Basic Path Testing:

Basic pathing is able to be tested on a single local controller by adding floors to an elevator's path through the injection of floor requests. The request should be added to the elevator's list of destination floors, and the elevator should then travel to the correct floors one by one.

Floor Arrival:

The last set of functional testing deals with floor arrival. Upon arrival of a destination floor, the doors should operate as intended (opening and closing properly), and the pathing of the elevator should be modified in order to show that one of the destination floors has been reached. The floor should be removed from the path and a new destination should be set.

Concurrency Testing:

Once the basic functional testing of the elevator has been successful, one is then able to test for different system optimizations, as well as different potential unusual situations occurring. The main areas being tested in the concurrency section dealt with multiple elevators and multiple requests in different manners.

Multiple Elevators, Single Request:

When a floor request is given to a system with multiple elevators, the system should choose the elevator with the smallest path size. If multiple elevators have the same path size, the system should then prioritize the elevators that are closest to where the source request is given.

Single Elevator, Multiple Requests:

If multiple requests are given to a single elevator, the system must distinguish the requests into two categories depending on both the destination of the elevator and the current floor the elevator is located at.

Latest Request Along the Path:

In the case of an elevator at position X going to floor Y when a request for floor Z is handled, if Z is along the path of X -> Y, the elevator must add floor Z to the path such that the next floor visited is Z.

Latest Request Not Along the Path:

In the case of an elevator at position X going to floor Y when a request for floor Z is handled, if Z is not along the path of X -> Y, the elevator must add floor Z to the path such that the next floor visited is Y, and then Z.

Multiple Elevators, Multiple Requests:

With multiple requests being handled by multiple elevators in the system, the system must be able to efficiently handle all the different requests, and spread them out among the local elevator controllers. If failure with an elevator occurs, other elevator may take some of the floor requests (but not the elevator requests) to lessen the load of the non-performing elevator.