web-based service for registration/ publication/ upload/ updating of metadata	Within 9 months
11	Deployment and roll-out of application software - the final version	Test Plans & Test Reports; Final Source Code; Final Design; Documents; Acceptance Document	Within 9 months
12	Installation/Adjustment the existing PSA security system	Security test report for the various database services	Within 9 months
13	User Acceptance Testing	Total System operationalization and / interoperability, Test Report	Within 10 months
14	Final deployment and roll-out of the complete system	Full developed REGISTER of Technical Constructions infrastructure Objects including online services for submission of applications and access to information, incl. interoperability with other systems and governmental platforms via Web-accessible E-Cadastre GIS Portal to the satisfaction of the PSA; integration/ interoperability Report; Acceptance Documents; Installation, Operations; Administration and User Manuals	Within 10 months
15	Training of staff	Trained staff to the satisfaction of the PSA	Within 10 months

16	System warranty	One year warranty	12 months from Operational Acceptance of the System
17	Technical Support	Technical support meaning development of additional functionalities or adjustment of the developed ones during the first 2 months of the warranty period. The cost of this effort shall be defined in person-days and provided upon necessity/request.	2 months from Operational Acceptance of the System

10.2. Overall Project Requirements

In the following chapters the list of requirements for the ROITE implementation project has been summarized.

Wherein: **M** – means **Mandatory**, **O** - means **Optional**, **P** - means **Preferable**.

10.2.1 Business requirements

Hereby, a list of major business requirements for ROITE system, also known as Business drivers, are presented.

ID	Capability	Description	Type
BR1	Building Capacity	Supporting creating the capacity for municipalities, enabling to support their legal responsibility about registration of information for technical infrastructure facilities	M
BR2	Centralized Registry	Build the centralized registry of technical infrastructure facilities	M
BR3	Cost cutting	Reduce the impact (cost, time, quality of service) of building new infrastructures for citizens and municipalities, providing a better service to citizens, for example minimizing the impact on other services when building new infrastructures.	M
BR4	Responsibilities	Allocation of responsibilities among identified authorities	M
BR5	Cooperation	Enhanced cooperation across the public authorities	M
BR6	Access to information	Smooth and controlled access to information and internet services	M
BR7	NSDI Principe	Collection and submission of information once, use many times.	M

BR 8	Utility Infra Data accessible and used	Assuring the easy on-line access to Open Utility Infra Data via ALRC NSDI Geoportal and via e-Cadastre portal for the professional user, like Utility Operators, engineering companies, spatial planners, etc.	M
BR 9	Security requirement's	The ROITE must apply the PSA Security Requirements as defined in Annex 4.	M

10.2.2 Organization requirements

ID	Capability	Description	Type
PR1	Own Project Organization	The bidder shall provide a detailed description of the project organization and management with clear division of roles and responsibilities of the bidder, subcontractors and Beneficiary.	M
PR2	Project Staff	The bidder shall provide an overview list of personnel, including of subcontractors, allocated to the project execution with the assigned positions, roles, responsibilities and required competence for each position	M
PR3	Proof of competence	The bidder shall provide a description of the project team members to proof that each member possesses sufficient competence and relevant experience for the assigned tasks	O
PR4	Staff replacement	The project team assigned to project cannot be changed without consent from PSA	M

10.2.3 Project Implementation Plan requirements

ID	Capability	Description	Type
PIP1	Project Plan	The Bidder shall propose a Project Implementation Plan based on his proposed implementation approach.	M
PIP2	Project Plan Content	The project plan shall at least include the following stages: <ol style="list-style-type: none"> 1. Inception (Discover) incl. Detail Work Plan (Activities, Deliverables, Millstones, etc. with time location) 2. System design and acceptance 3. Prototype demonstration and acceptance 4. Data preparation and access and download for development/testing purposes 5. Development of subsystems/modules) 6. Factory Acceptance Test (FAT) of each subsystem/module 7. Installation of subsystem/modules at PSA production environment 8. Testing and initial acceptance (UT-User test) 	M

		<p>9. System integration/interoperability and data access incl. download</p> <p>10. Testing of the integrated system (UAT-End User Acceptance test)</p> <p>11. Delivery of User Manuals</p> <p>12. Staff Training</p> <p>13. Pilot</p> <p>14. System roll-out</p> <p>15. Warranty conditions</p> <p>16. SLA conditions</p> <p>NB! Agile, Waterfall, as well OTS methods are allowed.</p>	
PIP3	Schedule	The Project Implementation Plan shall include the project time schedule with the stage milestones	M
PIP4	Delivery Plan	<p>Based on Bidder's development methodology, the Bidder shall provide a Delivery Plan that step-by-step specifies the deliveries. This plan shall include:</p> <ul style="list-style-type: none"> • Detailed specification of the deliverables • Timetable of deliveries • Milestones for iterations <p>NB! Based on the proposed Delivery Plan (subject of review and acceptance of Beneficiary) the Payment Plan will be adjusted/proposed (also subject of review and acceptance of Beneficiary)</p>	M
PIP5	Stage Reports	<p>For each of the initial stages: Inception, System design and prototype demonstration, the Contractor shall compile and submit individual Report with findings and recommendations for further implementation.</p> <p>The Beneficiary will be given 10 working days for acceptance or rejection of each report.</p> <p>The project cannot proceed to the next stage before the previous stage report is approved.</p> <p>The deadlines for Reports submission and time for acceptance shall be included in the Project Implementation Plan and scheduled in time</p>	M
PIP6	Monthly Report	<p>The ROITE Supplier shall provide monthly Project Progress Report (PPR) before the 7th day of the next month.</p> <p>PPR shall describe:</p> <ul style="list-style-type: none"> • Project status and any deviations from the project implementation plan, time schedule and delivery plan • Detailed plan for the following month • Proposal for revision of project plans if relevant 	M

		<ul style="list-style-type: none"> List of actions (task list) and responsibilities for special tasks to be provided both by Contractor and PSA. 	
PIP7	Tasks	<p>The ROITE Supplier shall be responsible for preparing detailed task lists for next period during the implementation of the project, which shall also include the tasks both for the Contractor and the Contracting authority and PSA.</p> <p>The information in the task list shall include:</p> <ul style="list-style-type: none"> Task description Responsible body and person Time for completion of the task Status Risks and potential mitigation measures Comments 	M
PIP8	Working Group	<p>The ROITE Supplier shall establish, call on and keep in live the Project/Working Group meetings during project implementation period at PSA site on request basis (based on project needs/developments)</p> <p>Brief minutes of meeting shall be made available to all participants and to the Project Managers of both sides.</p>	M

10.2.4 Installation and Test requirements

ITR2	Test Plan	<p>The ROITE Supplier shall deliver a Test Plan of all tests to be included in the FAT. This plan shall follow IEEE 829-2008 guidelines. The Test Plan shall contain:</p> <ul style="list-style-type: none"> A list of test scenarios (test cases) Datasets to be used for tests The roles of each party 	M
ITR3	Test Scenarios	<p>The ROITE Supplier shall prepare a list of Test scenarios which shall contain a short description of real use cases or workflows to be tested. The list of scenarios shall be approved by PSA.</p>	M
ITR4	Test Case Specs 1	<p>The ROITE Supplier shall prepare Test case specifications and provide them to the PSA for approval. The PSA shall have the right to request modifications to the test case documentation. The PSA shall have the right to use amended and expanded test cases for the User Test (UT) and End User Acceptance Test (UAT).</p>	M
ITR5	Test Case Specs 2	<p>The ROITE Supplier shall prepare test case descriptions for:</p> <ul style="list-style-type: none"> Functional tests 	M

		<ul style="list-style-type: none"> • Test of practical and all actual workflows / use cases 	
ITR6	Test Case Specs 3	<p>The test cases shall cover all test scenarios. The description shall be formatted as a step-by-step procedure (check-list), where each step is described by following information</p> <ul style="list-style-type: none"> • User function • Detail input test data • Detailed expected results from the function 	M
ITR7	Web-Services test	<p>The Contractor shall carefully test the Web-Services. The Contractor shall adopt OTS or home-made software tools for user testing of the Web-Services. The functionality of the software tool should be better or equal to SOAP-UI, http://www.soapui.org/</p>	M
ITR8	Testing/Training environment	<p>The ROITE Supplier shall develop testing, training and development environments, separated from the production system</p>	M
ITR9	FAT	<p>The ROITE Supplier shall perform FAT on all test cases. The FAT shall be documented and accepted by the PSA prior to the installation at PSA.</p>	M
ITR10	Monitoring Tests	<p>During the development period, the ROITE Supplier shall establish a test environment, which can be monitored or reviewed by the Controller on behalf of PSA.</p>	M
ITR11	User Test	<p>After installation, the User Test shall be performed at PSA and by at least one office or Internet user outside PSA. User test and acceptance shall be done after the training is completed for the relevant PSA staff.</p>	M
ITR12	Bug elimination	<p>Based on the user testing the ROITE Supplier shall correct the software and install a new version of the software. The user tests shall continue until all errors are corrected.</p>	M
ITR13	UAT	<p>When all errors are corrected, the Contractor shall participate in the UAT. The UAT shall take place no more than one week after UT has been completed. The UAT shall be executed at the premises of PSA and in at least one local office.</p>	M

10.3 Requirements overview specific for ROITE System (Registration of Infra Utilities)

10.3.1. System Functional requirements

Functional requirements listed in this section define what ROITE system will have to accomplish.

10.3.1.1 Data Load requirements

ID	Capability	Description	Type
DL1	Data Extraction	<p>In order to create the datasets for the ROITE, all the available information that ROITE will maintain must be consolidated into a single location, thus eliminating duplication, establishing better data management techniques and ensure the overall reliability of the system. There are two major forms in which relevant data comes in: Spatial and non-Spatial.</p> <p>Data extraction tools must be provided for massive registration applications, where a large number of objects and elements could be provided by the technical infrastructure facility owner (incl. earlier mentioned Database Dump).</p>	M
DL2	Data Transformation/ Conversion	<p>Assuming that all information exists in some sort of electronic format, this will require some type of transformation in order to be imported into the new database that will become the data source for the ROITE.</p> <p>It is important to include a check step which includes: Schema check (attributes, domain values), Geometry Check (no invalid geometries) and Topology Check (relations between elements according to topology rules).</p>	M
DL3	Data loading	<p>Once the information has been converted to the destination format which will be imported into the new database that supports both spatial and non-spatial data, the loading process should be performed with no significant issues, assuming that the formatting of the input data adheres to the database schema. For example, requirements for mandatory fields, uniqueness, referential integrity, etc. are all constrains that may be set by the schema, which can cause the loading to fail, should any of these constrains is validated.</p> <p>Data loading requires providing that the System will automatically or semi-automatically generate an "Technical Report" that will contain data about the object and be sent for registration signed with the digital signature – this document will serve as the basis for registration (the Technical Report template/model is attached -See Annex 3.).</p>	M
DL4	ETL Tools	<p>ETL tool must be implemented on a geoprocessing framework in order to improve interoperability and better scalability at the process level.</p> <p>ETL tools must support all business requirements and integrity rules</p>	M
DL6	Rollback	<p>A rollback feature must be available to undo a massive data load before its registration.</p>	M

DL7	Digital inventory	A digital inventory (digital map) of the technical infrastructure facilities, including all relevant information described in data-requirements of this document (both underground and above ground), must be the available as the result of the data load.	M

10.3.1.2 Object Registry requirements

ID	Capability	Description	Type
OR1	List	List objects registered	M
OR2	Search	Search objects by different criteria: <ul style="list-style-type: none"> • Spatial relation with Real Estate properties or Land Administrative limits (Location) • Topology relation • Attribute values 	M
OR3	New Objects	Register new object, including the following information: <ul style="list-style-type: none"> • Elements (geometry and alphanumeric information about each object according to defined classifiers, incl. that each type of network will be represented by assigned by PSA to it colour. • Attribute values for the object, about general characteristics of the object itself (not its elements) • Registry title supported by the digital document • Other real rights, including documents supporting that relation 	M
OR4	Update existing object	Update existing object, with the same integrity rules and content of OR3, with the exception of IDs (object ID and elements' IDs which cannot be modified in the whole lifecycle) <ul style="list-style-type: none"> • Update elements • Update attribute values of the object • Update Registry title • Update Other real rights 	M
OR5	Splitting of Object	Separation or division of objects according to business rules to be provided	M
OR6	Consolidation of objects	Consolidation or combination of objects according to business rules to be provided	M
OR7	Deleting Object	Un-register existing object	M
OR8	Object ID	Numbering elements according to defined rules, which will be different for each type of object/element. For example, water	M

		main pipes could be named as “WP-[XXX]” while electric cables could be named “EC-[XXX]”.	
OR9	Registry of Application	Receive an application request and query all information provided in order to let the register validate it. All information must be in digital format (scanning might be necessary at the office clerk desktop if hardcopy information is presented)	M
OR10	Print	Print Registry Application report	M
OR11	Decline application	Decline Registry application and notify to the client	M
OR12	Extend duration	Extend the registration term, including the notification to client, and generation of digitally signed resolution (see Digital Signature requirements).	M
OR13	Ownership validation	Check and validate ownership of objects to be registered by type of infrastructure. That is to say, operators or local/regional administrations (LPA’s) will only be able to apply for a registration of infrastructure objects according to their activities (for example, an electronic communication company will not be able to register a water pipe unless otherwise stated) and competences (LPA will not be able to register a national infrastructure).	M
OR14	Validation of registration objects	For LPAs, check and validate Registry of objects only within their administrative geographic limits.	M
	Object history	History of Object status will be stored; E.g. After the 1 st Registration any new update will become an Active and old needs goes the History/Archive Database. The relation between new and old Object version will be maintained, allowing at any moment performing so-called historic snap-shoots.	
OR15	Rural communal infrastructure management	At level of rayons, allow inter-village operators that shall manage the rural communal infrastructure	M

10.3.1.3. Payment Support/Automation requirements

ID	Capability	Description	Type
PS1	Cost calculation	Calculate the service cost	M
PS2	Payment receipt	Generate receipt for payment	M
PS3	Payment registration	Register payment receipt	M

PS4	Electronic payments	Support all type of electronic payment methods incl. the most recognized Credit Cards	O
PS5	MPay	Use of governmental platform MPay	M

10.3.1.4. Digital Signature requirements

ID	Capability	Description	Type
DSR1	Reading Digital signature	Read digital signature from uploaded files	M
DSR2	Verification of Digital signature	Verify the digital signature in the signed files	M
DSR3	Generating digital signature	Generate digital signature for documents created by ROITE. Digital certificate will be provided by PSA.	M
DSR4	MSign	Use of MSign platform	M

10.3.1.5. Protection Area requirements

ID	Capability	Description	Type
PA1	Protection Area calculation	Calculate the Protection Area for an object according to regulations.	M
PA2	Validation protection area	Validate an object versus Protection Areas	M
PA3	List documents	List documents supporting protection area. In this case the user could select an existing and registered protection area and get the list of the object/elements that generated it.	M
PA4	Register of Protection Area	Register Protection Area for object/elements. Inputs: <ul style="list-style-type: none"> Object ID / Element ID Document supporting right of ownership 	M

10.3.1.6. Document Management requirements

ID	Capability	Description	Type
DMR1	Document issues	Create (attach) document, including	M

		<p>Unique ID.</p> <p>File. The digital file, digitally signed or not depending on specific requirements. If available, digital signature cannot be “broken”, so no modifications can be made to the document itself.</p> <p>Metadata. Data about the document, including author, format, quality, date of creation, date of uploading, version, etc.</p>	
DMR2		Delete document. It cannot never be physically deleted any document from the system, it can be marked as “disabled” of “out of date” depending on its nature and lifecycle.	M
DMR3	Receiving doc	Get document	M
DMR4	Receiving metadata	Get metadata	M
DMR5	Update Doc	Update document (unique ID cannot be modified or deleted) File Metadata	M
DMR6	Search doc	Search document by: <ul style="list-style-type: none"> • Metadata values • Content • Object / Element 	M

10.3.1.7. Time Management requirements

ID	Capability	Description	Type
TM1	Date	Get current date	M
TM2	Set current date	Set current date of the system, which will define the information the user will see in the different forms and screens, including: <ul style="list-style-type: none"> • Spatial data (map) • Alphanumeric data • This will allow a user to see how the information that was at a certain past date. 	M
TM3	Set valid various dates	Set valid dates for: <ul style="list-style-type: none"> • Object • Element • Document • Valid dates define the existence period for an object. This requirement is closely related to OR5. 	M

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10.3.1.8. Administration requirements

ID	Capability	Description	Type
AR1	Classifier	Create Classifier	M
AR2	Update classifier	Update Classifier, adding records to existing classifiers and maintaining the history of classifiers.	M
AR3	Delete classifier	Delete Classifier	M
AR4	Search	Search and list Classifiers	M
AR5	Create role	Create role	M
AR6	Update role	Update role	M
AR7	Delete role	Delete role	M
AR8	Search	Search and list roles	M
AR9	Permissions granting	Grant permission	M
AR10	Permissions revoking	Revoke permission	M
AR11	User role	Add user to a role	M
AR12	User role	Remove User from his role	M

Note: all administration requirements might be supported by ROITE or by the actual system providing the service. In any case, the requirement is valid and must be supported by one or other system. This means that if these requirements are already provided by existing system, it will not be necessary to implement them.

10.3.1.9. Reporting requirements

ID	Capability	Description	Type
RR1	Reporting statistics	Data about tasks completed by officers will be available in BusinesCad and reporting module will extract that information and provide regular statistics of ROITE work.	M
RR2	Updates	Automatically updates of statistical reports will be available.	M

RR3	Reporting statistics	Reports with statistics of number and type of registration operations will be provided by ROITE	M
RR4	Dynamic reports	A reporting module will be implemented to allow dynamic reports to be defined by administrators of the system	M
RR5	Reports of massive data loads	Reports of massive data loads (Database dumps) will be generated, including the list of: <ul style="list-style-type: none"> • Registers successfully created • Geometry errors • Document errors • Topology errors • Other errors 	M
RR6	Application report	The system will automatically generate the “Application report” that will include: <ul style="list-style-type: none"> • Description of the object, both graphic and literal • Elements • Documents provided with basic metadata (size, name, format) • Restrictions of ownership • Encumbrances 	M
RR7	Land Restrictions Report	The system will automatically generate the “Land Restrictions Report” that will include: <ul style="list-style-type: none"> • Identification of the parcel (cadastral reference, map, owner, surface, allowed uses) • List of objects within the parcel • List of restrictions in the parcel 	M

10.3.1.10. Digital mapping

ID	Capability	Description	Type
DM1	Digital data display	Digital, georeferenced data, must be displayed according to description in previous sections of this documents, including: <ul style="list-style-type: none"> • Graphical display, e.g. maps and graphs with symbols, labels or annotations. • Textual or alphanumeric display from the graphical view. • Browsing, querying and windowing (zoom in, zoom out, pan, etc.) • Data searching and retrieval, e.g. on points, lines or areas, on user defined criteria (alphanumeric or spatial) 	M
DM2	Data manipulation	Data manipulation must include:	M

		<ul style="list-style-type: none"> • Data validation and editing, e.g. checking and correction of geometries • Geometric conversion, e.g. scale changes, projection changes, map transformations, rotation • Buffer generation, e.g. calculating and defining protection zones. 	
DM3	Spatial data analysis	<p>Simple spatial data analysis must be available:</p> <ul style="list-style-type: none"> • Measurement, e.g. line length, area calculations, distance and directions. • Simple spatial topology relations must be available (overlapping, within) 	M
DM4	Query searching	<p>Search via a query on the digital map of the technical infrastructure facilities inventory must be available, including:</p> <ul style="list-style-type: none"> • Search and query objects • Search and query elements • Search and query locations (administrative zones, points of interest, etc.) 	M
DM5	Visibility of elements	<p>Visibility of elements must be managed by Users, so that information showed at any moment is relevant and allow to analyze it in the most efficient and effective way.</p>	M

10.3.1.11. Workflow requirements

ID	Capability	Description	Type
WR1	Support to Workflows	Workflows must be supported according to description provided in this document about interoperability with existing systems.	M
WR2	Workflows configuration	Workflows for business process must be configured and documented according to existing technical requirements.	M
WR3	MLog	Use of governmental platform MLog	M

10.4.1 Detail requirements for extended PSA e-Cadastre Metadata Portal

10.4.1.1 General requirements for Portal/Web and Graphics design

The table below shows the additional requirements as a set of specific general requirements for Web and Graphics design:

ID	Capability	Feature description	Type
PD1	Applicability	It is applicable for all of the user interface parts and it refers to all modules/sites.	M
PD2	Standards	W3C “Web Design and Applications standards” shall be used. https://www.w3.org/standards/webdesign/	M
PD3	User Interface	The Clients will receive User Interface that offers easy navigation, effectiveness, efficiency, and user satisfaction, and is based on ergonomic principles for the dialogue laid down the standard ISO 9241	M
PD4	Colour Scheme	The Clients shall use contrasting colours and limited number of colours for User Interface.	M
PD5	Fonts	The Clients shall use simpler typeface and limited number of Fonts for user interface. Typeface that represents the thematic of site/client shall be used.	M
PD6	Graphics	Graphics shall be used to enhance or enable the representation of an idea, feeling or theme.	M
PD7	Usability	Usability best practices shall be included and implemented. Short learning curve, easy content exploration, findability, task efficiency and user satisfaction shall be archived.	M
PD8	Privacy	Privacy best practices shall be included and implemented. Possibility for users that want or need it, to keep their personal information private and fragmented. Monitoring, logging and reporting can be set up in such a way that the data protection (like GDPR) is complied with for the privacy of the administrators as well as for customer data.	M
PD9	Visual Hierarchy	Visual hierarchy shall be used. Arranging and organizing user interface/website elements so that Visitors naturally navigate toward the most important elements first	M
PD 10	Navigability	Navigability shall be used. Intuitive navigation shall be implemented. Moving from one content/function to another should be as frictionless as possible.	M
PD 11	Consistency	Consistency shall be used. Consistent style regarding fonts, colors, quality, lighting, and proportion shall be implemented.	M
PD 12	Responsivity	Responsive design shall be used. Web site has to be compatible with different devices that visitors are using.	M
PD 13	User-Centricity	User-centricity best practices shall be included and implemented.	M

ID	Capability	Feature description	Type
PD 14	Wireframe map and Mock-ups	Usage of wireframe map and Mock-ups to iterate proposals, ideas and outline solutions. The Supplier shall propose a design to be approved by the PSA before implementation.	M
PD 15	Logo	Logo redesign for Moldovan PSA Utility Infra Register to be in line and consistent to other building elements of user interface/web site.	O

10.4.1.2 Additional, general Requirements for e-Cadastre Portal/Website

ID	Capability	Feature description	Type
UP1	Authorization and Authentication	The component shall communicate via services with the User and Rights Management Component for user Authorization and Authentication	M
UP2	Response time	The response time shall be <5 sec for 50 parallel user/sec	M
UP3	HTTPS	HTTPS shall be used.	M
UP4	RIA support	The User interface functionality of the Utility e-Cadastre Portal-web site shall be implemented as Rich Internet Application	M
UP5	PWA	To ensure better user experience on all types of devices, the map and metadata browser application should be compatible with PWA (Progressive Web App) technology. PWA features allow to close the gap to native applications and create similar user experiences. App should include PWA features listed below: <ul style="list-style-type: none"> • High performance • Background processing in service workers in a separate thread • Access to the device's sensors (e.g. GPS) • Support for push notifications • An icon on the device 's home screen 	O
UP6	PC/Mobile Devices	The Web site user functions shall be configured to operate on all common personal computers on the market connected to the Internet. It shall also operate on Mobile devices. The Supplier shall propose a dedicated UI design for mobile devices, based on Responsive Web Design (RWD) to be approved by the PSA before implementation.	M
UP8	CMS	Content Management System (CMS) shall be used to publish and manage content on the web in an intuitive fashion	M

ID	Capability	Feature description	Type
UP9	WYSIWYG	What You See Is What You Get (WYSIWYG) editor shall be implemented	M
UP 10	Role segregation	Different roles shall be supported for administration, content creation, publishing and management of content	M
UP 11	User management	User management shall be supported.	M
UP 12	Groups management	Predefined groups for user management shall be supported. Groups management shall be supported	M
UP 13	User Interface language	Multilingualism support, minimum Romanian and Russian languages shall be available, changeable in the User interface. Deactivation for specific language should be enabled in a relatively simple way by the system administrator.	M
UP 14	Calendar	Calendar module shall be supported and configured. Adding events shall be supported and configured.	M
UP 15	Search	Content search shall be implemented	M
UP 16	Templates	Templates shall be supported. Predefined templates for specific sites shall be implemented.	M
UP 17	Content Management	Management of the content shall be possible on site and subsite level connected to roles.	M
UP 18	Flexibility of content formats	A CMS shall provide flexibility in managing and displaying content. CMS shall work with different content formats, including: <ul style="list-style-type: none"> • content pages • news items • documents • map locations • video • images • audio • data sources, charts and graphs • forms 	M
UP 19	SEO	Optimization of content for search engines shall be provided.	M
UP 20	Pools and Surveys	Pools and surveys to collect user feedback shall be implemented. Templates included.	O
UP 21	Social media	Social media interoperability shall be implemented.	O

10.4.1.3 Specific Overall System Requirements for Metadata on e-Cadastre

The table below shows the additional requirements as a set of specific overall system requirements for Metadata:

ID	Capability	Feature description	Type
MP1	Distributed and Centralized Data	<p>Generally, all metadata shall be stored by the custodian stakeholder, and brought into the PSA Metadata e-Cadastre Portal. However, some metadata sets may be stored at the source, a connection through API/Services solutions should be possible. Also, metadata as e.g. Index files for searching may also be stored centrally.</p> <p>These options must be fully supported.</p>	M
MP 2	Centralized system	<p>The system shall be implemented as a centralized modular system where all application software is located at the central system.</p>	M
MP 3	SOA, Modularity	<p>The system architecture of the Metadata Portal and its interoperability between the modules shall be implemented according to SOA principles.</p> <p>The user shall experience the total system as unified system</p> <ul style="list-style-type: none"> • The total system is an integration of independent, essential subsystems (modules) • Each subsystem is responsible and controls a defined part of the information, exclusively • The subsystems communicates and exchange data via web services <p>Note! SOA principles shall preferably also be applied within a software component within a module.</p>	M
MP 4	Intranet	<p>Internal users of the system shall have access to the system via the WAN and LAN network of the PSA.</p>	M
MP 5	Internet	<p>External Users, citizens and public users shall have access to the system via Internet</p>	M
MP 6	Web Based	<p>The User Interface of the portals shall be web- based and operate efficiently within the latest version of most common web browsers on the market.</p> <ul style="list-style-type: none"> • Internet Explorer • Edge • Firefox Mozilla • Opera 	M

ID	Capability	Feature description	Type
		<ul style="list-style-type: none"> • Safari • Chrome • Mobile (Android, iOS) 	
MP 7	Existing system platform the PSA	The Platform components shall operate in conjunction with and utilize existing systems programs running on the IT infrastructure at the PSA.	M
MP 8	Portal infrastructure	<p>The Supplier shall make inventory of existing infrastructure at PSA and if necessary, must recommend the necessary ones, assuring the optimal running of ROITE solution for the PSA (MCloud Platform)</p> <p>All necessary additional IT infrastructures, except of network, shall be described and proposed by the supplier in the offer in terms of capacity of servers and storage. Necessary capacity due to capacity and performance</p> <ul style="list-style-type: none"> • The number of virtual servers including processors, RAM-memory • Overall storage capacity and RAID configuration 	M
MP 9	High availability	<p>The system shall be resilient to system failures and provide continuous service even in the event of specific component failures through the use of multiple loads balanced individual components.</p> <p>The system must be designed to be highly available on software level. Targeted level of availability is 99% or greater.</p> <p>The Supplier shall describe in its Bid how to ensure high availability.</p>	M
MP 10	System Scalability	<p>As the number of users of the system grows, the load on system components will grow as well. It must be possible to increase the capacity of the system in the future by adding additional load balanced system components. No additional licensing costs (apart from operating system costs) should incur as a result of such capacity extension.</p> <p>The bidder shall describe in the offer how to ensure system scalability.</p>	M
MP 11	Restore databases	The Web Portal shall provide tools supporting Database restore from the Backup system	M
MP 12	Additional Backup	<p>The following Backup activities shall be provided:</p> <ul style="list-style-type: none"> • Saving archive logs 	M

ID	Capability	Feature description	Type
		<ul style="list-style-type: none"> • Saving daily increments • Weekly saving of the entire system (programs and databases). 	
MP 13	Recovery procedures	The system shall have a well-established procedure for System Recovery after break, which includes report generation regarding any exceptional data loss.	M
MP 14	Transactions and Users	The PSA Metadata e-Cadastre -Portal and Services shall have the capacity to serve normal transactions and users normal for a country like Moldova including a growth over the next years, satisfying the INSPIRE response requirements.	M
MP 15	Online Help	An Online Help system shall be delivered in the Romanian, Russian and English languages, and shall describe and illustrate all system functions. Online Help shall also be available through the F1 Function key or a one-touch link in the user interface, and be contextually sensitive so that help documentation relevant to the current screen is directly shown.	M
MP 16	Report formats	<p>Reports generated by the PSA e-Cadastre Utility Infra Portal components shall contain functionality to prepare the information in at least the following formats:</p> <ul style="list-style-type: none"> • .csv • .xml • .xlsx • .pdf • .doc 	M

10.4.1.4 Systems Administration and Management Functions

MP 17	Monitoring Tools	<p>The system shall have comprehensive monitoring tools including (but not limited to):</p> <ul style="list-style-type: none"> • Traffic statistics (hits / volume) by time period (hour, day, month ...), by web pages ... • Cumulated Statistics • Performance • Irregular and Error situations • Security Issues 	M
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		<p>All components shall be supported by monitoring tools necessary to foresee and identify the failure of any component of the portal.</p> <p>The monitoring tools shall:</p> <ul style="list-style-type: none"> • be fully configurable by administrator • have alerting mechanisms (mail, SMS), with configurable alert triggers and content • Report generation, with configurable reports 	
MP 18	Content Management of Services	The services modules shall have all necessary functionality to manage the content and availability of the services including assigning datasets from external or internal datasets to the relevant services.	M
MP 19	Editorial Content (PSA only)	<p>All the editorial sections of the Metadata Portal must be managed by the system.</p> <p>All editorial elements must be managed by the system, and shall provide a private preview of editorial contents in their final context regardless of the language.</p>	M
MP 20	Balance of HTTPS requests, Web Services	There shall be provided tools for load balancing HTTPS requests to different servers depending on the configuration, utilizing an acknowledged algorithm. (e.g. Round Robin)	M

10.4.1.5 Map and Metadata Browser and Viewer

The below requirements are applicable for ROITE specific thematic utility Metadata Browser /Viewer.

The Map and Metadata Browser and Viewer will be created in conformity with Government Decision of the Republic of Moldova nr. 738/2017 on approval of the Regulations on the Rules for creating and updating Metadata on spatial data sets and Services

https://www.legis.md/cautare/getResults?doc_id=135769&lang=ro# and

Government Decision of the Republic of Moldova nr. 737/2017 for the approval of the regulation on the rules for the creation of services network and the term of their implementation

https://www.legis.md/cautare/getResults?doc_id=135768&lang=ro#

The Table below gives an overview of the Mandatory main functionality of the Map and Metadata browser.

	Select Content (Search, Filter)	Display	Edit
Background Map	Select Package in List, Search	Always in Mapwindow	No
Spatial Extent	Bounding Box or Selected Feature Instance	Limit Map-window and filtering to Selected	N/A
Spatial Themes	Select in List, Search	Selected in Map Window	No
Feature Classes	Select in List, Search. Select in Map	Selected in Map Window	
Feature Instances	Filter, Search on attribute values. Select in Map	(Highlight Selected Feature Instances) Local Digitize	
Datasets Services Instances	Select in List, Search. Point in Map Window	Selected in Map Window	Add, delete, edit (If authorized)
	Filter, Search on metadata attribute values.	Metdataset/ Service attributes in Metadata Window	

Functional Overview Map and Metadata Browse 10.4.1.6 General requirements Metadata Tool

The table below shows the additional requirements as a set of specific general requirements for Metadata Tool. Please note, that the general Metadata for NSDI Geoportal is managed by the ALRC Agency and for the available their Metadata no any duplication in the ROITE system is required.

The below requirements are applicable for ROITE specific thematic utility Metadata, that is not available on the **NSDI Geoportal**, and/or is/will deviate from there available there data/definitions. The ROITE Metadata Tool will be synchronized with **NSDI Geoportal**, that function as national single point for international INSPIRE.

Metadata Tool will be created in conformity with Government Decision of the Republic of Moldova nr. 738/2017 on approval of the Regulations on the Rules for creating and updating Metadata on spatial data sets and Services

https://www.legis.md/cautare/getResults?doc_id=135769&lang=ru#

***NOTICE:** Map Viewer shall enable operations for anonymous public users on querying the web services (WMS, WMTS and WFS) even if they are password protected in source systems. Appropriate rights and authentication to these services will be provided by PSA.

ID	Capability	Feature description	Type
MT 1	Authorization and Authentication	The component shall communicate with services with the Digital Rights Management Component for Authorization and Authentication, for download, metadata editing and administration.	M
MT 2	User Interface	The Clients shall have a user interface that offers easy navigation, effectiveness, efficiency, and user satisfaction, and is based on ergonomic principles for the dialogue laid down the standard ISO 9241	M
MT 3	Response time	The response time shall satisfy the INSPIRE requirements.	M
MT 4	RIA	The user interface functionality of the map viewer solution shall be implemented as Rich Internet Application	M
MT 5	PWA	To ensure better user experience on all types of devices, the map and metadata browser application should be compatible with PWA (Progressive Web App) technology. PWA features allow to close the gap to native applications and create similar user experiences. App should include PWA features listed below: <ul style="list-style-type: none"> • High performance • Background processing in service workers in a separate thread • Access to the device's sensors (e.g. GPS) • Support for push notifications 	O

ID	Capability	Feature description	Type
		<ul style="list-style-type: none"> An icon on the device 's home screen 	
MT 6	Map/Image layers	<p>The Map Viewer to view the previews shall be able to display multiple map layers from the map services provided by other services (WMS, WMTS and WFS).</p> <ul style="list-style-type: none"> Raster maps Vector graphics 	M
MT 7	PC/Mobile Devices	<p>The Portals user functions shall be configured to operate on all common personal computers on the market connected to the Internet. The Web Map Viewer and Browser Component shall also operate on mobile devices.</p> <p>The Supplier shall propose a dedicated UI design for Mobile devices, based on Responsive Web Design (RWD) to be approved by the PSA before implementation.</p>	M
MT 8	Coordinate Reference System	All coordinates in the PSA Portal shall be stored in Moldavian official coordinate system.	M
10.4.1.7 Systems Administration and Management Functions			
AM1	Management and Configuration tool	<p>Shall provide configuration of data resources disseminated by all the different services including at least:</p> <ul style="list-style-type: none"> Data store and source data definition Publish / un-publish resources Service access settings 	M

10.4.1.8 Requirements to Selecting Content (Filtering)

The table below shows the additional requirements as a set of specific for Selecting (Filtering) Content:

ID	Capability	Feature description	Type
SC1	General Selection (Filtering)	<p>There shall be functionality to select background map, spatial themes and feature classes, feature instances, datasets and service instances, and spatial extent, in order to achieve:</p> <ul style="list-style-type: none"> Selected background maps, data sets and feature classes are shown in the map window. 	M

ID	Capability	Feature description	Type
		<ul style="list-style-type: none"> • Selected Feature Instances are highlighted in the map window. • Attributes of selected feature instances are shown in the feature instance list, and attribute window. • Metadata is shown in the metadata window. • Searches are limited to themes, datasets, feature classes, and spatial extent. 	
SC2	Selecting Background Map	It shall be possible to select background maps from a list.	M
SC3	Selecting Map Theme	It should be possible to select predefined map content for predefined themes, the Bidder should propose content for themes.	M
SC4	Select Spatial Extent	<p>It shall be possible to select the spatial extent display and search by:</p> <ul style="list-style-type: none"> • Set spatial extent to bounding box of selected data sets. • Set spatial extent to bounding box of selected feature instance. • Select Spatial extent by digitizing bounding box in map window. 	M
SC5	Search Criteria and Result	The default search criteria are the string with one or several words. The results contain the words in any order, and show results for close variations of the words. (Broad Search)	M
SC6	Search types	<p>Three types of search functionality shall be available:</p> <ul style="list-style-type: none"> • General Free Text Search. • Specific Search specifying feature type and criteria on one or several attributes. • Search Metadata by the geographical extent. 	M
SC7	Real time population of search list	The search list shall be populated in real time as the phrases are entered	P
SC8	Reset Selections	It shall be possible to reset each of the selection types individually, or all.	M
SC9	Wildcard	A search can be performed using a wildcard (*), AND, Or NOT operators	M
SC 10	Partly search	A search can be performed in only part of the Utility Metadata Portal for example only on one organisation	M

ID	Capability	Feature description	Type
SC 11	Filter Results	The search results can be sorted in several manners: <ul style="list-style-type: none"> • By theme • By alphabetic order • By relevance • By update date of the metadata 	M
SC 12	Export Search results	The search results can be exported to a table (*.csv/xlsx)	M
SC 13	Save results	A user can save the search and be reused at a later stage	P

10.4.1.9 Requirements to Display, Viewing and Browsing

The table below shows the additional requirements to Display, Viewing and Browsing:

ID	Capability	Feature description	Type
DV1	General Display, View and Browse	The data shall generally be viewed in four different modes: <ol style="list-style-type: none"> 1. Map 2. Attribute data 3. Metadata 4. Combination of above 	M

10.4.1.10 Requirements to functionality in Map Window

The table below shows the additional requirements to functionality in Map window.

ID	Capability	Feature description	Type
MW 1	Specification of the map view	Map view positioning shall be possible by <ul style="list-style-type: none"> • Positioning by pointing on the map • Positioning to the extent of selected feature instances 	M
MW 2	Zoom and Pan	It shall be possible to initiate Zoom and Pan via icons in the user interface.	M
MW 3	Zoom	It shall be possible to zoom the map view by defining a window on the screen.	M
MW 4	Zoom in and out	It shall also be possible to zoom in and out by scrolling the mouse wheel if existing	M
MW 5	Slide zoom	The map window shall be applied with possibility of using a slider to Zoom in and out	M

ID	Capability	Feature description	Type
MW 6	Slide zoom enable/ disable	The map window might have the possibility of enabling/disabling the slider by hiding it	M
MW 7	Zoom to selected feature	It shall be possible to zoom to selected feature instances.	M
MW 8	Select map scale	There shall be a dropdown box where it is possible to select among different present values for map scales	M
MW 9	Pan right/ left/ up /down	There shall be panning buttons on the map where it is possible to press the button showing the direction to move the map content	M
MW 10	Pan using the mouse	It shall be possible to double-click the map, and have the map cantered on the clicked point.	M
MW 11	Content on zoom levels	Datasets to be shown shall be automatically filtered or displayed based on the zoom level of the map. Filter criteria shall be configurable by administrator.	M
MW 12	Display position	The system shall be able to display the coordinates of the cursor position	M
MW 13	Direct attribute information	The map window shall show a pop-up with attributes of feature instances by mouse over. It shall be possible to turn this function off.	P
MW 14	Measure Area and Distances	There shall be functionality for measure area and distance by clicking points defining polylines or polygons.	M
MW 15	Simple digitize data to local file.	It shall be possible to digitize points, polylines and polygons to a local file, and to enter text data related to each feature. The data shall be stored in a local file in kml, gml or csv formats	M
MW 16	Image Export	It shall be possible to copy a map image from a bounding box to a clipboard or print it to pdf or jpg file.	M
MW 17	Print annotation	When printing map image it shall be possible to include title, logo, north arrow, date and time of printing, filename/database name. It shall also be possible to define page size, orientation and margins.	M
MW 18	Searching/ filtering inside datasets	It should be possible to search and filter feature class provided with WFS (OGC Filter encoding) services and display the results on a map or in a tabular form.	O

10.4.1.11 Requirements to Metadata Import and Edit

The below requirements are applicable for ROITE specific thematic utility Metadata Import and Edit that is not available on the national Geo-portal level, and/or is/will deviate from there available data/definitions and will be synchronized with national profile of metadata.

Metadata Import and Edit will be created in conformity with Government Decision of the Republic of Moldova nr. 738/2017 on approval of the Regulations on the Rules for creating and updating Metadata on spatial data sets and Services

https://www.legis.md/cautare/getResults?doc_id=135769&lang=ru# The table below shows the additional requirements to Metadata Import and Edit:

ID	Capability	Feature description	Type
MI 1	General	The Metadata editor shall offer a viewing and editing environment of forms and sub-forms to view and edit metadata. Editing shall be subject to access control.	M
MI 2	Metadata at source	Decentralized systems can deliver metadata records to the central repository while using automated tools.	M
MI 3	Bulk import	Bulk import and connection to API/Services should be possible	M
MI 4	Templates	Templates should be available for users while entering metadata	M
MI 5	Links	Metadata does not necessarily have to have a link to a dataset. In case of privacy sensitive data this can be linked to a source which can be contacted in case the users like to use the data.	M
MI 6	Metadata Profiles	The metadata editor shall support the INSPIRE Metadata model and the Moldavian Metadata profile based on INSPIRE. It shall also be possible to configure and edit other metadata profiles.	M
MI 7	Changes	There will be an option to make bulk changes to all metadata records when for example organisational names change.	M
MI 8	Validation	The editor shall have functionality for validation of metadata in accordance with defined models shall be available. Initially Moldavian profile made available by the PSA shall be validated. This should be available for individual metadata records and for validation multiple-file at the same time	M
MI 9	Compliance with Standards	Standards should be used explicitly when users enter the metadata	M
MI 10	Metadata Spatial Extent	There shall be functionality to make use of the map window to enter or exit the metadata spatial extent.	M

ID	Capability	Feature description	Type
MI 11	Bulk Exports	Bulk Exports of the Metadata should be possible	M

The table below shows a set of specific requirements to INSPIRE Discovery Services.

Discovery Services will be created according Government Decision of the Republic of Moldova nr. 378/2017 on approval of the Regulations on the Rules for creating and updating Metadata on spatial data sets and Services https://www.legis.md/cautare/getResults?doc_id=135769&lang=ro# and Government Decision of the Republic of Moldova nr. 737/2017 for the approval of the regulation on the rules for the creation of services network and the term of their implementation https://www.legis.md/cautare/getResults?doc_id=135768&lang=ro#

ID	Capability	Feature description	Type
IS 1	INSPIRE Compliance	The service shall comply with: Technical Guidance for the implementation of INSPIRE Discovery Services Version 3.1 or higher	M
IS 2	OGC Compliance	The service shall comply with the latest OGC and W3C standards: <ul style="list-style-type: none"> OGC CSW ISO AP (2.0.2) service, OAP found in http://www.opengeospatial.org/standards/cat 	M
IS 3	Harvest Option	The Publish Metadata operation shall be realized with the CSW service supporting harvesting option for the external system.	M
IS 4	Database Administration	The component shall have functionality for implementing and maintaining the metadata models of spatial data.	M
IS 5	Metadata standards	The components shall be able to comply with the following metadata standards: DCAT; GeoDCAT; ISO19115; ISO19139; ISO19110;	M
IS 6	Import/Export	The component shall have tools for import and export of Metadata, as well as harvesting other Metadata sources.	M
IS 7	Security	The component shall comply with latest security standards like TLS 1.2. Component will be able to cater with vulnerabilities like mentioned in OWASP top10 Components will have the latest security solutions for Web applications. Please see also the Annex 4 for additional security requirements.	M
IS 8	Plugin	No plugin installations will be needed for the Web application (zero footprint for users)	M

ID	Capability	Feature description	Type
IS 9	Standards	The following standards will be implemented in the tool: - OAI-PMH - RDF(a) - SOAP/XML - webdav - REST - JSON	M
IS 10	Data Repository Monitoring	It shall be provided tools to monitor the metadata data repositories general health. And include at least: <ul style="list-style-type: none"> Database access and disk access performance Database query performance Data Repository availability 	M

[10.4.1.12 General requirements for Analytics Module](#)

The below requirements are applicable for ROITE specific thematic utility Analytics (specific for this system functionalities).

The table below shows the additional requirements as a set of specific for Analytics module:

ID	Capability	Feature description	Type
AM 1	Applicability	It is applicable for all of the functional modules.	M
AM 2	Holistic view	Holistic approach shall be implemented. View of different modules and activity view per module as well as cumulative view. All logs and monitoring functions from modules shall be available thru analytics module.	M
AM 3	Centralized logs	Centralized logs shall be implemented. Analytics and display of logs at one place.	M
AM 4	Categorized logs	Categorized logs shall be implemented. Log grouping. Log categorization view within the UI.	M
AM 5	Dashboard	Dashboard style shall be implemented. To organize, store, and display important information from multiple data sources into one, easy-to-access place.	M
AM 6	Dashboard editing	Dashboard editing shall be supported and implemented. Create, edit and save dashboards functions available. Read only access to dashboard, role based.	M

ID	Capability	Feature description	Type
AM 7	Preconfigured dashboards	Preconfigured dashboards shall be supported and implemented.	M
AM 8	Modules	Modules for dashboards shall be supported and implemented. Modules for implemented web servers, database and OS shall be included.	M
AM 9	Visualisations	Visualisations shall be supported and implemented. Charts, metrics and tables shall be supported.	M
AM 10	Reports	Reports shall be implemented. Export dashboard visualisations to .pdf and .png shall be supported. Export of analysis data to .csv shall be supported.	M
AM 11	Automatically create report	Automatic generation of reports shall be implemented. Creation of reports on a schedule basis shall be implemented.	M
AM 12	Geospatial analysis	Geospatial analysis shall be supported. Option to embed map in dashboards	O
AM 13	Alerting	Alerting shall be supported. Alerts running checks on a schedule to detect conditions. Alerts managing from a single UI.	O
AM 14	Notifications	Notifications shall be supported. Notifications can be emailed or sent to other system. Notifications managing from a single UI.	O

[10.4.1.13 Requirements to the User and Rights Management](#)

The table below shows the additional requirements to the User and Rights Management:

ID	Capability	Feature description	Type
UR1	Applicability	It is applicable for all of the functional modules.	M
UR 2	Main functionality	The module shall authenticate / identify Users, and support other modules with role-based access control information	M
UR 3	Personal and system users	The module shall manage the authentication of personal users as well as system users.	M
UR 4	Holistic view	Holistic approach shall be implemented. View of different modules user and rights available from one point. View per module shall be available.	M
UR 5	SSO	Single Sign On - SSO shall be implemented. Authentication scheme that allows a user to log in with a single ID and password to any of several related, yet independent, software modules.	M

ID	Capability	Feature description	Type
UR 6	Standards	OpenID Connect and SAML 2.0 and oAuth2 shall be supported.	M
UR 7	LDAP	LDAP connection shall be supported. Connect to existing user directories.	M
UR 8	Additional functionality	The User and Rights Management Component shall provide reports and statistics regarding <ul style="list-style-type: none"> User, Roles and Groups User log on sessions and resource consumption for given time periods 	M

10.4.1.14 General requirements for PSA e-Cadastre extended Portal [Collaboration platform](#)

The table below shows the additional requirements as a set of specific for Portal Collaboration platform:

ID	Capability	Feature description	Type
PC1	Authorization and Authentication	The component shall communicate via services with the User and Rights Management Component for User Authorization and Authentication	M
PC 2	User Interface	The Clients shall have a user interface that offers easy navigation, effectiveness, efficiency, and user satisfaction, and is based on ergonomic principles for the dialogue laid down the standard ISO 9241	M
PC 3	HTTPS	HTTPS shall be used.	M
PC 4	Response time	The response time shall be <5 sec for 10 parallel user/sec	M
PC 5	RIA support	The User Interface functionality of the Utility Portal-Web site shall be implemented as Rich Internet Application	M
PC 6	PC/Mobile Devices	The Web site user functions shall be configured to operate on all common personal computers on the market connected to the Internet. It shall also operate on mobile devices. The Supplier shall propose a dedicated UI design for Mobile devices, based on Responsive Web design (RWD) to be approved by the PSA before implementation.	M
PC 7	CMS	Content Management System (CMS) shall be used to publish and manage content on the collaboration part in an intuitive way	O
PC 8	Roles for segregation	Different roles shall be supported for administration, content creation, publishing and management of content.	M

ID	Capability	Feature description	Type
PC 9	User Management	User Management shall be implemented.	M
PC 10	Groups management	Predefined Groups for user management shall be implemented. Groups management shall be supported	M
PC 11	User interface language	Multilingualism support Romanian English and Russian languages shall be available, changeable in the user interface. Deactivation for specific language should be enabled in a relatively simple way by the system administrator.	M
PC 12	Calendar	Calendar module shall be implemented. Adding events and optionally tasks shall be supported and configured.	M
PC 13	Files and Folders	Files and Folders concept of organizing and managing content shall be implemented.	M
PC 14	Search	Content search shall be implemented	M
PC 15	Teams	Teams shall be supported and implemented. Team manager can add and manage members.	M
PC 16	User Profiles	User profiles shall be supported and implemented. User profiles contain all essential info to collaborate and users input the information by themselves.	M
PC 17	Common Directory	Common Directory containing all the users and their contact information/profile shall be supported and implemented	M
PC 18	Notifications	Notifications shall be supported. Users can manage themselves notifications (email) easily.	M
PC 19	Events	Central scheduling, possibility to collaborate on preparation of an event or meeting shall be supported and implemented.	O
PC 20	Group chats	Chats per team or per project shall be supported and implemented.	O
PC 21	Tasks	Task management shall be supported and implemented. Team managers can assign people, add status and due dates.	O

10.4.2. System Non-Functional requirements

Non-functional requirements specify criteria that can be used to judge the operation of a system, rather than specific behaviours. They define how the system is supposed to be.

10.4.2.1. Data requirements

ID	Capability	Description	Type
DR1	Data model documentation	A logic and physical data model must be documented for all the entities to be maintained by this system, including all the elements described in section 3.3.1 (generalized object, element, right, protection area, etc.)	M
DR2	Data Model support	<p>In the case of data Interfaces (for example, data received in a registration application), a Data Model for the supported input or output formats must be documented.</p> <p>In this case, not only the data model but also the supported formats must be provided.</p>	M
DR3	Data integrity	Data integrity rules, including referential integrity, must be implemented according to the detailed data model	M
DR4	Geometry quality	Geometry quality rules must be implemented	M
DR5	Topology rules	Topology rules must be implemented in order to guarantee, for example, connectivity between network elements	M
DR6	Supporting data sources	Data sources to be supported: according to conceptual data model from “Classifier” georeferenced datasets for each feature type will have to be imported and managed by the system, but furthermore, non-georeferenced datasets will have to be imported and managed, including: non-referenced maps (scanned, inner plans for large building facilities), scanned documents (contracts, technical field books) and photos.	M
DR7	Support of 3D coordinates	<p>Datasets must support 3D coordinates when applicable. The precision and accuracy requested must be enough to deal with registration and restrictions of use.</p> <p>Z-Coordinates must allow registration and calculation of protection zones with the needed level of detail. No simulation or dynamic modelling accuracy levels are required.</p>	M
DR8	Support the common accuracy	Data model of the engineering infrastructure elements must support the common accuracy defined by the requirements for topographic surveys equal to M 1: 500 and higher.	M
DR9	Data registration for	<p>Data to be received with each registration application:</p> <ul style="list-style-type: none"> • Geometry and attributes of objects, elements and protection zones • Topographic control measurement data • Documents supporting rights of ownership and encumbrances 	M

10.4.2.2. Security requirements

ID	Capability	Description	Type
SR1	Controlled access	Controlled access to information at different levels: <ul style="list-style-type: none"> • Objects, elements and protection zones • Encumbrance • Right of ownership • Document 	M
SR2	Integration/Interoperability authentication / authorization	Integration/Interoperability with standard authentication / authorization system	M
SR3	Passwords	Passwords must be sent encrypted or on a secured transport protocol (never send plain text passwords on an open transport protocol –e .g. HTTP-)	M
SR4		Named User authentication for the economic operators and LPAs	M
SR5	2 stages identification	All external Users needs to undergo the 2-stage authorization (login, password and SMS or email code confirmation)	M
SR6	MPass	Use of governmental platform MPass	M
SR7	PSA Security requirements	Please view and apply the Security requirements as defined by PSA I Annex 4	M

10.4.2.3. Development Documentation requirements

ID	Capability	Description	Type
DDR1	Stage deliverables	The design stage deliverables shall include: <ul style="list-style-type: none"> • Software Design Description (SDD) • Software Requirements Specification (SRS) • Data Models 	M
DDR2	Software Requirements Specification	The Contractor must prepare the Software Requirements Specification (SRS) document according to RM Regulation RT-38370656-002:2006 “Software life-cycle” requirements. (http://lex.justice.md/md/316454)	M
DDR3	Software Design Description	The Contractor must prepare the Software Design Description (SDD) document according to RM Regulation RT-38370656 - 002:2006 “Software life-cycle” requirements. (http://lex.justice.md/md/316454)	M

DDR4	System Design	The Contractor must design the system according to regulation provided by the Law on Electronic Communications no. 241-XVI of November 15, 2007	M
DDR5	Language	Final versions of SDD and SRS shall be delivered in English, and Romanian languages.	M

10.4.2.4. System Documentation requirements

ID	Capability	Description	Type
SD1	Software Description Guide	<p>The ROITE Supplier shall deliver ROITE Software Description Guide, which shall describe the following:</p> <ul style="list-style-type: none"> • Software development environment with all the tools and means employed; • The procedures for developing and compiling, given the configuration development environment; • Implemented architectural features; • Software compilation details; • Implemented software architectural features; • Software coding standards; • Software support or for further development of ROITE; • And any other software details that will be of use for maintenance. 	M
SD2	Deployment Guide	<p>The ROITE Supplier shall deliver ROITE Deployment Guide, which shall describe the technical aspects of</p> <ul style="list-style-type: none"> • Installing; • Calibrating; • Fine-tuning; • Description of configurable parameters; • ROITE physical architecture, infrastructure and software application; <p>This guide shall be oriented towards the Technical Specialist (e.g. System Integrator, DBMS Administrator)</p>	M
SD3	System Administrator Guide	<p>The ROITE Supplier shall deliver ROITE System Administrator Guide. This guide shall support the work of the system administrators as complete as possible. The document shall include at least the following topics:</p> <ul style="list-style-type: none"> • Installation prerequisites conditions; • Installation procedure; • After installation procedures and check lists; • Database configuration and connection description; 	M

		<ul style="list-style-type: none"> • Management of roles and privileges of administrators; • Data communication management (ESB); • User management; • Backup and recovery scheme embracing Servers, Storages, communications; • Database tuning operations; • Action plan for disaster recovery. 	
SD4	Security manual	<p>The ROITE Supplier shall deliver Security manual that shall support the work of the IT security team.</p> <p>The document shall describe how the security functions work illustrates their processes.</p>	M
SD5	User Guides	<p>The ROITE Supplier shall deliver ROITE User Guides to support the main workflows for existing type of users:</p> <ul style="list-style-type: none"> • LPA • PSA • CPA (different from Cadastru SE) • Technical Infrastructure Facilities administrators 	M
SD6	Technical recommendations	<p>The ROITE Supplier shall deliver ROITE Technical recommendations for experts responsible of topographic control dataset, which will include at least:</p> <ul style="list-style-type: none"> • Type of entities to be provided • Level of detail, accuracy and precision of control points • Spatial Reference System 	M
SD7	Language	The documents shall be delivered in Romanian language. Some specialistic documentation like Source Code description can be in English.	M
SD8	Entering data into ROITE	<p>The ROITE Supplier must prepare a document with specific requirements for entering data into ROITE according to Data-Load functional requirements. This document must include:</p> <ul style="list-style-type: none"> • Data formats • Data quality specifications (precision, accuracy) • Data contents 	

10.4.2.5. User Manuals Documentation requirements

ID	Capability	Description	Type
UM1	Module User manuals	User manuals for each subsystem/module shall be delivered simultaneously with the delivery of each subsystem/module	M

UM 2	End User Manuals	User manuals shall be focused on the End User. Must contain illustrated processes and system functions, sequences and examples of operations	M
UM 3	Updates of User Manuals	The text files containing the original text of the User Manuals shall be organized in such a way that parallel updates in all the languages will be managed easily and consistently. The update method shall be described by the bidder in the offer.	M
UM 4		Text files used for the Online Help functions and tutorials shall be available for management and parallel update in all the languages. The update method shall be described by the bidder in the offer.	M
UM 5	Language	User manuals shall be available in Romanian language.	M

10.4.2.6. Support requirements

ID	Capability	Description	Type
S1	Warranty System support	The Contractor is obliged to provide system support during the warranty period and after the warranty period. The ROITE Supplier is obliged to offer 2 years SLA agreement for maintenance and support. The Content and the price of this SLA will be negotiated then between the parties.	M
S2	Coverage	Support covers system software and data issues.	M
S3	Levels of support	The support shall be implemented via three-level support regime: <u>1st level support</u> , by a Super-user who can give rapid help to the Users at PSA who experience a problem with the system. This requires a person who has very good knowledge of the system, who can understand the problem and give advice on what to do. <u>2nd level</u> support by an Analyst who can analyze problems that cannot be solved by the experienced User, or analyze the need for improved functionality in depth and prepare related specifications for subsequent changes to the source code; <u>3rd level</u> support by a developer who can make changes to the source code for correction of errors and for new functionality	M
S4	Support organization	The ROITE Supplier shall describe the support organization and the support procedures both at locally-based first-level support and at higher support levels.	M
S5	Timing of support	Local support shall be available from the start of the roll-out of the ROITE system	M

S6	Issue Tracking System	The Contractor shall apply an Issue Tracking System for supporting services. This system shall support the receipt of error messages from the error warning feature.	M
S7	Language	The support shall be provided in Romanian language.	M

10.4.2.7. Warranty and Maintenance requirements

ID	Capability	Description	Type
WM1	Maintenance agreement obligation	After Warranty period the ROITE Supplier is obliged to offer 2 years SLA maintenance and support (the content and price) will be then negotiated between the parties.	M
WM2	Warranty period	The Contractor shall provide a comprehensive warranty service for 1 (one) year. The warranty shall cover all software and customized applications that are delivered as parts of the software solution and database for the ROITE system. The warranty period shall begin once the End User Acceptance Test (UAT) has been positively accepted, On-the-job training of PSA staff is complete and approved by PSA and the Operational Acceptance Certificate is issued.	M
WM3	“Corrective” services	During the installation, acceptance and warranty period the contractor shall provide corrective services. The contractor shall present a proposal for error reporting and corrective services, including response times.	M
WM4	Level of support	The level of support during the warranty period shall be defined as described in table “Support Requirements” as well as Section - High Availability.	M
WM5	Origin of Warranty support	The support during the Warranty shall be implemented via locally-based first-level and second-level support, while third level support may be provided from outside Moldova.	M
WM6	Installation functions	ROITE shall have the following installation functions: <ul style="list-style-type: none"> • The system shall notify users of any forced upgrades, • The system shall have a function to forcibly stop the system, • The system shall have a function to roll-back to a previous version, • The system must perform backup before upgrading any updated objects: services, interfaces, database (if the structure is updated) • In case of unsuccessful update system should be restored to the state before updating 	M

		<ul style="list-style-type: none"> The system shall briefly notify the users about what has changed in the new version. 	

10.4.2.8. Training requirements

ID	Capability	Description	Type
T1	On-the-job Training	The ROITE Supplier shall describe how he will organize and execute the various required trainings incl. on-the-job training, ToT, etc.	M
T2	Training Plan/programme	<p>The ROITE Supplier shall prepare and execute a Training Plan/programme which shall identify timing, structure and content of the following training programmes for ROITE system:</p> <ul style="list-style-type: none"> Training of Registers, Training of Super Users, Training of PSA Web site programmer (if relevant), Training of PSA IT staff for system operation, Training of PSA Database manager Training for the End-Users (this could be the Training of Trainers (ToT) methodology) 	M
T3		The ROITE Supplier shall deliver a detailed Plan for on-the-job training and any other necessary Training courses during the Inception period.	M
T4	Close cooperation with PSA	The ROITE Supplier shall work in close cooperation with PSA and other Stakeholders identified by the PSA to ensure knowledge transfer and to build local capacity for use and maintenance of the system	M
T5	Involving PSA staff	The ROITE Supplier shall involve PSA staff when developing any system or training documentation.	M
T6	Knowledge transfer	The ROITE Supplier is obliged to deliver a knowledge transfer package which includes the Training on software development for necessary system customization (e.g. plug-in).	M
T7	Language	The training and training documentation including presentations, handouts and similar, shall be delivered in the Romanian except training documentation for System Administrators that must be in Romanian or English.	M

10.4.2.9. Interoperability requirements

ID	Capability	Description	Type
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I1	INSPIRE specifications	INSPIRE specifications about interoperability of network services must be generally followed. Any deviations need to be validated and agreed by PSA.	M
I2	SOA	System design, and specifically interfaces, must be based on Service Oriented Architecture (SOA) principles.	M
I3	e-Gov platforms	Assuring ROITE full interoperability with all e-government platforms, like PDSE, all mentioned in this Tech. Specs MPass, MPays, MLog, etc.	

10.4.2.10. High Availability requirements

ID	Capability	Description	Type
HA1	System availability	High availability of ROITE system according to details provided in previous sections.	M
HA2	Recover of system	A procedure to recover system from a general failure must be provided and tested before system acceptance	M
HA3	Test cases	Test cases must be included in the Test Plan to simulate failure of each one of the external components	M

E. IMPLEMENTATION SCHEDULE TABLE

Line Item No.	Subsystem / Item	Configuration Table No.	Site / Site Code	Delivery (Bidder to specify in the Preliminary Project Plan)	Installation (months from Effective Date)	Acceptance (months from Effective Date)	Liquidated Damages Milestone
1	Project preparation phase						
1.1	Inception Report, including analyses and Project Plan		PSA HQ		2 Months	2.5 Months	NO
1.2	Updated ROITE System Concept incl. description of re-engineered Business Processes		PSA HQ		2 Months	2.5 Months	NO
2	Development and Installation phase						
2.1	Web-Services incl. help to Utility Companies in establishing Informative Data in a standard format		PSA/Pilot Utility Operators		4 Months	5 Months	NO
2.2	Reception of Requests & Registration of Applications in PSA BusinessCad and PDSE		PSA		5 Months	6 Months	NO
2.3	ROITE functionalities for QC of Utility Network		PSA		5 Months	6 Months	NO

Line Item No.	Subsystem / Item	Configuration Table No.	Site / Site Code	Delivery (Bidder to specify in the Preliminary Project Plan)	Installation (months from Effective Date)	Acceptance (months from Effective Date)	Liquidated Damages Milestone
2.4	Complete Modules for Registration of Utility Infra incl. ROITE State Register		PSA		8 Months	9 Months	NO
2.5	Expanded e-Cadastre Portal for Public Access		PSA		9 Months	10 Months	NO
2.8	Pre-Commission plan and Test reports		PSA		9 Months	10 Months	YES
3	Transition and Commissioning phase						
3.1	Training materials		PSA		9 Months	9 Months	NO
3.2	Various System Management & Administration Training		PSA		9,5 Months	10 Months	NO
3.3	Training End Users (ToT)		PSA or Supplier Location		9.5 Months	10 Months	NO
3.4	Operational Acceptance Tests		PSA		10 Months	10 Months	NO

Line Item No.	Subsystem / Item	Configuration Table No.	Site / Site Code	Delivery (Bidder to specify in the Preliminary Project Plan)	Installation (months from Effective Date)	Acceptance (months from Effective Date)	Liquidated Damages Milestone
3.5	All documentation (User Manual (including training manuals), Quick Reference Guide, Context Sensitive On-line Help text, System Operations Guide, System Architecture Document, FAQ), including Source code and Final Report		PSA		10 Months	12 Months	NO
5	Warranty period		PSA		22 Months	22.5 months	NO
6	Technical Support during piloting		PSA		12 Months	12.5 months	No

Note: Refer to the System Inventory Table(s) for the specific items and components that constitute the Subsystems or item. Refer to the Site Table(s) below for details regarding the site and the site code. - - indicates not applicable. “Indicates repetition of table entry above.

F. SITE TABLE(S)

Site Code	Site	City / Town / Region	Primary Street Address
PSA	Public Service Agency	Chisinau, Republic of Moldova	Str. Pushkin 54
ALRC	Agency for Land Relations and Cadastre	Chisinau, Republic of Moldova	str. Serghei Lazo, 48

G. TABLE OF HOLIDAYS AND OTHER NON-WORKING DAYS

Days for each month for each year that are non-working days, due to Holidays or other business reasons (other than weekends).

Month	2023	2024
1		1, 2
2		
3		8
4	17, 24	25
5	1, 8, 9	1,6, 9, 13
6		
7		
8	31	27
9		
10	14 (Only in Chişinău)	14 (Only in Chişinău)
11		
12	25	25

System Inventory Tables

Notes on preparing the System Inventory Tables

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System Inventory Table (Recurrent Cost Items)	220

SYSTEM INVENTORY TABLE (SUPPLY AND INSTALLATION COST ITEMS)

Component No.	Component	Relevant Technical Specifications System.	Additional Site Information (e.g., building, floor, department, etc.)	Quantity
1	Project preparation phase			
1.1	Inception Report, including analyses and Project Plan	8.9	PSA HQ	1
1.2	Updated ROITE System Concept incl. description of re-engineered Business Processes	4.2, 4.3, 8.9, 10.2	PSA HQ	1
2	Development and Installation phase			
2.1	Web-Services incl. help to Utility Companies in establishing Informative Data in a standard format	3.1, 3.2, 4.1, 4.3, 4.4, 5.9, 8.1, 8.6, 8.7, 10.2	PSA/Pilot Utility Operators	Depends on number of participating Utility Operators (min. 3-4)
2.2	Reception of Requests & Registration of Applications in PSA Busines Cad and PDSE	3.2, 4.2, 4.3, 7, 8.1, 10.1	PSA	1
2.3	ROITE functionalities for QC of Utility Network	3.1, 4.1, 4.2, 4.3, 5.4, 5.7, 5.9, 1.3, 10.4	PSA	1
2.4	Complete Modules for Registration of Utility Infra incl. ROITE State Register	4.2, 4.3, 5.1, 5.4	PSA	1
2.5	Expanded e-Cadastre Portal for Public Access	3.1, 3.2, 4.2, 4.3, 4.4, 5.8, 10.1, 10.4	PSA	1
2.6	Pre-Commission plan and Test reports	9, 9.1, 9.2	PSA	1

Component No.	Component	Relevant Technical Specifications System.	Additional Site Information (e.g., building, floor, department, etc.)	Quantity
3	Transition and Commissioning phase			1 per module
3.1	Training materials	8.5, 10.1, 10,4	PSA	1 per specific course
3.2	Various Management & Administration Training	8.5, 10.1, 10,4	PSA	1 per specific course
3.3	Training End Users (TOT)	8.5, 10.1, 10,4	PSA or Supplier Location	1 per specific course
3.4	Operational Acceptance Tests	8.7, 9, 9.2, 10.1, 10.2, 10,4	PSA	1
3.5	All documentation (User Manual (including training manuals), Quick Reference Guide, Context Sensitive On-line Help text, System Operations Guide, System Architecture Document, FAQ), including Source code and Final Report	8.2, 8.8, 8.9, 10,1, 10.4	PSA	1
5	Warranty period	8.9, 8.11, 8.12	PSA	12 months

SYSTEM INVENTORY TABLE (RECURRENT COST ITEMS)

Component No.	Component	Relevant Technical Specifications No.	Y1 Warranty period
1.	Technical Support during Piloting stage	7, 7.4, 8.4, 8.6, 8.7, 8.8, 8.9, 8.12, 10.1, 10.2, 10.4	66 days

Component No.	Component	Relevant Technical Specifications No.	Y1 Warranty period
1.1	Sr. Systems Analyst		22 days
1.2	Sr. Programmer/Developer		44 days
	...		

Note: - - indicates not applicable. “ indicates repetition of table entry above.

H. ANNEXES

Annex 1



Annex 1. Selection of available PSA IT system

Signatures of the Parties

FOR THE PURCHASER

PUBLIC INSTITUTION

“PUBLIC SERVICES AGENCY”

Signed by: **Sergiu MANIC**

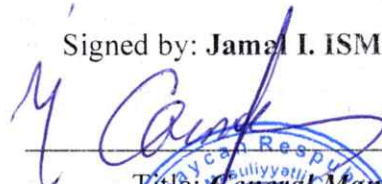

Title: **Deputy Director**




FOR THE SUPPLIER

DATUM LLC

Signed by: **Jamal I. ISMAYILOV**


Title: **General Manager**



Annex 2

Official Object Classification of Infrastructural elements

Codul	Tipul infrastructurii, tipul bunului imobil, elemente structurale	Noțiuni	Atribute specifice (ATR) /nr. clasificator
100000	Infrastructura transportului	Drum, Cale ferată, Aeroport, Port	
110000	Drum	Cale de comunicație terestră, constituită dintr-o fișie de teren specială amenajată pentru circulația vehiculelor, oamenilor și animalelor	ATR1.1, ATR2, ATR3, ATR4, ATR5.1, ATR6
110100	axa drumului	<i>locul geometric, format din linii drepte și curbe, al punctelor egal distanțate de marginile părții carosabile</i>	17
110200	construcție terestră	<i>pod, podețe, viaduct, tunel, pasarelă, etc.</i>	13
110300	intersecție	<i>loc de întretăiere a două sau mai multe drumuri, amenajat pentru înlesnirea circulației și a schimbării direcției de mers</i>	16
110400	altă (.....)	<i>zid de sprijin, etc.</i>	
120000	Calea ferată	Sistem de transport pe șine, destinat transportului de călători și mărfuri	ATR1.2, ATR2, ATR3, ATR4, ATR5.1, ATR6
120100	linia de cale ferată	<i>ansamblul de instalații și șine pe care circulă trenurile</i>	18
120200	construcție terestră	<i>Pod, tunel, zid de sprijin, canal de evacuare a apei, etc.</i>	13
120300	construcții subterane	<i>canal de evacuare a apei, etc.</i>	14
120400	Instalație de semnalizare		19
120500	altă (.....)	<i>stații de exploatare (depou, remiză....)</i>	
130000	Aeroport	Ansamblu constituit din terenul, clădirile și instalațiile necesare decolării, aterizării, manevrării, adăpostirii și întreținerii avioanelor	ATR1.3, ATR2, ATR3, ATR4, ATR5.1/5.2, ATR6
130100	pista de aterizare și rulare	<i>fâșie de teren amenajată similar unui drum și rezervată pentru aterizare și decolare a avioanelor</i>	
130200	peron	<i>construcție special amenajată pentru parcare și deservirea avioanelor</i>	
130300	altă (.....)	<i>(platforma, gard, etc.)</i>	
140000	Port	Ansamblu de construcții destinate asigurării tranzitului între căile navigabile și cele terestre, și pentru adăpostirea navelor	ATR1.4, ATR2, ATR3, ATR4, ATR5.2, ATR6
140100	chei	<i>Construcție amenajată într-un port pentru acostarea, încărcarea și descărcarea vapoarelor, servind, totodată, la consolidarea malului și la apărarea acestuia de acțiunea apelor</i>	
140200	far	<i>construcție înaltă prevăzută cu o sursă de lumină puternică, pentru semnalarea la distanță a punctelor importante situate de-a lungul liniilor de navigație maritimă.</i>	
140300	altă (.....)	<i>(gard, etc.)</i>	
200000	Infrastructura energetică	Rețele de gaze naturale, rețele electrice, rețele de energie termică, obiective pentru păstrarea și comercializarea produselor petroliere	

210000	Rețea de gaze naturale	Totalitatea sistemelor formate din conducte de transport și distribuție a gazelor naturale, compuse din stații de compresare, de predare și de măsurare și alte instalații care servesc în ansamblu la transportul și distribuția gazelor naturale	ATR1.5, ATR2, ATR3, ATR4, ATR5.1, ATR6
210100	conductă de gaze	<i>construcție executată din elemente tubulare, rigide, asamblate favorabil și etanșat, pentru a permite transportarea și distribuirea gazului natural de la sursă la consumator</i>	20,22,23,24
210200	instalații gaze naturale	<i>SPG, SC, SRG, PRG, PRGB, SMG, SDG, PPDG, etc</i>	21, 41
210300	nod de robinete	este o structură supraterană pe o rețea de conducte de gaz destinată pentru instalarea de supape care necesită inspecție și întreținere constantă în timpul funcționării	41
210400	nod de conexiune	+	
210500	construcție subterană	<i>fântină tehnică</i>	14, 41
210600	stație de alimentare cu gaze lichefiate	<i>instalații de alimentare a vehiculelor cu gaze naturale comprimate la presiunea de peste 20 MPa</i>	
210700	rezervor de GPL	<i>dispozitiv tehnologic care servește ca alimentare cu gaz pentru consumatori, inclusiv rezervoare GPL, conducte în fază lichidă și de vapori, evaporatoare, supape de control și închidere</i>	
210800	stație protecție catodică	<i>stație destinată să asigure protecția catodică a conductelor și altor structuri metalice subterane</i>	
210900	altă (.....)	<i>traversări, răsufătoare, cover, camera de primire/lansare a dispozitivelor de curățare, nod de reducere, punct de amplificare, sondă,</i>	
220000	Rețea electrică	Totalitatea instalațiilor electrice de transport și distribuție a energiei electrice, compuse din stații electrice, instalații de distribuție, linii electrice aeriene și linii electrice de cablu ce funcționează într-un anumit teritoriu	ATR1.6, ATR2, ATR3, ATR4, ATR5.1, ATR6
220100	centrală electrică	<i>Ansamblu de instalații, construcții și de echipamente necesare pentru conversia unei forme de energie în energie electrică.</i>	29, 41
220200	linie electrică	<i>linie electrică aeriană (LEA), linie electrică de cablu (LEC), linie electrică mixtă (LEAC)</i>	25, 22, 23, 27
220300	instalație electrică	<i>stație electrică, post de distribuție (PD), post de transformator (PT), punct de alimentare</i>	26, 41
220400	construcție subterană	camera de vizitare, canal de cabluri, etc.	14, 41
220500	construcție de înălțime	stâlpi, etc.	15, 28, 42
220600	Linie de contact cu două fire		
220700	Semafor		
220900	altă (.....)	<i>cutie de evidență, traversări, corp de iluminat, gard, semafor, automat pentru dirijarea circulației, etc.</i>	
230000	Rețea de energie termică	Ansamblu de instalații de producere, de rețele termice și de instalații de utilizare a energiei termice dintr-o localitate sau dintr-o zonă a unei localități, legate printr-un proces comun de funcționare, destinate producerii, distribuției și utilizării energiei termice sub formă de aburi sau de apă fierbinte.	ATR1.7, ATR2, ATR3, ATR4, ATR5.1, ATR6
230100	centru termic	instalație sau ansamblu de instalații pentru producerea energiei termice	31
230200	conducta	<i>construcție executată din elemente tubulare, rigide, asamblate convenabil și etanș pentru a permite transportul și distribuirea energiei termice de la sursă la consumatori</i>	29,22,30
230300	construcție subterană	cameră termică, canal pentru conducte, cutie, cameră de vizitare,	14, 41

230400	construcție de înălțime	turn de răcire, coș de fum	15, 41
230500	altă (.....)	cutie, nod de dirijare, traversăr, gard, etc.	
240000	Obiectiv pentru păstrarea și comercializarea produselor petroliere		ATR.1.8, ATR2, ATR3, ATR4, ATR5.2/5.3, ATR6
240100	conductă	construcție executată din elemente tubulare, rigide, asamblate convenabil și etanș pentru a permite transportul produselor petroliere	22
240200	depozit	depozit destinat depozitării și păstrării produselor petroliere	
240300	stație de pompare	ansamblu de instalații și utilaje destinate ridicării nivelului produselor petrolifere de la o cotă mai joasă la o cotă mai înaltă sau invers	
240400	rezervor	construcție staționară care permite acumularea, depozitarea unui lichid și altele.	
240500	stație catodică	stație destinată să asigure protecția catodică a conductelor și altor structuri metalice subterane	
240600	stație de alimentare cu carburanți	instalație pentru aprovizionarea automobilelor cu carburanți	
240700	altă (.....)	traversări, gard, etc.	
300000	Infrastructura comunicații electronice	Rețea de comunicații electronice	
310000	Rețea de comunicații electronice	Sisteme de transmisie, echipamente de comutare sau rutare, alte resurse care permit transmiterea semnalelor prin suport fizic, electromagnetic sau alte mijloace, incluzând rețele de comunicații prin satelit, rețele fixe (cu comutare de circuite sau comutare de pachete, inclusiv Internet) și rețele mobile terestre, rețele utilizate pentru difuzarea programelor audiovizuale, rețele de televiziune prin cablu, indiferent de tipul informației transmise.	ATR1.9, ATR2, ATR3, ATR4, ATR5.1, ATR6
310100	linie de cablu	linia de cabluri metalice sau de fibră optică, inclusiv fibra optică inactivă - „dark fiber”, situată între două puncte de acces la rețea, prin intermediul căreia se pot transporta semnale electrice, optice între echipamente ale rețelei.	32, 22
310200	conductă de cablu	conexiune subterană, aeriană, sau mixtă ce servește pentru interconectare a două sau mai multe puncte	22
310300	dulap de distribuție	element al unei rețele de comunicații electronice care face posibilă recepționarea, în rețeaua de acces, a semnalelor de comunicații audiovizuale pentru procesare și distribuție la nivel local/regional	
310400	stație de radiocomunicații	Emițătoare, receptoare cu echipamente accesorii care asigură funcționarea serviciului de radiocomunicații într-un amplasament	
310500	cabinet de comunicații electronice	reprezintă o construcție cu rol de protejare a unor echipamente specifice, amplasată de regulă pe trotuare, spații verzi sau în incintele șinișele construcțiilor	
310600	construcție subterană	Camera de vizitare	14, 41
310700	construcție de înălțime	Turn, pilon, stîlp	15, 28, 41
310800	altă (.....)	traversări, antenă, gard,	
400000	Infrastructura comunală	Rețele de aprovizionare cu apă, rețele de canalizare, sisteme de gestionare a deșeurilor, rețele transport electric, rețele iluminare stradală, rețele de semaforizare	
410000	Rețea de aprovizionare cu apă	Ansamblu de construcții, instalații, prin care apa captată dintr-o sursă naturală (râu, izvor, fântână, etc.) este tratată, transportată, înmagazinată și distribuită consumatorului cu o presiune stabilă, conform normelor de cantitate și calitate	ATR1.10, ATR2, ATR3, ATR4, ATR5.1, ATR6
410100	stație de captare (SC)	construcții și instalații care servesc pentru preluarea apei dintr-o sursă naturală	

410200	aducție	<i>o parte a unui sistem de alimentare cu apă, alcătuit din construcții și instalații, care asigură transportul apei de la captare până la stația de tratare sau la rezervorul de înmagazinare.</i>	33,22, 34
410300	conductă	<i>construcție executată din elemente tubulare, rigide, asamblate convenabil și etanș pentru a permite transportul și distribuirea apei</i>	33,22,34
410400	stație de tratare (ST) (clorinare)	<i>ansamblu de construcții și operațiuni tehnologice prin care sânt corectate caracteristicile organoleptice, fizice, chimice și bacteriologice ale apei naturale</i>	
410500	statei de pompare (SP)	<i>ansamblu de construcții, instalații și utilaje destinate ridicării nivelului apei în scopul asigurării transportului pe cale hidraulică de la o cotă mai joasă la o cotă mai înaltă</i>	
410600	statei hidrofor (SH)	<i>element al instalațiilor de ridicare a presiunii apei</i>	
410700	rezervor de înmagazinare	<i>Construcție pentru acumularea apei cu scopul compensării variațiilor orare de debit, stingerea incendiilor etc</i>	
410800	rezervor de apă	<i>construcție care permite acumularea unui anumit volum de apă și folosirea după un anumit regim.</i>	
410900	construcție subterană	<i>Fântână, cămin de vizitare,</i>	14, 41
411000	construcție de înălțime	<i>Castel de apă, etc.</i>	15, 41
411100	hidrant	<i>se axează pe conductele de serviciu, în special în intersecțiile străzilor și de-a lungul acestora, la distanța de maximum 100 m</i>	
411200	altă (.....)	<i>cișmea de stradă, traversări, gard, fântână obișnuită, etc.</i>	
420000	Rețea de canalizare	Parte a sistemului public de canalizare, alcătuită din canale colectoare, canale de serviciu, cămine, guri de scurgere și construcții anexe care asigură preluarea, evacuarea și transportul apelor de canalizare de la doi ori de la mai mulți utilizatori independenți	ATR1.11, ATR2, ATR3, ATR4, ATR5.1, ATR6
420100	colector	<i>conduce din azbociment, ceramică, fontă, polietilenă destinate colectării apelor uzate de la utilizatori.</i>	22
420200	conductă	<i>conduce de transport sub presiune al apelor uzate spre stația de epurare</i>	35,22,34
420300	state de pompare	<i>ansamblu de construcții, instalații și utilaje care asigură transportul apelor uzate spre stația de epurare</i>	41
420400	stație de epurare	<i>construcție destinată curățirii apelor uzate</i>	41
420401	<i>bazin</i>	+	
420402	<i>decantor</i>	+	
420403	<i>deznisipator</i>	+	
420404	<i>rezervor</i>	+	
420405	<i>instalație de tratare a nămolului</i>		
420406	<i>metan-tanc</i>	+	
420500	construcție subterană	<i>Cămin de vizitare, canal de evacuare, etc.</i>	14, 41
420600	bazin de retenție	<i>bazin amenajat pe rețelele de canalizare în sistem unitar sau mixt pentru a permite funcționarea uniformă a stațiilor de epurare</i>	
420700	altă (.....)	<i>diversor, rigolă pluvială, traversăr, gard, etc.</i>	
430000	Obiectiv pentru gestionarea deșeurilor		ATR1.12, ATR2, ATR3, ATR4, ATR5.2, ATR6
430100	platforma de colectare a deșeurilor	<i>Construcție sau suprafață de teren amenajată cu instalarea utilajelor pentru colectarea deșeurilor</i>	

430200	depozit de deșuri	<i>amplasament de evacuare a deșeurilor pentru depozitarea lor pe sau în pământ (în subsol)</i>	36, 41
430300	altă (.....)	<i>instalație biogaz, instalație pentru tratarea deșeurilor, etc.</i>	
500000	Altă infrastructură	Obiective al gospodăriei apelor, obiective pentru agriment, social cultural, obiective industriale, agrotehnice	
510000	Obiectiv al gospodăriei apelor	<i>La obiectivele gospodăriei apelor se referă: 1) rețele de irigare 2) rețele de desecare 3) construcții hidrotehnice: dig de protecție contra inundațiilor, baraj</i>	ATR1.16, ATR2, ATR3, ATR4, ATR5.1/5.2, ATR6
510100	conductă	<i>construcție executată din elemente tubulare, rigide, asamblate convenabil și etanș pentru a permite transportul apelor</i>	
510200	colector	<i>conducte din azbociment, ceramică, fontă, polietilenă destinate colectării apelor</i>	37
510300	stație de pompare	<i>ansamblu de construcții, instalații și utilaje destinate ridicării nivelului apei în scopul asigurării transportului pe cale hidraulică de la o cotă mai joasă la o cotă mai înaltă</i>	
510400	rezervor	<i>construcție staționară care permite acumularea, depozitarea unui lichid și altele</i>	
510500	bazin	<i>rezervor deschis, de mari dimensiuni, construit din metal, din piatră, din beton, etc.</i>	
510600	canal	<i>Conductă (construită din beton, tuburi îmbinate, șanțuri sau rigole) destinată să transporte apa la irigare, desecare sau la construcții hidrotehnice</i>	38, 38
510700	dig de protecție contra inundațiilor	<i>construcții de pământ amplasată de-a lungul unui curs de apă cu destinația pentru a apăra de inundație o localitate sau o porțiune de teren</i>	
510800	baraj	<i>construcții executată transversal direcției de curgere a unui curs de apă, pentru a crea o denivelare între bieful amonte și cel din aval și a aduna apa într-un lac de acumulare</i>	
510900	drenaj subteran		40
510900	altă (.....)	<i>drenaj subteran cu tuburi, depozit de reziduuri lichide, etc.</i>	
520000	Obiectiv pentru agrement, social cultural	<i>Obiective predestinate pentru organizarea distracțiilor, pentru activități sportive, organizării spectacolelor....</i>	ATR1.17, ATR2, ATR3, ATR4, ATR5.2, ATR6
520100	telescaun	<i>teleferic amenajat cu scaune pentru transportul persoanelor</i>	
520200	parc de distracții pentru copii	<i>instalații, utilizate cu echipamente specializate cu tracțiune electrică și/sau mecanică pentru organizarea distracțiilor pentru copii și minori</i>	
520300	stadion	<i>construcție predestinată unor activități sportive, de regulă include un teren sportiv mare cu piste de alergări pe contur și locuri pentru spectatori amplasate în trepte în jurul terenului</i>	
520400	teatru în aer liber	<i>construcție predestinată organizării spectacolelor, de regulă include o suprafață în formă de scenă înconjurată total sau parțial de locuri pentru spectatori amplasate în trepte.</i>	
520500	monument în formă de turn	<i>construcție supraterană, izolată sau alipită de altă construcție ori așezată deasupra ei, executată din lemn, din zidărie, din beton sau metal, cu înălțime relativ mare în raport cu dimensiunile bazei folosită la construcțiile civile monumentale ca elemente decorative</i>	
520600	havuz	<i>bazin de apă descoperit construit în parcuri, scuaruri</i>	
520700	altă (.....)		
530000	Obiectiv industrial/agrotehnic		ATR1.18, ATR2, ATR3, ATR4, ATR5.2, ATR6

530100	silozar	construcție destinată depozitării unor materiale necoezive, granulare sau pulverulente (cereale, semințe, făină, minereuri, cărbune, cenușă, ciment, etc.) constituită din elemente verticale numite celule, având pereți cu o înălțime care depășește cu mult dimensiunile în plan și dotată cu instalații mecanice de încărcare și descărcare prin gravitație.	
530200	buncăr	construcție destinată depozitării pe timp limitat a unor materii ale necoroziive și semifluide, pregătite a intra într-un proces de fabricație. Are o înmagazinare și dimensiuni mai reduse decât silozul.	
530300	rezervor	construcție staționară care permite acumularea, depozitarea unui lichid și altele	
530400	altă (.....)	construcție specială subterană, etc.	
540000	Altă construcție specială (.....)	Alte construcții speciale nespecificate în prezentul clasificator	ATR1.19, ATR2, ATR3, ATR4, ATR5/1/5.2/5.3, ATR6

Signatures of the Parties

FOR THE PURCHASER

PUBLIC INSTITUTION

“PUBLIC SERVICES AGENCY”

Signed by: **Sergiu MANIC**

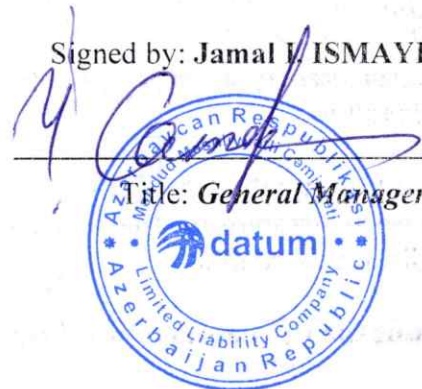


Title: **Deputy Director**

FOR THE SUPPLIER

DATUM LLC

Signed by: **Jamal ISMAYILOV**



Title: **General Manager**

Annex 3

The Technical Report of Object No. ____ to the situation in _____

The Technical Report of the Object is prepared for:

- primary registration of the technical-building infrastructure object
- modification of the data of the technical-building infrastructure object (.....)
- formation of technical-building infrastructure object (purpose)

(ID of initial purpose for the undergoing operation/performance) (operation path)

1. Data describing the technical-building infrastructure object:

Identification number from the Branch Information System:

Type of property:

Individual name:

Destinated function/usage:

Location, object address:

The basic parameters of the object (length, area, volume):

Main functionality:

2. Data about the Protection Zone:

The legal base for establishing the restrictions in the Protection Zone:

Protection Zone parameters:

3. Data about the Operator/Rights holder/Data provider):

Full name:

State Registration number:

Headquarters address:

Contacts:

4. Parameters and accuracy of the object geometric map (the digital package is attached):

Coordinate system: MOLDREF99:

Exchange format (DWG, SHP...)

The precision of determining the coordinates (x, y):

The precision of determining the coordinates (z) h:

5. Data describing the structural elements of the object:

(Informational layers, Attributive data set, Metadata info, Other GIS system info)

Digital signature

Annex 4

1. Security Requirements for ROITE

#	Feature	Technical Requirements
1	Single entry point	ROITE shall implement a Single entry point for all users. The modules in ROITE project shall utilize the single entry point for identifying and authenticating users in ROITE system. Both newly developed and integrated modules shall be included.
2	Access and Identity Management	Access and Identity Management Creation, expiration, modification of user identity data Authentication, verification that an entity claims to be using a password or biometrics or distinctive behaviour Managing authorization information that defines what operations an entity can perform in the context of a specific application.
3	Role and context based security model	ROITE shall implement a role and context based security model which makes possible controlling access rights based on the users' position, function and actual task, e.g. an officer can have access to archived documents which has direct relation to an on-going case assigned to him/her.
4	Role	The Contractor shall elaborate the list and definition of roles during the design phase.
5	Security standards	Adopt security standards, e.g. HTTPS, SSL, IPS, VPNS etc. in an optimal extent to match to the security requirements.
6	Separation of security functions	General administrative security functions shall be separated from end-user functions.
7	Contextual Authentication	The ROITE security system shall support the contextual authentication which means the authentication is a function of the location, time, device, network, application. Furthermore the application shall limit the access information to the extent of a case which is settled by the user, e.g. normal users have access only those documents in the Document Archive which are directly linked to the managed objects.
8	Contextual Authentication	Access to editing of information objects and generation of documents from the system shall be limited by the objects identified in the application submitted by client. In case if access to other objects is necessary, then this shall be recorded in the application in BusinessCad system. This should not limit viewing access to different objects.
9	Authentication external	The MOLDLIS external authentication (web portal) shall include: simple authentication by user name and password e-identification (authentication using digital certificates) and mobile e-identification (authentication via mobile technologies). M-Cloud will provide the mobile e-identification service in the future. MOLDLIS shall be able to adopt such an e-government service to identify clients (specification is available at https://mpas.gov.md).
10	Two factor authentication	The ROITE software architecture shall enable two factor authentication method which will make possible the use of special physical devices (e.g. memory token, smart cards, and biometric authentication) apart from the password confirmation. One mandatory authentication method shall include LDAP (light-weight directory access protocol)
11	Public Identification Key method	The e-government will establish a Certificate Authority (specification is available at https://mpas.gov.md) which digitally sign and publish the public key bound to a given user and provides the infrastructure for mobile phone based signatures. MOLDLIS system must be technically compatible with these services. ROITE shall be able to adopt these Public Identification Key methods. The adoption shall be based on a set up and shall not need software development or modification.
12	User id	All users (including end-users, administrators, developers) shall have a unique identifier (user ID), which must not contain signs of user access level.

13	Administration	The user ID administration shall include: 1) recognition of each user 2) the authentication of each user 3) obtain authorization from the responsible manager to issue of the user ID 4) ensuring that the user ID is issued specifically to a certain person 5) decontamination user account after a specified time period of inactivity (idle for no more than 2 months) 6) Implementation of backup copies of user Ids. 7) Setting the organizational structure of users. (Creating of organizational structure: the formation of lists) users; roles; departments and organizations; 8) Access control features (Setting permissions) Assign roles to users; · Assign privileges to roles; · bind users to roles.
14	Administration	User data and person data of ROITE must be separately managed in separated data bases by separated software application modules.
15	Authentication	The authentication process of a user (or client) shall be an interactive communication between the client and the ROITE system, which does not violate the authentication mechanism.
16	Warning at Authentication	Before granting access to the system, users should be informed that the use of information (especially personal data) is monitored and that their unauthorized use prosecuted in accordance with applicable law.
17	Passwords	All users of ROITE are responsible for their IDs and passwords: Users can choose and change their own passwords Users are blocked to access after 3 incorrect authentication attempts Previous user passwords are stored and re-use are prevented Passwords are not visible on the screen. Passwords are stored in encrypted form, using one-way encryption algorithm (function hash). During development the Contract will get access to a confidential document defining the password policy.
18	Password restoring	The ROITE shall include a mechanism for restoring of lost passwords.
19	Monitoring	ROITE shall include automated tools for recording and reporting on the creation, modification, disabling, terminate of user accounts.
20	Blocking Session	ROITE Working session regarding registers and personal data shall be blocked automatically after more than 15 minutes of user inactivity, which prevents any further access until the user unlocks the session by repeating the procedure of identification and authentication.

2. Personal Data Protection Related Requirements ROITE

1	Control of the access control	As part of user account management user roles shall have clear profiles regarding personal data management. These characteristics are managed by user account management: the type of the person related data managed, e.g. rights the context of data management, e.g. valuation operation of personal data management rights (creation, activation , modification, revision, disable and delete user accounts).
2	Control of the access control	ROITE shall make possible the Security investigation regarding the correctness and consistency of user access control by providing clear information regarding actual authentication and access regime.
3	Monitoring	ROITE tracks personal data access on various level: Officers and their tasks are recorded Officers and their actions are linked to case id Changes are linked to cases and assigned officers via case ids Database: user log and monitoring Manages log files regarding messages which access to personal data, e.g. access to the external civil register.
4	Documents including personal data	ROITE shall label electronic and paper documents with a remark how to handle the included information. Remark: This requirement of the Privacy Protection law slightly conflicts the Law on Cadastre.

		This issue is still being negotiated and result expected by the time of the implementation.
3. Other Security requirements ROITE		
1	Business Objectives	The ROITE shall include a comprehensive security framework.
	History	All registers should keep the history of information objects and other data, including id of users who made changes, date of creation and date of changing of statuses. The registers should allow to see the situation as it was in the register at a certain point in time. History must be linked to the case (including steps, I..n).
2	Protection from knowingly entering incorrect information (filter input)	In data entering interfaces there should be verifications set for numerical data entered, like numbers or dates. The system shall allow to configure verification rules, and the actions resulting from verification: to give warning only, or to prevent saving of data, in case if a verification is not passed
3	Communication between several systems	The systems integrated in ROITE shall communicate with each other to manage search, view and distribution of data.
4	Monitoring	ROITE shall provide audit component and logging facilities for monitoring system and process execution. ROITE will incorporate a Heart-beat service that will communicate regularly normal working state of the system.

Signatures of the Parties

FOR THE PURCHASER

PUBLIC INSTITUTION

“PUBLIC SERVICES AGENCY”

Signed by: **Sergiu MANIC**

Title: *Deputy Director*



FOR THE SUPPLIER

DATUM LLC

Signed by: **Jamal L. SMAYILOV**

Title: *General Manager*

