|  |
| --- |
| Competency Standard C: Operate Motor grader |

**Overview**: This competency standard covers the skills and knowledge required to operate a motor grader and perform different operations.

|  |  |
| --- | --- |
| **Competency Units** | **Performance Criteria** |
| **CU1. Adopt Effective listening to Skills** | ***Trainee will be able to:***1. Operate controls smoothly and safely
2. Operate different operating controls simultaneously as required
3. React to changing conditions/situations
 |
| **CU2.Apply Grading Fundamentals** | ***Trainee will be able to:***1. Apply wheel lean control
2. Apply frame articulation fundamentals
3. Select gear and engine speed
4. Apply grading tips
 |
| **CU3. Form and handle windrows** | ***Trainee will be able to:***1. Choose gear and engine speed
2. Choose blade position
3. Cut material to form a windrow
4. Move material back over area
 |
| **CU4. Strip surface materials**  | ***Trainee will be able to:***1. Estimate the height of cut and fill
2. Choose blade tilt, angel and position
3. Cut heights
4. Match blade load to available power and traction
5. Move material to low areas
6. Grade area to desired profile
 |
| **CU5. Maintain access roads** | ***Trainee will be able to:***1. Identify drainage structures, culverts and obstacles
2. Adjust windrow to allow traffic to continue
3. Choose blade position, wheel lean, articulation, gear and speed
4. Reshape and recover materials for the road surface
5. Cut shoulders and move material to center or from one side to another
 |
| **CU5. Create slopes**  | ***Trainee will be able to:***1. Identify required slope
2. Apply grade checking instruments
3. Choose blade position, wheel lean, articulation, gear and speed
4. Smooth the area at the base of the slope for smooth working platform
5. Start at the top of slope
6. Shape the shoulder accurately
 |
| **CU5. Create ditches**  | ***Trainee will be able to:***1. Identify the required profile using grade checking instruments
2. Choose blade position, wheel lean, articulation, gear and speed.
3. Shape ditch by repeated passes
 |
| **CU6. Create shouldering** | ***Trainee will be able to:***1. Choose blade position, wheel lean, articulation, gear and speed.
2. Position grader with outer tires on pavement, and inner tires just off pavement on shoulder for left side shoulder.
3. Position grader with inner tires on pavement, and outer tires just off pavement on shoulder for right side shoulder
4. Move only enough material to pavement edge to dress the shoulder
5. Roll the windrow back away from the pavement edge
6. Shape the shoulder accurately
 |
| **CU7. Form sub-grade**  | ***Trainee will be able to:***1. Choose blade tilt, angel and position
2. Match blade load to available power and traction
3. Remove unsuitable material
4. Cut and fill load bearing soils to create desired profile
5. Shape for drainage and ditch as required
 |
| **CU8. Place aggregates to specified elevations (finish grading)**  | ***Trainee will be able to:***1. Identify the required profile using grade checking instruments
2. Get the correct volume in the efficient placement
3. Position for efficient spreading
4. Get correct volume of aggregates
5. Shift the circle and blade towards the piles
6. Cut out windrows only as large as the machine can handle without tire spinning
7. Angle the blade as appropriate
8. Precise control to achieve elevations and shape to very accurate tolerances
 |
| **CU9. Clear snow and ice** | ***Trainee will be able to:***1. Choose proper attachment, as chains, V-plow, wing plow, skid shoes and wing gates
2. Identify snow type, moisture content, density, weight, depth of snow, underlying surface, weather, visibility, traffic, obstacles and hidden structures
3. Mount chain on tires carefully
4. Drive the machine in higher speed to move snow across and off the blade
 |
| **CU10. Place aggregates to specified elevations (finish grading** | ***Trainee will be able to:***1. Identify the required profile using grade checking instruments
2. Get the correct volume in the efficient placement
3. Position for efficient spreading
4. Get correct volume of aggregates
5. Shift the circle and blade towards the piles
6. Cut out windrows only as large as the machine can handle without tire spinning
7. Angle the blade as appropriate
8. Precise control to achieve elevations and shape to very accurate tolerances
 |
| **CU11. Clear snow and ice** | ***Trainee will be able to:***1. Choose proper attachment, as chains, V-plow, wing plow, skid shoes and wing gates
2. Identify snow type, moisture content, density, weight, depth of snow, underlying surface, weather, visibility, traffic, obstacles and hidden structures
3. Mount chain on tires carefully
4. 4. Drive the machine in higher speed to move snow across and off the blade
 |

**Knowledge & Understanding**

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

|  |  |
| --- | --- |
|  | Understanding basic operating control and their functions. |
|  | Describe different situations which an operator can encounter under different conditions.  |
|  | Learning smooth and safe handling of controls |
|  | Describe wheel lean control |
|  | Describe how to apply frame articulation fundamentals |
|  | Explain selection of gear and engine speed.  |
|  | Describe grading points and positions of blade for different tasks |
|  | Describe how to form a windrow and how to move material back |
|  | Explain how to cut and fill material and how to grade the surface |
|  | Describe tilting of blade and how to Match blade load to available power and traction |
|  | Describe drainage structures, culverts and obstacles |
|  | Explain how to reshape and recover materials for the road surface.  |
|  | Explain how to Cut shoulders and move material to center or from one side to another |
|  | Describe requirement and establishment of gradient and camber |
|  | Describe grade checking instruments |
|  | Explain how to smooth the area at the base of the slope |
|  | Explain layer by layer grading |
|  | Describe ditches to be made under different environment/conditions |
|  | Describe safety measures to be kept in mind while making ditch |
|  | Describe problems faced while making ditch |
|  | Describe shouldering, positioning of blade for this task and how to dress the shoulders.  |
|  | Describe sub grade and method of removal of unsuitable material |
|  | The blade position for sub grading and how to accurately perform grading of aggregates |
|  | Describe identification of profile using grade checking instruments |
|  | Positioning of machine for efficient spreading how to avoid wastage of aggregates. |
|  | Snow clearing attachments and working procedure for snow clearance with safety. |
|  | Use of chains on wheels |
|  | The procedure for identification of obstacles and hidden structures and their removal. |

**Critical Evidence(s) Required**

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

1. Control Operation of the machine with the safety.

2. Windrow Formation with proper blade position.

3. Surface Stripping for grading.

4. Maintain roads effectively.

5. Slope Creation for drainage grading.

6. Aggregate Placement for finished grading.

7. Snow and Ice Clearance maintain operational safety and access.