Drop structures are grade control structures used when a stream needs to ‘fall’ over an area of steep slope. Drop structures can stabilize the streambed and limit erosion in these areas. They provide many benefits to the stream system and stream ecosystems, including:

- Controls slope of the stream
- Reduces scour/streambed erosion and streambank erosion
- Adds oxygen to the water
- Improves fish habitat

Stream slopes vary greatly not only by region (mountains vs. plains), but also by reach. The slope of your stream may change within your property limits. There may be places where the slope is steep and the streambed and streambanks are eroding as a result. When both sides of the stream are eroding, this can often be a sign that grade control would help to solve the problem. Drop structures, or ‘drops,’ are engineered structures that stabilize a quick change in elevation in the stream.

Drop structures can be designed and built in many configurations and from many materials. An engineer will be able to help determine what configuration will be best for your reach of the stream, as well as the organisms living within it. While they can be constructed from concrete, a drop structure built from natural materials like boulders or logs will provide more benefits to the ecosystems. They will also look much more fitting in a natural setting.

Drop structures require careful engineering and design to ensure they function properly. This includes calculating how the water flows will affect the streambed and streambanks upstream and downstream of the project, as well as considering how fish can pass through the structure. When designed a drop structure, it is important to make sure that they fish species living in your area will be able to jump up the structure so they can move upstream and downstream. Sometimes, a constructed riffle can provide similar benefits to drop structures while allowing for better fish passage. The engineers will also need to calculate and analyze the structure’s impacts to the floodplain and floodway.

A drop structure will require permitting in both the design and construction phases of the project. Depending on the complexity of the project, it may make sense to work with a multi-disciplinary team. This is especially true if the drop structure is being combined with other work such as bank revegetation, aquatic habitat creation and/or bank stabilization.

When working with outside consultants on a drop structure project, it will be helpful if you can go into the conversation with some ideas about what you want the structure to look like. Doing some initial research online or by looking at other reaches of streams and rivers in person can give you a head start on this. Knowing what types of fish live in your stream will also be useful. The consultants and/or constructors should be able to discuss the design/configuration options with you, as well as the pros and cons of each option. When selecting your outside help, make sure to ask questions about similar projects they have completed. Questions about your role in the permitting process and the anticipated timeframe for permits are also important.