TOR FOR CONDUCT OF VARIOUS SURVEYS FOR THE PROJECT

DEVELOPMENT OF PULIVENDULA AS MODEL TOWN

January, 2021

ANDHRA PRADESH URBAN INFRASTRUCTURE ASSET MANAGEMENT LIMITED, VIJAYAWADA



I. Background

APUIAML is JV company of Government of Andhra Pradesh (GoAP) and is under Municipal Administration & Urban Development department of GoAP.

GoAP envisages to develop as a Model town. In this context, GoAP has approved multiple projects under various sectors such as Water Supply, Sewerage, Storm Water Management, roads, Solid Waste Management, Development of Lakes & Canals, urban design projects etc. APUIAML is an end to end service provider for the entire initiative. APUIAML is now is in the process of preparing DPRs and gearing up for issuance of tenders.

II. Solicitation

In this context, it is required to carry out various surveys such as Topographic survey, Geotechnical survey, Drone survey, SWM related surveys etc. for preparation of DPRs. In this regard, financial quotes are solicited to engage various survey agencies to for conduct of surveys as tabulated below. The scope of work with key ToRs, General Conditions and quote formats are annexed.

#	Survey/Survey Type	Scope of Work	
1	Topographic	Annexure 1	
2	Geotechnical Annexure 2		
3	3 Traffic Related Surveys		
3.1	Classified volume count	Annexure 3	
3.2	Turning movement count		
3.3	Road Inventory		
3.4	Parking		
4	Drone	Annexure 4	
Gene	eral Conditions	Annexure 5	
* Please note that the general conditions, payment terms, locations, units etc. are indicative.			



III. Instructions to Agencies

- a) The agencies are to quote for one or more surveys (survey types) suiting their candidature and competencies.
- b) The quotes provided shall be exclusive of applicable taxes.
- c) It is to be noted that separate Work Orders shall be given for each survey type. Therefore, APUIMAL as per its procurement policy/discretion may choose different survey agencies for each survey type.
- d) The survey agencies are to submit their quotes in sealed envelopes at the following address on or before 17:00 HRS, IST, 28.01.2021. The subject on the envelope should be – Quote for conduct for various surveys for the project – Development of Pulivendula as Model Town.

Division Head – Smart Cities Andhra Pradesh Urban Infrastructure Asset Management Limited (APUIAML), 4th Floor, NTR Administrative Block, PNBS, Vijayawada - 520013

- e) The quotes should be submitted on agencies' letterhead duly signed by the competent authority and shall have the following contact information: (i) Contact Person Name (ii) Contact Mobile No (iii) Contact email ID (iv) Contact Address
- For further clarifications, the agencies may contact Mr. Santosh Kumar Alishala on 8897518289, santosh.alishala@apurban.in
- g) This document is also available on the website www.apurban.com



KEY TOR FOR CONDUCT OF TOPOGRAPHIC SURVEY

Survey Type	Topographic Survey	
Location	Pulivendula	
~Est. Quantity	Garudala River –5 Km	
(Indicative)	Lakes – 60 acres	
	Roads – 50 Km	
Proposed Scope As under		
Deliverables	 Survey drawing on 1: 1000 scale and plotting of spot / Ground levels at thirty meters Intervals (with grid) and at sudden changes in levels and all features and spotting all utilities. Output shall be in electronic version in AutoCAD (2010 version) All levelling calculations shall be submitted in a register along with all field recording data books. All the field data and calculation work shall be done in MS- Excel. All field books, note books, CDs, drawings and other documents containing field data gathered during traverse survey shall be handed over to the client and consultant shall have no claim or use whatsoever. Soft copies of time stamped photographs of survey 	
Proposed Payment Terms	 Final payment shall be paid on actual surveyed quantities 25% Upon deployment of machinery & manpower on site 50% Upon submission of survey drawings 25% Upon approval of deliverable/s Initial payment shall be made based on the estimated quantity as given in the work order. The final payment shall be paid on based on the actual surveyed quantities and shall be adjusted according w.r.t initial payment 	

APUIAML shall facilitate in obtaining any permissions if required.

Proposed Scope

The surveys shall be carried out to capture the following using Total Station Survey. All the levels shall be carry forwarded from the nearest GTS bench mark.



- a. Roads
 - i. Longitudinal Levels @ 50m C/C
 - ii. Cross Sections at Every 100 C/C and Photos at each Junction
 - iii. All physical feature visible on ground like Electrical, Telephone, Street light poles, advertisement poles, manholes, signage boards, trees etc.
 - iv. Property Boundaries
 - v. Levels required for Carriage way Width, Median Width, Drains, Shoulder and Culverts (nos., length & dia.)
 - vi. Chainage of alignment
 - vii. Cross Section for Roads, Junctions, Rotaries, Drains, Footpaths, and Connecting roads, Manholes
 - viii. Three Levels for Strom water Drains at every 100 m interval and also at every junction (Top Level at both Ends and Invert Level)
 - ix. TBMs have to be marked with paint and the of list of TBMs along with the location sketches shall be provided. At least 30% TBMS should be preferably permanent structures.
 - x. Each town should be provided with Bench Mark Stone near the Municipal building. The mark-stones are generally 30 cm x 30 xm x 90 cm in size, and are embedded below ground 2/3rd height and 30 cm above ground.
- b. Garuala River / Canals/ Vagu / Drains
 - i. Longitudinal Levels @ 50m C/C
 - ii. Cross Sections at Every 100 C/C and Photos at each Junction. Minimum 6 points (Water Level, level at both ends, one bottom level and two levels in b/w top and bottom level).
 - iii. Total Width of Canal/ Vagu from Toe to Teo (external with a buffer zone of 10 m on either side) shall be covered and levels at Top width and toe level, width of top width are required.
 - iv. Shall capture the physical features with in the canal ROW, if any (Viz. Manholes, buildings or any other structures).
 - v. If manhole (MH) exists, Levels required at Bottom of MH, top of MH, dia of manhole etc.
 - vi. Points for Structures, Culverts, Bridges etc.,
 - 1. Max Flood Level
 - 2. No. of Openings
 - 3. Size
 - 4. Width
 - 5. U/S and D/S levels
 - vii. Pipe line Crossings with level, dia. and material



- viii. Connecting points of Road
- ix. Shall provide the Longitudinal Section and Cross sections in CAD at the intervals specified above
- x. TBMs have to be marked with paint and the of list of TBMs along with the location sketches shall be provided at least every km.
- xi. The TBM mark-stones are generally 30 cm x 30 xm x 90 cm in size, and are embedded below ground 2/3rd height and 30 cm above ground.
- c. Ulimella Lake
 - i. Boundary need to cover the total lake area as per revenue records with levels and surrounding features of lakes with a buffer zone of 20 m all sides.
 - ii. Points for approach Roads and Connecting Roads
 - iii. Minimum of 60 points with in lake for getting the depth of lakes at different points to assess the capacity of the lake.
 - iv. Area should also cover under MFL
 - v. Water Level
 - vi. All physical features visible on ground like Electrical, Telephone, Street light poles, advertisement poles, manholes, signage boards, trees, islands in lakes, bund width, toe levels gates if any etc.
 - vii. Points and mapping of Bund along with road
 - viii. Surplus Weir, control gates mapping with all hydraulic levels and dimensions
 - ix. TBMs have to be marked with paint and the of list of TBMs along with the location sketches. At least one point per lake.
 - x. The TBM mark-stones are generally 30 cm x 30 cm x 90 cm in size, and are embedded below ground 2/3rd height and 30 cm above ground.



FORMAT FOR SUBMISSION OF QUOTE

	SURVEY QUOTE			
#	Survey Type	Unit	Unit Cost (in INR Rs)	
	TOPOGRAPHIC			
1	Drains	Km		
	Canals	Km		
	Lakes	Acres		
	Roads	km		

- 1. Agencies are to submit quotes for one or more survey types suiting their candidature and competencies and mark other fields as 'NA'.
- In order for the quote to be considered for evaluation, for a particular survey type, the agency is to quote for all sub-surveys/items within it. For ex. an agency quoting for survey type "Topographic" should quote for all sub items/surveys i.e., drains, lakes, canals & roads, failing which the quote for that particular 'survey type' will not be considered for evaluation.
- 3. The quotes provided shall be exclusive of applicable taxes
- 4. The quotes should be submitted on agencies' letterhead along with cover letter duly signed by the competent authority and shall have the following contact information: (i) Contact Person Name (ii) Contact Mobile No (iii) Contact email ID (iv) Contact Address
- 5. It is to be noted that separate Work Orders shall be given for each survey type. Therefore, APUIAML as per its procurement policy/discretion may choose different survey agencies for each survey type.



KEY TOR FOR CONDUCT OF GEO TECH SURVEY

Survey Type	Geotechnical Survey	
Location	Pulivendula	
~Est. Quantity (Indicative)	Up to 10 m – 20 nos. Up to 20 m – 10 no.s	
Proposed Scope	As under	
Deliverables	Submission of Geo-Technical Investigation Report along with recommendations of foundations, water characteristics, use of soil for backfilling purpose, SBC at various depths etc.	
Proposed Payment Terms	 Estimated quantity is indicative. Agency shall quote the rate per running 'm' cost for In different soils Normal Soils In weathered rock/SDR etc. In hard rock Agency shall also indicate the rate Shifting cost with in the project area Mobilisation of equipment each time Cost of sample Since the quantity (number of locations) is more, the work may be entrusted to survey agency in different lots and Payments also shall be based on 'Lot' basis. A 'Lot' is a collection of locations that have to be surveyed together at a time. APUIAML shall finalize 'Lots' considering priority of projects. The following terms for payments are for each 'Lot'. 50% payment upon completion of survey on ground 50% payment upon acceptance of Deliverables Initial payment shall be made based on the estimated quantity as given in the work order. The final payment shall be paid on based on the actual surveyed quantities and shall be adjusted according w.r.t initial payment.	



Proposed Scope

The survey agency shall carryout the flowing tasks:

- a. Mobilization of equipment and personnel to the project site, setting up the equipment and carrying out the field investigation and demobilization of the same after completion of fieldwork
- b. All the labor, rig, water or any other equipment/infrastructure/material required for making borehole, transportation to site/ laboratory has to be arranged by the agency.
- c. The Survey Agency shall carry out borehole drilling work in all types of strata including hard rock and will take out of samples. All the samples collected from borehole needs to be stored in standard procedure/s.
- d. Drilling of Bore holes up to 15 m depth of 100-150mm/100mm diameter boring (or refusal) in all types of soil, soft disintegrated rock, rock at the identified locations in Pulivendula.
- e. Conduct of Standard Penetration test at regular depth intervals of 1.5 m upto the refusal and collect samples for further testing.
- f. Calculate the Safe Bearing Capacity of Soil for determining type and size of foundations of structures
- g. Borehole drilling and sampling for determining various parameters of foundation
- h. Recording the depth of Ground Water Table
- i. Carrying out Laboratory Investigations on representative soil samples recovered from the Borehole
- j. Submission of Report including field investigation, borehole log showing soil profile, laboratory investigations, test results, interpretation of test results, datasheets, graphical representation of soil parameters, relevant maps and drawings, conclusions and recommendations for ground improvement, net safe bearing capacity of soil, type of foundation etc.
- k. The method of taking samples and the tests on soil samples shall be conducted as per relevant Indian Standard Code of practice.
- It is to be noted that visual examination of the soil exposed in suitably located trial pits at the site, combined with already established data for different types of soil is commonly used for deciding on the safe bearing capacity. While this procedure may be adequate for light or less important structures under normal conditions, relevant laboratory tests or field tests are essentially to be carried in the case of unusual soil types and for all heavy and important structures.
- m. All investigations should be done with the directions of APUIAML



DEVELOPMENT OF PULIVENDULA AS MODEL TOWN

FORMAT FOR SUBMISSION OF QUOTE

	SURVEY QUOTE			
#	Survey Type	Unit	Unit Cost (in INR)	
1	GEOTECHNICAL			
1.1	Mobilization of Hydraulic drilling rig with all accessories like drill rods, casing pipes, S.P.T. equipment etc., which are required for boring and sample collection.	Each Rig		
1.2				
	Drilling of bore holes upto 15m depth of 100-150mm/100mm diameter all types of:	Boring in		
1.3	Soil	Per RMT		
	Soft Rock or Gravel (SDR)	Per RMT		
	Hard Rock	Per RMT		
1.4	Carrying out standard penetration test (SPT) as per IS: 2131-1963, at site at every $1\frac{1}{2}$ m depth up to the refusal.	Each		
1.5	Conducting laboratory analysis with Applicable tests on the collected samples a) Grain size analysis b) Atterberg Limits, N.M.C & Density c) Specific gravity d) Direct shear test	LS		

- 1. Agencies are to submit quotes for one or more survey types suiting their candidature and competencies and mark other fields as 'NA'.
- In order for the quote to be considered for evaluation, for a particular survey type, the agency is to quote for all sub-surveys/items within it. For ex. an agency quoting for survey type "Topographic" should quote for all sub items/surveys i.e., drains, lakes, canals & roads, failing which the quote for that particular 'survey type' will not be considered for evaluation.
- 3. The quotes provided shall be exclusive of applicable taxes
- 4. The quotes should be submitted on agencies' letterhead along with cover letter duly signed by the competent authority and shall have the following contact information: (i) Contact Person Name (ii) Contact Mobile No (iii) Contact email ID (iv) Contact Address
- 5. It is to be noted that separate Work Orders shall be given for each survey type. Therefore, APUIAML as per its procurement policy/discretion may choose different survey agencies for each survey type.



KEY TOR FOR CONDUCT OF TRAFFIC & TRANSPORT RELATED SURVEYS

Classified Volume Count (CVC)		
Pulivendula		
At all major roads & junctions (shall be finalised as per client requirements)		
Duration : These surveys shall be conducted at the points identified for one day/s for 16 hrs duration on a week day.		
Surveying : Counting of vehicles classified by the type of vehicle during the specified duration. At each identified point, both directional counts will be carried out by vehicle type. i.e. cars, jeeps, vans, buses, trucks, Multi-Axle Vehicles (MAVs), Light Carrier Vehicles (LCVs), tractors, motorized two wheelers, slow-moving vehicles etc.		
 Survey data duly filled in format (as mutually finalised) in MS Exc format Filled in survey formats (hard copies) Timestamped site photographs form site while surveying 		
 50% payment upon completion of survey on ground 50% payment upon acceptance of Deliverables Initial payment shall be made based on the estimated quantity as given in the work order. The final payment shall be paid on based on the actual surveyed quantities and shall be adjusted according w.r.t initial payment. 		

Survey Type	Turning Movement Count (CVC)	
Location	Pulivendula	
~Est. Quantity (Indicative)	At all major roads & junctions (shall be finalised as per client requirements)	



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Proposed Scope	 Duration: These surveys shall be conducted at the points identified for one day/s for 16 hrs duration on a week day. Surveying: Counting of vehicles covering all turning movements classified by the type of vehicle (i.e. cars, jeeps, vans, buses, trucks, Multi-Axle Vehicles (MAVs), Light Carrier Vehicles (LCVs), tractors, motorized two wheelers, slow-moving vehicles etc.) during the specified duration at each identified point. 		
Deliverables	 Survey data duly filled in format (as mutually finalised) in MS Excel format Filled in survey formats (hard copies) 		
	Timestamped site photographs form site while surveying		
Proposed	• 50% payment upon completion of survey on ground		
Payment Terms	• 50% payment upon acceptance of Deliverables		
	• Initial payment shall be made based on the estimated quantity as given in the work order. The final payment shall be paid on based on the actual surveyed quantities and shall be adjusted according w.r.t initial payment.		
APUIAML shall fa	APUIAML shall facilitate in obtaining any permissions if required.		

Survey Type	Parking Number Plate Surveys (On street & Off-street)			
Location	Pulivendula			
~Est. Quantity (Indicative)	At all major roads & junctions (shall be finalised as per client requirements)			
Proposed Scope	Duration : These surveys shall be conducted at the points identified for one day/s for 16 hrs duration on a week day.			
	Surveying : On/off street parking surveys will be carried out at identified locations. Enumerators are to note the vehicle type and registration number of parked vehicles every 1/4 hour. Information will also be collected on associated parking fees (if any).			
Deliverables	 Survey data duly filled in format (as mutually finalised) in MS Excel format Filled in survey formats (hard copies) Timestamped site photographs form site while surveying Peak Parking Demand Period by Location Parking Demand by Vehicle Type Parking Duration Information 			



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Proposed Payment Terms	 50% payment upon completion of survey on ground 50% payment upon acceptance of Deliverables Initial payment shall be made based on the estimated quantity as given in the work order. The final payment shall be paid on based on the actual surveyed quantities and shall be adjusted according with the initial payment. 	
quantities and shall be adjusted according w.r.t initial payment.APUIAML shall facilitate in obtaining any permissions if required.		



FORMAT FOR SUBMISSION OF QUOTE

	SURVEY QUOTE			
#	Survey Type	Unit	Unit Cost (in INR Rs)	
1.0	TRAFFIC & TRANSPORT RELATED			
1.1	CVC	No.		
1.2	TMC	No.		
1.3	Road Inventory	Km.		
1.4	Parking	No.		

- 1. Agencies are to submit quotes for one or more survey types suiting their candidature and competencies and mark other fields as 'NA'.
- In order for the quote to be considered for evaluation, for a particular survey type, the agency is to quote for all sub-surveys/items within it. For ex. an agency quoting for survey type "Topographic" should quote for all sub items/surveys i.e., drains, lakes, canals & roads, failing which the quote for that particular 'survey type' will not be considered for evaluation.
- 3. The quotes provided shall be exclusive of applicable taxes
- 4. The quotes should be submitted on agencies' letterhead along with cover letter duly signed by the competent authority and shall have the following contact information: (i) Contact Person Name (ii) Contact Mobile No (iii) Contact email ID (iv) Contact Address
- 5. It is to be noted that separate Work Orders shall be given for each survey type. Therefore, APUIAML as per its procurement policy/discretion may choose different survey agencies for each survey type.



PROPOSED KEY TOR FOR CONDUCT OF DRONE SURVEY

Pulivendula	
Pulivendula Town ~ 80 Sq. Kms	
with reference to	
uantity as given in ased on the actual .t initial payment.	

Proposed Scope

The survey agency shall carry the following tasks

- a. Drone based survey / flying aided with GCP of marked with DGPS (for collecting Ground Control Points) instrument,
- b. Post Processing of data
- c. Development of Ortho images, DSM, DTM, DEM, Contour Levels etc.
- d. Preparation of GIS Base map with all different physical layers Viz. poles, electrical, telephone, footpath, right of way, carriage way, road center line, vegetation, water bodies, canals, elevations, DGPS points, boundary etc.



FORMAT FOR SUBMISSION OF QUOTE

SURVEY QUOTE			
#	Survey Type	Unit	Unit Cost (in INR Rs)
1	DRONE		
1.1	Drone survey along with GIS mapping	Sq.Km	
1.2	DGPS survey	Nos	

- 1. Agencies are to submit quotes for one or more survey types suiting their candidature and competencies and mark other fields as 'NA'.
- In order for the quote to be considered for evaluation, for a particular survey type, the agency is to quote for all sub-surveys/items within it. For ex. an agency quoting for survey type "Topographic"

 should quote for all sub items/surveys i.e., drains, lakes, canals & roads, failing which the quote for that particular 'survey type' will not be considered for evaluation.
- 3. The quotes provided shall be exclusive of applicable taxes
- The quotes should be submitted on agencies' letterhead along with cover letter duly signed by the competent authority and shall have the following contact information: (i) Contact Person Name (ii) Contact Mobile No (iii) Contact email ID (iv) Contact Address
- 5. It is to be noted that separate Work Orders shall be given for each survey type. Therefore, APUIAML as per its procurement policy/discretion may choose different survey agencies for each survey type.



GENERAL INSTRUCTIONS TOR FOR ALL SURVEYS (as applicable)

1. General Instructions

- a) All survey work locations shall be identified and data collection shall be carried out by the survey agency in the prescribed format agreed with APUIAML.
- b) The Calibration Certificate for the instruments used shall be submitted to APUIAML
- c) All survey data sheets shall be provided to APUIAML upon completion of survey.
- d) All survey data needs to be entered by the survey agency in the format agreed with APUIAML.
- e) APUIAML representatives visiting the site shall be extended full cooperation and they shall be explained about methodology adopted and shall be appraised about the measures adopted for accuracy of work.
- f) The schedule of surveys should be approved by APUIAML before commencement of survey.
- g) The quoted rates shall be inclusive of the cost of labour, materials, equipment, transport, punching of data in prescribed format, and reports etc. and no other charges whatsoever shall be entertained in any circumstances.
- h) The number of survey locations is subject to change at the time of issue of work order.
- i) The survey agency at his cost shall ensure all safety measures and APUIAML shall hold no responsibilities in this regard.

2. Deliverables

- a) Survey data shall be submitted by the survey agency in the agreed format in agreed software.
- b) All field survey sheets, observations, drawings and other documents containing field data gathered during survey shall be handed over to the client and survey agency shall have no claim or use whatsoever. The survey agency shall not reproduce any data collected from the work in any form.
- c) Survey Data Analysis Report shall be submitted by the survey agency in the agreed format
- d) The soft copy of the drawings, database and report in Word /Excel /PPT/Dwg/PDF /shape/Dbx. Etc. format needs to be submitted at each stage along with the above.
- e) The format for submission of the data and report shall be discussed and agreed with the client and the reports shall be in submitted in the format agreed upon.
- f) No other payment shall be made towards out of pocket expenses.

3. Effecting Payment to the Survey agency

a) The payment due to the survey agency for various milestones shall be paid once APUIAML approves all the deliverables for respective milestones.



b) If services of survey agency are required for any work, not covered under this assignment, the scope and payment for the same shall be decided on mutually acceptable terms.

4. Deduction

All payments to the survey agency under the terms of engagement are subject to tax deduction at source under Income Tax Act and any other enactment that may be in force from time to time. The client will also be entitled to deduct from the payment due to any dues payable by the survey agency to the client. The client shall provide to you within prescribed time limit the appropriate tax deduction certificate evidencing payment of such taxes.

5. Execution of the Assignment

The survey agency shall keep the client informed about the progress of work.

6. Ownership of Copyright

Any deliverable prepared as part of this assignment shall be the intellectual property of the APUIAML. The drawings, specifications, documents and reports, survey formats, filled data sheets etc prepared as instruments of service shall be the property of APUIAML whether the project, for which they are made, is executed or not. APUIAML shall retain copies of the survey agency's drawings, specifications and other documents for information and use in connection with the projects.

7. Arbitration

All disputes or difference which may arise between APUIAML and the Survey agency with regard to the meaning or interpretation or things done in pursuance of executed workorder, such disputes and difference shall be resolved mutually and if required and called for the same shall be referred for arbitration, which shall be conducted as per the provisions of the Arbitration and Conciliation Act 1996. Any dispute submitted to arbitration shall be considered by a mutually acceptable sole arbitrator. In case the Parties are unable to agree & decide on a sole arbitrator, then the dispute shall be considered by three arbitrators one to be appointed by APUIAML and one to be appointed by Survey agency and the third arbitrator to be appointed jointly by the arbitrators of the Client and the Survey agency. Each Party shall bear their respective cost to be incurred on the arbitration proceedings. The decision and award of the arbitrator shall be final and binding on the Survey agency and the Client. Place of arbitration shall be Vijayawada, Andhra Pradesh

8. Indemnity

In case of any dispute, controversy, litigation, public agitation etc. connected with the with the services rendered/ being rendered by Survey agency or arising out of any matter connected with or incidental to the services provided/ or being provided by Survey agency or for any other reason, the Survey agency



shall indemnify and keep indemnified and hold APUIAML, its employees, authorized representatives, agents harmless from and against all costs, claims, damages, proceedings, liability, including fees paid to legal counsels etc. in this behalf.

9. Confidentiality

Survey agency shall not disclose to anyone either during carrying out the services or within two years after completion of this assignment, any confidential or proprietary information relating to the Project or the APUIAML's business affairs or operations without the prior written consent of APUIAML.

10. General

APUIAML may make such rules and/ or lay out such procedures as may be deemed necessary for the implementation/ administration of the terms and conditions of your employment as stated in this work order with due intimation to you and the same will be binding on you.