FIELD ENGINEERING AIDE (CODE 7228)

TASK LIST

1. Sets up various types of equipment including but not limited to tripods, tribrachs, Global Navigational Satellite System (GNSS receivers), and measuring wheels sufficient to support the measurement of lines, angles, elevations, and distances to typical survey-grade accuracy.

2. Takes precise readings and measurements using steel tapes, prisms, and measuring wheels in order to acquire survey data and/or obtain approximate work quantities.

3. Measures vertical elevations and horizontal distances using various surveying instruments and devices including but not limited to tripods, tribrachs, GNSS receivers, measuring wheels, prisms, rods, and steel tapes, in order to obtain data with the appropriate degree of accuracy.

4. Obtains vertical readings by using a surveyor's level/digital level and a rod, such as a Philadelphia, Lenkar, and Precise (lovar/invar), in order to provide accurate measurements to survey personnel, including but not limited to Land Surveying Assistants and Survey Party Chiefs.

5. Measures street crown profiles by taking vertical offset measurements sufficient for designing purposes to determine the proper elevations and grades to allow for proper street drainage.

6. Measures elevations in a body of water by using various devices, such as a: sounding chain (a cable weighted at on end) in order to measure the depth of the water by determining the elevation of the bottom; fathometer triggering device in order to obtain a measurement of depth at a known distance from a reference line; and graduated cable or tape by suspending it from a known point of elevation in order to obtain tide elevation and/or effluent readings sufficient to provide topographic information.

7. Measures horizontal distances such as streets (curb-to-curb), arc-lengths, tower spans, construction layouts, traverses, as-built, center-line ties, and stationing and offsets, using a chain, cloth tape, and/or a pocket tape in order to provide accurate information to survey personnel such as Land Surveying Assistants and Survey Party Chiefs.

8. Measures the lengths and widths of resurfacing projects, by manually rolling a "measuring wheel" in order to obtain approximate work quantities and to place orders for materials and equipment such as asphalt, base, and trucking.

9. Measures the internal and the external diameters of objects using a Vernier in order to obtain readings, such as linear measurements like length, width, diameter, and depth, with greater precision.

10. Establishes a plumb line using a plumb bob by hanging the plumb bob on the nail that is set on the mark and letting gravity draw a vertical line in order to provide a vertical point of reference and ensure a structure is centered.

11. Establishes a horizontal line of sight using a hand level by holding the device at eye level until the bubble centers on the center line in order to provide a vertical point of reference.

12. Measures vertical angles using a surveying equipment such as clinometer from a plane of reference in order to determine a degree of slope.

13. Measures horizontal 90 degree angles using a right angle prism in order to obtain stationing and offset measurements.

14. Measures tension on a chain and/or tape using a spring balance (tension handle) in order to ensure the accuracy of its use.

15. Measures temperatures of asphalt using a thermometer in order to provide accurate information to paving crew and/or paving supervisor.

16. Sets up instruments, devices, and equipment such as surveyor's levels for use in conjunction with a leveling rod in order to take vertical readings; EDM (Electronic Distance Measurement) reflectors, including the tripod, prism, and tribrach with an optical plummet, over a known point in order to prepare the equipment for surveying personnel to take reading; transits and tripods over a known point in order to prepare it for survey personnel's use; and various types of line sights on or above a known point, which may include ultra sights, light sights, can sights, cone sights, paper targets, welding rods, reflector sights, and/or butterfly sights in order to provide a point of reference.

17. Reads fluid monitoring devices in order to acquire measurements which may include installing and/or removing rain gauges using wrenches and screwdrivers to obtain rainfall measurements, manually changing paper charts on rain gauges to obtain current rainfall information, and positioning sewer-monitoring devices by manually placing them in sewer manhole locations using appropriate safety equipment, such as breathing apparatus, safety harnesses, and gloves to obtain effluent readings.

18. Sets-up safety equipment and devices such as traffic early warning devices to alert on-coming traffic that work is in progress, arrow boards on trucks and/or trailers to direct oncoming traffic, cones and/or delineators to provide a safe work area, barricades to hold up signs and/or prevent the public from accessing hazardous areas, and signs to provide instructions and/or warning, in order to ensure one’s own safety and the safety of others.

19. Fixes points of reference by driving nails, spikes, stakes and pipes, drilling holes, and painting spots on the ground surface using appropriate tools and materials, such

as hammers, star drills, gads, lieutenants (covers that provide a hitting surface), electric drills, paint, and brushes in order to affix and/or mark survey points on a variety of surfaces.

20. Lifts materials, equipment, and/or objects, such as chaining equipment, generators, manhole covers, sacks of cement, bundles of stakes, power and hand augers, and digging tools in order to load them onto vehicles and/or relocate them.

21. Digs holes using tools, such as shovels, picks, augers, digging bars, post-hole diggers, and electric jack hammers in order to locate existing survey monuments and/or place new ones.

22. Clears work sites and/or lines of vision by cutting and removing brush and debris using tools, such as brush hooks, machetes, hand saws, weed-whackers, pole-saws, lopping shears, and shovels in order to provide an adequately unobstructed work area.

23. Shovels materials, such as dirt, rock, sand, asphalt, and cement using tools such as lutes and shovels in order to mix, move, and/or spread the material.

24. Performs work in areas above and below ground levels, such as trenches, manholes, container cranes, construction sites, wharfs, water tanks, inlet-outlet towers, and crane rails by climbing, hiking, and descending ladders in order to perform specific survey related tasks.

25. Drives standard and/or automatic transmission types of vehicles, which may include ½ ton pick-up trucks, one-ton vans, one-ton trucks with utility bodies (dog houses), and 4-wheel drive trucks in order to transport equipment, materials, and/or personnel to the work site.

26. Navigates motorboats such as Boston whalers, skiffs, and punts by piloting them in order to maintain a course required for obtaining accurate soundings.

27. Performs non-mechanical vehicle maintenance, such as checking fluid levels, tire pressure, and cleanliness and either completes the necessary maintenance and/or requests it be done by appropriate personnel in order to ensure the vehicles are in operational readiness.

28. Inventories work materials, supplies, tools, and equipment by inspecting and re-stocking work vehicles in order to ensure that the vehicle is appropriately equipped.

29. Performs basic arithmetic, such as addition, subtraction, multiplication, and division in order to ensure the accuracy of numerical data, which may include survey notes, establishing street crown profiles, and/or estimating material quantities.

30. Performs mathematical computations using methods such as algebra, geometry, and trigonometry sufficient to determine angles, distances, and elevations from measured field data.

31. Performs basic trigonometry, including Pythagorean Theorem, and transcendental functions (sine, cosine, tangent, cotangent, secant, and cosecant) in order to obtain triangle solutions.

32. Counts surveys by observing pile driving work, and records data on number of diesel and/or steam driven hammer blm1is per foot and per pile, and the times at which the work is started and stopped in order to collect accurate information.

33. Records numerical and/or descriptive narrative survey information, such as differential level, and station and offset notes, and benchmark and point descriptions into field notebooks in order to provide a reference for verifying the accuracy of the information, and/or to provide rough draft field notes to other survey personnel.

34. Completes departmental work activities and/or substructure reports by writing in information, such as work quantities, descriptions, and stationing in order to provide accurate information crew's supervisor.

35. Receives written information, from supervisory personnel, which provides descriptive data specific to an assignment or task, this may include benchmark and point descriptions, manhole locations, station and offset data, cut and fill data, street guide locations, identification numbers of DWP transmission towers, and plans depicting projects construction in order to supplement verbal work instructions.

36. Receives verbal instructions and/or information such as scope of work and accuracy required for the task, from supervisory survey personnel in order to carry out survey assignments as instructed.

37. Receives and/or gives hands signals such as number gestures to other survey personnel using established survey signals in order to convey instructions and/or directions when performing survey measurements.